Program Change Request

New Program Proposal

Date Submitted: 09/04/17 5:21 pm

Viewing: PHD-MCMS : Ph.D. in Marine and Coastal Management and Science

Last edit: 10/05/17 2:58 pm

Changes proposed by: highfield

Contact(s)

<table>
<thead>
<tr>
<th>Name</th>
<th>E-mail</th>
<th>Phone</th>
</tr>
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<tbody>
<tr>
<td>Wesley Highfield</td>
<td><a href="mailto:highfiew@tamug.edu">highfiew@tamug.edu</a></td>
<td>409-740-4726</td>
</tr>
</tbody>
</table>

Academic level: Graduate

Effective Term: 2018-2019 Galveston

Department: Marine Science

College: Galveston Campus

Program type: Degree

Degree designation: Ph.D. - Doctor of Philosophy

With a major in: Marine & Coastal Management & Science (MCMS)

Catalog Program Title

Ph.D. in Marine and Coastal Management and Science

CIP and Fund code: 0302010002

Rationale for Proposal

The proposed Ph.D. in Marine and Coastal Management and Science is an interdisciplinary program focused on the policy and social sciences that draws on expertise from faculty members in multiple marine and coastal-related fields at Texas A&M University. Students in the program will be exposed to knowledge and research techniques related to coastal management, geospatial analysis, human impacts on coastal areas, natural and technological hazards, and legal/ethical issues. The primary goal of this program will be to provide students with the training and analytical techniques to create new knowledge and make informed policy decisions at the highest levels. The Marine and Coastal Management and Science Ph.D. will matriculate students who are poised to be leaders in coastal management fields that will not only be in demand, but also necessary to address increasingly visible and critical policy and management issues in coastal areas in Texas and worldwide.

Program hours: 64

Is this program eligible for financial aid?: No

Program delivery mode: On-campus

Proposed Program Start Date: 09/2018

Catalog Program Requirements

Program Requirements

Student's Advisory Committee
Degree Plan
Transfer of Credit
Research Proposal
Examinations
Preliminary Examination
Preliminary Examination Format
Preliminary Examination Scheduling
Report of Preliminary Examination
Retake of Failed Preliminary Examination
Final Examination
Report of Final Examination
Dissertation

In Workflow

1. MARS Department Head
2. Curricular Services Review
3. GV Committee Preparer GR
4. GV Committee Chair GR
5. GV College Dean GR
6. Provost
7. GC Preparer
8. GC Chair
9. Faculty Senate Preparer
10. Faculty Senate
11. Provost II
12. President
13. External Approval
14. Curricular Services

Approval Path

1. 09/05/17 8:49 am
   Kyeong Park (parkk): Approved for MARS Department Head

2. 09/11/17 10:39 am
   Sandra Williams (sandra­williams): Approved for Curricular Services Review

3. 09/11/17 11:17 am
   Nicole Kinslow (wilkinsn): Approved for GV Committee Preparer GR

4. 09/14/17 6:21 pm
   Antonietta Quigg (quigga): Approved for GV Committee Chair GR

5. 09/14/17 6:22 pm
   Antonietta Quigg (quigga): Approved for GV College Dean GR

6. 09/16/17 9:03 am
   Deena McConnell (djmm): Approved for Provost

7. 09/25/17 8:29 am
   LaRhesa Johnson (lrjohnson): Approved for GC Preparer

8. 10/05/17 2:58 pm
   LaRhesa Johnson (lrjohnson): Approved for GC Chair
Student’s Advisory Committee

After receiving admission to graduate studies and enrolling, the student will consult with the head of his or her major or administrative department (or chair of the intercollegiate faculty) concerning appointment of the chair of the advisory committee. The student’s advisory committee will consist of no fewer than four members of the graduate faculty representatives of the student’s several fields of study and research, where the chair or co-chair must be from the student’s department (or intercollegiate faculty, if applicable), and at least one or more of the members must have an appointment to a department other than the student’s major department. The outside member for a student in an interdisciplinary degree program must be from a department different from the chair of the student’s committee. The chair, in consultation with the student, will select the remainder of the advisory committee. Only graduate faculty members located on Texas A&M University campuses may serve as chair of a student’s advisory committee. Other Texas A&M University graduate faculty members located off-campus may serve as a member or co-chair (but not chair), with a member as the chair.

If the chair of a student’s advisory committee voluntarily leaves the University and the student is near completion of the degree and wants the chair to continue to serve in this role, the student is responsible for securing a current member of the University Graduate Faculty, from the student’s academic program and located near the Texas A&M University campus site, to serve as the co-chair of the committee. The Department Head or Chair of Intercollegiate faculty may request in writing to the Associate Provost for Graduate and Professional Studies that a faculty member who is an approved leave of absence or has voluntarily separated from the university, be allowed to continue to serve in the role of chair of a student’s advisory committee without a co-chair for up to one year. The students should be near completion of the degree. Extensions beyond the one year period can be granted with additional approval of the Dean.

The committee members’ signatures on the degree plan indicate their willingness to accept the responsibility for guiding and directing the entire academic program of the student and for initiating all academic actions concerning the student. Although individual committee members may be replaced by petition for valid reasons, a committee cannot resign en masse. The chair of the committee, who usually has immediate supervision of the student’s research and dissertation or record of study, has the responsibility for calling all meetings of the committee. The duties of the committee include responsibility for the proposed degree plan, the research proposal, the preliminary examination, the dissertation or record of study and the final examination. In addition, the committee, as a group and as individual members, is responsible for counseling the student on academic matters, and, in the case of academic deficiency, initiating recommendations to the Office of Graduate and Professional Studies.

Degree Plan

The student’s advisory committee will evaluate the student’s previous education and degree objectives. The committee, in consultation with the student, will develop a proposed degree plan and outline a research problem which, when completed, as indicated by the dissertation (or its equivalent for the degree of Doctor of Education or the degree of Doctor of Engineering), will constitute the basic requirements for the degree. The degree plan must be filed with the Office of Graduate and Professional Studies prior to the deadline imposed by the student’s college and no later than 90 days prior to the preliminary examination.

This proposed degree plan should be submitted through the online Document Processing Submission System located on the website http://ogsdpss.tamu.edu. A minimum of 64 hours is required on the degree plan for the Doctor of Philosophy for a student who has completed a master’s degree. A student who has completed a DDS/DMD, DVM or a MD at a U.S. institution is also required to complete a minimum of 64 hours. A student who has completed a baccalaureate degree but not a master’s degree will be required to complete a 96-hour degree plan. Completion of a DDS/DMD, DVM or MD degree at a foreign institution requires completion of a minimum of 56 hours for the Doctor of Philosophy. A field of study may be primarily in one department or in a combination of departments. A degree plan must carry a reasonable amount of 691 or 598/599 (research).

Additional coursework may be added by petition to the approved degree plan by the student’s advisory committee if it is deemed necessary to correct deficiencies in the student’s academic preparation. No changes can be made to the degree plan once the student’s Request for Final Examination is approved by the Office of Graduate and Professional Studies.

Approval to enroll in any professional course (900-level) should be obtained from the head of the department (or Chair of the intercollegiate faculty, if applicable) in which the course will be offered before including such a course on a degree plan.

No credit may be obtained by correspondence study, by extension or for any course of fewer than three weeks duration.

Transfer of Credit

Courses for which transfer credits are sought must have been completed with a grade of B or greater and must be approved by the student’s advisory committee and the Office of Graduate and Professional Studies. These courses must not have been used previously for another degree. Except for officially approved cooperative doctoral programs, credit for thesis or dissertation research or the equivalent is not transferable. Credit for “internship” coursework in any form is not transferable. Courses taken in residence at an accredited U.S. institution or approved international institution with a final grade of B or greater will be considered for transfer credit if, at the time the courses were completed, the courses would be accepted for credit toward a similar degree for a student in degree-seeking status at the host institution. Credit for coursework taken by extension is not transferable. Coursework in which no formal grades are given or in which grades other than letter grades (A or B) are earned (for example, CR, P, S, U, H, etc.) is not accepted for transfer credit. Credit for coursework submitted for transfer from any college or university must be shown in semester credit hours, or equated to semester credit hours.

Courses used toward a degree at another institution may not be applied for graduate credit. If the course to be transferred was taken prior to the conferment of a degree at the transfer institution, a letter from the registrar at that institution stating that the course was not applied for credit toward the degree must be submitted to the Office of Graduate and Professional Studies.

Grades for courses completed at other institutions are not included in computing the GPR. An official transcript from the university at which transfer courses are taken must be sent directly to the Office of Admissions.

Research Proposal

The general field of research to be used for the dissertation should be agreed on by the student and the advisory committee at their first meeting, as a basis for selecting the proper courses to support the proposed research.

As soon thereafter as the research project can be outlined in reasonable detail, the dissertation research proposal should be completed. The research proposal should be approved at a meeting of the student’s advisory committee, at which time the feasibility of the proposed research and the adequacy of available facilities should be reviewed. The approved proposal, signed by all members of the student’s advisory committee, the head of the student’s major department (or chair of the intercollegiate faculty, if applicable), must be submitted to the Office of Graduate and Professional Studies at least 20 working days prior to the submission of the Request for the Final Examination.

Compliance issues must be addressed if a graduate student is performing research involving human subjects, animals, infectious biohazards and recombinant DNA. A student involved in these types of research should check with the Office of Research Compliance and Biosafety at (979) 458.1467 to address questions about all research compliance responsibilities. Additional information can also be obtained on the website http://rcb.tamu.edu.
Examinations

Preliminary Examination for Doctoral Students

The student’s major department (or chair of the interdisciplinary degree program faculty, if applicable) and his or her advisory committee may require qualifying, cumulative or other types of examinations at any time deemed desirable. These examinations are entirely at the discretion of the department and the student’s advisory committee.

The preliminary examination is required. The preliminary examination for a doctoral student shall be given no earlier than a date at which the student is within 6 credit hours of completion of the formal coursework on the degree plan (i.e., all coursework on the degree plan except 681, 684, 690, 691, 692, 693, 695, 697, 791, or other graduate courses specifically designated as S/U in the course catalog). The student should complete the Preliminary Examination no later than the end of the semester following the completion of the formal coursework on the degree plan.

Preliminary Examination Format

The objective of preliminary examination is to evaluate whether the student has demonstrated the following qualifications:

- a. mastery of the subject matter of all fields in the program;
- b. an adequate knowledge of the literature in these fields and an ability to carry out bibliographical research;
- c. an understanding of the research problem and the appropriate methodological approaches.

The format of the preliminary examination shall be determined by the student’s department (or interdisciplinary degree program, if applicable) and advisory committee, and communicated to the student in advance of the examination. The exam may consist of a written component, oral component, or combination of written and oral components.

The preliminary exam may be administered by the advisory committee or a departmental committee; herein referred to as the examination committee. Regardless of exam format, a student will receive an overall preliminary exam result of pass or fail. The department (or interdisciplinary degree program, if applicable) will determine how the overall pass or fail result is determined based on the exam structure and internal department procedures. If the exam is administered by the advisory committee, each advisory committee member will provide a pass or fail evaluation decision.

Only one advisory committee substitution is allowed to provide an evaluation decision for a student’s preliminary exam, and it cannot be the committee chair.

If a student is required to take, as a part of the preliminary examination, a written component administered by a department or interdisciplinary degree program, the department or interdisciplinary degree program faculty must:

- a. offer the examination at least once every six months. The departmental or interdisciplinary degree program examination should be announced at least 30 days prior to the scheduled examination date.
- b. assume the responsibility for marking the examination satisfactory or unsatisfactory, or otherwise graded, and in the case of unsatisfactory, stating specifically the reasons for such a mark.
- c. forward the marked examination to the chair of the student’s advisory committee within one week after the examination.

Preliminary Examination Scheduling

Prior to commencing any component of the preliminary examination, a departmental representative or the advisory committee chair will review the eligibility criteria with the student, using the Preliminary Examination Checklist to ensure the student is eligible for the preliminary examination. The following list of eligibility requirements applies.

Student is registered at Texas A&M University for a minimum of one semester credit hour in the long semester or summer term during which any component of the preliminary examination is held. If the entire examination is held between semesters, then the student must be registered for the term immediately preceding the examination.

An approved degree plan is on file with the Office of Graduate and Professional Studies prior to commencement of the first component of the examination.

Student’s cumulative GPR is at least 3.000. Student’s degree plan GPR is at least 3.000. All English language proficiency requirements are satisfied.

At the end of the semester in which at least the first component of the exam is given, there are no more than 6 hours of coursework remaining on the degree plan (except 681, 684, 690, 691, 692, 693, 695, 697, 791, or other graduate courses specifically designated as S/U in the course catalog). The head of the student’s department (or Chair of the Interdisciplinary Degree Program, if applicable) has the authority to approve a waiver of this criterion.

Report of Preliminary Examination

Credit for the preliminary examination is not transferable in cases where a student changes degree programs after passing a preliminary exam.

If a written component precedes an oral component of the preliminary exam, the chair of the student’s examination committee is responsible for making all written examinations available to all members of the committee. A positive evaluation of the preliminary exam by all members of a student’s examination committee with at most one dissenion is required to pass a student on his or her preliminary exam.

The student’s department will promptly report the results of the Preliminary Examination to the Office of Graduate and Professional Studies via the Report of Doctoral Preliminary Examination form. The Preliminary Examination checklist form must also be submitted. These forms should be submitted to the Office of Graduate and Professional Studies within 10 working days of completion of the preliminary examination.

The Report of the Preliminary Examination form must be submitted with original signatures of the approved examination committee members. If an approved examination committee member substitution (one only) has been made, that signature must also be included, in place of the committee member, on the form submitted to the Office of Graduate and Professional Studies. The original signature of the department head is also required on the form.

After passing the required preliminary examination for the doctoral degree, the student must complete the final examination for the degree within four calendar years. Otherwise, the student will be required to repeat the preliminary examination.

Retake of Failed Preliminary Examination

Upon approval of the student’s examination committee, with no more than one member dissenting, and approval of the Office of Graduate and Professional Studies, a student who has failed the preliminary examination may be given one re-examination. Adequate time must be given to permit the student to address the inadequacies emerging from the first preliminary examination. The examination committee must agree upon and communicate in writing to the student, an adequate time-frame from the first examination (normally six months) to retest, as well as a detailed explanation of the inadequacies emerging from the examination. The student and the committee should jointly negotiate a mutually acceptable date for this retest. When providing feedback on inadequacies, the committee should clearly document expected improvements that the student must be able to exhibit in order to retake the exam. The examination committee will document and communicate the time-frame and feedback within 10 working days of the exam that was not passed.

Final Examination for Doctoral Students

The candidate for the doctoral degree must pass a final examination by deadline dates announced in the “Office of Graduate and Professional Studies Calendar” each semester. The doctoral student is allowed only one opportunity to take the final examination.
No unsolved grades of D, F, or U for any course can be listed on the degree plan. The student must be registered for any remaining hours of 681, 684, 690, 691, 692, 791 or other graduate courses specifically designated as S/U in the course catalog during the semester of the final exam. No student may be given a final examination until they have been admitted to candidacy and their current official cumulative and degree plan GPAs are 3.00 or better.

To be admitted to candidacy for a doctoral degree, a student must have:
1. completed all formal coursework on the degree plan with the exception of any remaining 681, 684, 690 and 691, 692 (Professional Study), or 791 hours,
2. a 3.0 Graduate GPA and a Degree Plan GPA of at least 3.0 with no grade lower than C in any course on the degree plan,
3. passed the preliminary examination,
4. submitted an approved dissertation proposal,
5. met the residence requirements.

The request to hold and announce the final examination must be submitted to the Office of Graduate and Professional Studies a minimum of 10 working days in advance of the scheduled date. Any changes to the degree plan must be approved by the Office of Graduate and Professional Studies prior to the submission of the request for final examination.

The student’s advisory committee will conduct this examination. The final examination is not to be administered until the dissertation or record of study is available in substantially final form to the student’s advisory committee, and all concerned have had adequate time to review the document. Whereas the final examination may cover the broad field of the candidate’s training, it is presumed that the major portion of the time will be devoted to the dissertation and closely allied topics. Persons other than members of the graduate faculty may, with mutual consent of the candidate and the chair of the advisory committee, be invited to attend a final examination for an advanced degree. A positive vote by all members of the graduate committee with at most one dissension is required to pass a student on his or her exam. A department can have a stricter requirement provided there is consistency within all degree programs within a department. Upon completion of the questioning of the candidate, all visitors must excuse themselves from the proceedings.

**Report of Final Examination**

The student’s department will promptly report the results of the Final Examination to the Office of Graduate and Professional Studies via the Report of Doctoral Final Examination form. These forms should be submitted to the Office of Graduate and Professional Studies within 10 working days of completion of the final examination.

The Office of Graduate and Professional Studies must be notified in writing of any cancellations.

A positive evaluation of the final exam by all members of a student’s advisory committee with at most one dissension is required to pass a student on his or her final exam. The Report of the Final Examination Form must be submitted with original signatures of only the committee members approved by the Office of Graduate and Professional Studies. If necessary, multiple copies of the form may be submitted with different committee member original signatures. If an approved committee member substitution (1 only) has been made, his/her signature must be included on the form submitted to the Office of Graduate and Professional Studies.

**Dissertation**

The ability to perform independent research must be demonstrated by the dissertation, which must be the original work of the candidate. Whereas acceptance of the dissertation is based primarily on its scholarly merit, it must also exhibit creditable literary workmanship. The format of the dissertation must be acceptable to the Office of Graduate and Professional Studies. Guidelines for the preparation of the dissertation are available in the Thesis Manual, which is available online at http://ogaps.tamu.edu.

After successful defense and approval by the student’s advisory committee and the head of the student’s major department (or chair of the intercollegiate faculty, if applicable), a student must submit his/her dissertation in electronic format as a single PDF file. The PDF file must be uploaded to the website, http://ogaps.tamu.edu.

Additionally, a signed paper approval form with original signatures must be received by the Office of Graduate and Professional Studies. Both the PDF file and the signed approval form are required by the deadline.

Deadline dates for submitting are announced each semester or summer term in the Office of Graduate and Professional Studies Calendar (see Time Limit statement). These dates also can be accessed via the website http://ogaps.tamu.edu.

Each student who submits a document for review is assessed a one-time thesis/dissertation processing fee through Student Business Services. This processing fee is for the thesis/dissertation services provided. After commencement, dissertations are digitally stored and made available through the Texas A&M Libraries.

A dissertation that is deemed unacceptable by the Office of Graduate and Professional Studies because of excessive corrections will be returned to the student’s department head or chair of the intercollegiate faculty. The manuscript must be resubmitted as a new document, and the entire review process must begin anew. All original submittal deadlines must be met during the resubmittal process in order to graduate.

**Additional Requirements**

**Residence**

A student who enters the doctoral degree program with a baccalaureate degree must spend one academic year plus one semester in resident study at Texas A&M University. A student who holds master’s degree when he/she enters doctoral degree program must spend one academic year in resident study. One academic year may include two adjacent regular semesters or one regular semester and one adjacent 10-week summer semester. The third semester is not required to be adjacent to the one year. Enrollment for each semester must be a minimum of 9 credit hours each to satisfy the residence requirement.

To satisfy the residence requirement, the student must complete a minimum of 9 credit hours per semester or 10-week summer semester in resident study at Texas A&M University for the required period. A student who enters a doctoral degree program with a baccalaureate degree may fulfill residence requirements in excess of one academic year (18 credit hours) by registration during summer sessions or by completion of a less-than-full course load (in this context a full course load is considered 9 credit hours per semester).

Students who are employed full-time while completing their degree may fulfill total residence requirements by completion of less-than-full time course loads each semester. In order to be considered for this, the student is required to submit a Petition for Waivers and Exceptions along with verification of his/her employment to
the Office of Graduate and Professional Studies. An employee should submit verification of his/her employment at the time he/she submits the degree plan. See Registration. See Residence Requirements.

**Time Limit**

All requirements for doctoral degrees must be completed within a period of ten consecutive calendar years for the degree to be granted. A course will be considered valid until 10 years after the end of the semester in which it is taken. Graduate credit for coursework more than ten calendar years old at the time of the final oral examination may not be used to satisfy degree requirements. After passing the required preliminary oral and written examinations for a doctoral degree, the student must complete the final examination within four calendar years. Otherwise, the student will be required to repeat the preliminary examination. A final corrected version of the dissertation or record of study in electronic format as a single PDF file must be cleared by the Office of Graduate and Professional Studies no later than one year after the final examination or within the 10-year time limit, whichever occurs first. Failure to do so will result in the degree not being awarded.

**Continuous Registration**

A student in a program leading to a Doctor of Philosophy who has completed all coursework on his/her degree plan other than 691, 5V98 or 5V99 (research) are required to be in continuous registration until all requirements for the degree have been completed. See Continuous Registration Requirements.

**Admission to Candidacy**

To be admitted to candidacy for a doctoral degree, a student must have:
- completed all formal coursework on the degree plan with the exception of any remaining 681, 684, 690 and 691, 5V98 and 5V99, or 791.
- a 3.0 Graduate GPA and a Degree Plan GPA of at least 3.0 with no grade lower than C in any course on the degree plan,
- passed the preliminary examination (written and oral portions),
- submitted an approved dissertation proposal,
- met the residence requirements. The final examination will not be authorized for any doctoral student who has not been admitted to candidacy.

**Languages**

A student is required to possess a competent command of English. For English language proficiency requirements, see the Admissions section of this catalog. The doctoral (PhD) foreign language requirement at Texas A&M University is a departmental option, to be administered and monitored by the individual departments of academic instruction.

**99-Hour Cap on Doctoral Degrees**

In Texas, public colleges and universities are funded by the state according to the number of students enrolled. In accordance with legislation passed by the Texas Legislature, the number of hours for which state universities may receive subvention funding at the doctoral rate for any individual is limited to 99 hours. Texas A&M University and other universities will not receive subvention for hours in excess of the limit. Institutions of higher education are allowed to charge the equivalent of nonresident tuition to a resident doctoral student who has enrolled in 100 or more semester credit hours of doctoral coursework. A doctoral student at Texas A&M has seven years to complete his/her degree before being charged out-of-state tuition. A doctoral student who, after seven years of study, has accumulated 100 or more doctoral hours will be charged tuition at a rate equivalent to out-of-state tuition. Please note that the tuition increases will apply to Texas residents as well as students from other states and countries who currently are charged tuition at the resident rate. This includes those doctoral students who hold GAT, GANT, and GAR appointments of 20 or more hours and recipients of competitive fellowships who receive more than $1,000 per semester. Doctoral students who, after seven years of study, have not accumulated 100 hours are eligible to pay in-state tuition if otherwise eligible.

For count purposes, a year is counted as three semesters, normally fall, spring and summer. Using this system, a student is allowed 21 semesters as a G8 student to complete the doctoral degree before being penalized with the higher tuition rate. Any semester in which a G8 student is enrolled for a doctoral level course is counted.

The following majors are exempt from the 99-Hour Cap on Doctoral Degrees:
- Biomedical Sciences
- Biochemistry
- Microbiology
- Genetics
- Toxicology
- Nutrition Sciences
- Community Clinical Psychology
- School Psychology
- Veterinary Pathology
- Clinical Psychology
- Counseling Psychology
- Medical Sciences
- Health Services Research
- Health Promotion and Community Health Sciences
- Epidemiology and Environmental Health
- Oral Biology

The hour limit for these majors is 130 doctoral hours

**Application for Degree**

For information on applying for your degree, please visit the Graduation section.

Additional information 3.27.17—Updates to Examinations verbiage requested by OGAPS.
Required Proposal Forms

MCMS PhD Proposal_cost estimation tool.xlsx
MCMS PhD Proposal_Fall 2017.docx
MCMS PhD_support letters.pdf
MCMS PhD proposal_BOR-Agenda Item-New Degree Program.docx

Reviewer Comments
Melanie Moser (moserm) (12/06/16 4:56 pm): Dr. Park asked me to approve so it could move through the process. He is not currently able to approve himself.
Antonietta Quigg (quigga) (02/07/17 4:47 pm): Pls reject. Department head needs to resubmit with updated form.
Antonietta Quigg (quigga) (02/07/17 4:48 pm): Rollback: pls resubmit with revised paperwork
Kyeong Park (parkk) (09/04/17 3:13 pm): Rollback: upload new proposal
Kyeong Park (parkk) (09/04/17 3:27 pm): Rollback: delete the two support letters. They are already attached to the end of the proposal.
Deena McConnell (djm) (09/16/17 9:03 am): Replaced the PDF versions of THECB proposal and BOR agenda item with Word versions. PDF of the support letters will be added to the proposal when submitted to the THECB.
Russell Ramirez (rramirez) (09/26/17 3:03 pm): Under the Degree Plan Section of the Program Requirements section, I believe it should state “64” and “96” where it states “60” and “90” respectively.
LaRhesa Johnson (ljjohnson) (10/05/17 2:58 pm): Editorial Updates submitted by OGAPS.

Program Reviewer Comments
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Texas Higher Education Coordinating Board
Proposal for a Doctoral Program

**Directions:** This form requires signatures of (1) the Chief Executive Officer, certifying adequacy of funding for the new program; (2) the Chief Executive Officer, acknowledging agreement to reimburse consultants’ costs; (3) a member of the Board of Regents (or designee), certifying Board of Regents approval for Coordinating Board consideration; or, if applicable, (4) a member of the Board of Regents (or designee), certifying that criteria have been met for Commissioner consideration. Additional information and instructions are available in the Guidelines for Institutions Submitting Proposals for New Doctoral Programs found on the Coordinating Board website, www.thecb.state.tx.us/newprograms_certificates. Institution officials should also refer to Texas Administrative Code (TAC) 5.46, Criteria for New Doctoral Programs.

**Note:** Institutions should first notify the Coordinating Board of their intent to request the proposed doctoral program before submitting a proposal. Notification may consist of a letter sent to the Assistant Commissioner of Academic Quality and Workforce, stating the title, CIP code, and degree designation of the doctoral program, and the anticipated date of submission of the proposal.

**Information:** Contact the Division of Academic Quality and Workforce at (512) 427-6200.

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**Administrative Information**

1. **Institution Name and Accountability Group:** Texas A&M University - 003632

   NOTE: The proposed program will be offered at Texas A&M University’s branch campus, Texas A&M University at Galveston, and will be reflected on the Program Inventories of both Texas A&M University and Texas A&M University at Galveston.

2. **Program Name:** Doctor of Philosophy (Ph.D.) in Marine and Coastal Management and Science

3. **Proposed CIP Code:** 03.0201.00

4. **Program Description:** The Ph.D. in Marine and Coastal Management and Science will be an interdisciplinary program focused on the policy and social sciences that draws on expertise from faculty members in multiple marine and coastal-related fields at Texas A&M University and Texas A&M University at Galveston. Students in the program will be exposed to knowledge and research techniques related to coastal management, geospatial analysis, human impacts on coastal areas, natural and technological hazards, and legal/ethical issues. A major goal of this program will be to provide students with the training and analytical techniques to create new knowledge and make informed policy decisions at the highest levels.

5. **Administrative Unit:** Department of Marine Sciences, Texas A&M University at Galveston

   NOTE: The proposed program will be reflected on the Program Inventories of both Texas A&M University and Texas A&M University at Galveston.

6. **Proposed Implementation Date:** August 1, 2019

7. **Contact Person**

   Name: Dr. Kyeong Park
   Title: Professor and Head, Department of Marine Sciences
   E-mail: parkk@tamug.edu
   Phone: 409-740-4710
Proposed Doctoral Program -- Required Information

I. Need

A. Job Market Need - Provide short- and long-term evidence of the need for graduates in the Texas and US job markets. Common sources for workforce need and workforce projections include the Bureau of Labor Statistics, the Texas Workforce Commission, and professional associations. If the program is designed to address particular regional or state needs in addition to workforce demands, provide a detailed description.

Increasing population growth and development in coastal areas in Texas and around the world are impacting ecological systems while placing human communities at risk from anthropogenic and natural hazards. Threats associated with storm and flooding events, the alteration of wetland systems, and sprawling development patterns have helped make sustainable and resilient coastal communities an issue of paramount importance. According to the National Oceanic Atmospheric Administration (NOAA), from 1970 to 2010, coastal shoreline counties population increased by 39% and if current population trends continue, the already crowded U.S. coast will see population grow from 123 million people to nearly 134 million people by 2020. Employers are increasingly looking to hire graduates with advanced degrees that can address some of the most critical issues of our generation, including increasing intensity of coastal storms, sea level rise, loss of wetlands, and threats to our diverse coastal economy. Population and employment growth in nearshore areas far outpaces other parts of the country. Areas along the Texas coast, such as Galveston Bay are among the most ecologically and economically important resources in the United States. For example, Galveston Bay and the nearby coastal zone are leaders in commercial and recreational fishing. The Gulf of Mexico is also a critical center for marine activities, from mineral exploration to shipping, drilling, platform installation, lightering, and construction, to name but a few. The Gulf of Mexico is also home to two of the world’s ten busiest ports by cargo volume, a number which is likely only to increase with the expansion of the Panama Canal as cargo shifts away from the congested West Coast and the rapid expansion of the Houston-Galveston complex as an exporter of locally manufactured plastic and chemical by-products. Furthermore, the Houston area is the leading petrochemical industrial complex in the United States.

Protecting critical coastal resources and economic productivity, in the face of increasing natural hazards and environmental change, demands a new breed of advanced skillsets in the policy and management sciences. Today’s coastal leaders must take an interdisciplinary approach to research and problem solving like never before. Texas A&M University’s (Texas A&M’s) peer institutions across the country are recognizing the growing need for doctoral level training in coastal and marine management by establishing their own programs and making major investments in their coastal facilities. Given the recent increase in capacity (see Section IV.C), rising enrollment in coastal management degrees (see Section II.I) and a critical mass of scholars and experts in the fields (see Section III.C) at Texas A&M University at Galveston (TAMUG), we are ideally positioned to fulfill an unmet need with approval of the proposed Ph.D. in Marine and Coastal Management and Science (MCMS).

Positions in universities, consulting firms, government, and non-profits focusing on marine and coastal management have been steadily increasing, spurred by ongoing coastal initiatives across the U.S. There is a clear, unmet need within Texas and nationwide for education and training that prepares future scholars, researchers, and decision makers in the area of coastal and marine

2 The top 10 metropolitan port complexes in the U.S. (https://www.brookings.edu/blog/the-avenue/2015/07/01/the-top-10-metropolitan-port-complexes-in-the-u-s/)
3 The Port of Houston Authority (http://www.portofhouston.com/about-us/overview/)
4 Hanover Research, Labor Market Analysis: Ph.D. in Marine and Coastal Management and Science (March 2016)
The MCMS Ph.D. program will help fulfill this need by offering a policy-focused, scientifically-grounded doctoral program that addresses human and social infrastructure development in coastal environments. This program will be distinct from other doctoral programs based on physical and natural sciences already existing throughout the state. There is a strong demonstrated need for education and training in the social and policy sciences that can address our most pressing coastal and marine problems in Texas and around the world. Increasingly, positions in government, universities, and the private sector are requiring an interdisciplinary doctoral degree grounded in policy and decision sciences. This is particularly the case for jobs focusing on coastal and marine issues. Organizations are more than ever seeking individuals with doctoral training to teach, research, and make policy recommendations on issues such as coastal hazards, human health effects, climate change, and resilient community development.

National and State Level Demand

The job market need and demand for graduates in this field can be objectively demonstrated. On a coarse level, an analysis based on a cross-walk of Classifications of Instructional Programs (CIP) and Standard Occupational Classifications (SOC) shows projected employment in areas related to the MCMS Ph.D. program to steadily grow nationwide by 15-30% over the next 10 years. A market analysis conducted by Hanover Research at the request of TAMUG indicates that several areas of employment are poised for growth for which MCMS graduates would be competitive. At the national level, job categories such as “Environmental Scientists and Specialists, including Health” and “Geoscientists, except Hydrologists and Geographers” are expected to grow between 15 and 20% through 2020. Additional job categories ideal for MCMS graduates that are expected to see job growth in the 8-14% range on the national level include “Post-Secondary Forestry and Conservation Science Teachers” and “Post-Secondary Atmospheric, Earth, Marine, and Space-Sciences Teachers.”

Perhaps more important are the increasing employment demands for MCMS graduates in the State of Texas. Four of the five job classifications identified at the national level show even higher projected growth in Texas when compared to the national level, ranging from of 19-34%. In addition, the following three other job categories relevant for MCMS graduates were identified as high-growth areas: “Natural Science Managers” (18%), “Biological Scientists, All Other” (22%), and “Conservation Scientists” (16%).

Educational requirements for entry into these professions vary. For example, all of the post-secondary teaching jobs prefer a terminal degree for consideration. Other job categories outside of the academic workplace may not require a Ph.D. for entry into the workplace, yet many professionals in these fields have attained a doctoral degree and the successful completion of a Ph.D. program makes these candidates more competitive applicants, particularly at the managerial/supervisory level. At the national level, 5-52% of employees within the four additional high-growth employment have a Ph.D. or professional degree above a Master’s degree.

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5 Hanover Research, Labor Market Analysis: Ph.D. in Marine and Coastal Management and Science (March 2016)
6 Ibid
7 Hanover Research, Market Analysis: Ph.D. in Marine Resource Management (May 2014)
9 Ibid
10 Texas Workforce Commission, Texas Long-term Occupation Projections (http://www.tracer2.com/p...)
In order to better understand the job market demand for MCMS graduates, we also requested a finer-scaled analysis from Hanover Research, which further demonstrates the need for the MCMS Ph.D. program. Perhaps the most indicative characteristics of job market need are open employment opportunities. A recent nationwide job search identified 77 relevant employment opportunities for MCMC Ph.D. graduates. These job opportunities were found in all sectors, including federal, state and local government, non-profit organizations, higher education, and private sector. Over 71% of MCMS related employment opportunities required an advanced degree; 26% required a Ph.D. while the remaining required a Master’s, but with preference toward a Ph.D. Further, there is evidence that this snap-shot of employment opportunities is poised to remain stable or experience growth in the future. Based on a survey of marine and coastal planners, there is an increasing number of coastal and marine planning initiatives emerging in the United States, and these initiatives will likely spur labor market demand for coastal and marine management professionals.

In summary, the coastal location of TAMUG as well as its immediate proximity to the growing metropolitan area of Houston-Sugar Land-Baytown makes it the perfect location for advanced educational opportunities in Marine and Coastal Management. Texas A&M University’s Ph.D. program in Urban and Regional Sciences loses many applicants each year because prospective students chose more coastally-focused programs outside of the state. With the approval of a Ph.D. program in Marine and Coastal Management and Science, students would have the opportunity to study on the Texas coast in their chosen field without seeking educational opportunities elsewhere. Finally, we believe based on the market analyses and evidence from current job opportunities there is current and future demand for job candidates who have received Ph.D.’s in Marine and Coastal Management and Science.

B. Existing Programs - Identify the existing programs and their locations in Texas. Provide enrollments and graduates of these programs for the last five years, and explain how the proposed program would not unnecessarily duplicate existing or similar programs in Texas. Provide evidence that existing Texas programs are at or near capacity and describe how the existing programs are not meeting current workforce needs. Provide the job placement of existing Texas programs. Provide information about the number of existing programs nationally.

Currently, there are no programs in the State of Texas that train students at the doctoral level in coastal and marine resources management and policy, and only five programs nationally (see below). In addition, no such program currently exists along the Gulf of Mexico states. Existing programs with what may appear to be related emphases at Texas A&M University (Texas A&M), such as the Ph.D. program in Urban and Regional Science in the College of Architecture, do not cater to the growing coastal and marine focused educational markets. The proposed MCMS Ph.D. program therefore will fulfill an unmet educational need.

The MCMS Ph.D. program is a policy-focused, scientifically-grounded doctoral program that addresses intersection of human and social characteristics with the natural environment in coastal areas. It hence will not duplicate any program within the state because no policy-led coastal and marine degree program currently exists. Within Texas A&M, there is a Ph.D. program in Urban and Regional Science in the College of Architecture that focuses on social science and equity issues in urban regions. Students in this program can take environmental courses throughout Texas A&M, but any coastal focus would need to be done through TAMUG. The Galveston campus also hosts the interdisciplinary Ph.D. program in Marine Biology (MARB-IDP), a doctoral program that integrates courses from three Texas A&M University System campuses: Texas A&M University at Galveston, Texas A&M University (College Station), and Texas A&M University-Corpus Christi. However, as its name clearly indicates, the MARB-IDP program has a focus in biological sciences, as opposed to the policy and social science-based focus of the proposed MCMS Ph.D. program. Texas A&M University-Corpus Christi also offers a Ph.D. in Coastal and Marine System Science (CMSS), but this program has a focus on the natural and computational sciences. In contrast, while the MCMS Ph.D. program

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12 Hanover Research, Labor Market Analysis: Ph.D. in Marine and Coastal Management and Science (March 2016)
calls on the expertise of natural sciences, it is far more interdisciplinary and policy-focused compared
to the Ph.D. program in CMSS.

The MCMS Ph.D. program would build upon existing programs at TAMUG and Texas A&M and
provide opportunities currently unavailable to prospective students. Texas A&M students with
Bachelor or Master degrees in programs such as Ocean and Coastal Resources, Marine Sciences, and
Marine Biology at the Galveston campus and Environmental Geosciences, Environmental Studies,
Civil Engineering, Renewable Natural Resources, Urban and Regional Science, Geography, and
Ecosystem Science and Management from the College Station campus will have the opportunity to
build upon their studies at a more advanced level. Master’s programs, such as Marine Resources
Management at the Galveston campus and Urban and Regional Planning at the College Station
campus, would also serve as direct feeders to the MCMS Ph.D. program and better enable Texas
A&M to retain the best undergraduate students for graduate-level programs. The TAMUG campus
has been working with graduate students for several decades and has had graduate programs for
over 10 years. The resources and personnel to support an additional program are already in place
and would not strain TAMUG’s resources. The availability of a terminal degree to complement the
existing Master’s in Marine Resources Management would be of great value to students in that
program as well as current undergraduate students in various programs throughout TAMUG.
Additional course offerings that will become available with the approval of the Ph.D. program in
MCMS will also serve to strengthen our course offerings for the existing graduate programs.

Nation-wide, there are several similar Ph.D. programs and the number is growing. An informal
survey identified five programs that are similar to the proposed MCMS Ph.D. program (see below).
The Ph.D. program in MCMS would be distinguished from these and other programs in that it will: a)
be led by policy and social science, but also receive expertise in the natural sciences; b) have a
focus on the impacts and opportunities from the built environment and development; c) require
rigorous training in research methods and analytical procedures; d) require an interdisciplinary
approach to research and learning; and e) be focused on the coastal onshore and marine near-shore
environments where problems at the interface of the natural and built-environment are most
pronounced. Currently, there is no formal entity at Texas A&M with the ability to comprehensively
train students in terminal degree in sustainable practices with a focus on marine and coastal system
in a way that integrates the built environment, the physical processes associated with coastal
systems, and the management of their natural resources and ecosystems. Following the Bachelor in
Ocean and Coastal Resources (OCRE) and Master’s in Marine Resources Management (MMMRM)
offered by TAMUG, the MCMS Ph.D. would be an appropriate addition to this sequence of programs
and would provide a terminal degree program for the graduates from the afore-mentioned Master’s
programs at TAMUG and Texas A&M.

Existing U.S. academic programs resulting in Ph.D. in marine or coastal management or policy

- Marine Policy – School of Marine Science and Policy, University of Delaware (Lewes, DE)
- Marine Science and Oceanography with specialization in Marine Affairs or Ocean Policy – School of the
Earth, Ocean and Environment, University of South Carolina (Columbia, SC)
- Marine Affairs – Department of Marine Affairs, University of Rhode Island (Narragansett, RI)
- Environmental Policy and Marine Science and Conservation – Nicholas School of the Environment,
Duke University (Durham, NC)
- Coastal Resources Management (Coastal Social Sciences and Policy Primary Track, and Coastal
Economics Primary Track) – Thomas Harriot College of Arts & Sciences, East Carolina University
(Greenville, NC)

C. Student Demand - Provide short- and long-term evidence of student demand for the program. Types of
data commonly used to demonstrate this include increased enrollment in related and feeder programs at the
institution, high enrollment in similar programs at other institutions, qualified applicants rejected at similar
provides documentation that qualified applicants are leaving Texas for similar programs in other states.

There are only five Ph.D. programs in the U.S. that are similar to the proposed MCMS Ph.D. program (see above). The enrollment data available in their websites indicate 33, 16, 15, 52, and 16 students for the Ph.D. programs in the University of Delaware\textsuperscript{13}, University of South Carolina\textsuperscript{14}, University of Rhode Island\textsuperscript{15}, Duke University\textsuperscript{16}, and East Carolina University\textsuperscript{17}, respectively. Only the Duke University reports data for application and admission, with the Environmental Policy program accepting only 13\% (8 out of 61 applicants)\textsuperscript{18} and the Marine Science and Conservation program accepting only 7\% (4 out of 58 applicants)\textsuperscript{19} of the applicants in 2016-2017, clearly demonstrating demand of students in the proposed MCMS program.

There is also strong evidence of student demand for the MCMS Ph.D. program from graduates from existing Master’s programs, such as MMRM at TAMUG, and Master of Urban and Regional Planning (MUP) and Master of Ecosystem Science and Management (ESSM) at Texas A&M. Graduates of these programs are often seeking this type of Ph.D. program, but instead are forced to go out of state to complete their education in some comparable way. A recent survey of current and former TAMUG students, administered by Hanover Research at the request of TAMUG, provides supporting evidence of the demand for the proposed MCMS Ph.D. program. For example, of 190 survey respondents 78\% expressed some interest in doctoral programs in the field. After being provided with a description of the MCMS Ph.D. program, 22\% of respondents reported to be “very interested” in the program, while an additional 64\% reported to be slightly or moderately interested. In what is perhaps the most indicative sign of immediate demand, 39\% of respondents who indicated an interest in the Ph.D. program would be most likely to apply within the next two years; an additional 36\% indicated they would be most likely to apply within four years. It is also notable that those survey respondents who were at least moderately interested in the MCMS Ph.D. program are not solely the current students in the Department of Marine Sciences as 37\% identified themselves as in the field of Marine Biology. Finally, while a nationwide survey is beyond the scope of this proposal, we are confident that we can attract the highest quality students, both nationally and internationally, to the MCMS Ph.D. program.

In addition to the favorable interest of the proposed MCMS Ph.D. program by current and former TAMUG students, the last 2-3 years have seen a significant shift in enrollment and rejuvenation of faculty within the Department of Marine Sciences. In the years prior to Hurricane Ike, the Marine Sciences department’s enrollment dwindled to nearly 80 undergraduates across its majors (OCRE and Marine Sciences (MARS)) combined. Since then, our enrollment has increased to a total of 156 undergraduates in the Fall of 2016 (+86\% since 2007; see Figure 1). This shift may be due in part to the initial decline of the energy sector in the early 2000’s on which our program was dependent for hiring. Due to a combination of the dynamic growth in the energy sector in the late 2000’s and the diversification of the Department to include a number of environmental science approaches, our graduates now respond to a broader job market and we recruit students with a similarly broader interest. For example, utilizing TAMUG’s B.S. in University Studies, in the Fall of 2014 the Marine Sciences department started offering a specialty in pre-health (“Oceans and One Health”), which will help recruit undergraduate students interested both in health studies and ocean sciences. Some of these students will be interested in pursuing graduate work in coastal management. The graduate

\textsuperscript{13} https://www.ceoe.udel.edu/our-people
\textsuperscript{14} http://www.seoe.sc.edu/msci-grad-students
\textsuperscript{15} http://web.uri.edu/maf/students/
\textsuperscript{17} http://www.ecu.edu/cs-acad/crm/students.cfm
\textsuperscript{18} https://gradschool.duke.edu/about/statistics/environmental-policy-phd-admissions-and-enrollment-statistics
\textsuperscript{19} https://gradschool.duke.edu/about/statistics/marine-science-and-conservation-phd-admission-and-enrollment-statistics
MMRM program at TAMUG has had a healthy average enrollment of approximately 31±2 students per year over the last several years (see Figure 1).

**Figure 1.** Annual enrollment numbers for undergraduate (blue circles) and graduate (red triangles) students in the Department of Marine Sciences.

D. **Student Recruitment** - Describe recruitment efforts specific to the proposed program, including plans to recruit and retain students from underrepresented groups.

Recruitment of students into the MCMS Ph.D. program would be a joint effort between the Graduate Studies Office and the Department of Marine Sciences at TAMUG. Faculty of the Department of Marine Sciences have been actively recruiting students into their laboratories and research groups each year. Graduate recruiters from the Graduate Studies Office engage in yearly recruiting trips to colleges and universities within the Gulf Coast region to discuss graduate programs at TAMUG and recruit prospective students into our programs. Specific schools targeted for recruitment initiatives include Historically Black Colleges and Universities (HBCUs) and Hispanic Serving Institutions (HSIs). The Graduate Studies Office also offers campus tours and prospective student sessions each month to provide opportunities for students to visit the Galveston campus.

In addition to recruiting efforts, the Graduate Studies Office also provides Prospective Student Travel Grants of $500 each to faculty at TAMUG. These travel grants are designed to allow faculty to bring prospective students to campus for an in-person visit. These grants are an important tool, as it has been demonstrated that students who visit with their faculty advisor and other campus representatives in person prior to their admissions offer are more likely to commit to study at the institution.

Each year TAMUG’s top programs lose some of their best applicants to more competitive offers from peer or aspirant peer institutions, including students who have been offered more competitive financial packages. This situation was recently addressed by the TAMUG Office of the Executive Associate Vice President for Academic Affairs and Chief Academic Officer through the creation of the TAMUG Merit and Diversity Fellowships. These six 2-year competitive graduate student fellowships allow faculty and graduate programs to compete effectively for high quality and diverse graduate students. We anticipate adding two additional 2-year fellowships that will be dedicated to the proposed MCMS Ph.D. program, if approved. Currently our MARB-IDP program has four dedicated
scholarships for incoming Ph.D. and Master students; the goal would be to share these resources initially and with time, increase the overall pool such that a combination of Merit, Diversity and program specific fellowships will be available to recruit the best and brightest. Doctoral fellowships amount to approximately $74,500 during the first two year period, while Master’s fellowships amount to approximately $72,000 during the first two year period depending on the program and classification. Given the above approaches and resources, we are confident that the MCMS Ph.D. program will attract students from all over the United States, specifically students who pursued undergraduate and/or Master’s degrees at coastally-located colleges and universities.

E. Enrollment Projections - Use Table 1 to show the estimated cumulative headcount and full-time student equivalent (FTSE) enrollment for the first five years of the program, including the ethnic breakdown of the projected enrollment (White, African American, Hispanic, International, Other). Include summer enrollments, if relevant, in the same year as fall enrollments. Subtract students as necessary for projected graduations or attrition. Provide explanations of how headcounts, FTSE numbers, projections for underrepresented students, and attrition were determined. Define full-time and part-time status.

Enrollment for the MCMS Ph.D. program will take place during fall and spring admission terms. We expect to recruit 4-5 students per year, with FTSE (full-time student equivalent) and cumulative headcount limited to 16-18 students during the first five years (see Table 1). This figure includes the first cohort of MCMS Ph.D. students graduating at the end of Year 4 and 5, and some attrition in the beginning of Year 4 and 5, a realistic assumption for a rigorous Ph.D. program. Our primary focus in the first five years will be on building funding sources to sustain increased numbers of doctoral students into the program. Projections for underrepresented students are based on related proportions in the MMRM program. Additionally, with funding from the TAMUG Merit and Diversity Fellowships, underrepresented students will be sought and recruited for admission into the MCMS Ph.D. program.

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<th>Table 1. Enrollment Projections</th>
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<tr>
<td><strong>Year 1</strong></td>
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<td>New Students</td>
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<tr>
<td>White</td>
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<td>African-American</td>
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<td>Hispanic</td>
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<td>International</td>
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<tr>
<td>Other</td>
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<tr>
<td>Cumulative Headcount</td>
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<td>FTSE (full-time student equivalent)</td>
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<td>Attrition</td>
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<tr>
<td>Graduates</td>
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II. Academics

A. Accreditation - If the discipline has a national accrediting body, describe plans and timeline to obtain accreditation. For disciplines where licensure of graduates is necessary for employment, such as nursing, plans for accreditation are required. If the program will not seek accreditation, provide a detailed rationale explaining why.
There is no national accrediting body for the field of the proposed Ph.D. program. Accreditation will be through the Southern Association of Colleges and Schools Commission on Colleges (SACSCOC) concomitant with the accreditation process that occurs every 10 years for Texas A&M University.

B. Admissions Standards - Describe the institution’s general graduate admissions standards and the program-specific admissions standards for applicants of the program. The description addresses how the proposed program will seek to become nationally competitive. Explain how students will be assessed for readiness to enroll in program coursework. Include any policies for accepting students transferring from other graduate programs. Explain whether the program will accept full-time and part-time students.

The requirements for admission to the Ph.D. program in MCMS will be the same as the current requirements for admission to graduate studies at TAMUG; that is, a student must:

- Hold a four-year baccalaureate degree or higher from a college or university of recognized standing (i.e., a degree recognized as equivalent to a baccalaureate degree from an accredited institution in the U.S.) and have a satisfactory overall transcript, with a minimum of 3.0 grade point average in the last 60 hours of coursework;
- Show promise of intellectual and academic ability to pursue advanced study and research satisfactorily, through both scholastic evidence and a minimum of three letters of recommendation from persons capable of judging the applicant’s capabilities, and an evaluation of the Statement of Purpose essay;
- Have had adequate preparation to enter graduate study in the chosen field;
- Provide proof of standardized test scores of the Graduate Records Examination (GRE) with a recommended minimum of 150 on GRE-Verbal and 152 on GRE-Quantitative; and
- Provide proof of a minimum score of 80 on TOEFL iBT (550 paper-based), a minimum IELTS score of 6.0, or a PTE Academic score of 53 for all international applicants.

Students transferring into the program from another graduate program will be required to meet the same admissions requirements as outlined above. Transfer students may be allowed to transfer graded coursework credits completed with a grade B or greater, up to 18 credit hours (approximately one year of coursework), from another accredited graduate program that have not been used toward another degree upon the advice and approval of the student’s graduate advisory committee, the Department of Marine Sciences, and the Office of Graduate and Professional Studies.

The MCMS Ph.D. program will seek to become nationally competitive by recruiting top quality students internally and from research programs across the country. While the proposed program is interdisciplinary in nature, we will ensure graduating students have a very strong foundation in research methods and design, as these are the skills most sought by top universities and research institutions. We expect that each graduating student will be prepared to succeed as a researcher at a top university or a research institution, even if they may choose not to pursue this career tract. With these skills, students will have multiple employment opportunities beyond academia, including government, consulting, industry, and non-governmental organizations. By training students to succeed in top research settings, this proposed program will be able to place graduates in a broad range of research positions where they will have a long-lasting impact on society.

C. Program Degree Requirements - Describe the similarities and differences between the proposed program and peer programs in Texas and nationally. Indicate the different credit hour and curricular requirements, if any, for students entering with a bachelor’s degree and students entering with a master’s degree. Use Table 2 to show the degree requirements of the program. If requirements vary for students entering with a master’s degree or comparable qualifications, provide an explanation. Modify the table as needed. If necessary, replicate the table to show more than one option.

Students entering the Ph.D. program in MCMS will be expected to have a strong background in the marine sciences and/or marine and coastal resources management and policy. Students lacking preparation in a particular subject area, but who are otherwise well-qualified to enter the graduate
program, will be required to take appropriate leveling course work in addition to that specified for the Ph.D. degree. These courses will not be credited as part of the degree plan. A full complement of undergraduate leveling courses is already available. The need for leveling courses for a prospective student will be decided upon by the Ph.D. Admissions Committee in consultation with the prospective graduate advisory committee chair. As with all graduate degrees at Texas A&M, the academic program is tailored to the background and educational goals of each degree candidate in consultation with her or his graduate advisory committee, utilizing courses provided by the faculty (a list of courses available to the MCMS Ph.D. students is given in Appendix A).

The curriculum of the MCMS Ph.D. program requires that all students demonstrate competence in, and understanding of, general principles of marine sciences and ecology; broad knowledge of marine and coastal ecosystems and the management and policy aspects that impact and govern these ecosystems; and broad knowledge of the characteristics of the marine and coastal environment accompanied by an understanding of, and skills in, the analysis of data (e.g., research design and quantitative analysis). Assessment of this body of knowledge on an individual student basis will be through course work completed, the preliminary examination, the dissertation proposal, the dissertation defense, and the written dissertation of the student's original research.

The overall requirements of the MCMS Ph.D. program in terms of course-load, preliminary examination, dissertation proposal and defense, are similar to the five existing peer programs listed in Section I.B. The MCMS Ph.D. curriculum also follows the general pattern of the five existing programs with regard to required courses in coastal management, theory, Ph.D. specific seminars, and research methods. One notable difference in the MCMS Ph.D. program relative to the existing programs is the increased emphasis on quantitative methods. The other existing programs typically require one course focused on methods, whereas the MCMS Ph.D. program places increased emphasis on methodological knowledge through three required quantitative analysis courses (see Table 4).

The courses for the Ph.D. program in MCMS are listed in Appendix A; other courses may be substituted for one or more of the courses in the lists, if the student has previously completed upper division or graduate-level courses with content deemed adequate by the student’s graduate advisory committee. If a student advances from the MMRM in the Marine Sciences department directly to the MCMS Ph.D. program, and has already taken these courses, the student will still need to demonstrate competence in the subject areas on the preliminary examination. The courses in each student’s degree plan will be determined by the student, the student’s graduate advisory committee, and the department. The total number of hours for the degree sought must still be met. Minimum degree requirements for the Ph.D. program is listed in Table 2.

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<th>Table 2. Program Degree Requirements</th>
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<tr>
<td><strong>Category</strong></td>
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<td>Required Courses</td>
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<td>Prescribed Electives</td>
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<td>Free Electives</td>
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<td>Dissertation</td>
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<td>Total</td>
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Please note that Education Code 61.059 (l) limits funding for doctoral programs to 99 SCH, unless exempted by the THECB.
Students who desire a Ph.D. in the MCMS program without prior attainment of a Master’s degree will also be considered by the Admissions Committee. The student’s graduate advisory committee will work with the student to develop a degree plan that fills gaps in their knowledge base and skill-sets. They will be allowed to obtain a MMRM degree, should they have completed all the requirements, if their path to a Ph.D. becomes unsuccessful or interrupted. Admission and degree planning for students who only possess an undergraduate degree will occur, within the maximum of 96 credit hours, with full consultation of the Admissions Committee and the prospective graduate advisory committee chair.

| Table 3. Semester Credit Hour Requirements of Similar Programs in Texas |
|-----------------------------|-------------------------------|-----------------------------|-----------------------------|-----------------------------|
| Institution | Program CIP Code | Degree Program | Semester Credit Hours, Entering with Bachelor’s | Semester Credit Hours, Entering with Master’s |
| No similar program in Texas |

**D. Curriculum** - Describe the educational objectives of the proposed program. If the program has a unique focus or niche, describe it in relationship to peer programs. Describe how the program would achieve national prominence. Provide an explanation of required, prescribed, and elective courses and how they fulfill program requirements.

Describe policies for transfer of credit, course credit by examination, credit for professional experience, placing out of courses, and any accelerated advancement to candidacy. Identify any alternative learning strategies, such as competency-based education, that may increase efficiency in student progress in the curriculum. If no such policies are in place to improve student progression through a program, provide an explanation.

Complete Tables 4, 5, and 6 to list the required/core courses, prescribed elective courses, and elective courses of the program and semester credit hours (SCH). Note with an asterisk (*) courses that would be added if the program is approved. Modify the tables as needed. If applicable, replicate the tables for different tracks/options.

The MCMS Ph.D. program will expect its graduates to have a multitude of options for employment, ranging from academic/research institutions, government, industry, consulting, to non-governmental organizations. Training students for multiple avenues of employment success will ensure an impactful and long-lasting program. The proposed Ph.D. program will also be competitive with the top universities focusing on marine and coastal management and science, such as Duke University, University of Delaware, and University of Rhode Island. We will emphasize research methods and design in training students to ensure scholarly productivity upon graduation so that each graduating student will be prepared to succeed as a researcher at a top university or a research institution, even if they may choose not to pursue this career tract. By producing highly productive scholars, we expect this program to attain national prominence.

The curriculum for the MCMS Ph.D. program is interdisciplinary in nature. This curriculum will draw upon multiple marine and coastal-related courses that will be used to provide a context to traditionally required methodological, quantitative, and theoretical courses. Students in the MCMS Ph.D. program will be exposed to knowledge and research techniques related to coastal management, geospatial analysis, living and nonliving resources, health and human impacts, natural and technological hazards, and legal/ethical issues. Courses required of all MCMS Ph.D. students include a course on research methods; three courses in statistics, with one aimed to provide knowledge to a specific field of statistics; a GIS (Geographic Information System) course to provide or increase spatial-analytical capabilities; an epistemology course to provide an understanding of theories of knowledge and learning; a coastal management course to provide a deeper knowledge of the interface between anthropogenic and natural environments from a policy perspective; and a series of two seminars designed for the MCMS Ph.D. students and with the aim of increasing technical, proposal, and research-related writing skills (see Table 4 and Table 5). The remainder of the curriculum consists of free elective courses that the student can select depending upon the
student’s research interests and with input from the student’s graduate advisory committee. For a “straight-shot” Ph.D. student without a prior M.S. degree, an additional 18 hours of course work will be required (see Table 4). The student’s graduate advisory committee will work with the student to develop a degree plan specific to the needs of the student that at minimum will include the required core (Table 4) and prescribed elective (Table 5) courses.

To maintain the rigor and high-expectations of a Ph.D. program that seeks national prominence, credits by examination or based on professional experience, and other forms of accelerated advancement to candidacy will not be granted. However, transfer students may be allowed to use graded coursework completed with a grade of B or greater for up to 18 credit hours (approximately one year of coursework) from another accredited graduate program, so long as they have not been used toward another degree and with approval of the student’s graduate advisory committee, the Department of Marine Sciences, and the Office of Graduate and Professional Studies.

The interdisciplinary nature of the MCMS Ph.D. program curriculum is intended to provide increased flexibility and topical specialization across a range of coastal and marine related topics. This curricular approach will provide open access to a variety of courses from the Texas A&M and TAMUG campuses, allowing students with diverse educational backgrounds to gain the knowledge necessary to be successful at the Ph.D. level. Descriptions for required core courses, prescribed elective courses, and examples of potential elective courses are listed in Table 6 and can also be found in Appendix A.

<table>
<thead>
<tr>
<th>Table 4. Required/Core Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prefix and Number</td>
</tr>
<tr>
<td>MARS 603*</td>
</tr>
<tr>
<td>MARS 604*</td>
</tr>
<tr>
<td>MARS 625</td>
</tr>
<tr>
<td>MARS 643*</td>
</tr>
<tr>
<td>MARS 644*</td>
</tr>
<tr>
<td>MARS 652</td>
</tr>
</tbody>
</table>

* Courses that would be added if the program is approved

<table>
<thead>
<tr>
<th>Additional Required Courses for students without a prior M.S. degree</th>
</tr>
</thead>
<tbody>
<tr>
<td>MARS 615</td>
</tr>
<tr>
<td>MARS 635</td>
</tr>
<tr>
<td>MARS 675</td>
</tr>
<tr>
<td>MARS 676</td>
</tr>
<tr>
<td>PLAN 641</td>
</tr>
<tr>
<td>PLAN 642</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 5. Prescribed Elective Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prefix and Number</td>
</tr>
<tr>
<td>MARS 681</td>
</tr>
<tr>
<td>(to be determined)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 6. Elective Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prefix and Number</td>
</tr>
<tr>
<td>ESSM 631</td>
</tr>
<tr>
<td>Course</td>
</tr>
<tr>
<td>----------</td>
</tr>
<tr>
<td>ESSM 635</td>
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<tr>
<td>ESSM 660</td>
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<tr>
<td>ESSM 689</td>
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<tr>
<td>GEOG 651</td>
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<tr>
<td>GEOG 665</td>
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<tr>
<td>GEOG 676</td>
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<tr>
<td>MARB 620</td>
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<tr>
<td>MARS 610</td>
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<tr>
<td>MARS 615</td>
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<tr>
<td>MARS 626</td>
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<tr>
<td>MARS 635</td>
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<td>MARS 650</td>
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<tr>
<td>MARS 655</td>
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<td>MARS 656</td>
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<td>MARS 660</td>
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<td>MARS 670</td>
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<td>MARS 675</td>
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<td>MARS 676</td>
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<tr>
<td>MARS 680</td>
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<td>MARS 689</td>
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<td>MARS 691</td>
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<td>PLAN 642</td>
</tr>
<tr>
<td>PLAN 665</td>
</tr>
<tr>
<td>PSAA 606</td>
</tr>
<tr>
<td>PSAA 689</td>
</tr>
</tbody>
</table>

**E. Candidacy/Dissertation** - If the proposed program requires a dissertation, describe the process leading to candidacy and completion of the dissertation. Describe policies related to dissertation hours, such as a requirement to enroll in a certain number of dissertation hours each semester. Indicate if a master’s degree or other certification is awarded to students who leave the program after completing the coursework, but before the dissertation defense.

A preliminary examination, written and oral, is required, and shall be administered in accordance with the rules outlined in the Texas A&M Graduate Catalog. It will be given no earlier than a date at which the student is within approximately 6 credit hours of completion of the formal course work on the degree plan, or no later than the end of the semester following completion of the formal course work on the degree plan. The written portion of the exam shall cover all fields of study included in the student’s degree plan. The written examinations must be completed and reported as satisfactory before the oral portion of the examination may be held. Upon successful completion of the preliminary examination (written and oral portions), completion of all graded coursework on the degree plan with the exception of any remaining seminars, internship or research courses, meeting residency requirements, and submission of an approved dissertation proposal, the student will be admitted to candidacy.

Students must pass the final examination/dissertation defense by deadline dates published in the Texas A&M Office of Graduate and Professional Studies calendar. No student may be given a final examination unless their GPR is 3.0 or above, they have been admitted to candidacy, and there are no grades of D, F or U for any course listed on the degree plan. Students must also maintain
continuous registration, by registering either ‘In Absentia’ or ‘In Residence’, until all requirements for the MCMS Ph.D. degree have been completed.

For students who are admitted to candidacy but fail to complete or successfully defend their dissertation, they may be allowed, at the discretion of their graduate advisory committee and the Department of Marine Sciences, to leave the doctoral program and receive a Master’s in Marine Resources Management, an existing graduate program within the Department of Marine Sciences at TAMUG, upon completion of the degree requirements.

F. Use of Distance Technologies - If applicable, describe the use of any distance technologies in the program, including a description of interactions between students and faculty, opportunities for students to access educational resources related to the program, exchanges with the academic community, and in-depth mentoring and evaluation of students. If more than 50 percent of the program content will be delivered off-campus, the institution must also submit a completed “Distance Education Doctoral Degree Proposal” form: Distance Education Degree Doctoral Form.

The MCMS Ph.D. program seeks to offer some selected courses by distance to provide flexibility to the students. Some courses, including MARS and College Station courses (e.g., ESSM 635), may be available for students through distance learning, but current course offerings limit the number of distance learning courses to less than four courses. Those who pursue their coursework by distance will do so under the close scrutiny, advice, and consent of their graduate advisory committees. Conventional laboratory courses will require time on campus, or in the field, on weekends or during summers. Courses may be converted for distance delivery as needed by students and if course content permits.

Distance courses offer students a “common look and feel” through its web-based eCampus and TTVN. TAMUG has several well-equipped distance learning facilities located in the Williams Library, in Kirkham Hall, two in the Classroom-Laboratory Building, in the recently renovated Sea Aggie Center, and in the new Ocean and Coastal Studies Building. Galveston and College Station library facilities are able to serve both distance and residence students. The chair of the student’s graduate advisory committee will provide frequent guidance for distance education via e-mail and telephone.

G. Program Evaluation - Describe how the program will be evaluated. Describe any reviews that would be required by an accreditor, and show how the program would be evaluated under Board Rule 5.52.

As required by the Texas Higher Education Coordinating Board, initial program assessment and reporting will be conducted for each of the first five years of the MCMS Ph.D. program. In addition, as required by Texas A&M in fulfillment of the requirements set forth by the Southern Association of Colleges and Schools Commission on Colleges (SACSCOC), program level assessment and reporting will be conducted using the framework outlined by the Provost at Texas A&M and utilizing WeaveOnline. The institutional effectiveness process currently in place requires each degree program to identify at least 3-4 student learning outcomes, develop appropriate measures, report results annually, and determine any program modifications needed.

At the conclusion of year three of the Ph.D. program in MCMS, the program will begin reporting and publishing their 18 Characteristics of Doctoral Programs data on the Texas A&M (http://ogaps.tamu.edu/Prospective-Students/Programs-and-Degrees/18-Characteristics-of-the-Doctoral-Programs) and TAMUG (http://www.tamug.edu/grad/images/18_Characteristics_MarineBiology.pdf) websites for public access. Data collection for 18 Characteristics of Doctoral Programs will begin at the program’s inception and be ongoing. At the conclusion of seven years of instruction, the MCMS Ph.D. program will be due for its first Academic Program Review as outlined and required by the Texas Administrative Code (Rule §5.52: Review of Existing Degree Programs). This multi-stage review process will include a comprehensive self-study of the program, a review of the previous five years, as well as an External Review Site Visit, and Post Review. These reviews will be conducted by a
select group of well-known academicians and administrators from prestigious institutions as well as industry leaders. The reviews will be undertaken on campus over a three or four day period. Prior to the reviews, extensive documentation collected through a departmental self-study will be provided to the review team. These materials will include faculty CVs, teaching loads, budgets, extramural funding, faculty publications, graduate student qualifications, student time-in-residence, student retention, and student employment after graduation, among others. The self-study as well as the review will also focus on specific student learning outcomes developed by the faculty emphasizing Texas A&M’s commitment to research, technology, diversity, and internationalization as defined by the University’s Quality Enhancement Plan (QEP). In addition, the faculty will assess their contribution and relationship within the context of the University’s Strategic Plan, Vision 2020. The reviewers will supply to the administration an in-depth evaluation of the program including suggestions for program improvement.

H. Strategic Plan - Describe how the proposed doctoral program fits into the institution’s overall strategic plan, and provide the web link to the institution’s strategic plan. Explain how the proposed program builds on and expands the institution’s existing recognized strengths.

TAMUG is committed to continuing its development to become a modern 21st Century research institution that integrates state-of-the-art facilities, top-tier faculty, and incorporates diversity and inclusiveness as central tenets of its mission of academic success; refer to the websites for the mission statement of Texas A&M (http://www.tamu.edu/statements/mission.html) and TAMUG (http://www.tamug.edu/about/#mission). The MCMS Ph.D. program fits in the Texas A&M 2015-2020 Strategic Plan (http://provost.tamu.edu/initiatives/strategic-planning-2015-2020-folder/FINALSTRATPLANwitheditsv2.pdf) to “produce impactful new knowledge, innovations, and creative works as evidenced by contributions to solving society’s grand challenges” and to “produce the needs of the public good at the forefront of our mission as evidenced by translating rapidly our scholarly and creative work to serve and improve society’s natural environment, economic environment, and human condition” and the TAMUG 2016-2020 Strategic Plan (http://www.tamug.edu/AcademicAffairs/pdf/TAMUG_Strategic_Plan-FINAL_Dec_2015.pdf) to increase graduate student enrollment and develop applied solutions to coastal and marine related issues. This program will thus allow TAMUG to fulfill these tenets by strategically developing its graduate education structure and increasing graduate enrollment while further supporting the enhanced scholarship of its faculty.

The MCMS Ph.D. program also fits squarely within the Texas Higher Education Coordinating Board’s 60x30TX Plan (http://www.thecb.state.tx.us/reports/PDF/6862.PDF) to increase the percentage of 25-34 year olds with a degree to 60%. In addition to increasing the number of Texans with a degree, the MCMS Ph.D. program also specifically addresses one of the four goals outlined in the 60x30TX Plan. The linkage of the MCMS Ph.D. program with the third goal of “Marketable Skills” is strong based on the intersection of job market needs and the lack of existing state programs. The MCMS Ph.D. program will matriculate students who are poised to be leaders in coastal management fields that will not only be in demand, but also necessary to address increasingly visible and critical policy and management issues along the Texas coastline.

I. Related and Supporting Programs - Complete Table 7 with a list of all existing programs that would support the proposed program. This includes all programs in the same two-digit CIP code, and any other programs (graduate and undergraduate) that may be relevant. Include data for the applications, admissions, enrollments, and number of graduates for each of the last five years. Modify the table as needed. The example provided in Table 7 shows degree programs that would relate to or support an additional Ph.D. in another area of chemistry, for example a proposal for a PhD in Forensic Chemistry (40.0510).

The MCMS Ph.D. program is internally related to two bachelor’s degrees (OCRE and MARS) and one master’s degree (MMRM) in the Department of Marine Sciences at TAMUG. As demonstrated in Table 7, the two related undergraduate programs continue upward/stable trends in enrollment and consistently generate graduates each academic year, while the MMRM program has maintained both
stable enrollment counts and graduates. These undergraduate and graduate programs are expected to support the MCMS Ph.D. program by supplying new students. There are two related degrees in College Station campus, Master of Urban and Regional Planning (MUP) and Ph.D. in Urban and Regional Science (URSC) in the College of Architecture that focus on social science and equity issues in urban regions (see Table 7). The MUP degree program is expected to supply the students who are interested in coastal environments to the MCMS Ph.D. program. Also listed in Table 7 are other undergraduate and graduate programs in Galveston and College Station campuses that have the same 2-digit CIP code.

<table>
<thead>
<tr>
<th>Table 7. Related and Supporting Programs</th>
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<tbody>
<tr>
<td></td>
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<tr>
<td><strong>Galveston Campus (TAMUG)</strong></td>
</tr>
<tr>
<td><strong>BS in Ocean and Coastal Resources (OCRE) (03.0205.00)</strong></td>
</tr>
<tr>
<td>Applications</td>
</tr>
<tr>
<td>Admissions</td>
</tr>
<tr>
<td>Enrollments</td>
</tr>
<tr>
<td>Number of Graduates</td>
</tr>
<tr>
<td><strong>BS in Marine Sciences (MARS) (30.3201.00)</strong></td>
</tr>
<tr>
<td>Applications</td>
</tr>
<tr>
<td>Admissions</td>
</tr>
<tr>
<td>Enrollments</td>
</tr>
<tr>
<td>Number of Graduates</td>
</tr>
<tr>
<td><strong>Master of Marine Resources Management (MMRM) (03.0205.00)</strong></td>
</tr>
<tr>
<td>Applications</td>
</tr>
<tr>
<td>Admissions</td>
</tr>
<tr>
<td>Enrollments</td>
</tr>
<tr>
<td>Number of Graduates</td>
</tr>
<tr>
<td><strong>BS in Marine Fisheries (MARF) (03.0301.00)</strong></td>
</tr>
<tr>
<td>Applications</td>
</tr>
<tr>
<td>Admissions</td>
</tr>
<tr>
<td>Enrollments</td>
</tr>
<tr>
<td>Number of Graduates</td>
</tr>
<tr>
<td><strong>College Station</strong></td>
</tr>
<tr>
<td><strong>Master of Urban and Regional Planning (MUP) (04.0301.00)</strong></td>
</tr>
<tr>
<td>Applications</td>
</tr>
<tr>
<td>Admissions</td>
</tr>
<tr>
<td>Enrollments</td>
</tr>
<tr>
<td>Number of Graduates</td>
</tr>
<tr>
<td><strong>PhD in Urban and Regional Science (URSC) (04.0301.00)</strong></td>
</tr>
<tr>
<td>Program</td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
</tr>
<tr>
<td>BS in Renewable Natural Resources (RENR) (03.0101.00)</td>
</tr>
<tr>
<td>Master of Natural Resources Development (MNRD) (03.0101.00)</td>
</tr>
<tr>
<td>BS in Wildlife and Fisheries Sciences - Wildlife Ecology &amp; Conservation (WFSC-WEC) (03.0601.00)</td>
</tr>
<tr>
<td>MS in Wildlife and Fisheries Sciences (WFSC) (03.0101.00)</td>
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<tr>
<td>PhD in Wildlife and Fisheries Sciences (WFSC) (03.0101.00)</td>
</tr>
<tr>
<td>BS in Environmental Studies (ENST) (03.0103.00)</td>
</tr>
<tr>
<td>BS in Bioenvironmental Sciences (BESC) (03.0104.00)</td>
</tr>
<tr>
<td>Enrollments</td>
</tr>
<tr>
<td>Number of Graduates</td>
</tr>
<tr>
<td><strong>BS in Environmental Geoscience (ENGS) (03.0104.00)</strong></td>
</tr>
<tr>
<td>Applications</td>
</tr>
<tr>
<td>Admissions</td>
</tr>
<tr>
<td>Enrollments</td>
</tr>
<tr>
<td>Number of Graduates</td>
</tr>
<tr>
<td><strong>BS in Forestry (FORS) (03.0501.00)</strong></td>
</tr>
<tr>
<td>Applications</td>
</tr>
<tr>
<td>Admissions</td>
</tr>
<tr>
<td>Enrollments</td>
</tr>
<tr>
<td>Number of Graduates</td>
</tr>
<tr>
<td><strong>Master of Wildlife Science (MWSC) (03.0601.00)</strong></td>
</tr>
<tr>
<td>Applications</td>
</tr>
<tr>
<td>Admissions</td>
</tr>
<tr>
<td>Enrollments</td>
</tr>
<tr>
<td>Number of Graduates</td>
</tr>
</tbody>
</table>

| a The numbers for applications, admissions and enrollments are based on the Fall semester of each academic year. |
| b The number of graduates is the number of students who graduated during that academic year. |

J. **Existing Doctoral Programs** - Provide the web link(s) for the 18 Characteristics of Doctoral Programs for each of the institution’s existing doctoral programs. Describe how existing closely related doctoral programs would enhance and complement the proposed program.

The 18 Characteristics for Doctoral Programs for each of the existing doctoral programs at Texas A&M can be found at [http://ogaps.tamu.edu/Prospective-Students/Programs-and-Degrees/18-Characteristics-of-the-Doctoral-Programs](http://ogaps.tamu.edu/Prospective-Students/Programs-and-Degrees/18-Characteristics-of-the-Doctoral-Programs) and the TAMUG at [http://www.tamug.edu/grad/images/18_Characteristics_MarineBiology.pdf](http://www.tamug.edu/grad/images/18_Characteristics_MarineBiology.pdf).

TAMUG has one existing doctoral program, the Marine Biology Interdisciplinary Program (MARB-IDP, [http://www.tamug.edu/marb/Graduate/](http://www.tamug.edu/marb/Graduate/)), a relatively young doctoral program that integrates courses from three Texas A&M campuses: Galveston, College Station, and Texas A&M University-Corpus Christi. The 18 Characteristics of Doctoral Programs for MARB-IDP are available at [http://www.tamug.edu/grad/images/18_Characteristics_MarineBiology.pdf](http://www.tamug.edu/grad/images/18_Characteristics_MarineBiology.pdf). The MARB-IDP program at Galveston had 59 students enrolled in the Fall 2016 semester, and 79% of full-time students had some level of institutional financial support. While the MARB-IDP and MCMS Ph.D. programs both focus on marine and coastal-related topics, they are very different. As its name suggests the MARB-IDP attracts and educates students who desire to research and study in fields related to biology and more “bench-science” focused topics. Although the importance of management and policy-related topics are acknowledged in the MARB-IDP program, they are rarely the focus. Conversely, the MCMS Ph.D. program provides an increased focus on management and policy related topics while explicitly recognizing the importance of the underlying science. In this sense, the MCMS Ph.D. program would truly be complementary to the existing MARB-IDP program.

There is one related doctoral program in College Station campus, Ph.D. in Urban and Regional Science (URSC) in the College of Architecture ([http://laup.arch.tamu.edu/academics/graduate/ursc/](http://laup.arch.tamu.edu/academics/graduate/ursc/)). The 18 Characteristics of Doctoral Programs
for URSC are available at http://ogaps.tamu.edu/OGAPS/media/medi.library/documents/18%20Characteristics%20of%20Doctoral%20Programs%202015/URSC.pdf. The URSC program had 42 students enrolled in the Fall 2016 semester, and 100% of full-time students had some level of institutional financial support. The URSC program is a social science program that focuses on issues related to planning on policy from the perspective of municipal and regional systems, including land use and transportation planning, housing, and equity issues in urban regions. The URSC program, however, does not cater to specific coastal and marine focused topics and their growing educational markets. The proposed MCMS Ph.D. program therefore will fulfill an unmet educational need and would be complimentary to the existing URSC program.

There is another doctoral program in College Station campus that has the same 2-digit CIP code, Ph.D. in Wildlife and Fisheries Sciences (WFSC) in the College of Agriculture and Life Sciences (http://wfsc.tamu.edu/academics/graduate/). The 18 Characteristics of Doctoral Programs for WFSC are available at http://ogaps.tamu.edu/OGAPS/media/media-library/documents/18%20Characteristics%20of%20Doctoral%20Programs%202015/WFSC.pdf. The WFSC program had 64 students enrolled in the Fall 2016 semester, and 39% of full-time students had some level of institutional financial support. The WFSC program has a focus in biological sciences, particularly as they relate to whole-organism biological systems. As the MCMS Ph.D. program focuses on management and policy related topics while explicitly recognizing the importance of the underlying science, it would be complementary to the existing WFSC program.

K. Recent Graduates Employment: For existing graduate programs (master’s and doctoral) within the same two-digit CIP code in the most recent year, show the number and percentage of graduates employed within one year of graduation, and list graduates’ field of employment, location, and the employer.

Texas A&M has one Ph.D. and four Master programs that have the same two-digit CIP code (03) as the proposed MCMS program. The Ph.D. program is the WFSC (Wildlife and Fisheries Science) program in College Station. The four Master programs include the MMRM (Master of Marine Resources Management) at TAMUG and the MNRD (Master of Natural Resources Development), MWSC (Master of Wildlife Science), and M.S. in WFSC in College Station (see Table 7).

The Department of Wildlife and Fisheries Sciences offers WFSC, which has graduated 9 Ph.D. students in 2015-2016 and 67% were employed within one year of graduation. The graduates were employed in academic institution (Texas A&M), government agencies (Department of Defense and U.S. Fish and Wildlife Service), and private consulting company (Querencia Environmental).

The Department of Marine Sciences offers MMRM, which has graduated 13 Master students in 2015-2016 and 100% were employed within one year of graduation. The graduates were employed in academic institutions (Beth Yeshurun School and TAMUG), government agencies (City of South Padre Island and U.S. Army Corps of Engineers), non-profit organizations (Memorial Park Conservancy and Sea Star Base Galveston), and private companies (Campbell Global, Half Associates, Hanson Professional Service Inc., Moody Gardens Inc., Organicis by Gosh, Penn’s Cave and Wildlife Park, and Weathertop Farm).

The Department of Wildlife and Fisheries Sciences offers three Master programs, including the MNRD, MWSC, and M.S. in WFSC, which have graduated 14 Master students in 2015-2016 and 79% were employed within one year of graduation. The graduates were employed in academic institution (Robert M. Beren Academy), research agency (Texas A&M AgriLife Extension), government agencies (Miami Bay County, Tennessee Wildlife Resources Agency, U.S. Fish and Wildlife Service, and U.S. Forest Service), and private organizations (Bee Creek Veterinary Hospital and Houston Zoo).

III. Faculty
A. Faculty Availability - Complete Tables 8 and 9 to provide information about core21 and support22 faculty. There should be at least four FTE faculty for a new doctoral program. Add an asterisk (*) before the names of the individuals who will have direct administrative responsibilities for the program. Add a pound symbol (#) before the name of any individuals who have directed doctoral dissertations or master’s theses. Modify table as needed.

The core for the MCMS Ph.D. program will consist of 11 faculty members, five of which will have some administrative duties within the program (see Table 8). Core membership is made up of faculty who will teach both required and elective courses as well as those who will direct dissertation research within the MCMS program. In addition to the 11 core MCMS faculty members, an additional 12 faculty members have also been designated as support faculty (see Table 9). The support faculty members teach elective courses in the MCMS program and/or may direct dissertation research.

Table 8. Core Faculty

<table>
<thead>
<tr>
<th>Name and Rank of Core Faculty</th>
<th>Highest Degree and Awarding Institution</th>
<th>Courses Assigned in Program</th>
<th>% Time Assigned to Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brody, Samuel #* Professor</td>
<td>Ph.D. (2002), University of North Carolina</td>
<td>MARS 652, PLAN 641, PLAN 642</td>
<td>50%</td>
</tr>
<tr>
<td>Davlasheridze, Meri #* Assistant Professor</td>
<td>Ph.D. (2013), Pennsylvania State University</td>
<td>MARS 603, MARS 604</td>
<td>25%</td>
</tr>
<tr>
<td>Dellapenna, Timothy # Associate Professor</td>
<td>Ph.D. (1999), College of William and Mary</td>
<td>MARS 644</td>
<td>10%</td>
</tr>
<tr>
<td>Highfield, Wesley #* Associate Professor</td>
<td>Ph.D. (2008), Texas A&amp;M University</td>
<td>MARS 626, MARS 681</td>
<td>50%</td>
</tr>
<tr>
<td>Kaiser, Karl # Assistant Professor</td>
<td>Ph.D. (2009), University of South Carolina</td>
<td>MARS 691</td>
<td>10%</td>
</tr>
<tr>
<td>Louchouarn, Patrick #* Professor</td>
<td>Ph.D. (1997), Université du Québec á Montréal, Canada</td>
<td>MARS 643</td>
<td>20%</td>
</tr>
<tr>
<td>Park, Kyeong #* Professor</td>
<td>Ph.D. (1993), College of William and Mary</td>
<td>MARS 670</td>
<td>20%</td>
</tr>
<tr>
<td>Retchless, David # Assistant Professor</td>
<td>Ph.D. (2015), Penn State University</td>
<td>MARS 625</td>
<td>25%</td>
</tr>
<tr>
<td>Ross, Ashley # Assistant Professor</td>
<td>Ph.D. (2010), Texas A&amp;M University</td>
<td>MARS 660, MARS 675</td>
<td>25%</td>
</tr>
<tr>
<td>Santschi, Peter # Professor</td>
<td>Ph.D. (1975), University of Berne, Switzerland</td>
<td>MARS 644</td>
<td>10%</td>
</tr>
<tr>
<td>van Hengstum, Peter # Assistant Professor</td>
<td>Ph.D. (2010), Dalhousie University, Canada</td>
<td>MARS 650</td>
<td>10%</td>
</tr>
</tbody>
</table>

* Indicates faculty member has administrative responsibilities for the MCMS Ph.D. program.
# Indicates faculty member has directed dissertations or theses and is expected to direct dissertation research in the MCMS Ph.D. program.

Table 9. Support Faculty

<table>
<thead>
<tr>
<th>Name and Rank of Support Faculty</th>
<th>Highest Degree and Awarding Institution</th>
<th>Courses Assigned in Program</th>
<th>% Time Assigned to Program</th>
</tr>
</thead>
</table>

21 Core Faculty: Full-time tenured and tenure-track faculty who teach 50% or more in the doctoral program or other individuals integral to the doctoral program who can direct dissertation research.
22 Support Faculty: Other full-time or part-time faculty affiliated with the doctoral program.
### Core Faculty

<table>
<thead>
<tr>
<th>Name</th>
<th>Title</th>
<th>Degree</th>
<th>University</th>
<th>Courses/Programs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Armitage, Anna</td>
<td>Associate Professor</td>
<td>Ph.D. (2003), University of California, Los Angeles</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Berke, Philip</td>
<td>Professor</td>
<td>Ph.D. (1981), Texas A&amp;M University</td>
<td>PLAN 665</td>
<td></td>
</tr>
<tr>
<td>Bodson, Bruce</td>
<td>Lecturer</td>
<td>J.D. (1993), South Texas College of Law</td>
<td>MARS 635, MARS 676, 15%</td>
<td></td>
</tr>
<tr>
<td>Feagin, Rusty</td>
<td>Associate Professor</td>
<td>Ph.D. (2003), Texas A&amp;M University</td>
<td>ESSM 631, ESSM 689</td>
<td></td>
</tr>
<tr>
<td>Jones, Glenn</td>
<td>Professor</td>
<td>Ph.D. (1983), Columbia University</td>
<td>MARS 615, 10%</td>
<td></td>
</tr>
<tr>
<td>Merrell, William</td>
<td>Professor</td>
<td>Ph.D. (1971), Texas A&amp;M University</td>
<td>MARS 680, 15%</td>
<td></td>
</tr>
<tr>
<td>Nyman, Elizabeth</td>
<td>Assistant Professor</td>
<td>Ph.D. (2010), Florida State University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Portney, Kent</td>
<td>Professor</td>
<td>Ph.D. (1979), Florida State University</td>
<td>PSAA 606, PSAA 689</td>
<td></td>
</tr>
<tr>
<td>Quigg, Antonietta</td>
<td>Professor</td>
<td>Ph.D. (2000), Monash University, Australia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rowe, Gilbert</td>
<td>Professor</td>
<td>Ph.D. (1968), Duke University</td>
<td>MARB 620</td>
<td></td>
</tr>
<tr>
<td>Wang, Grace</td>
<td>Assistant Professor</td>
<td>Ph.D. (2008), Texas A&amp;M University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wu, X. Ben</td>
<td>Professor</td>
<td>Ph.D. (1991), University of Tennessee</td>
<td>ESSM 660</td>
<td></td>
</tr>
</tbody>
</table>

# Indicates faculty member has directed dissertations or theses and is expected to direct dissertation research in the MCMS Ph.D. program.

#### B. Teaching Load

Indicate the targeted teaching load for core faculty supporting the proposed program. Teaching load is the total number of semester credit hours in organized teaching courses taught per academic year by core faculty, divided by the number of core faculty at the institution the previous year. Provide an assessment of the impact the proposed program will have, if approved, on faculty workload for existing related programs at the institution.

We plan to offer all required/prescribed courses (7) and 20% of elective courses (26 excluding MARS 689 and MARS 691 in Table 6) every year, then the increase in teaching load from this proposed Ph.D. program will be 1.11 courses per academic year: 12.2 courses / 11 core faculty members. Only 4 required courses are new courses and all other courses are existing ones (see Table 4, Table 5 and Table 6). The existing courses have been taught by core and other faculty members and thus do not impact the teaching load. Tenure track faculty teach the equivalent of 2 classes each semester and research active faculty usually have one-course release time and teach 3 courses per academic year at TAMUG. The 11 core faculty members in Table 8 taught 86 semester credit hours in 2016-2017, resulting in 7.82 credit hours per core faculty. Adding 4 new courses, i.e., 12 semester credit hours, will increase it to 8.91 credit hours per core faculty: 98 credit hours / 11 core faculty members. Therefore, the impact of teaching 4 new courses would have minimal impact on the teaching load of 11 core faculty and would not increase the teaching load of the core faculty beyond the level of a two-two load per year.

#### C. Core Faculty Productivity

Complete Tables 10 and 11 to provide information about faculty productivity, including the number of publications and scholarly activities and grant awards. Table 10 shows the most recent five years of data by core faculty, including the number of discipline-related refereed papers/publications, books/book chapters, juried creative/performance accomplishments, and notices of discoveries filed/patents issued. Table 11 shows the number and amount of external grants by core faculty.
Where relevant to performing arts degrees, major performances or creative endeavors by core faculty should be included. Examples are provided below. Do not include conference papers, reviews, posters, and similar scholarship. The format of the tables and information may vary, as long as the information is conveyed clearly. Include a list of the key journals in the field.

The core (Table 8) and support (Table 9) faculty for the proposed MCMS Ph.D. program consist of national and international leaders in the fields of coastal and marine resource management and policy who have been very productive (see Appendix F and Appendix G for their Curriculum Vitae). For example, 11 core faculty members published 166 peer-reviewed journal publications, 18 book chapters and 3 books, and received about $25 million ($16.4 million to TAMUG) in grant monies for the past 5 years, i.e., since 2012 (see Table 10 and Table 11).

### Table 10. Total Faculty Publications and Other Scholarly/Creative Accomplishments for the Past Five Years

<table>
<thead>
<tr>
<th>Faculty Name</th>
<th>Refereed Papers</th>
<th>Book Chapters</th>
<th>Books</th>
<th>Juried Creative/Performance</th>
<th>Patent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brody, Samuel</td>
<td>20</td>
<td>9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Davlasheridze, Meri</td>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dellapenna, Timothy</td>
<td>13</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Highfield, Wesley</td>
<td>15</td>
<td>4</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kaiser, Karl</td>
<td>16</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Louchouarn, Patrick</td>
<td>19</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Park, Kyeong</td>
<td>12</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Retchless, David</td>
<td>6</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ross, Ashley</td>
<td>6</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Santschi, Peter</td>
<td>39</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>van Hengstum, Peter</td>
<td>14</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>166</td>
<td>18</td>
<td>3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*a Recent Ph.D.’s: Davlasheridze (2013) and Retchless (2015)*

*b A new faculty who joined TAMUG in Fall 2016 used to have higher teaching loads at the previously affiliated schools (at least 6 courses per year).*

### Table 11. External Grant Awards for the Past Five Years

<table>
<thead>
<tr>
<th>Faculty Name</th>
<th>Grant Source</th>
<th>Grant Subject</th>
<th>Dates</th>
<th>Total Grant Amount</th>
<th>Institutional Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brody, Samuel</td>
<td>NSF</td>
<td>Examining the 100-year floodplain as a metric of risk, loss, and household adjustment.</td>
<td>2011-2013</td>
<td>$345,891</td>
<td>$345,891</td>
</tr>
<tr>
<td></td>
<td>Federal Transportation Agency</td>
<td>Transit climate change adaptation assessment pilots for the Gulf Coast region</td>
<td>2012-2013</td>
<td>$146,000</td>
<td>$146,000</td>
</tr>
<tr>
<td></td>
<td>Rice University Shell Center for Sustainability</td>
<td>Population development, infrastructure security, and morphological dynamics of the Upper Texas Gulf Coast</td>
<td>2013-2016</td>
<td>$207,000</td>
<td>$207,000</td>
</tr>
<tr>
<td></td>
<td>Houston Advanced Research Center</td>
<td>Survey of preferences for wave-based flood risk reduction strategies in Harris County, TX</td>
<td>2014</td>
<td>$132,146</td>
<td>$132,146</td>
</tr>
<tr>
<td></td>
<td>West Galveston Island Homeowner’s Association</td>
<td>An integrated assessment of flood risk reduction on the West End of Galveston Island</td>
<td>2014-2015</td>
<td>$50,000</td>
<td>$50,000</td>
</tr>
<tr>
<td>Sponsor</td>
<td>Project Title</td>
<td>Grant Period</td>
<td>Amounts</td>
<td></td>
<td></td>
</tr>
<tr>
<td>---------</td>
<td>---------------</td>
<td>--------------</td>
<td>---------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NSF</td>
<td>Enabling the next generation of hazards and disasters researchers</td>
<td>2014-2016</td>
<td>$349,725 $349,725</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NSF-PIRE</td>
<td>Coastal flood risk reduction program: Integrated, multi-scale approaches for understanding how to reduce vulnerability to damaging events</td>
<td>2015-2020</td>
<td>$3,598,502 $1,600,067</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Davlashe-ridze, Meri</td>
<td>Surge protection for the Galveston Bay region – Advancing the Ike Dike concept to protect the UTMB and its associated communities</td>
<td>2013-2015</td>
<td>$250,000 $250,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dellape-nna, Timothy</td>
<td>Seabed mapping of the lower shoreface and inner shelf of Galveston Island-post Ike</td>
<td>2009-2012</td>
<td>$159,761 $159,761</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dellape-nna, Timothy</td>
<td>Geological controls on submarine ground-water discharge into an upper bay estuary</td>
<td>2010-2013</td>
<td>$266,898 $266,898</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NSF</td>
<td>REU Internship Program: Marine science and marine biology-supplemental funding</td>
<td>2012</td>
<td>$59,909 $59,909</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NOAA/TGLO</td>
<td>Mapping of Brazos subaqueous delta-supplemental funding</td>
<td>2012-2013</td>
<td>$21,000 $21,000</td>
<td></td>
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<tr>
<td>USFWS/TGLO</td>
<td>Sediment sources investigation along the Texas Coast</td>
<td>2012-2014</td>
<td>$75,000 $75,000</td>
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<tr>
<td>NOAA/TGLO</td>
<td>Geological framework study of Follets Island</td>
<td>2013-2015</td>
<td>$202,000 $202,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TGLO</td>
<td>Berger-Resen Rebar breakwater feasibility testing</td>
<td>2013</td>
<td>$65,000 $65,000</td>
<td></td>
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</tr>
<tr>
<td>TX Sea Grant</td>
<td>If we lose Follets Island we lose Christmas Bay and coastal communities</td>
<td>2014-2016</td>
<td>$261,793 $261,793</td>
<td></td>
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<tr>
<td>City of Galveston/Atkins</td>
<td>Galveston Island beach monitoring</td>
<td>2014-2017</td>
<td>$150,000 $150,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NOAA/TGLO</td>
<td>Acquisition of a PVL-tech coring rig</td>
<td>2015</td>
<td>$25,000 $25,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BOEM/TGLO</td>
<td>Sand source investigation of offshore eastern Follets Island</td>
<td>2015-2016</td>
<td>$125,000 $125,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NSF-RAPID</td>
<td>Link between fluvial flood events, remobilization, and preservation in stratigraphic record</td>
<td>2015-2016</td>
<td>$24,984 $24,984</td>
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<tr>
<td>NWF</td>
<td>Matagorda Bay oyster reef mapping</td>
<td>2016-2018</td>
<td>$32,500 $32,500</td>
<td></td>
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<tr>
<td>NSF-OCE</td>
<td>Role and mechanisms of nuclei-induced calcium carbonate precipitation in the coastal C cycle</td>
<td>2016-2018</td>
<td>$46,970 $46,970</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NSF</td>
<td>Flood risk reduction colloquium with Delft University, Netherlands</td>
<td>2013</td>
<td>$27,230 $27,230</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TCEQ</td>
<td>Galveston Bay Estuary Program status and trends maintenance project</td>
<td>2014-2016</td>
<td>$173,228 $173,228</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TGLO</td>
<td>Identifying the future costs of floods in the Houston-Galveston Area</td>
<td>2017-2018</td>
<td>$127,182 $127,182</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kaiser, Karl</td>
<td>Vascular plant and aqueous microbial biomarkers for transformations of DOM</td>
<td>2013-2017</td>
<td>$808,727 $242,541</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NSF-EAR</td>
<td>Biomarkers for transformations of dissolved C and N reservoirs in Arctic rivers</td>
<td>2013-2016</td>
<td>$74,209 $74,209</td>
<td></td>
<td></td>
</tr>
<tr>
<td>US Fish &amp; Wildlife</td>
<td>Dissolved free amino acids as signals for homing by salmon</td>
<td>2015</td>
<td>$18,000 $18,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NSF-PLR</td>
<td>Effect of DOM on distributions of trace elements in the Arctic Ocean</td>
<td>2015-2018</td>
<td>$498,997 $399,878</td>
<td></td>
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</tr>
<tr>
<td>International Humic Substance Society</td>
<td>Chemical analysis of standard humic and fulvic acids</td>
<td>2016</td>
<td>$3,486 $3,486</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Louchou-arn, Patrick</td>
<td>PAH and levoglucosan analyses in Botanical Garden Lake sediment cores</td>
<td>2011-2013</td>
<td>$15,840 $15,840</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NASA-USDA</td>
<td>Relationships between land use change, wetland alteration &amp; carbon sequestration</td>
<td>2011-2014</td>
<td>$399,857 $399,857</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Welch Foundation</td>
<td>Basic chemical research at Texas A&amp;M University at Galveston</td>
<td>2011-2014</td>
<td>$175,000 $175,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cameron</td>
<td>A CDX pilot plant on TAMUG Campus: Site preparation, installation operation</td>
<td>2014-2015</td>
<td>$105,776 $105,776</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NSF</td>
<td>REU: Ocean &amp; Coastal resEArch experieNces for UndergraduateS (REU-OCEANUS)</td>
<td>2017-2020</td>
<td>$390,259 $390,259</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AL DCNR</td>
<td>Physical monitoring for fisheries applications</td>
<td>2006</td>
<td>$341,430 $341,430</td>
<td></td>
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</tr>
<tr>
<td>Name</td>
<td>Funding Agency</td>
<td>Project Description</td>
<td>Start Year</td>
<td>End Year</td>
<td>Full Cost (USD)</td>
</tr>
<tr>
<td>---------------------------</td>
<td>----------------</td>
<td>--------------------------------------------------------------------------------------</td>
<td>------------</td>
<td>-----------</td>
<td>-----------------</td>
</tr>
<tr>
<td>Park, Kyeong</td>
<td>NSF</td>
<td>Estimation of tracer fluxes and distributions</td>
<td>2007</td>
<td>2012</td>
<td>$86,593</td>
</tr>
<tr>
<td></td>
<td>GOMRI</td>
<td>Modeling of circulation and physical transport</td>
<td>2010</td>
<td>2012</td>
<td>$129,246</td>
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<tr>
<td></td>
<td>GOMRI</td>
<td>Identifying transport pathways</td>
<td>2010</td>
<td>2012</td>
<td>$199,223</td>
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<tr>
<td></td>
<td>GOMRI</td>
<td>Eulerian flow field and Lagrangian transport pathways</td>
<td>2010</td>
<td>2012</td>
<td>$177,975</td>
</tr>
<tr>
<td></td>
<td>MS-AL Sea Grant</td>
<td>Effects of residence time on HABs and fecal coliform bacteria</td>
<td>2010</td>
<td>2013</td>
<td>$295,160</td>
</tr>
<tr>
<td></td>
<td>NSF EPSCoR</td>
<td>Cyberinfrastructure for coastal hazards collaborative</td>
<td>2010</td>
<td>2013</td>
<td>$232,573</td>
</tr>
<tr>
<td></td>
<td>MS-AL Sea Grant</td>
<td>Circulation and transport model for fishery management</td>
<td>2014</td>
<td>2017</td>
<td>$149,876</td>
</tr>
<tr>
<td>Ross, Ashley</td>
<td>Dept. Homeland Security</td>
<td>Assess community resilience across localities in Gulf Coast.</td>
<td>2012</td>
<td>2013</td>
<td>$74,000</td>
</tr>
<tr>
<td></td>
<td>Murray-Darling Basin Authority, Australia</td>
<td>Assess community resilience of drought-stricken rural communities.</td>
<td>2016</td>
<td></td>
<td>$51,000</td>
</tr>
<tr>
<td>Santschi, Peter</td>
<td>NSF-OCE</td>
<td>Examining the binding of radionuclides with marine biopolymers</td>
<td>2009</td>
<td>2012</td>
<td>$460,487</td>
</tr>
<tr>
<td></td>
<td>NSF-CBET</td>
<td>Effects of exopolymeric substances on nanoparticle into marine phytoplankton cells</td>
<td>2009</td>
<td>2012</td>
<td>$248,158</td>
</tr>
<tr>
<td></td>
<td>Lawrence Berkeley National Lab</td>
<td>Using humic acid to immobilize radiiodine (1-129) in acidic waste plumes</td>
<td>2011</td>
<td>2013</td>
<td>$25,000</td>
</tr>
<tr>
<td></td>
<td>DOE, Office of Science, SBR</td>
<td>Importance of organo-iodine &amp; iodate in iodine-127,129 speciation, mobility and microbial activity in groundwater at DOE sites</td>
<td>2011</td>
<td>2015</td>
<td>$671,819</td>
</tr>
<tr>
<td></td>
<td>DOE, Office of Science, SBR</td>
<td>Plutonium speciation and mobility through the subsurface environment</td>
<td>2011</td>
<td>2016</td>
<td>$660,128</td>
</tr>
<tr>
<td></td>
<td>Pacific Northwest National Lab</td>
<td>Subsurface characteristics and treatment of iodine-129 contaminated groundwater</td>
<td>2012</td>
<td></td>
<td>$175,000</td>
</tr>
<tr>
<td></td>
<td>Pacific Northwest National Lab</td>
<td>Quantification of iodine speciation in contaminated groundwater and sediment</td>
<td>2013</td>
<td></td>
<td>$65,000</td>
</tr>
<tr>
<td></td>
<td>Naval Postgraduate School</td>
<td>Chemisorption of selected radionuclides for use in autonomous collection &amp; in-situ detection systems for monitoring marine/coastal waters</td>
<td>2013</td>
<td>2014</td>
<td>$167,477</td>
</tr>
<tr>
<td></td>
<td>NSF-OCE</td>
<td>Biopolymers produced by diatoms and coccolithophores as carriers for selected natural radionuclides in the ocean</td>
<td>2014</td>
<td>2018</td>
<td>$506,849</td>
</tr>
<tr>
<td></td>
<td>GOMRI</td>
<td>Role of microbial exopolymers in aggregation and degradation of oil and dispersants</td>
<td>2015</td>
<td>2017</td>
<td>$7,245,432</td>
</tr>
<tr>
<td></td>
<td>DOE, SBR</td>
<td>Natural organic matter and microbial controls on mobilization/immobilization of I and Pu in soils in USA and Japan</td>
<td>2015</td>
<td>2018</td>
<td>$600,000</td>
</tr>
<tr>
<td></td>
<td>DOE, PNNL</td>
<td>Post detonation maritime collection and analysis paper study</td>
<td>2016</td>
<td></td>
<td>$20,000</td>
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<tr>
<td></td>
<td>DOE, NEUP</td>
<td>Using radiiodine speciation for environmental remediation at the Fukushima Daiichi Nuclear Power Plant and a DOE site</td>
<td>2016</td>
<td>2019</td>
<td>$420,000</td>
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<td></td>
<td>DOE, LDRD</td>
<td>Silver-iodine secondary waste stabilization: multiscale evaluation</td>
<td>2017</td>
<td></td>
<td>$40,000</td>
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<td></td>
<td>DOE, SRNS</td>
<td>Radiiodine speciation on G-SOW-A-01859 waste form stabilization</td>
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<td></td>
<td>NSF-OCE</td>
<td>Calibrating storm records in Bermuda after Hurricane Gonzalo</td>
<td>2015</td>
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<td>Ray Dalio Research Fund</td>
<td>Climate drivers of hurricane activity in tropical North Atlantic</td>
<td>2015</td>
<td>2017</td>
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<td>TAMU-CONACyT</td>
<td>Drivers of Hurricane activity on the Yucatan Peninsula</td>
<td>2016</td>
<td>2017</td>
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</table>

AQW Updated 10/19/2015
Proposal to establish a Ph.D. Program in MCMS
The research activities in the entire Department of Marine Sciences generate a positive revenue stream for TAMUG and the Department (through indirect returns for the latter). Several researchers in the Department maintain large research groups and projects, and the department averages approximately $2.7 million per year in extramural funding over the last five years (see Figure 2). Approximately 42% of that funding is derived from Federal agencies including the National Science Foundation (NSF), National Oceanographic and Atmospheric Administration (NOAA), National Aeronautics and Space Administration (NASA), and Department of Energy (DOE), whereas the remaining is derived from state and regional programs including the Texas Commission of Environmental Quality (TCEQ) and Texas General Land Office (TGLO). We anticipate that the recent addition of nine new faculty including seven tenure-track Assistant Professors and one tenured Professor in the Department since 2012 will substantially contribute to the increase in funded research for TAMUG and the Department. The funding for these additional positions is independent of this proposal and will contribute to the strength of the faculty to support the proposed MCMS program. The research activities for the entire Galveston campus show a positive increasing trend over the years. Total research revenue has increased by approximately 46% over the last four years, and 30-50% of that funding was from federal funding programs (see Figure 3). Grant data also show that the Department of Marine Sciences contributes close to 36-44% of all research expenditures on the Galveston campus (see Figure 2 and Figure 3).

<table>
<thead>
<tr>
<th></th>
<th>Climate drivers of drought in the northeastern Caribbean basin</th>
<th>2017-2020</th>
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<tr>
<td></td>
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<td>$24,870,107</td>
<td>$16,386,407</td>
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**Figure 2.** Research revenue generated by the Marine Sciences Faculty from federal (red bars) and state, local and private (blue bars) sources as reported to the NSF Higher Education Research and Development Survey.
Most recently, TAMUG faculty have secured a $3.6 million grant from the NSF to establish an international research and education program on flood risk reduction. This program greatly increases our research capabilities on coastal and marine management and policy, and creates a new demand for on-campus doctoral students to support research activities. In fact, the MCMS Ph.D. program would provide a foundation for seeking additional and larger externally funded grants in the future.

With recent hires (11 total in the Marine Sciences department since 2012, with eight as tenure-track/tenured faculty), there is a substantial number of high-quality faculty at TAMUG to support the MCMS Ph.D. program. At present, the campus houses leading scholars in planning, geospatial analysis, economics, legal and policy studies, natural hazards, and health issues. In addition, TAMUG now formally houses two Sea Grant extension specialists since the summer of 2014, the head of Sea Grant Extension and an ecosystem extension specialist. The Center for Texas Beaches and Shores (CTBS) also has been awarded a fellowship from the Texas Institute for Advanced Study, with which the CTBS along with the Department of Marine Sciences are hosting Professor Gerry Galloway, a leading international scholar in coastal flood policy.

IV. Resources

A. Student Financial Assistance - Complete Table 12 to provide the number of full- and part-time students who would be funded and the anticipated amounts for each of the first five years. Modify the table as needed to distinguish between Teaching Assistantships, Research Assistantships, and Scholarships/Grants. If student financial assistance is reliant upon grant funding, explain how funding will be consistently sustained if grant income falls short of projections. Additionally, show how the level of student support compares to the anticipated overall student cost of tuition and fees.

We anticipate the ability to provide some form of financial assistance to each full-time student enrolled in the MCMS Ph.D. program under the proposed enrollment cap of 5 new students per year during the first five years. Financial assistance will be provided through teaching and research assistantships as well as competitive fellowships/scholarships both in and outside of TAMUG (see Table 12). Doctoral students receiving graduate assistantships would receive financial assistance in

Figure 3. Research revenue generated by TAMUG Faculty from federal (blue bars) and state, local and private (blue bars) sources.
the form of a non-resident tuition waiver, full tuition payment, competitive graduate monthly stipend, and eligibility for health benefits. The financial assistance shown in Table 12 ($34,440) covers full tuition for 24 credit hours (9 credit hours for each of Fall and Spring semesters, and 6 credit hours during the Summer semester) and includes monthly stipend ($2,000) for 12 months.

<table>
<thead>
<tr>
<th>Table 12. Student Financial Assistance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<tr>
<td></td>
</tr>
<tr>
<td>Teaching Assistants</td>
</tr>
<tr>
<td># of Full-time students</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Amount per student†</td>
</tr>
<tr>
<td>Research Assistants</td>
</tr>
<tr>
<td># of Full-time students</td>
</tr>
<tr>
<td>Amount per student†</td>
</tr>
<tr>
<td>Fellowships/Scholarships</td>
</tr>
<tr>
<td># of Full-time students</td>
</tr>
<tr>
<td>Amount per student†</td>
</tr>
</tbody>
</table>

† With the assumption of 3% increase from Year 3 to Year 4

The student financial assistance in Table 12 is competitive with the financial assistance provided by the five existing U.S. Ph.D. academic programs in coastal and marine management and policy (see Section I.B). All these programs provide some form of assistance, but the level of support varies. For example, materials for the Ph.D. program in Coastal Resources Management at East Carolina University state that “graduate fellowships and out-of-state tuition remissions are available to highly qualified applicants during their first year.” Comparable statements of financial support are found in the Marine Science program at University of South Carolina, whose materials maintain that “financial support is available to a number of students each year in the form of marine science instructional assistantships and research assistantships, as well as external and university-wide fellowships.” A third example of our competitive funding stance comes from the Ph.D. in Oceanography and Marine Affairs at the University of Rhode Island, where university-sourced financial assistance is limited to the first “two to three years.” Finally, the most well-funded example of a similar program can be found at the in the Marine Policy Ph.D. program at the University of Delaware, where “nearly all full-time graduate students at the University of Delaware College of Earth, Ocean, and Environment receive full financial aid via fellowships, teaching assistantships or research assistantships.” Notably, this statement also applies to the proposed MCMS Ph.D. program. For example, in Year 5, all of the projected enrollment of 18 students (see Table 1) will receive financial support in the form of research assistantships, teaching assistantships and fellowships/scholarships (see Table 12).

Every semester, approximately 15 Master students in the MMRM program work as teaching assistants to support courses taught by the faculty at the Marine Sciences department. We plan to allocate 3-8 teaching assistantships per year to the MCMS Ph.D. students for the first five years (see Table 12). With the proposed MCMS Ph.D. program in place, we expect some students only with Bachelor degrees who would have entered into the MMRM program will enter directly to the Ph.D.

---

23 No financial support information was provided for the Ph.D. in Environmental Policy and Marine Science and Conservation at Duke University.
25 [http://artsandsciences.sc.edu/marine-science-2](http://artsandsciences.sc.edu/marine-science-2)
27 [https://www.ceoe.udel.edu/academics/for-prospective-graduate-students/financial-support](https://www.ceoe.udel.edu/academics/for-prospective-graduate-students/financial-support)
program. Diversion of teaching assistantships to the MCMS Ph.D. program, therefore, is expected to have minimal impact on existing MMRM program. The core faculty shown in Table 8 have been supporting at least four research assistantships per year with their research grants/contracts. With the proposed MCMS Ph.D. program in place, we expect the core faculty to become more active in research and thus would be able to support 6-8 research assistantships per year in Year 4 and 5. TAMUG has been offering six 2-year Competitive Graduate Student Fellowships for new incoming graduate students to recruit high quality and diverse graduate students (http://www.tamug.edu/grad/Incoming_Students/Graduate_Student_Fellowships.html). We anticipate adding two additional 2-year fellowships that will be dedicated to the proposed MCMS Ph.D. program, if approved. Currently our MARB-IDP program has four dedicated scholarships for incoming PhD and Masters students; the goal would be to share these resources initially and with time, increase the overall pool. In addition, TAMUG is committed to continue developing more of such fellowships with particular attention to help recruit and retain students from underserved and underrepresented groups, and we will encourage the MCMS Ph.D. students to pursue outside competitive scholarships, such as John A. Knauss Marine Policy Fellowships, Dr. Nancy Foster Scholarship Program, and Texas Sea Grant College Program’s Grants-In-Aid of Graduate Research Program).

B. Library Resources - Provide the library director’s assessment of both paper and electronic library resources for the proposed program. Describe plans to build the library holdings to support the program. Include the amount allocated to the proposed program.

As described in the Appendix E (Librarian’s Statement of Adequate Resources), students and faculty have access to the Texas A&M Libraries and the Jack K. Williams Library at the Galveston campus which should be sufficient to ensure resources for the new MCMS Ph.D. program.

C. Facilities and Equipment - Describe the availability and adequacy of facilities and equipment to support the proposed program. Describe plans for new facilities, improvements, additions, and renovations.

The Ocean and Coastal Studies Building (OCSB) houses the robust Departments of Marine Sciences and Marine Biology, their faculty and graduate students, as well as classrooms and labs for physics and chemistry. It is equipped to support some 40 faculty researchers (and that number includes permanent laboratory space for four visiting researchers) and approximately 100 graduate students. In addition, the OCSB also offers classrooms and laboratories for undergraduate students in ten scientific major areas of study.

The OCSB houses the Center for Texas Beaches and Shores (CTBS), a state-legislated entity that focuses on the protection of the Texas shoreline, bays and waterways through research in cooperation with government and private sector agencies. CTBS facilities include a geospatial laboratory (established in 2014). This new laboratory supports both teaching and research needs for geospatial and remote sensing initiatives and facilitated the hiring of new faculty in marine/environmental management in the fall of 2015. CTBS also houses a research laboratory with advanced computing capabilities and a large server and data storage cluster to disseminate coastal geospatial data.

In addition to the OCSB, the Galveston campus is currently engaged in an exciting, aggressive campus expansion. Phase 1 of the new Academic Complex is currently under construction and will include more state-of-the-art classrooms and teaching laboratories for both graduate and undergraduate students, as well as a new graduate student office with distance education rooms instrumented with communication technology in support of coursework offered across multiple campuses. Phase 1 is anticipated to open in time for the Fall 2017 semester. Other projects under construction include significant campus infrastructure work, including Phase 2 of the Academic Complex and Waterfront Events Pavilion and Amphitheater. Phase 2 broke ground in February 2017 and will include a large assembly room that will accommodate 750 people in banquet seating and
approximately 1300 people in theater seating. Additionally, Phase 2 will include a large lounge area for graduate and undergraduate students to gather, 4 seminar rooms, a retail coffee shop, administrative offices and the campus bookstore operation. A 6,000-square foot Waterfront Events Pavilion and Amphitheater broke ground in January 2017 and will include a multipurpose room for hosting events that graduate and undergraduate students can participate in.

D. Support Staff - Describe plans, if any, to increase or reallocate support staff in order to provide sufficient services for the projected increases in students and faculty.

A total of five full-time staff members are available to support the MCMS Ph.D. program. The Department of Marine Sciences currently has three full-time support staff members, and the Center for Texas Beaches and Shoals currently has two full-time support staff members. The current staffing levels will be able to provide adequate services for the projected increases in students and faculty at least for the coming several years, with no negative impact on existing programs at TAMUG. Specialist staff members are available to support IT, communications and engagement, assessment, and recruitment at TAMUG.

E. External Learning - If applicable, describe the plans for providing Internships, Clerkships, Clinical Experiences, or other required external learning opportunities. Explain the impact this new program would have, if approved, on the available number of external learning opportunities in Texas for this type of program.

Not applicable.

F. List of Potential Consultants - Provide the names and contact information for six potential consultants to review the proposed program. Consultants must come from top-ranked programs in the nation, hold the rank of full professor or senior administrator, and have no conflicts of interest relating to the proposed program. Describe concisely the qualifications of each consultant.

Institution's Proposed Consultants:

1. Name: Gavin Smith  
   Title and Rank: Professor
   Institution: University of North Carolina at Chapel Hill
   Phone #: 919-606-5578  
   Email: gavin_smith@unc.edu
   Qualifications/Expertise:
   Hazard mitigation, planning for post-disaster recovery, and climate change adaptation

2. Name: Jamie Kruse  
   Title and Rank: Distinguished Professor
   Institution: East Carolina University
   Phone #: 252-328-5784  
   Email: krusej@ecu.edu
   Qualifications/Expertise:
   Risk and decision making, experimental economics, industrial organization and regulation, natural hazards economics, insurance and risk mitigation, and interdisciplinary research that integrates economic analysis with engineering, ecology, and the geosciences

3. Name: Kent Messer  
   Title and Rank: Professor, Unidel Howard Cosgrove Chair for the Environment
   Institution: University of Delaware
   Phone #: 302-831-1316  
   Email: messer@udel.edu
Qualifications/Expertise:
Coastal and marine applied economics, policy and decision making

4. Name: Dennis Nixon  Title and Rank: Professor and Director, Rhode Island Sea Grant
   Institution: University of Rhode Island
   Phone #: 401-874-2841  Email: dnixon@uri.edu

Qualifications/Expertise:
Admiralty law, with particular reference to research and fishing vessels, fisheries law and management, coastal zone law, and marine pollution law

5. Name: Tim Beatley  Title and Rank: Teresa Heinz Professor of Sustainable Communities
   Institution: University of Virginia
   Phone #: 434-924-6457  Email: beatley@virginia.edu

Qualifications/Expertise:
Coastal resiliency, hazard mitigation, land use planning

6. Name: Patrick Christie  Title and Rank: Professor
   Institution: University of Washington
   Phone #: 206-685-6661  Email: patrickc@uw.edu

Qualifications/Expertise:
Human dimensions of marine conservation employing marine protected areas, ecosystem-based management, and conservation fishing technologies

G. Five-Year Costs and Funding Sources Summary - On the attached forms, provide estimates of new costs to the institution related to the proposed program and provide information regarding sources of the funding that would defray those costs. Use the Program Funding Estimation Tool found on the Coordinating Board web site (www.thecb.state.tx.us/newprogramscertificates) and attach a saved copy of the completed Excel spreadsheet to your application.

The proposed MCMS Ph.D. program will be self-sustainable as the projected costs are smaller than the projected funding. Please refer to the attached forms for the costs to the institution related to the proposed program and information regarding sources of the funding that would defray those costs. A saved copy of the competed Excel spreadsheet has been attached to this application.

H. Signature Page

See the end of this proposal.
### COSTS TO THE INSTITUTION OF THE PROPOSED PROGRAM

<table>
<thead>
<tr>
<th>Cost Category</th>
<th>Cost Sub-Category</th>
<th>1st Year</th>
<th>2nd Year</th>
<th>3rd Year</th>
<th>4th Year</th>
<th>5th Year</th>
<th>TOTALS</th>
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<tr>
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<tr>
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<td>9,834</td>
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<td><strong>TOTALS</strong></td>
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<td>704,793</td>
<td>779,796</td>
<td>2,734,089</td>
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</tbody>
</table>

**Faculty Salaries**: 2 faculty for a total of 1.33 FTE to teach new required core courses (MARS 603, 604, 643 and 644 in Table 4), with the assumption of $75,000 for 9 months for 1 FTE (with 3% yearly increase)

**Program Administration**: 1 faculty at 10% FTE to administer the program, with the assumption of $90,000 for 1 FTE (with 3% yearly increase)

**Graduate Assistants**: At least four Research Assistants have been supported per year by the research grants/contracts conducted by the core faculty. Research Assistants beyond four are considered as “new” and all others (including Teaching Assistants, Scholarships and up to four Research Assistants in Table 12) are considered as “reallocated” (see Section IV.A).

**Clerical/Staff**: 1 full-time staff at 33% FTE, with the assumption of $45,000 for 12 months for 1 FTE (with 3% yearly increase)

**Supplies & Materials**: To defray expendable items, including computer peripherals, stationeries, copying, etc.
### ANTI CIPATED SOURCES OF FUNDING

<table>
<thead>
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<th>Funding Category</th>
<th>1st Year (FY 2019)</th>
<th>2nd Year (FY 2020)</th>
<th>3rd Year (FY 2021)</th>
<th>4th Year (FY 2022)</th>
<th>5th Year (FY 2023)</th>
<th>TOTALS</th>
</tr>
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<tbody>
<tr>
<td><strong>I. Formula Income</strong>*</td>
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<tr>
<td><strong>II. Other State Funding</strong></td>
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<tr>
<td><strong>III. Reallocation of Existing Resources</strong></td>
<td>261,510</td>
<td>402,983</td>
<td>579,007</td>
<td>596,374</td>
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<tr>
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<td></td>
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<td></td>
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</tr>
<tr>
<td><strong>V. Other Funding</strong></td>
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<td>168,480</td>
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<td>: Student Fees</td>
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<td>37,440</td>
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<td>15,600</td>
<td>19,200</td>
<td>21,000</td>
<td>70,200</td>
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<td>: Designated Tuition</td>
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<td>49,184</td>
<td>60,534</td>
<td>66,209</td>
<td>221,327</td>
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<tr>
<td><strong>TOTALS</strong></td>
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<td>732,254</td>
<td>913,528</td>
<td>966,653</td>
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</tbody>
</table>

* Use the Formula Funding Calculation Tool on the Coordinating Board web site to estimate income from the State. See also the Guidelines for Institutions Submitting Proposals for New Doctoral Programs document found on the Coordinating Board website for additional information.

# We list a portion of an on-going NSF Program for International Research and Education (PIRE) project that will be used to support research assistantship for the proposed program for the 1st Year till August 2020. It is virtually impossible to know future in-hand federal funding for the 2nd-5th Year.
# NON-FORMULA SOURCES OF FUNDING

<table>
<thead>
<tr>
<th>Funding Category</th>
<th>Non-Formula Funding Sources</th>
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</thead>
<tbody>
<tr>
<td>II. Other State Funding</td>
<td>#1 Statutory Tuition Estimate</td>
</tr>
<tr>
<td></td>
<td>#2</td>
</tr>
<tr>
<td>III. Reallocation of Existing Resources</td>
<td>#1 Reallocated funding from the existing budget of Texas A&amp;M University at Galveston for Faculty Salaries, Program Administration, Graduate Teaching Assistants, Graduate Student Scholarships, and Clerical/Staff and from externally funded research projects for up to four Research Assistants (as shown in the Table for Costs)</td>
</tr>
<tr>
<td></td>
<td>#2</td>
</tr>
<tr>
<td>IV. Federal Funding</td>
<td>#1 Existing NSF Program for International Research and Education (PIRE) project, entitled “Coastal Flood Risk Reduction Program”</td>
</tr>
<tr>
<td></td>
<td>#2</td>
</tr>
<tr>
<td>V. Other Funding</td>
<td>#1 Students Fees, Board- Authorized Tuition and Designated Tuition</td>
</tr>
<tr>
<td></td>
<td>#2</td>
</tr>
</tbody>
</table>
H. Institutional and Board of Regents
Signature Page for Board Consideration

1. **Adequacy of Funding** – The chief executive officer shall sign the following statement:

   *I certify that the institution has adequate funds to cover the costs of the new program. Furthermore, the new program will not reduce the effectiveness or quality of existing programs at the institution.*

   

   ____________________________                      __________________
   Chief Executive Officer                                   Date

2. **Reimbursement of Consultant Costs** – The chief executive officer shall sign the following statement:

   *I understand that the doctoral proposal process includes the use of external consultants. In the event that one or more consultants are contracted to review a doctoral proposal put forward by my institution, I understand that my institution will be required to reimburse the Texas Higher Education Coordinating Board for costs associated with the use of such consultants. By signing, I agree on behalf of my institution to provide reimbursement for consultant costs.*

   

   ____________________________                      __________________
   Provost/Chief Executive Officer                      Date

3. **Board of Regents Certification of Criteria for Board Consideration** -- The Board of Regents or designee must certify that the new program has been approved by the Board of Regents and meets the fourteen criteria under Texas Administrative Code (TAC) Section 5.46.

   *On behalf of the Board of Regents, I certify that the new program meets the fourteen criteria specified under TAC Section 5.46 and has been approved by the Board of Regents.*

   

   ____________________________                      __________________
   Board of Regents (Designee)                                            Date
4. **Board of Regents Certification of Criteria for Commissioner or Assistant Commissioner Consideration** – Typically doctoral programs are approved by the Board, supported with a recommendation for approval by the Commissioner. Under very limited circumstance a program may be approved by the Commissioner. In this case only, the Board of Regents or designee must certify that the new program meets the criteria under Texas Administrative Code (TAC) Section 5.50 (b) and (c).

TAC §5.50(b) The program:

1. has a curriculum, faculty, resources, support services, and other components of a degree program that are comparable to those of high quality programs in the same or similar disciplines at other institutions;
2. has sufficient clinical or in-service sites, if applicable, to support the program;
3. is consistent with the standards of the Commission of Colleges of the Southern Association of Colleges and Schools and, if applicable, with the standards or discipline-specific accrediting agencies and licensing agencies;
4. attracts students on a long-term basis and produce graduates who would have opportunities for employment; or the program is appropriate for the development of a well-rounded array of basic baccalaureate degree programs at the institution;
5. does not unnecessarily duplicate existing programs at other institutions;
6. does not be dependent on future Special Item funding;
7. has new five-year costs that would not exceed $2 million.

TAC §5.50 (c) The program:

1. is in a closely related discipline to an already existing doctoral program(s) which is productive and of high quality;
2. has core faculty that are already active and productive in an existing doctoral program;
3. has a strong link with workforce needs or the economic development of the state; and
4. the institution has notified Texas public institutions that offer the proposed program or a related program and resolved any objections.

*On behalf of the Board of Regents, I certify that the new program meets the criteria specified under TAC Section 5.50 (b and c) and has been approved by the Board of Regents.*

________________________________________  __________________
Board of Regents (Designee)                Date
V. Required Appendices

A. Course Descriptions

**ESSM 631 - Ecological Restoration of Wetland and Riparian Systems** (2-2). Credit 3. How wetland and riparian areas link terrestrial and aquatic systems and function hydrologically and ecologically within watersheds; integrated approaches for restoration of degraded wetland and riparian systems; improving water resources through vegetation management with a special interest in rangelands. Prerequisite: RENR 205 or equivalent and WFSC 428 or equivalent.

**ESSM 635 - Ecohydrology** (3-0). Credit 3. Framework for understanding how plants and animals affect the water cycle; examine and explore the water cycle in all of its aspects with the idea of understanding how changes in land cover may influence the water cycle; implications for both upland and riparian systems. Prerequisite: Graduate classification.

**ESSM 660 - Landscape Analysis and Modeling** (2-2). Credit 3. Introduction to quantitative methods of landscape analysis and modeling for applications in natural resource conservation and management; quantification of landscape composition and configuration; spatial statistical methods for characterizing landscape pattern; methods for hypothesis testing with spatial data; landscape modeling approaches and applications; current literature and software.

**ESSM 689 - Special Topics in Coastal Processes and Ecosystem Management** (1 to 4-0 to 4). Credit 1-4. Selected topics in an identified area of ecosystem science and management. May be repeated for credit. Prerequisite: Graduate classification.

**GEOG 651 - Remote Sensing for Geographical Analysis** (3-1). Credit 3. Provides and introduction to remote sensing fundamentals. Discussion of past, present and planned earth observing sensors as well as technical issues involved in the collection, processing and interpretation of remote sensing images with emphasis on application to geographic problems, including geomorphology, hydrology and coastal oceanography. Prerequisite: Graduate classification.

**GEOG 665 - GIS-Based Spatial Analysis and Modeling** (3-1). Credit 3. Investigates methodology of integrating various spatial analysis and modeling techniques with GIS for environmental/socio-economic applications; practical applications; theoretical/technical aspects of related issues in detail. Prerequisite: GEOG 660 or equivalent or approval of instructor.

**GEOG 676 - GIS Programming** (3-1). Credit 3. Automation of GIS software; integration of custom code as extensions into GIS software; programmatic manipulation of GIS data. Prerequisite: Graduate classification.

**MARB 620 - Marine Biological Resources** (3-0). Credit 3. An introduction to biological resources which can be recovered from the marine environment to provide food, biomass and materials, recreation, and employment to the coastal United States and other regions. With emphasis on fisheries and hatcheries, in: oceanic resources, coastal and estuarine resources, and mariculture. Natural and societal limitations to resource recovery are investigated, and environmental impacts are analyzed. Prerequisite: (at least 3 of these) CHEM 102, BIOL 112, GEOL 104 and/or OCNG 251; graduate status or special approval.

**MARS 603 - Quantitative Methods I** (3-0). Credit 3. Theory and application of scientific data development, summarization, visualization, analysis, and interpretation. Emphasis is placed on traditional parametric statistical methods through the use of statistical software packages. First course in a two-course sequence. Prerequisite: STAT 303 or equivalent introductory undergraduate quantitative methods course.

**MARS 604 - Quantitative Methods II** (3-0). Credit 3. Theory and application of scientific data analysis and interpretation. Emphasis is placed on advanced multivariate statistical models, assumptions, and interpretations through the use of statistical software packages. Second course in a two-course sequence. Prerequisite: MARS 603.

**MARS 610 - Environmental Law** (3-0). Credit 3. This course is designed to provide a broad overview of basic environmental laws including statutes, regulations, and cases. It also focuses on the both economic and
ethical issues within the context of environmental law and policy. Prerequisite: Approval of instructor; graduate status or special approval.

MARS 615 - Physical and Geochemical Marine Resources (3-0). Credit 3. Location, identification, extraction and exploitation of non-fisheries marine resources, including: water, salt, hydrocarbons, minerals, energy from the thermal, wave, tidal, current and wind fields, chemical compounds, pharmaceuticals, and construction materials in estuarine, coastal and open ocean areas. Prerequisite: CHEM 102, GEOL 104, OCNG 251 or equivalent. Graduate status or approval of instructor.

MARS 625 - GIS Use in Costal Resources (1-3). Credit 3. Basic concepts of design, planning, and implementation of Geographical Information Systems; computer hardware and software evaluation; practical experience in data entry, analysis and update of spatial and characteristic data; use of maps and remotely sensed data as data. Prerequisite: Any computer science course or equivalent; graduate status or special approval.

MARS 626 - Advanced GIS for Coastal Systems (1-3) Credit 3. Advanced concepts and application of Geographical Information Systems including a deeper understanding of data types and secondary data, advanced spatial analysis techniques in raster and vector environments, and a survey of various spatial statistical methods. Prerequisite: MARS 625 or permission of instructor.

MARS 635 - Environmental Impact Statements and Natural Resource Damage Assessment (3-0). Credit 3. The course presents an overview of: a) environmental impact statements (EIS) under the National Environmental Policy Act (NEPA); and b) natural resource damage assessment (NRDA) under the Oil Pollution Act of 1990 (OPA 90) and the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). It is designed to cover requirements for a wide variety of EISs. NRDA hypothetical cases will be presented in which students are asked to calculate assessments. Prerequisite: Approval of instructor; graduate status or special approval.

MARS 643 - Epistemology of Research (3-0). Credit 3. Critical analysis of various traditions of thought underlying the production of scientific knowledge and discovery. Emphasis will be placed on examining the past and current theories and epistemologies guiding the scientific process.

MARS 644 - Research Methods (3-0). Credit 3. In-depth treatment of the research process and components necessary to carry out a research project. Topics include experimental and observational study designs, sampling strategies, data collection, measurement, and study validity.

MARS 650 - Geochemical Marine Resources Management (3-0). Credit 3. The purpose of this course is to provide an overview of the issues involved in geochemical marine resources management. This course explores the management of exploration, production, and protection of the geochemical marine resources of the earth and the interface of the many players. Prerequisite: Approval of instructor.

MARS 652 - Sustainable Management of Coastal Margins (3-0). Credit 3. The class will study federal, state, and local laws, regulations, ordinances and programs pertaining to management of coastal margins, visit the Texas General Land Office, attend meetings of the Coastal Coordinating Council, the Texas Legislature when a coastal-related bill is being debated, or attend the Galveston County Commissioner's Court or Galveston City Council when a coastal ordinance is being considered. Prerequisite: Approval of instructor.

MARS 655 - Wetlands Management (3-3). Credit 4. This course surveys the interrelationship of chemistry, physics, geology and biology of coastal wetland systems and explores and defines the context of wetlands sustainability and management. Field exercises are an integral component providing students "hands on" experiences. Guest lectures, seminars and field trips lead by agency personnel who are experts in these fields of research are included. Prerequisite: Background in chemistry, physics, geology and biology.

MARS 656 - Coastal Water Policy (3-0). Credit 3. History, past and present legislation, the government entities and agencies molding the policies affecting coastal water policy in Texas. Prerequisite: Approval of instructor or graduate classification.

MARS 660 - Environmental Alternative Dispute Resolution (3-0). Credit 3. Because environmental issues and law were born and raised in the arena of adversarial combat, the traditional adversarial litigative process is far from ideal. This course first explores the traditional method of settling disputes: the court
system. It then reviews the increasingly visible dispute resolution alternatives. Finally, it provides certification in mediation. Prerequisite: Approval of instructor; graduate status or special approval.

**MARS 670 - Eco-Environmental Modeling** (3-0). Credit 3. Biological organisms are surrounded by chemical and physical environments which are influenced by the bio-system and flows of energy, water, and chemical species. Coupling to atmospheric, aquatic, and terrestrial systems is important. Modeling entails both mathematical tools and the underlying science. This course focuses on scientific models, from the simplest to more elaborate. Prerequisite: BIOL 111, 112; CHEM. 101, 102; MATH 151, and 161 or 166; graduate status or special approval.

**MARS 675 - Environmental Management Strategies** (3-0). Credit 3. The elements of EMS strategist’s skills, including what environmental laws may be triggered by scientific activities; the fundamental structure of an EMS; EMS alternatives; concepts in an audit; uses of an effective EMS to reduce costs and increase profits. Prerequisite: Approval of instructor or graduate classification.

**MARS 676 - Environmental Policy** (3-0). Credit 3. This course will provide a general introduction to the basic concepts and mechanisms of international and U.S. federal environmental law and policy. It will survey the field and its development as well as focus on case studies that illustrate the basic types of environmental problems. Prerequisite: Approval of instructor; graduate status or special approval.

**MARS 680 - Integrative Analysis in Marine Resources** (2-0). Credit 2. Review of public policy change mechanisms in marine resources management, including Congressional testimony, agency recommendations and structure, and NGO reports. Students propose and defend a public policy change with detailed documentation and an oral presentation demonstrating a professional understanding of marine resources issues within the context of current law. Prerequisite: 24 hours of MMRM course credits completed, or in concurrent enrollment, approval of instructor.

**MARS 681 - Seminar** (2-0). Credit 1. Discussion, development, and presentation of types of scientific and research literature, literature reviews, research synthesis, and hypothesis/research question development. Prerequisite: Graduate classification.

**MARS 689 - Special Topics in Marine Resources Management** (1 to 6-0). Credit 1-6. Selected topics in an identified area of marine resources management. May be repeated for credit. Prerequisite: Approval of instructor; graduate status or special approval.

**MARS 691 - Research in Marine Sciences** Credit 1-12 each semester. For thesis or dissertation.

**OCNG 669 - Python for Geosciences** (3-1). Credit 3. Core language Python programming; scientific programming analysis methods; analysis of large geophysical data sets; plotting geophysical data; interpolation. Prerequisite: Graduate classification.

**PLAN 641 - Problems of Environmental Planning Administration** (3-0). Credit 3. State and federal legislation pertaining to environmental consumer protective aspects of urban planning; review of administrative procedures; major judicial decisions.

**PLAN 642 - Planning for Coastal Sustainability and Resiliency** (3-0). Credit 3. Principles of resiliency and sustainability in coastal areas; examination of issues from ecological, social, economic, organizational, planning and built-environment perspectives; application of principles to realistic problems, settings and solutions. Prerequisite: Graduate classification.

**PLAN 665 - Plan Making** (3-0). Credit 3. Introduction to a wide variety of styles and methodologies employed by the urban and regional planner; planning styles reviewed include: comprehensive land use planning; policies planning; strategic planning; regional planning; and private sector corporate planning. Emphasis is given to the actual review and content analysis of plans.

**PSAA 606 - Environmental Policy and Management** (3-0). Credit 3. Covers environmental policy areas, including air and water pollution, toxic waste disposal, public land use, sustainable development, and resource conservation. Explores actions of governmental institutions and actors at all levels in their efforts to implement and manage environmental policy. Prerequisite: Graduate classification.
PSAA 689 - *Special Topics in Urban Sustainability* (1 to 4-0). Credit 1-4. Selected topics in an identified area of government and public service. May be repeated for credit. Prerequisite: Graduate classification and approval of MPSA or MPIA director.
B. Five-Year Faculty Recruitment Plan/Hiring Schedule

All of the core faculty for the proposed Ph.D. program have already been recruited, with the most recent hire starting in September 2016. In anticipation of the retirement of two senior faculty and to continue strengthening our capacity, the Department of Marine Sciences plans to recruit two new faculty during the first five years of the MCMS Ph.D. program in the fields of remote sensing (to strengthen our capability in geospatial analysis and coastal management) and interdisciplinary coastal resource management and policy.
C. Institution’s Policy on Faculty Teaching Load

The assignment of faculty teaching loads is governed by Texas A&M University Rule 12.03.99.M1, Faculty Teaching Workload Reporting (http://rules-saps.tamu.edu/PDFs/12.03.99.M1.pdf). This rule is compliant with the Texas A&M System Policy 12.03, Faculty Academic Workload and Reporting Requirements, which in turn follows guidelines and requirements legislated by of the Texas Education Code Section 51.402(b).

Rule 12.03.99.M1 states that full-time faculty members must have 9 teaching workload credits every semester, which may be a combination of Classroom Teaching and Equivalent Teaching Credits. Each lecture contact hour is equivalent to 1 or 1.5 Classroom Teaching Credit for undergraduate and graduate courses, respectively. Equivalent teaching credits depend on the type of activity. For example, chairing a Ph.D. dissertation yields 1 equivalent teaching credit.
### D. Itemized List of Capital Equipment Purchases during the Past Five Years

<table>
<thead>
<tr>
<th>Year</th>
<th>Description</th>
<th>Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>Truck, 2012 Chevrolet Lease Purchas 3/4 Long Box 4x4 Crew Cab Pickup</td>
<td>$32,550</td>
</tr>
<tr>
<td>2012</td>
<td>Van, Chevy</td>
<td>$25,432</td>
</tr>
<tr>
<td>2012</td>
<td>Canopy Package With Optical Sensor (2) Lai-2250</td>
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<tr>
<td>2012</td>
<td>Mocness Closing Net W/Multi Opening Sampling System</td>
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</tr>
<tr>
<td>2012</td>
<td>Microway Opteron Whisperstation</td>
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<td>2012</td>
<td>Ranger Towboat 29,000lb 25'x14'x5' Twin Screw Truckable Towboat</td>
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<tr>
<td>2012</td>
<td>Centrifuge-Eppendorf MI Adapters</td>
<td>$12,074</td>
</tr>
<tr>
<td>2012</td>
<td>Sartorius Cubis Micro Balance 1/2/3G X 1/2/5ug</td>
<td>$13,400</td>
</tr>
<tr>
<td>2012</td>
<td>Van, Chevy 2012 - 15 Pass Express Lease Purchase</td>
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<td>2012</td>
<td>Freezone Plus 6 Liter Cascade Freez Dry System W/Purge Valve &amp; Collecto</td>
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</tr>
<tr>
<td>2012</td>
<td>Microscope System, Partial Charge for Leica M205 C</td>
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</tr>
<tr>
<td>2012</td>
<td>Recorder, Partial Charge for Miniature Video Data</td>
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<tr>
<td>2012</td>
<td>Rs08 Viva Netrover Rtk-All On the P</td>
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<td>2012</td>
<td>Polariq W/Trace Ultra Gctrace Support Plan Quotation # 2026700</td>
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<td>2013</td>
<td>Autosampler Liquid Chromatography 1260 Infinity High Performance Auto</td>
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<td>2013</td>
<td>Wave Gauge (up 100m Probe) WG-55 Ca</td>
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<td>2013</td>
<td>Side-Looking Vectrino With Custom C</td>
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<tr>
<td>2013</td>
<td>Barge, 100-Mini Tank</td>
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<tr>
<td>2013</td>
<td>Barge, 200-Mini Tank</td>
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<tr>
<td>2013</td>
<td>Microscope System - See Full Quote</td>
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<td>2013</td>
<td>Van, 2013 Chevrolet Express 3500 Lease Purchase</td>
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<td>Freeze Dryer Free Zone-Labconco 6 Port Manifold</td>
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<td>Em38-Mk@ Geonics Ground Conductivit</td>
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<td>2013</td>
<td>Metrohm Voltammetry System for Trace Level Concentrations</td>
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<td>Milli-Q Advantage A10 Water System Rainer Amon Lab 322</td>
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<td>Vectrino II</td>
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<td>2013</td>
<td>Profiling Vectrino Firmware</td>
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<td>2013</td>
<td>Total Organic Carbon Instrument Shimadzu</td>
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<td>86c Upright Freezer Forma Model 956 W/ 5 Inner Door Kit and Racks</td>
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<td>2013</td>
<td>Atlas Xs+ Accelerated Suntest Expo Kaiser Lab</td>
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<td>2013</td>
<td>Laser- Accuprofile Model 820</td>
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<td>2013</td>
<td>Micromill 110vac Power W/Computer 19&quot; Lcd Monitor Keyboard Mouse</td>
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<td>2013</td>
<td>GA-200 Metabolic Iworx Add On Set for Marb</td>
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<td>2013</td>
<td>Stereomicroscope Leica M125 With TI</td>
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<td>2013</td>
<td>Stereomicroscope Leica M205 C W/Accessories/Software/Etc</td>
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<td>2013</td>
<td>Muffle Furnace Programable 240 Pete Van Hengstum</td>
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<td>2013</td>
<td>Rockport Boat Bateau 23 Lt Jbs23a</td>
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<tr>
<td>2014</td>
<td>Rebuild Suzuki Motoron Norsafe</td>
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<tr>
<td>2014</td>
<td>Microscope Olympus Bx51m U-Tr30-2 Trinocular Observation He</td>
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<td>2014</td>
<td>Sonar Aris-1800 Dual Frequency Identification Sound Metrics System</td>
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<td>2014</td>
<td>Ford F150 Super (see Attachments)</td>
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<td>2014</td>
<td>Aris Rotator Ar2 With Brackets and Power Supply</td>
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<tr>
<td>2014</td>
<td>Cbts Atlas Server - Brody Cto Server</td>
<td>$14,376</td>
</tr>
<tr>
<td>Year</td>
<td>Description</td>
<td>Price</td>
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<tr>
<td>2014</td>
<td>Gps Trimble Geo 7x Handheld and Ran Gefinder W/H-Star Floodlight Nmea</td>
<td>$8,046</td>
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<tr>
<td>2014</td>
<td>Vacufuge Plus_w/ Pump and 2 Rotors</td>
<td>$7,700</td>
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<tr>
<td>2014</td>
<td>Baler Bramidan Model B3 Standard Downstroke Po Ab0226712</td>
<td>$10,315</td>
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<td>2014</td>
<td>Freezer C760 Innova 26.9CUFT 208-220v/60</td>
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<td>2014</td>
<td>Hicube 80 Eco, Dn 40 Iso-KF Package</td>
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<td>2014</td>
<td>Ultra Low Temperature Innova Freeze R (-80)</td>
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<td>2014</td>
<td>G-859 Mining-Mag Cesium Portable Ma Gnetometer Advanced-Pack W/Gps Inte</td>
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<td>2014</td>
<td>G-856ax Portable Proton Memory Magn Otometer W/ Builtin Digital Memory</td>
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<td>2014</td>
<td>Simulator Student Stations, K-Pos</td>
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<td>2014</td>
<td>Simulator Instructor Station K-Pos</td>
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<td>Freezer Ult Tsu 400 Bx 230v-W/Racks</td>
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<td>Radar/Ecdis Lab Upgrade - ADD'L. St</td>
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<td>2014</td>
<td>Isomet 4000 Precision Saw W/ Glue Chuck, Mounting Wax, Wafering Blade</td>
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<td>2014</td>
<td>Caterpillar D398 Engi</td>
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<td>2014</td>
<td>Imaging Flowcytobot-Submersible Imaging Flow Cytometer W/Anti-Fouling</td>
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<td>Electric Motor Control Learning Sys</td>
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<tr>
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<td>Electric Motor Control Learning Sys</td>
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<tr>
<td>2014</td>
<td>Basic Electrical Machines Learning</td>
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<td>Alternator / Synchronous Motor Lear</td>
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<tr>
<td>2014</td>
<td>X-Ray Detector Digital, Flat Panel Inspex 20i-1417 Flat Panel Digital</td>
<td>$33,465</td>
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<td>2014</td>
<td>Spectrophotometer W/H Laptop Nanodrop 2000</td>
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<td>2014</td>
<td>Computer W/Camera for Beach Project</td>
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<td>Server Cto Quote 7986 Dr Park Marine Sciences</td>
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<td>Inboard Motors(2) &amp; 2 Transmissions</td>
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<td>2015</td>
<td>Helmet, KM-57, Burgundy Stock Trim Item 500-080bu</td>
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<tr>
<td>2015</td>
<td>Dive Helmet Kirby Morgan Km Part Number 500-700</td>
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<td>2015</td>
<td>6421 Triple Quadruple LC/MS (liquid)</td>
<td>$239,106</td>
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<tr>
<td>2015</td>
<td>1995 Norsafe Boat #13459 Built In A</td>
<td>$17,000</td>
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<td>2015</td>
<td>Excelam 1100swing 45&quot; Laminator</td>
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<td>2015</td>
<td>Adcp-Acoustic Doppler Current Profi Teledyne-Dr.kyeong Park</td>
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<td>2015</td>
<td>Mobile Dive Locker Trailer, 7&quot; X 16</td>
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<td>Camera-Dp27-Cu; 5mp Color Camera W/ Software and Adapter</td>
<td>$6,413</td>
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<tr>
<td>2015</td>
<td>Dual Carbon Isotope Analyzer (ich4+ Ico2 W/ Vacuum Pump/Keyboard/Mouse</td>
<td>$74,233</td>
</tr>
<tr>
<td>2015</td>
<td>Vc 3.5.2 Vibracore System: One 1 H Dellapenna Lab</td>
<td>$19,500</td>
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<td>2015</td>
<td>Printer_replikator Replicator Z18 3d</td>
<td>$7,385</td>
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<td>2015</td>
<td>P-3C Underwater Vibrocoring System, Pete Van Hengstum</td>
<td>$31,000</td>
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<td>2015</td>
<td>1260 Infinity Standard Autosampler W/ Ext Inj Vol 400 Bar 7 Power Cord</td>
<td>$11,309</td>
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<td>2015</td>
<td>1260 Infinity Quaternary Pump-Max P W/ 600bar; Bottle Head Assembly;</td>
<td>$15,358</td>
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<td>2015</td>
<td>1290 Infinity Flexible Cube To Redu W/ Accessory Kit</td>
<td>$8,302</td>
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<td>2015</td>
<td>Sterilizer Autoclave Port 75l W/ 3 Ss Wire Mesh Baskets</td>
<td>$11,750</td>
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<td>2015</td>
<td>102 X 18 Loadrunner 10k Trailervin:</td>
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<td>2015</td>
<td>Ez Pi Plus Tensiometerusb Interface</td>
<td>$10,910</td>
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<td>2015</td>
<td>3-D Scanner for Anthropology LAB. T</td>
<td>$32,512</td>
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<td>2015</td>
<td>Millipore Pro-Flux M30 Ultra Filter</td>
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<td>2015</td>
<td>Superblade Module Sba-7142g-T4. Con</td>
<td>$8,431</td>
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<td>Year</td>
<td>Description</td>
<td>Cost</td>
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<tr>
<td>2015</td>
<td>Idraman Microscope Raman System</td>
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<td>2015</td>
<td>Motorized Sample Stage and Controll</td>
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<td>2015</td>
<td>Z1 Particle Counter, Dual</td>
<td>$7,261</td>
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<td>2015</td>
<td>Super Computer, Expandable &amp; Server</td>
<td>$8,431</td>
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<tr>
<td>2015</td>
<td>Superblade</td>
<td>$10,771</td>
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<td>2015</td>
<td>Detector, Broad Energy Germanium Be3830</td>
<td>$28,671</td>
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<td>2015</td>
<td>Cascade Microtech Model 42 Manual Probe Station/Microscope</td>
<td>$7,500</td>
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<td>2015</td>
<td>Vector Single Point Current Meter</td>
<td>$20,090</td>
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<td>2015</td>
<td>Cathode Plasma Source, Stainless St</td>
<td>$8,417</td>
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<td>2015</td>
<td>Alumacraft Escape 145 Cs Boat, Moto</td>
<td>$12,398</td>
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<td>2015</td>
<td>Cytation 5 Plate Reader W/ Built-IN Micro Well Plate</td>
<td>$34,999</td>
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<td>2015</td>
<td>Vibration Monitoring Equipment</td>
<td>$7,500</td>
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<td>2015</td>
<td>Computer, Mac Pro W/ 2.7 Ghz 12-C</td>
<td>$8,099</td>
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<td>2015</td>
<td>Zooscan Miv (v2015)-Digital Imaging System for Aquatic Ecology</td>
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<tr>
<td>2016</td>
<td>Utv - Yamaha Viking Utv Model Yxm70</td>
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<td>2016</td>
<td>Wavemaker</td>
<td>$6,082</td>
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<td>2016</td>
<td>Cary 630 Ftir Instrument /Laptop Ab0295306 Recreation Agilent Inv 11</td>
<td>$15,022</td>
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<tr>
<td>2016</td>
<td>Fluke Vibration Tester</td>
<td>$7,500</td>
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<td>2016</td>
<td>Liquid Chromatography/Mass Spectrom Reference Quote #2032628 for Pricin</td>
<td>$120,012</td>
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<td>2016</td>
<td>Bauer Vertecon Legacy 18 E3 Vertica Compressor W/Five Storage Cylinders</td>
<td>$27,968</td>
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<td>2016</td>
<td>Hp DD560 Research Serverhp DD560 Ge</td>
<td>$34,617</td>
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<tr>
<td>2016</td>
<td>Savant Spd121p Speedvac Kit W/Conce Ntrator; Vacuum; Vapor Trap; Etc</td>
<td>$13,208</td>
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<td>2016</td>
<td>Rinkoiiii-Optical Miniature DO/Temp Rockland Scientific Quote AE-0648</td>
<td>$6,996</td>
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<tr>
<td>2016</td>
<td>Hpe Server DD560 Transfer To Uh Pl Per Funding Ag</td>
<td>$21,797</td>
</tr>
<tr>
<td>2016</td>
<td>Microscope, Leica M125 Optics Carri</td>
<td>$8,651</td>
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<tr>
<td>2016</td>
<td>Spectrometer, Cary 630 Ftir W Note- Book Pc</td>
<td>$21,400</td>
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<td>2016</td>
<td>Van, 2017 Chevrolet Express 3500</td>
<td>$33,245</td>
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<td>2016</td>
<td>Water Purification, Genpure Pro UV/</td>
<td>$6,540</td>
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<td>2016</td>
<td>Meter, Seabird 19plus Ctd Unit</td>
<td>$37,121</td>
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<tr>
<td>2017</td>
<td>Microscope, Leica Dm2000 Led</td>
<td>$26,389</td>
</tr>
<tr>
<td>2017</td>
<td>Furnace, Ts Thermolyne Tabletop Muffle Furnace</td>
<td>$6,644</td>
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<tr>
<td>2017</td>
<td>Thermistor Sensor, Fast Ctd Profile</td>
<td>$5,903</td>
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<tr>
<td>2017</td>
<td>Adcp - Signature 1000 - Acoustic Doppler Current Profiler</td>
<td>$23,500</td>
</tr>
<tr>
<td>2017</td>
<td>Liaison Interface Module</td>
<td>$16,415</td>
</tr>
<tr>
<td>2017</td>
<td>Replacement Inserts and Rotor Set</td>
<td>$10,082</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>$2,977,233</strong></td>
</tr>
</tbody>
</table>

1 “Equipment” has the meaning established in the Texas Administrative Code §252.7(3) as items and components whose cost are over $5,000 and have a useful life of at least one year.
E. Librarian’s Statement of Adequate Resources

Dr. Kyeong Park
Professor and Department Head
Department of Marine Sciences
Texas A&M University at Galveston
P.O. Box 1675
10001 Texas Clipper Road, OCSB 280
Galveston, TX 77553

Dear Dr. Park:

The Texas A&M University (TAMU) Libraries can readily support the proposed PhD program in Marine and Coastal Management and Science at the TAMU’s branch campus, Texas A&M University at Galveston. This program will not require additional library resources, because the library has steadily acquired resources in the Marine and Coastal Sciences and related fields as part of its aggressive growth campaign.

The Libraries maintain subscriptions to top tier journals in the field along with access to key indices like BIOSIS, Web of Science, COS Conference Papers Index, Aquatic Sciences and Fisheries Abstracts (ASFA), ASFA 1: Biological Sciences and Living Resources, ASFA 2: Ocean Technology Policy and Non-Living Resources, ASFA 3: Aquatic Pollution and Environmental Quality, ASFA Marine Biotechnology Abstracts, Oceanic Abstracts, Environmental Engineering Abstracts, Environmental Sciences and Pollution Management, Environmental Impact Statements, Fish, Fisheries & Aquatic Biodiversity Worldwide, GreenFILE, Sustainability Science Abstracts, TOXLINE, Wildlife & Ecology Studies Worldwide, and Water Resources Abstracts. Some of the main journal subscriptions include Elsevier Science Direct, Taylor & Francis STM Journal Collections, American Society of Civil Engineers (ASCE) Library, Nature Publishing Group Journals, and Wiley Online Library. These resources provide comprehensive coverage and research support in subject areas such as marine and coastal management, geospatial analysis, human impacts on coastal areas, natural and technological hazards, and legal and ethical issues.

The library has a collaborative approach to purchasing key resources in a field of study by encouraging and supporting faculty and student recommendations for new resources. Recommendations for databases, scholarly journals, and monographs can be made through the assigned library subject librarian or the library’s online “Suggest a Purchase” form. Faculty with dual appointment at the main TAMU campus and the Galveston branch can take advantage of this service. Overall, the University Libraries’ collection includes 1,712 databases, approximately 121,838 unique serial titles, and over 5.6 million volumes, which will adequately support the proposed PhD program in Marine and Coastal Management and Science at Texas A&M University at Galveston.

Texas A&M University Libraries is a member of the Association of Research Libraries (ARL). This distinct membership is based on TAMU Libraries extensive collections, commitment to servicing the scholarly community, and leadership. In addition, TAMU Libraries currently holds membership in the Greater Western Alliance (GWLA), which allows our campus users access to the holdings of 33 other research libraries located in the central and western United States. Another important consortium membership includes the Center for Research Libraries
(CRL) whose mission is to foster and advance scholarly inquiry by granting members access to its five million newspapers, journals, dissertations, and digital resources.

To summarize, the Texas A&M University Libraries is committed to supporting a new PhD program in Marine and Coastal Management and Science at Texas A&M University at Galveston.

Sincerely yours,

David H. Carlson

David Carlson
Dean of University Libraries

3/13/2017 | 09:42:20 CDT
F. Articulation Agreements with Partner Institutions

Not applicable.
G. Curriculum Vitae for Core Faculty

Attached are CV’s (2-page NSF format) of the following 12 core faculty:

Brody, Samuel
Davlashiridze, Meri
Dellappena, Timothy
Highfield, Wesley
Kaiser, Karl
Louchouarn, Patrick
Park, Kyeong
Retchless, David
Ross, Ashley
Santchi, Peter
van Hengstum, Peter
Samuel D. Brody

Department of Marine Science/Landscape Architecture and Urban Planning
Texas A&M University
Galveston, TX 77553
(409) 740-4939; brodys@tamug.edu

Education

University of North Carolina  Environmental Planning  Ph.D.  2002
University of Michigan     Natural Resources Planning  M.S.  1996
University of Adelaide      Environmental Studies  Grad. Dipl.  1995
Bowdoin College         Enviro. Studies/Anthropology  B.A.  1992

Principal Appointments

2009-present  Professor, Marine Sciences / Landscape Architecture and Urban Planning, Texas A&M University
George P. Mitchell ’40 Chair in Sustainable Coasts
Director:  Center for Texas Beaches and Shores
Institute for Sustainable Coastal Communities
2008-2009  Acting Director, Hazard Reduction & Recovery Center, Texas A&M University at College Station
2006-2009  Associate Professor, Department of Landscape Architecture and Urban Planning, Texas A&M University at College Station
2002-2005  Assistant Professor, Department of Landscape Architecture and Urban Planning, Texas A&M University at College Station
1999-2002  Research Assistant, Center for Urban and Regional Studies, University of North Carolina – Chapel Hill
1998-1999  Teaching Assistant, Department of City and Regional Planning, University of North Carolina – Chapel Hill
1997-1998  Project Director, Marine Policy Center, Woods Hole Oceanographic Institution

Ten Representative Publications


**Synergistic Activities**

Dr. Brody is a Professor in the Departments of Marine Sciences and Landscape Architecture and Urban Planning, and Director of the Director of the Center for Texas Beaches and Shores. He is also the Director of the Institute for Sustainable Coastal Communities. Dr. Brody teaches courses in Environmental Planning, Coastal Resiliency, and Dispute Resolution. Currently, Dr. Brody is engaged in research that focuses on the intersection of watershed management and natural hazards mitigation. He has received funding to conduct this work from multiple federal agencies, including NSF, NOAA, NASA, NPS, and FTA.

**Co-Principal Investigator’s Graduate Advisors and Recent Collaborators**

Dr. Brody completed his Ph.D. in the Department of City and Regional Planning at the University of North Carolina – Chapel Hill under Dr. David Godschalk and Dr. Phil Berke. Within the past 48 months, Dr. Brody has collaborated on research projects and journal publications with Walter Peacock, Michael Lindell, Shannon Van Zandt, and George Rogers in the Department of Landscape Architecture and Urban Planning, Texas A&M University; Arnie Vedlitz, at the Institute of Science, Technology, and Public Policy, Texas A&M University; and Wes Highfield, Anna Armitage, Patrick Louchouarn, and Bill Merrell, Texas A&M University at Galveston. During that time, Dr. Brody has supervised over twenty-five graduate students at Texas A&M University.
Meri Davlasheridze
Assistant Professor
Department of Marine Sciences
Texas A&M University at Galveston
PO Box 1675, Galveston, TX 77553
Phone: (409) 741-4338, e-mail: davlashm@tamug.edu

a. Professional Preparation

Tbilisi State University  Economics  BS  1998
Texas A & M University  Agriculture Economics  MS  2007
Pennsylvania State University Agricultural, Environmental, and Regional Economics  PhD  2013

b. Appointments

2013-Present  Assistant Professor, Department of Marine Sciences, Texas A&M University-
Galveston
2009-2013  Research Assistant, Department of Agricultural Economics, Sociology and
Education, the Pennsylvania State University
2008-2009  Lecturer, Ilia State University of Tbilisi, Georgia
2009  Value Chain Initiative Director, CNFA Georgia, Agribusiness Development
Activity (ADA), Tbilisi, Georgia
2007-2009  Strategic Programs Manager, JSC Bank of Georgia, Strategic Development
Department

c. Publications

1. Goetz, S. J., Davlasheridze, M., & Han, Y. (2014). County-Level Determinants of Mental
Evaluating the National Flood Insurance Program's Community Rating System. Risk Analysis,
Farm Exits. Applied Economic Perspectives and Public Policy, ppw007,
Regional Studies. (Forthcoming).
Measures on Hurricane Induced Property Losses. Journal of Environmental Economics and

d. Under Review & Working Papers (student co-author indicated by *)

6. Davlasheridze, M., Goetz, S. J., & Han, Y. “Mental Health and Economic Growth in U.S.
Counties.” Submitted to The Review of Regional Studies. (Revise & Resubmit).
7. Davlasheridze, M. “Sectoral Impacts and Spillovers of Hurricane Disasters.” (In review)
(In review)
Survival.” (Manuscript)

e. Synergistic Activities

Faculty research fellow in the Center for Texas Beaches and Shores (CTBS) at Texas A&M University at Galveston. Co-PI of the PIRE project, Coastal Flood Risk Reduction Program: Integrated, multi-scale approaches for understanding how to reduce vulnerability to damaging events (2015-2019). Panel organizer at the Association for Public Policy Analysis and Management meetings (2014; 2015; 2016); Member of the Interdisciplinary Research Program “Program of Integrated Assessment Model Development, Diagnostics and Inter-Model Comparisons (PIAMDI)”, funded by the U.S. Department of Energy (2014-2016). Member of the Texas OneGulf Network of Experts (TONE) (2015-current). Resource Member of Beach Management Advisory Council (BMAC), Galveston Park Board (2015 – present).

f. Graduate/ Undergraduate Students and Post-docs Supervised

Advised: Graduated - One Master student
Current - One undergraduate Research Scholar

Undergraduate supervised: Four Undergraduate Students

Committee member: One M.S. student (Department of Agricultural Economics, TAMU)
One MMRM student (Department of Marine Sciences)
Timothy M. Dellapenna
Texas A&M University at Galveston
Department of Marine Sciences/Dept. of Oceanography (Joint Appointment)
1001 Texas Clipper Road, Galveston, TX 77553
Phone: (409) 740-4952, email: dellapet@tamug.edu

Professional Preparation

<table>
<thead>
<tr>
<th>Institution</th>
<th>Degree</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Michigan State University</td>
<td>Geology BS</td>
<td>1986</td>
</tr>
<tr>
<td>Western Michigan University</td>
<td>Geology MS</td>
<td>1991</td>
</tr>
<tr>
<td>Western Michigan University</td>
<td>Hydrogeology MS</td>
<td>1993</td>
</tr>
<tr>
<td>College of William and Mary</td>
<td>Marine Science Ph.D.</td>
<td>1999</td>
</tr>
<tr>
<td>Texas A&amp;M University</td>
<td>Oceanography Post-doc.</td>
<td>1999-2000</td>
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Appointments

<table>
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<tr>
<th>Year</th>
<th>Position</th>
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</thead>
<tbody>
<tr>
<td>Sept. 2000</td>
<td>Assistant Professor, TAMUG-Dept. of Marine Sciences/Oceanography</td>
</tr>
<tr>
<td>Sept. 2000</td>
<td>Assistant Professor, TAMUG-Dept. Oceanography- joint appointment</td>
</tr>
<tr>
<td>1999-2000</td>
<td>Texas Institute of Oceanography Postdoctoral Fellow- Texas A&amp;M University</td>
</tr>
</tbody>
</table>

Awards and Fellowships

1999 Texas Institute of Oceanography Post-doctoral Fellowship, TAMU/TAMUG
1998 VIMS Matthew Fontaine Maury Award for Outstanding Marine Science Research

Ten Representative Publications

(Underlined names are graduate students mentored by Dellapenna)


**Synergistic Activities**


2) **Director of Undergraduate Research-TAMUG**- 2008-2012-developed an NSF REU Site-Marine Science and Marine Biology in the Gulf of Mexico and other Coastal Oceans, co-organizer and founder of the annual TAMUG Research Symposium and Marine Sciences Departmental coordinator of Undergraduate Research.

3) **Participation in development and implementation of multidisciplinary curriculum in marine science, oceanography and marine resource management**- Texas A&M University at Galveston and Texas A&M University-College Station.

Wesley E. Highfield

Associate Professor
Center for Texas Beaches and Shores • Department of Marine Sciences
Texas A&M University at Galveston
200 Seawolf Parkway, Galveston, TX 77553-1675
Phone: (409) 740-4726 • e-mail: highfiew@tamug.edu

a. Professional Preparation

<table>
<thead>
<tr>
<th>Institution</th>
<th>Degree</th>
<th>Year</th>
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<tbody>
<tr>
<td>Texas A &amp; M University</td>
<td>Renewable Natural Resources BS</td>
<td>2001</td>
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<tr>
<td>Texas A &amp; M University</td>
<td>Urban Planning MUP</td>
<td>2004</td>
</tr>
<tr>
<td>Texas A &amp; M University</td>
<td>Urban And regional sciences Ph.D.</td>
<td>2008</td>
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b. Appointments

2011-Present Assistant Professor, Department of Marine Sciences, Texas A&M University at Galveston
2010-Present Associate Director, Center for Texas Beaches and Shores, Texas A&M University at Galveston
2010-2011 Research Scientist, Department of Marine Sciences, Texas A&M University at Galveston
2008-2010 Post doctoral Research Associate, Department of Landscape Architecture & Urban Planning, Texas A&M University

c. Products


d. Synergistic Activities
Dr. Highfield is an Assistant Professor in the Department of Marine Sciences at Texas A&M University at Galveston, Associate Director of the Center for Texas Beaches and Shores, and Associate Faculty Fellow in the Hazard Reduction and Recover Center at Texas A&M. He teaches introductory and advanced Geographic Information Systems to undergraduate and graduate students in the Department of Marine Sciences and is the coordinator for the Marine Resources Management Master’s Program. He has performed ad-hoc manuscript reviews for Journal of Environmental Planning and Management, Disasters, Natural Hazards Review, Natural Hazards, Journal of Planning Education and Research, and proposal reviews for the Cooperative Institute for Coastal and Estuarine Environmental Technology.

e. Collaborators & other affiliations.

1. Collaborators
   - Anna Armitage  Texas A&M University at Galveston
   - Samuel D. Brody  Texas A&M University
   - Himanshu Grover  University of Washington
   - Michael K. Lindell  Texas A&M University
   - Patrick Loucharn  Texas A&M University at Galveston
   - Walter G. Peacock  Texas A&M University
   - Shannon Van Zandt  Texas A&M University
   - Arnold Vedlitz  Texas A&M University
   - Sammy Zahran  Colorado State University
   - Yang Zhang  Virginia Tech University

2. Graduate Advisors
   - Samuel D. Brody  Texas A&M University
   - Walter G. Peacock  Texas A&M University
   - Michael K. Lindell  Texas A&M University
   - Patricia K. Smith  Texas A&M University

3. Thesis Advising
   - Current students: William Mobley (PhD); Ryan Gay (MMRM)
a. Education

2009  Ph.D. Marine Sciences, University of South Carolina
1997  M.Sc. Chemical Engineering, Johannes Kepler University, Linz, Austria

b. Professional Background

Sept 1st 2012  Assistant Professor, Texas A&M University at Galveston
2010-2012  Postdoctoral Associate, University of South Carolina

c. Ten Representative Publications


### d. Synergistic Activities

Assisted in numerous undergraduate research projects in marine science, reviewer for numerous journals.

### e. Collaborators & Other Affiliations

(i) Active Collaborators

<table>
<thead>
<tr>
<th>Name</th>
<th>Affiliation</th>
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</thead>
<tbody>
<tr>
<td>Lihini Aluwihare</td>
<td>Scripps Institution of Oceanography</td>
</tr>
<tr>
<td>Rainer Amon</td>
<td>Texas A&amp;M University at Galveston</td>
</tr>
<tr>
<td>David Beilman</td>
<td>University of Hawaii, Hawaii</td>
</tr>
<tr>
<td>Ronald Benner</td>
<td>University of South Carolina (PhD advisor)</td>
</tr>
<tr>
<td>Frank Chapelle</td>
<td>USGS, Columbia</td>
</tr>
<tr>
<td>Tim Dellapenna</td>
<td>Texas A&amp;M University at Galveston</td>
</tr>
<tr>
<td>Peter Herses</td>
<td>University of California, Davis (Co-PI, NSF OCE-1333633)</td>
</tr>
<tr>
<td>Norbert Hertkorn</td>
<td>GSF Research Center for Environment and Health (Germany)</td>
</tr>
<tr>
<td>Patrick Louchouarn</td>
<td>Texas A&amp;M University at Galveston</td>
</tr>
<tr>
<td>Hiroshi Ogawa</td>
<td>Ocean Research Institute (University of Tokyo)</td>
</tr>
<tr>
<td>Robert Spencer</td>
<td>Woods Hole Research Center (Co-PI, OCE-1333633)</td>
</tr>
<tr>
<td>Zicheng Yu</td>
<td>Lehigh University, Pennsylvania</td>
</tr>
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</table>

(ii) Graduate and Postdoctoral Advisees

<table>
<thead>
<tr>
<th>Name</th>
<th>Degree</th>
<th>Year</th>
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</thead>
<tbody>
<tr>
<td>Ge Yan</td>
<td>Post-doc</td>
<td>2015-present</td>
</tr>
<tr>
<td>Amanda Sterne</td>
<td>PhD</td>
<td>2016</td>
</tr>
<tr>
<td>Maria Canedo</td>
<td>MS</td>
<td>2013-present</td>
</tr>
<tr>
<td>Danielle Creeley</td>
<td>MS</td>
<td>2013-present</td>
</tr>
</tbody>
</table>

Thesis/dissertation committee: 9
Undergraduate Students Advised in the Laboratory: 13
Patrick Louchouarn
Texas A&M University at Galveston
Department of Marine Sciences
1001 Texas Clipper Rd, Bldg 3029, TX 77554
Phone: (409) 740-4710, Fax: (409) 740-4514, email: loup@tamug.edu

Education:
B.S. Marine Biology, McGill University, 1989
M.S. Environmental Sciences, University of Quebec in Montreal (UQAM), 1992
Ph.D. Environmental Sciences, University of Quebec in Montreal (UQAM), 1997
Post-Doc. Chemical Oceanography, University of Texas Marine Science Institute, 1998-1999

Professional Experience:
Vice President of Academic Affairs & CAO Texas A&M University at Galveston, 2012-present.
Associate Provost. Texas A&M University, 2012-present.
Head, Dept. of Marine Sciences; Texas A&M University at Galveston, 2010-2013.
Professor of Marine Sciences and of Oceanography, Texas A&M at Galveston, 2011-present.
Director of Research, Texas A&M University at Galveston; Dept. of Marine Sciences, 2009-2010.
Associate Professor of Marine Sciences and of Oceanography, Texas A&M at Galveston, 2006-2011.
Associate Director, Columbia University, MPA in Environmental Science and Policy. 2003-2006.
Associate Professor of Environmental Sciences, Columbia University. 2002-2006.
Assistant Professor of Environmental Sciences, Texas A&M University-Corpus Christi. 2000-2002.
Associate Research Scientist, Texas Engineering Experimental Station (TEES). 1999-2000
Post-Doctoral Fellow, The University of Texas, Marine Science Institute, 1998-1999
Post-Doctoral Fellow, University of Québec in Montréal (UQAM), Chair in Environmental Res., 1997
Adjunct Professor, UQAM, Department of Earth and Atmospheric Sciences, 1992-1997

Representative Products (students underlined):


**Synergistic Activities:**
- **Permanent Member (2010-present),** Jury Panel for the International *Partner University Fund - Grant Foundation.*
- **Associate Editor:** *Nature: Education-Knowledge Project* (Environmental Sciences)
- **Co-Chair of special symposia:**
  3. “Multitracer studies in Geochemistry - When the sum is greater than the parts”: 227th Annual ACS meeting.

**Collaborators:**
Amon, R. (TAMU); Benner, R. (Univ. South Carolina); Bischoff J. (USGS); Brandenberger J. (Pacific Northwest National Laboratory); Brandes, J. (Skidaway Institute of Oceanography); Cornelissen G. (Norwegian geotechnical Institute); Gill, G. (Pacific Northwest National Laboratory); Griffin, R. (Rice Univ.); Harvey, O. (Univ. Southern Mississippi); Kjær K.H. (Univ. of Copenhagen); Lee C. (National Sun Yat Sen University); Masiello C. (Rice Univ.); Perez T. (Venezuelan Institute for Scientific Research); Rosell Melé A. (Univ. Autonoma de Barcelona); Rumpel, C. (INRA-CNRS France); Sánchez-García L. (Univ. de Zaragosa, Spain); Santschi, P. (TAMU); Snowman Andresen C. (Geological Survey of Denmark and Greenland); Teisserenc R. (INP Toulouse); West A. (USGS).

**Graduate Advisors:**
M.Sc. and Ph. D. Advisor: Lucotte M., UQAM (Canada); Post-doctoral Advisor: Benner R., Univ. South Carolina

**Graduate/ Undergraduate Advisees:**
Allison Myers-Pigg, Ph.D. ongoing (Advisor), TAMU; Matt Norwood, Ph.D. ongoing (Advisor), TAMU; Anne Tamalavage, M.Sc. ongoing (Advisor), TAMU; Kendra Kopp, M.Sc. ongoing (Advisor), and B.Sc. Senior Thesis (Advisor), TAMU; Ching-Ping Lu, Ph.D. ongoing (Thesis Committee), TAMU; Josh Williams, Ph.D. ongoing (Thesis Committee), TAMU; Li-Jung Kuo, Ph.D. (Co-Advisor), TAMU; Shaya M. Seward, M.Sc. (Advisor), TAMU; Xin-Xin Li, Ph.D. (Thesis Committee), TAMU; Sally Walker, Ph.D. (Thesis Committee), TAMU; Richard Smith, Ph.D. (Thesis Committee), TAMU; Omar R. Harvey, Ph.D. (Thesis Committee), TAMU; Brandon Laroy, M.Sc. (Thesis Committee), TAMU; Ryan Schloesser, M.Sc. (Thesis Committee), TAMU; Kayce Peirce, B.Sc. Senior Thesis (Advisor), TAMU; Matt Norwood, B.Sc. Senior Thesis (Advisor), TAMU; Danielle Aguirre, B.Sc. Senior Thesis (Advisor), TAMU; Christina Pondell, B.Sc. Senior Thesis (Advisor), TAMU; Marie Alexis, Ph.D. (External Thesis Reviewer).

Université Pierre et Marie Curie. 2007; Lillian Pitts, MPA Columbia University; April Patterson, MPA Columbia University; Jill Brandenberger, M.Sc, Texas A&M University-Corpus Christi; Jason Clark, M.Sc., Texas A&M University-Corpus Christi. Stephane Houel Ph.D. University of Quebec in Montreal (Co-Advised).

**Post Doctoral Advisee:** Dr. Stephane Houel
Kyeong Park

Professor and Head
Department of Marine Sciences
Texas A&M University at Galveston
P.O. Box 1675, Galveston, TX 77553
409-740-4710, parkk@tamug.edu

(a) Professional Preparation

Seoul National Univ., Korea
State University of New York at Stony Brook
College of William and Mary

Marine Environmental Sciences
Marine Science
Numerical Modeling

B.S. 1985
M.S. 1987
Ph.D. 1993
Post-doc 1993-95

(b) Academic/Professional Appointments

2014-present  Professor and Head, Department of Marine Sciences, Texas A&M University at Galveston
2015-present  Graduate Faculty, Marine Biology-IDP, Texas A&M University at Galveston
2014-present  Graduate Faculty, Department of Oceanography, Texas A&M University
2003-2014  Associate, Full Professor, Department of Marine Sciences, University of South Alabama
2007-2014  Senior Marine Scientist, Dauphin Island Sea Lab
1995-2003  Assistant, Associate Professor, Department of Oceanography, Inha University, Korea
2014/5-8  Visiting Scientist, Department of Environmental Engineering, Chungnam National University, Korea: Brain Pool Program of the Korean Research Foundation (KRF)
2013-2014  Affiliate Professor, School of Fisheries, Aquaculture, and Aquatic Sciences, Auburn University
2001-2002  Faculty Researcher, Virginia Institute of Marine Science (VIMS), College of William and Mary
2000-2001  Visiting Research Associate Professor, VIMS, College of William and Mary
1999/1-2  Visiting Scientist, VIMS, College of William and Mary

(c) Ten Representative Publications

(Name indicates author was a student/post-doc mentored by Park at the time of research.)


(d) Synergistic Activities

Development of water quality and sediment diagenesis submodels of Environmental Fluid Dynamics Code (EFDC)/Three-Dimensional Hydrodynamic-Eutrophication Model (HEM-3D) and tidal prism water quality model (TPWQM), listed by USEPA as a tool for Total Maximum Daily Load (TMDL) development (EPA841-B-97-006 and EPA/600/R-05/149); Member, Organizing Committee, GCOOS Ecological Modeling Workshop, Houston, TX (April 2014); Member of the GCOOS Modeling Task Team (2012-present); Member (2012-present), Member, Team for the Development of an Ocean Monitoring System for the Five Gulf States, GOMURC (Gulf of Mexico University Research Collaborative) (2012-2014); Panelist, 2014 NSF Graduate Research Fellowship Program (GRFP); Editorial board member of Water Quality and Ecosystem Modeling (2000-2002) and Ocean Research (1998); Panelist, Symposium on Hypoxia in the Northern Gulf of Mexico: Assessing the State of the Science, NOAA and USEPA, New Orleans, LA (April 2006)

(e) Graduate/ Undergraduate Students and Post-docs Supervised

Advised: Graduated - Three Ph.D. and 10 Master students
         Current - Two Ph.D. and one Master students

Trained/sponsored: Three post-docs

Committee member: 20 Ph.D. and 19 M.S. students

Undergraduate supervised: Four REU students at DISL and one UCUR at USA
David Retchless

Assistant Professor
Department of Marine Sciences
Texas A&M University at Galveston
P.O. Box 1675, Galveston, TX 77553
409-741-7130, retchled@tamug.edu

(a) Professional Preparation

The Univ. of Notre Dame  Program of Liberal Studies  B.A.  2004
The Pennsylvania State Univ.  Geography  M.S.  2011
The Pennsylvania State Univ.  Geography  Ph.D.  2015

(b) Academic/Professional Appointments

2016-present  Graduate Faculty, Master of Marine Resources Management, Texas A&M University at Galveston
2016-present  Assistant Professor, Department of Geography, Texas A&M University
2015-present  Assistant Professor, Department of Marine Sciences, Texas A&M University at Galveston
2010-2015  Graduate Assistant, Department of Geography, The Pennsylvania State University

(c) Representative Publications


(d) Synergistic Activities

Development of online interactive map of sea level rise in Sarasota, Florida; Developer of NSF-STEP center-funded InTeGrate online educational materials for Coastal Processes, Hazards, and...
Society course (2014-present); Development of visually distinguishable bivariate cartographic representations of temperature change and its uncertainty; Member, American Association of Geographers (2010-present); Member, North American Cartographic Information Society (2014-present)
Ashley Ross
Assistant Professor
Department of Marine Sciences
Texas A&M University at Galveston
200 Seawolf Parkway, Galveston, TX 77553-1675
E-mail: ashleydross@tamug.edu

(A) Professional Preparation
Texas A&M University
Speech Communications
Political Science & BA, 2003

Louisiana State University
Political Science
MA, 2006

Texas A&M University
Political Science
PhD, 2010

(B) Appointments
2016-present
Assistant Professor
Texas A&M University at Galveston Marine Sciences

2013-2016
Assistant Professor,
Sam Houston State University Political Science

2010-2013
Assistant Professor,
Texas A&M University-Corpus Christi Political Science

(C) Products


(D) Synergistic Activities
Community development: Water management in the Murray-Darling Basin, Australia
Community development outreach on behalf of the Murray-Darling Basin Authority, Australian Government, in nine communities affected by water buy-backs; developed good practice guidelines for water management based on community findings, May 2016.

Community outreach: Designed materials for Baldwin County, Alabama Emergency Management for presentation to Chambers and Commerce and dissemination to community groups related to county community resilience, disaster preparedness, and business continuity planning, April 2014.

Practitioner engagement: Presented at Texas Hurricane Conference, Houston, Texas, August 2015,


Undergraduate student research advisement: Designed undergraduate research opportunities and advised 12 undergraduate student researchers through grant funded by the Department of Homeland Security Summer Research Team Program for Minority Serving Institutions, 2011-2013.

Pro-bono work: Consultant with LAN Engineering on a project to enhance asset management priority rankings through incorporation of environmental and social metrics; Paper presented at the Annual Meeting of the American Society of Civil Engineers, Miami, Florida, August 2012 (with Rafael Ortega), “Enhancing Asset Management Priority Ranking – A Case Study.”

(E) Collaborators & Other Affiliations

Collaborators and Co-Editors:
Carollo, Cristina, Texas A&M University-Corpus Christi
Escobar-Lemmon, Maria, Texas A&M University
Robinson, Scott, University of Oklahoma
Rouse, Stella, University of Maryland
Yoskowitz, David, Texas A&M University-Corpus Christi

Graduate Advisors and Postdoctoral Sponsors:
Escobar-Lemmon, Maria, Texas A&M University
Meier, Kenneth, Texas A&M University
Taylor-Robinson, Michelle, Texas A&M University

Thesis Advisor and Postgraduate-Scholar Sponsor:
n/a
PETER H. SANTSCHI

Departments of Oceanography and Marine Sciences
Texas A&M University
200 Seawolf Pkwy, Galveston, TX 77553
409-740-4476, santschi@tamug.edu, http://loer.tamug.edu/people/Santschi/index.html

PROFESSIONAL PREPARATION
1971 University of Bern, Switzerland; Major: Chemistry; MS (phil.nat.)
1975 University of Bern, Switzerland: Major: Chemistry; PhD (Dr. phil.II)
1976 Postdoctoral and research scientist, LDEO, Columbia University; Geochemistry.

APPOINTMENTS
1988-present Professor, Texas A&M University
1982-1988 Privatdozent, ETH Zurich, Switzerland; Research Scientist, EAWAG, Switzerland
1977-1982 Asst., Assoc., & Senior Research Scientist, LDEO, Columbia University

10 TEN REPRESENTATIVE PUBLICATIONS (OUT OF OVER 290)
oxidizing bacterium facilitates iodide oxidation. Applied and Environmental Microbiology, 80(9), 2693-2699.

**Synergistic Activities**

1. AGU Fellow (2014), Recipient of the Distinguished Achievement Awards in Graduate Student Mentoring from Texas A&M’s Association of Former Students (2013), Regents Professor of Texas A&M University (2009), and Distinguished Achievement Award for Research from the Association of Former Students at Texas A&M University in 2004. 2. Associate Editor of Marine Chemistry, since 2000. 3. Organizer of sessions at national or international scientific meetings. 4. Presentations on new research results on interdisciplinary research in “radio-bio- geochemical” studies in classes, seminars, at local, national and international meetings. 5. While visiting Professor in the Chemistry Departments of the University of Bern and Geneva, Switzerland, the Swiss Institute of Technology (ETH), Zurich, Switzerland, National Taiwan University, Taipei, Taiwan, and Hong Kong University of Science and Technology, Hong Kong, in the years 2002-2004, I lectured on marine radiochemistry, marine organic chemistry, and marine colloids chemistry, which greatly helped with attracting top graduate students and collaborators for projects.

**Other Activities**

1. **Graduate Advisors and Postdoctoral Sponsors**
   - Paul W. Schindler, Dept. of Chemistry, Univ. of Bern, Switzerland (PhD Advisor); Wallace S. Broecker, LDEO, Columbia University, New York (Postdoctoral Advisor).

2. **Thesis Advisor and Postgraduate-Scholar Sponsor (past 5 years)**
Peter J. van Hengstum  
Department of Marine Sciences  
Texas A&M University at Galveston, Galveston, TX  
Phone: 1 (409) 740-4919, Fax: 1 (409) 740-4787, vanhenp@tamug.edu

A. Professional Preparation

Dalhousie University, Canada, Earth Sciences, PhD 2010  
McMaster University, Canada, Earth Sciences, MSc 2008  
McMaster University, Canada, Earth Sciences, BSc *summa cum laude*, 2006

B. Professional Affiliation/Experience

Assistant Professor, Texas A&M University at Galveston 2013 to present  
Post-Doctoral Fellow, Woods Hole Oceanographic Institution 2011 to 2013

C. Ten Representative Products (21 total, 15 first author):

van Hengstum, PJ, Donnelly, JP, Kingston, AW, Williams, BE, Scott, DB, Reinhardt, EG, Little, SN, Patterson, WP, 2015, Late Holocene low frequency storminess signal in Bermuda linked to higher latitude climatic cooling, *Paleoceanography* 30, 52-76.  

D. Synergistic Activities
(i) Ad hoc journal and proposal reviewer for the international scientific community (e.g., National Science Foundation, Czech Science Foundation, Global Planetary Change, Journal of Foraminiferal Research, Geology, Quaternary Science Reviews, Marine Micropaleontology, Biogeosciences, Microbial Ecology); (ii) Maintain and utilize a micropaleontological reference collection for teaching and research purposes in the southern USA; (iii) community lectures in Bermuda and The Bahamas to public stakeholders outside the scientific community, (iv) help maintain online websites to help disseminate current research results to international community, (v) Session Co-chair (with DB Scott): 2009. Advances in Micropaleontology: Addressing issues across the spectrum of paleoclimatology, paleoenvironmental reconstruction, and paleoecology. Session PP74A, AGU-GAC-MAC Joint Meeting, Toronto, Canada.

E. Collaborators & Other Affiliations

- **Collaborators and Co-Editors Within Past 48 Months (Alphabetical):** Nancy Albury (The Bahamas Natural History Museum), Patricia Beddows (Northwestern), Matthew Charette (Woods Hole Oceanographic Institution), Timothy Dellapenna (Texas A&M), Jeffrey Donnelly (Woods Hole Oceanographic Institution), Jeffrey Dorale (University of Iowa), Patricia Fall (University of North Carolina Charlotte), Darren Grocke (Durham University), Andrea Hawkes (University of North Carolina Wilmington), William Patterson (University of Saskatchewan), Eduard Reinhardt (McMaster University), Luis M. Mejía Ortiz (Universidad de Quintana Roo), Bogdan Onac (University of South Florida), Dana McDonald (UMass Amherst), Darren Grocke (Durham University), Andrea Hawkes (University of North Carolina Wilmington), William Patterson (University of Saskatchewan), Eduard Reinhardt (McMaster University), David Richards (Bristol University), Peter Santschi (Texas A&M University), David Scott (Dalhousie University), Michael Toomey (University of Texas at Austin), Davin Wallace (University of Southern Mississippi), Bruce Williams (Bermuda Institute of Ocean Sciences), Jonathan Woodruff (University of Massachusetts-Amherst).

- **Graduate Advisors and PostDoctoral Sponsors**
  Dr. Jeffrey P. Donnelly, Woods Hole Oceanographic Institution, USA (Postdoctoral Sponsor)
  Dr. David B. Scott, Dalhousie University, Canada (PhD Advisor)
  Dr. Eduard G. Reinhardt, McMaster University, Canada (MSc Advisor)

- **Thesis Advisor and Postgraduate-Scholar Sponsor**
  Undergraduates (5 total, 3 female, 5 of 5 have become students authors on peer-reviewed research in international journals): Rachel Huang (McMaster U), Alyson Brown (McMaster U), Shawn Kovacs (McMaster U), Shauna Little (Dalhousie U), Tyler Winkler (TAMUG).
  Graduates (9 total): David Brankovits (PhD student, TAMUG), Jacque Cresswell (PhD student, TAMUG), Paul Laverty (MS Student, TAMU), Jake Emmert (Masters student, TAMUG), Gary Maale (Masters student, TAMUG), Tariq Alrushaid (MS, TAMU), Annie Tamalavage (MS, TAMU), Tyler Winkler (PhD, TAMU Oceanography), Richard Sullivan (PhD, TAMU Oceanography).
H. Curriculum Vitae for Support Faculty

Attached are CV’s (2-page NSF format) of the following 12 support faculty:

Armitage, Anna
Berke, Philip
Bodson, Bruce
Feagin, Rusty
Jones, Glenn
Merrell, William
Nyman, Elizabeth
Portney, Kent
Quigg, Antonietta
Rowe, Gilbert
Wang, Grace
Wu, X. Ben
Anna R. Armitage
Associate Professor and Chair
Department of Marine Biology
Texas A&M University at Galveston
PO Box 1675, Galveston, TX 77553
409-740-4842, armitaga@tamug.edu

(a) Professional Preparation

University of California Los Angeles  Biology, Marine Biology  B.S.  1995
University of California Los Angeles  Biology  Ph.D.  2003
Florida International University  Biological Sciences  Post-doc  2003-2006

(b) Academic/Professional Appointments

2015-Present  Chair, Marine Biol. Interdisciplinary Graduate Program, TAMU-TAMUG-TAMU-CC
2012-Present  Associate Professor, Department of Marine Biology, TAMUG
2006-2012  Assistant Professor, Department of Marine Biology, TAMUG
2007-Present  Adjunct Faculty, Dept. of Biol. and Biochem., University of Houston
2007-Present Graduate Faculty
  • Dept. Marine Sciences, Master of Marine Resources Management Program, TAMUG
  • Department of Ecosystem Science & Management, TAMU
  • Marine Biology Interdisciplinary Program, TAMU-TAMUG-TAMUCC
  • Ecology and Evolutionary Biology Interdisciplinary Graduate Program, TAMU

(c) Ten Representative Publications

(Name indicates author was a student or a post-doc at the time of research.)


(d) Synergistic Activities

- Active in diversity initiatives, such as the TAMUG NSF Research Experience for Undergraduates program (2009-2012), which sought to attract and train students from underrepresented groups in science and first-generation college students; past REU interns have performed and published field and laboratory experiments on wetland plant ecology and participated in salt marsh restoration activities.
- Spearhead the integration of distance technology, interactive tools, and current technology-based activities (e.g., geocaching, cloud-based collaboration) into the traditional classroom; include applied, practical field experiences in laboratory courses.
- Integrate citizen scientists into mangrove research: recruited citizen volunteers to report bird species and abundance at survey sites (http://www.tamug.edu/armitage/CitizenScience.html) and report observations through a dedicated, secure website (http://f611.qr.ai), supplemented with bird observations from the citizen science database eBird.
- Serve on the Board of Directors for local non-profit Galveston Bay Foundation and consult about wetland management and restoration policies.
- Research fellow active with numerous interdisciplinary institutes and programs, including Institute for Sustainable Coastal Communities (TAMUG), Center for Texas Beaches and Shores (TAMUG), Marine Biology Interdisciplinary Graduate Program (TAMUG); Ecology and Evolutionary Biology Interdisciplinary Graduate Program (TAMU); Florida Coastal Everglades LTER.

(e) Graduate/Undergraduate Students and Post-docs Supervised

<table>
<thead>
<tr>
<th>Advised:</th>
<th>Graduated</th>
<th>- 1 Ph.D. and 4 M.S. students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current</td>
<td></td>
<td>- 3 Ph.D. students, 1 M.S. student</td>
</tr>
<tr>
<td>Trained/sponsored:</td>
<td>3 post-docs</td>
<td></td>
</tr>
<tr>
<td>Undergraduate supervised:</td>
<td>9 students in REU, Honors, other scholarship programs; 48 other volunteer or research interns</td>
<td></td>
</tr>
<tr>
<td>Committee member:</td>
<td>17 Ph.D. and 5 M.S. students</td>
<td></td>
</tr>
</tbody>
</table>
Philip R. Berke

Department of Landscape Architecture & Urban Planning, College of Architecture
Texas A&M University
College Station, Texas 77843-3137
Tel: (919) 357-0239; E-mail: pberke@arch.tamu.edu

(a) Professional Preparation

<table>
<thead>
<tr>
<th>College/University</th>
<th>Major</th>
<th>Degree &amp; Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Empire State College</td>
<td>Economics and Environmental Science</td>
<td>B.A., 1974</td>
</tr>
<tr>
<td>University of Vermont</td>
<td>Natural Resources Planning</td>
<td>M.S., 1977</td>
</tr>
<tr>
<td>Texas A&amp;M University</td>
<td>Urban and Regional Science</td>
<td>Ph.D., 1981</td>
</tr>
</tbody>
</table>

(b) Appointments

2014–present  Professor, Department of Landscape Architecture and Urban Planning, Director, Institute of Sustainable Coastal Communities, Texas A&M University

2006–2013    Director, Center for Sustainable Community Design, and Deputy Director, University of North Carolina Institute for the Environment.

2000–present Collaborative Research Scholar, International Global Change Institute, University of Waikato, New Zealand.

1995–2013    Associate Professor and Professor, Department of City & Regional Planning, University of North Carolina-Chapel Hill.


1993         Senior Fulbright Scholar, Centre for Environmental and Resource Studies, University of Waikato, New Zealand.

1987–1994    Assistant and Associate Professor, Department of Landscape Architecture and Urban Planning, Texas A&M University.

(c.i) Products Most Related to this Research


(c.ii) Other Significant Products


**d) Synergistic Activities**

- Member, Advisory Council, National Academy of Environmental Design: 2014-16.
- Member, Committee on Carolinas Climate Resilience, NOAA, 2013-14.
- Clarkson Visiting Chair, University of Buffalo, School of Architecture & Planning, 2011.
- Faculty Award for Excellence in Doctoral Student Mentoring, UNC Graduate School, 2013.

**e.i) Collaborators and Co-Editors (within the last 48 months)**

Band, Larry, University of North Carolina; BenDor, Todd, University of North Carolina; Bernhardt, Emily, Duke University; Campanella, Thomas, Cornell University; Godschalk, David, University of North Carolina; Hess, George, North Carolina State University; Nguyen, Mai, University of North Carolina; Salvesen, David, University of North Carolina; Smith, Gavin, University of North Carolina; Song, Yan, University of North Carolina; Urban, Dean, Duke University

**e.ii) Graduate Advisors and Postdoctoral Sponsors**

Hinojosa, Jesus, Mathewson, Chris, and Roeseler, Wolfgang (deceased) of Texas A&M University

**e.iii) Thesis Advisor and Postgraduate-Scholar Sponsor**

Brody, Sam, Texas A&M University; Cooper, John, Texas A&M University; Laurian, Lucie, University of Iowa; Lyles, Ward, University of Kansas; McDonald, Joe, American Planning Association; Manta-Conroy, Maria, Ohio State University; Spurlock, Danielle, University of North Carolina; Stevens, Mark, University of British Columbia.

*Graduate students advised in last 5 years: 8 Ph.D. students; 21 Masters students.*
Bruce R. Bodson
Lecturer (Adjunct), Texas A&M University at Galveston
Bodson Environmental Law and Science
4426 Lakeshore Forest Drive, Missouri City, Texas 77459
281-438-7398, bruce.bodson@bodsonlaw.com

(a) Professional Preparation

B.S. Fishery Science, University of Arizona 1980
M.S. Environmental Science, University of Texas at Dallas 1987
J.D., South Texas College of Law 1993
Post Doc, Environmental and Energy Law, University of Houston Law Center 2000-2002

(b) Academic/Professional Appointments

2001-Present, Lecturer in Marine Sciences, Texas A&M University at Galveston
2008- Present, Principal Attorney/Scientist, Bodson Environmental Law and Science, P.C.
2005-2008, Senior Consultant/Attorney, CH2M Hill, Inc.
2000-2004, Client Service Manager/Attorney, Weston Solutions, Inc.

(c) Representative Publications, and Presentations

Bodson, B. 2002. "Practical Impacts of Wetland Jurisdiction Changes", Houston Bar Association, Environmental Section

(d) Representative Projects

Senior Consultant, Oil Field Remedial Investigation and Feasibility Study, Two Lease Blocks in the Oriente Region, Ecuador Provided senior technical/legal consulting in the investigation of environmental damages resulting from the operation and abandonment of two extensive production fields in the Oriente region of Ecuador. Project involved the assessment of impacts to soils, sensitive habitats, groundwater and surface water resulting from releases of hydrocarbons and drilling fluids. The project team did field sampling of soils and water and modeled the area extent, depth and volume of contamination. The project also involved selection of a remedy and cost estimation for remediation of identified contamination.
Field Project Manager; Uranium Mill Tailings Natural Resource Damage Assessment and Ecological Risk Assessment; U.S. Department of Energy (DOE); Monticello, Utah. Conducted wetlands delineation, threatened and endangered species surveys, vegetation mapping, and benthic and terrestrial invertebrate sampling in areas contaminated with uranium mill tailings. Species of concern included Southwestern willow flycatcher, peregrine falcon and spotted bat. The project required a variety of sampling techniques to assess potential receptors. Fieldwork required radiation worker training. Data were used to prepare a resource map to be used in guiding restoration following cleanup.

Field Manager; Natural Resource Damage Assessment and Ecological Risk Assessment; BFI CECOS; Livingston, Louisiana. Conducted field inventories of potential sensitive receptors at a closed hazardous waste facility in Louisiana. Project included conducting species inventories on- and off-site, evaluating watersheds, and looking for evidence of potential migration pathways.

Environmental Project Manager; Natural Resource Damage Assessment (NRDA) Studies for Superfund Site; Orange, Texas. Planned and conducted environmental sampling and analysis to identify and quantify natural resource damages resulting from the release of hazardous materials, from an abandoned treatment, storage and disposal facility to a tidal marsh. Work included sampling of sediments and water column for analytical testing for hazardous contaminants, sampling of sediments for sediment bioassays in the laboratory, and sampling of benthic invertebrates to conduct studies of impacts to biodiversity and community structure. Data was used to negotiate the NRDA settlement between the responsible parties and the resource trustees.

Project Manager; Environmental Studies and Document Preparation; United Gas Pipe Line Company; Mobile County, Alabama. Managed field office; used integrated global positioning system/geographic information system (GPS/GIS) for project mapping and analysis; prepared FERC environmental report; prepared applicant environmental impact statement (EIS); completed environmental field surveys of the right-of-way; Section 7 consultation with U.S. Fish and Wildlife Service for two listed species, and Section 106 coordination with SHPO to obtain cultural resource clearance. Wrote environmental plans and procedures for construction; provided expert testimony in judicial and legislative forums; and provided agency coordination for multiple agencies and jurisdictions.

(e) Synergistic Activities

Serve as Chairman of the Christmas Bay Foundation 2015- present , Serve as Board member for the Bayou Land Conservancy 2006-present, and Bayou Preservation Association 2016- present, Served on the Planning and Zoning Commission for City of Missouri City 1999-2008, Served on board of the Gulf Coast Bird Observatory 1996-1999, Member of the Steering Committee Brazos River National Water Trail Proposal 2014-present, Member of the Satae Bar of Texas Section on Environmental and Natural Resources Law.

(f) Graduate/ Undergraduate Students and Post-docs Supervised

Committee Member: Graduated: 11Masters Students
Current: 8 Masters Students
Rusty A. Feagin
Professor
Dept. Ecosystem Science and Management
Texas A&M University

(a) PROFESSIONAL PREPARATION

University of California, Santa Cruz  Environmental Studies  B.A. 1996
Texas A&M University  Rangeland Ecology and Management  Ph.D. 2003

(b) APPOINTMENTS

2016-present  Professor, Dept. of Ecosystem Science & Management, Texas A&M University
2009-2016  Associate Professor, Texas A&M University
2003-2009  Assistant Professor, Texas A&M University
2015-present  Associate Editor, Frontiers in Ecology and the Environment
2014-present  Associate Editor, Estuarine, Coastal and Shelf Science
2014-present  Graduate Faculty, University of Kentucky
2012-2014  Special Issue Editor, Geomorphology
2012-present  Graduate Jury, Instituto de Ecología, A.C.
2010-2013  Fellow, Mexican American and Latino Research Center
2011  Visiting Faculty, Gulf Coast Research Laboratory, University of Southern Mississippi
2009-2010  Visiting Faculty, Restoration Institute, University of Victoria
2008  Visiting Fellow, Fitzwilliam College, Dept. Geography, University of Cambridge

(c) PRODUCTS

Recent Examples:

Other Significant Products:


(d) SYNERGISTIC ACTIVITIES

Member, US National Greenhouse Gas Inventory, Blue Carbon working group.
Member, Scientific consultation group on dune and constructed infrastructure, Texas General Land Office. 2015-present.
Co-Organizer, Steering Committee, Binghamton Geomorphology Symposium; Co-PI, 44th Coastal Geomorphology and Restoration, NSF-funded symposium. 2012-2015.
Co-Director and Co-PI, Coastal Barrier Islands Network, NSF-funded Research Coordination Network in Biological Sciences (RCN), 2006-2014.
Taught/Visiting Scientist at University of Southern Mississippi (2011), University of Victoria, CAN (2009-2010), and Fitzwilliam College, University of Cambridge, UK (2008)

(e) RECENT AWARDS

Texas Environmental Excellence Award, Civic/Community, 2016. Highest environmental honor in state.
Outstanding Graduate Professor Award. 2016. Dept. Ecosystem Science and Management.

(f) TEACHING RESPONSIBILITY

Coastal Processes and Ecosystem Management, Spring 2017 and beyond
Ecological Restoration of Wetland Systems, Fall 2017 and beyond
Glenn A. Jones
Professor of Marine Sciences
Texas A&M University at Galveston
Galveston, TX 77553
Work: (409) 741-4360, e-mail: jonesg@tamug.edu

Education

Ph.D.  Marine Geology, Columbia University, 1983
M.Sc.  Marine Geology, Columbia University, 1979
B.A.   Geology, University of Rhode Island, 1977

Professional Experience:

1996-Present  Texas A&M University at Galveston, Galveston, Texas
1996-present  Professor of Oceanography (tenured)
1997-1999    Dean of Academic Affairs, Texas A&M University at Galveston
1996-1999    Associate VP of Research, Texas A&M University at Galveston
1983-1995    Woods Hole Oceanographic Institution, Woods Hole, Massachusetts
1989-1995    Founding Director, National Ocean Sciences AMS Facility

Awards:

2013  William Paul Ricker Distinguished Staff Award – Faculty
2008  Texas A&M Association of Former Students - Teacher of the Year - College Level
1995  Chandler-Misener Award for best paper of 1994 - Great Lakes Research

Field Experience:

PI and/or participant in 9 field expeditions.

Selected Publications:  (Author or co-author of 65 peer-reviewed publications, h-index=29)


William Merrell

Professor and George P. Mitchell Chair
Department of Marine Sciences
Texas A&M University at Galveston
P.O. Box 1675, Galveston, TX 77553
409-740-4732, merrellw@tamug.edu

(a) Professional Preparation

Sam Houston State College  Physics and Mathematics majors  B.S. 1965
Sam Houston State College  Physics major; Mathematics minor  M.A. 1967
Texas A&M University  Oceanography major  Ph.D. 1971

(b) Academic/Professional Appointments (partial list)

Academic:
2002-present  George P. Mitchell Chair in Marine Sciences, Texas A&M University at Galveston
2013  Acting President, Texas A&M University at Galveston
2006-2011  Director, Center for Texas Beaches and Shores, Texas A&M University at Galveston
2002-2008  Partner, MerrellKatsouros LLP
1993-1995  Vice Chancellor for Strategic Programs, The Texas A&M University System
1992-1993  Vice President for Research Policy, Texas A&M University
1989-1991  President, Texas Institute of Oceanography
1987-1992  President, Texas A&M University at Galveston
1985-1987  Assistant Director, National Science Foundation
1985-2002  Professor, Department of Oceanography, Texas A&M University
1985  Director, Division of Atmospheric and Marine Sciences, College of Geosciences, Texas A&M University
1983-1985  Principal Investigator, Ocean Drilling Program, Texas A&M University
1983-1984  Associate Dean, College of Geosciences, Texas A&M University
1983-1984  Director, Earth Resources Institute, Texas A&M University
1981-1985  Associate Professor, Department of Oceanography, Texas A&M University
1981-1983  Deputy Department Head, Department of Oceanography, Texas A&M University

Professional:
2013-present  Chair, International Maritime Advisory Committee, Bay Area Houston Economic Partnership
2010  Chair, Sustainability Committee, City of Galveston
2008-2011  Member, Comprehensive Planning Committee, City of Galveston
2006-2009  Member, Hurricane Recovery Task Force, City of Galveston
2005-present  Member, Adv. Committee, Frank Evans Mediation Center, South Texas School of Law
2002  Co-Chairman, Fish Performance Measures Workshop, NOAA Fisheries
2001-2012  Member, Advisory Council for the National Center for Atmospheric Research
2001-2004  Member, Subcommittee on Global Change Research Programs, Biological and Environmental Research Advisory Committee, U.S. Department of Energy
2000-2005  Member, Executive Campaign Cabinet, Earth Systems Science Research Center, University of California, Irvine
2000-2008  Member, U. S. President’s Panel on The Ocean Exploration, U.S. Department of Commerce Panel Chair, Governance: Oceans for the New Millennium: Developing and Implementing Ocean Policy, American Geophysical Union and the American Association for the Advancement of Science, Washington, DC

1999-2014  Member, Board of Directors, Houston Advance Research Center

(c) Representative Publications


(d) Synergistic Activities

Developed the concept of Coastal Barrier "Ike Dike" that would protect the people and properties around Galveston Bay from Hurricane-induced storm surge. Conceived and implemented multi-disciplinary and multi-institutional Research Program to advance the Ike Dike concept. Researchers are mainly faculty and students from Texas A&M, Jackson State University, University of Houston, Engineering and Research and Development Center of the USACE, and Delft Technical University and have a wide range of expertise including physical oceanography, hydraulic engineering, civil engineering, meteorology, storm surge modeling, urban planning, micro-economics, and landscape architecture.

(e) Graduate/ Undergraduate Students and Post-docs Supervised

Thesis advisor and Post-graduate Scholar Sponsor

Tanveerul Islam, Texas A&M University
Maarten Ruijs, Delft University of Technology
Kasper Stoeten, Delft University of Technology
Peter de Vries, Delft University of Technology
Rolf Kelderman, Delft University of Technology
Anniek de Milliano, Delft University of Technology
Refke Gunnewijk, Delft University of Technology
Tom Heeringa, Delft University of Technology
Geert Roukens, Delft University of Technology
Merijn Janssen, Delft University of Technology
(a) Professional Preparation

Ph.D. in Political Science, Florida State University, August 2010.
M.S. in Political Science, Florida State University, December 2006.
B.A. in International Relations, College of William and Mary, May 2005.

(b) Academic/Professional Appointments

Maritime Studies Coordinator, Department of Liberal Studies, Texas A&M University at Galveston, 1/2016-present.

Assistant Professor of Political Science, Department of Liberal Studies, Texas A&M University at Galveston, 1/2016-present.

Assistant Professor of Political Science, Department of Political Science, University of Louisiana at Lafayette, 8/2012-12/2015.

Visiting Instructor, Center for International Studies, Georgia Southern University, 8/2011-6/2012.

Post-Doctoral Associate, Department of Geography, Florida State University, 8/2010-8/2011.

(c) Ten Representative Publications


(d) Synergistic Activities

Secretary and Council Member, North American Society for Oceanic History (2016-present); NOAA Teacher at Sea program participant (2013), application reviewer (2013-present), and representative (2016-present). Award to Louisiana Artists and Scholars, Louisiana Board of Regents (2014-2015, $28,885).

(e) Graduate/Undergraduate Students and Post-docs Supervised

Undergraduate Thesis Supervision:
    Zac Wallace, Undergraduate Honors in Political Science, 2012-2013.

Masters Thesis Committee:
    Philippe Callais, Master’s in Architecture (outside member), 2012.
Kent E. Portney
Professor and Director
Institute for Science, Technology and Public Policy
Bush School of Government and Public Service, Texas A&M University

a. Profession Preparation

Doctor of Philosophy in Political Science and Public Policy, Florida State University, 1979
Master of Arts in Political Science and Public Policy, University of Connecticut, 1975
Bachelor of Arts in Political Science Rutgers University, 1973

b. Professional Appointments (present position first)

2014-Present  Professor, Bush School of Government and Public Service, Texas A&M University, College Station, TX
2016-Present  Director, Institute for Science, Technology, and Public Policy, Bush School of Government and Public Service
2013-2014  Director, Water and Oceans Program, Center for International Environment and Resource Policy, Fletcher School, Tufts University, Medford, MA
2006-2014  Adjunct Professor, Tisch College of Citizenship and Public Service, Tufts University
1992-2014  Professor of Political Science, Tufts University
1986-1992  Associate Professor of Political Science, Tufts University
1979-1986  Assistant Professor of Political Science, Tufts University

c. All Publications (2013-2016)


2013 - Kent E. Portney and Jeffrey M. Berry, “Sustainability and Interest Group Participation in City Politics,” “Sustainable Cities” symposium issue of Sustainability, 5, 2077-2097.


d. Five Other Relevant Publications

2010 - Kent E. Portney and Jeffrey M. Berry, “Participation and the Pursuit of Sustainability in U.S. Cities,” Urban Affairs Review, 46 (1), 119-139.


Antonietta Quigg

Professor
Department of Marine Biology
Texas A&M University at Galveston
P.O. Box 1675, Galveston, TX 77553
409-740-4990, quigga@tamug.edu

(a) Professional Preparation
La Trobe University, Australia  Biochemistry & Chemistry  B.S.  1989
La Trobe University, Australia  Biochemistry  B.S. (Honors)  1990
Monash University, Australia  Biological Sciences  Ph. D.  2000
Rutgers University, NJ  Environmental Biophysics & Molecular Biology  Post-doc  11/00-08/03

(b) Academic/Professional Appointments
09/13–Present  Associate Vice President for Research and Graduate Studies, Texas A&M University at Galveston
09/13–Present  Professor, Department of Marine Biology, TAMUG and Professor, Department of Oceanography, TAMU
11/11–08/13  Associate Vice President for Research Development, Texas A&M University at Galveston
01/11–08/13  Deputy Department Head, Department of Marine Biology, Texas A&M University at Galveston
09/09–08/13  Associate Professor, Department of Marine Biology and Oceanography, TAMU(G)
03/09–Present  Graduate Faculty, Department of Life Science, Texas A&M University-Corpus Christi
09/08–Present  Graduate Faculty, Marine Biology-IDP, Texas A&M University at Galveston
09/07–Present  Graduate Faculty, Ecology and Evolutionary Biology Interdisciplinary Research Program, Texas A&M University
09/03–08/09  Assistant Professor, Department of Marine Biology and Oceanography, TAMU(G)
09/03–Present  Graduate Faculty, Department of Marine Science, TAMUG

(c) Ten Representative Publications
(Name indicates author was a student or a post-doc at the time of research.)


McInnes, A. S., Nunnally, C.C., Rowe, G.T., Davis, R.W. and Quigg, A. 2015 Undetected blooms in Prince William Sound: Using multiple techniques to elucidate the base of the summer food web. *Estuaries and Coasts.* 38: 2227-2239. DOI:10.1007/s12237-014-9924-0

Williams AK, McInnes AS, Rooker JR, Quigg A. 2015 Changes in Microbial Plankton Assemblages Induced by Mesoscale Oceanographic Features in the Northern Gulf of Mexico. *PLOS One.* 10(9):e0138230.


**Synergistic Activities**

2008-present  Expert Science Team, Trinity and San Jacinto River Basins and Galveston Bay. Appointed by TCEQ, Section 11.02362(j) of Senate Bill 3

2006-Present  Monitoring and Research Advisory committee, Galveston Bay Estuary Program/TCEQ

2004-Present  Texas Harmful Algal Bloom Work Group

Editorial Reviewer & Panel Member  NSF Biological & Chemical OCNG, NSF Biodiversity, Rhode Island Sea Grant, Louisiana Sea Grant, NOAA ECOHAB, MERHAB and CSCOR programs, National Fish and Wildlife Foundation. Council for Earth and Life Sciences, Netherlands Polar Programme; EPA Fellowships and ECOHAB

**Graduate/ Undergraduate Students and Post-docs Supervised**

Advised: Graduated - Four Ph.D. and 9 Master students

Current - Three Ph.D. students and 1 Masters students

Trained/sponsored: 12 post-docs (4 currently)

Undergraduate supervised: >50 in various capacities from volunteers to REU

Committee member: 12 Ph.D. and 20 M.S. students
Gilbert Thomas Rowe

Date of Birth: February 7, 1942
Place of Birth: Ames, Iowa
Married: Judith Lee Ingram, Dec. 27, 1962
One child: Atticus Ingram Rowe
One grandchild: Locke Kyle Rowe

Educational Background:

B.S. Texas A&M University, Zoology 1964
M.S. Texas A&M University, Oceanography 1966
Ph.D. Duke University, Zoology 1968

Professional Experience:

Undergraduate Teaching Asst., Comparative Anatomy, TAMU 1962-64
Summer Trainee, Texas Game and Fish Commission 1962
Graduate Fellow, Dept. Oceanography, TAMU 1964-65
NDEA Fellow, Zoology, Duke University 1965-66
NSF Pre-doctoral Oceanographic Trainee, Duke University Marine Laboratory 1966-68
Research Associate, Florida State University 1968
Postdoctoral Fellow, Woods Hole Oceanographic Institution 1968-69
Assistant Scientist, Woods Hole Oceanographic Institution 1969-73
Associate Scientist, Woods Hole Oceanographic Institution 1973-79
Oceanographer, Brookhaven National Laboratory 1979-87
Head, Oceanographic Sciences Division, BNL 1985-87
Head, Dept. of Oceanography, Texas A&M 1987-93
Professor, Dept. of Oceanography, Texas A&M 1987-present
Head, Dept. of Marine Biology, Texas A&M-Galveston 2003-07
Associate Vice President for Academic Affairs, TAMUG 2007-09
Professor, Dept. of Marine Biology, TAMUG 2003-present
Chair, Marine Biology Interdisciplinary Degree Program, TAMU System 2011-15

Honor and Professional Societies:

Phi Kappa Phi Honor Society 1963
Honorary Deep-Sea Biological Society 1973
Sigma Xi
American Society of Limnology and Oceanography
The Oceanography Society, Life Member
Fulbright Scholar, Universidad de Concepcion, Chile 2000
Regents Professor, Texas A&M University System 2007
American Academy of Underwater Sciences 2016

Bibliography:

154. Al-Ansari, E ____________; Mohamed A Abdel-Moati; Ibrahim A Al-Maslamani; Mehsin A Al-Yafei; Ismail M Al-Shaikh; Robert C Upstill-Goddard; Oguz Yigiterhan, 2016. Hypoxia in the central Arabian Gulf Exclusive Economic Zone (EEZ) of Qatar during Summer Season. Estuarine, Coastal and Shelf Science DOI:10.1016/j.ecss.2016.03.0.22

*student or former student of GTR
Grace W.Y. Wang

Department of Maritime Administration
Texas A&M University at Galveston
200 Seawolf Parkway, P.O. Box 1675, Galveston, TX 77551
Phone (409) 740-4496
Email: wangw@tamug.edu

(a) Education
Ph.D. in Economics, Texas A&M University at College Station, Texas, 2008
M.A. in Economics, National Taipei University, Taipei, Taiwan, 2001
B.A. in Economics, National Taipei University, Taipei, Taiwan, 1999

(b) Honors and Awards
- Nominated Runner-up Paper, Best Published Manuscript Award 2014, Maritime Policy & Management, 2015
- Best Paper Award- Banking, World Business Institute-Australia and UK, the 8th London Business Research Conference, UK, 2013
- Best Paper Award, Maritime Policy & Management, International Association of Maritime Economists, Taiwan, 2012
- Faculty Teaching Excellence Awards, Texas A&M University at Galveston, 2012
- Best Reviewer Award, International Association of Maritime Economists, Taiwan, 2012
- 2nd Prize Best Paper Award - Graduate track, Southwestern Economics Association, 2007
- Academic Conference Scholarship, Ministry of Education, Taiwan, 2007
- Chinese Faculty Merit Scholarship, Texas A&M University, 2006, 2007

National/International Professional Services and Leadership
- Associate editor, Maritime Policy & Management, 2016
- President, Young Professional Chapter, Transportation Research Forum, US, 2015
- Planning committee, Port Performance Research Network, Kuala Lumpur, Malaysia, 2015
- Member, PortEconomics.eu, 2014-present
- Guest editor for the Maritime Policy & Management special issue for IAME 2014
- Co-Chair, Communications, International Association of Maritime Economists, 2014
- General council member, the International Association of Maritime Economists, 2013-2014

(c) Ten Representative Publications
- US Port Efficiency, Port Privatization and Concession, Cruise Concession, Risk Assessment and Performance of Shipping firms; Financial Crises, Bank Failures and Policy, Incentives Mechanism Design

(d) Synergistic Activities
Dr. Grace W. Y. Wang has published many journal papers and conference papers as well as editing journal issues. Her articles have appeared in journals such as Transportation Research Part E: Logistics and Transportation Review, Maritime Policy & Management, Maritime Economics and Logistics, Research in Transportation Business & Management, International Journal of Shipping and Transport Logistics, etc.

Dr. Grace Wang has been recognized several times by the international research best paper awards and awarded grants including from the U.S. Army Corp of Engineers and the International Association of Maritime University. She is also the President of Young Professional Chapter of the Transportation Research Forum, and an active member of the International Association of Maritime Economists, Port Performance Research Network, and PortEconomics.eu.

(e) Course Taught
- Graduate – Economic Issues in Shipping; Graduate – Direct Study
- Undergraduate – Principles of Macroeconomics (Honors); Microeconomics; Money and Banking; Research Method; Direct Study-Research
- Graduate Student Committee– Master of Science in Economics; Master of Marine Resources Management (Total 27 students)
X. Ben Wu
Professor, Ecosystem Science and Management, Texas A&M University
College Station, Texas 77843-2138; 979-845-7334; xbw@tamu.edu

(a) Professional Preparation

<table>
<thead>
<tr>
<th>Institution</th>
<th>Degree</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lanzhou University, China</td>
<td>Botany</td>
<td>B.S.</td>
</tr>
<tr>
<td>University of Tennessee</td>
<td>Ecology</td>
<td>M.S.</td>
</tr>
<tr>
<td>University of Tennessee</td>
<td>Management</td>
<td>M.S.</td>
</tr>
<tr>
<td>University of Tennessee</td>
<td>Science</td>
<td>Ph.D.</td>
</tr>
<tr>
<td>Ohio State University</td>
<td>Ecology</td>
<td>Postdoc</td>
</tr>
</tbody>
</table>

(b) Appointments


(c) Publications

(Total 73 journal articles and 8 book chapters; *student or postdoc advised at the time of study)


**d) Synergistic Activities**

- Member, National Research Council Committee on Barriers and Opportunities in Completing 2- and 4-Year STEM Degrees (2013-2016);  - Member, Steering Committee of NSF-funded Faculty Development Network for Undergraduate Biology (FDN-UB) (2014-present)
- Co-chair, Quality Enhancement Plan (QEP) committee for the decennial reaffirmation of accreditation of Texas A&M University (2011-2012);  - Co-chair, Faculty Teaching and Learning Portal committee (2009-2014);  - Activity Leader, Roadmap workshops for early-career academics, Texas A&M ADVANCE program (2011-2014);  - Project Director (2007-2012), Sloan Minority Ph.D. Program in Ecosystem Science and Management;  - Chair, Graduate Programs Committee of Ecosystem Science and Management (2007-2009);  - Co-chair, Exploratory Committee for the merger of Departments of Rangeland Ecology and Management and Forest Science (2006);  - Chair, Committee for Development of BS degree program in Ecological Restoration (2004-2006), Texas A&M University.
- Member of grant review panels: NSF (3 panels);  USDA (3 panels);  USEPA (5 panels).
- Selected collaborative grants: High throughput phenotyping early stage root bulking in cassava using ground penetrating radar (NSF, $2,490,232, 2015-2018, co-PI);  - Enhancing blended and active learning in a large ecology course (Texas A&M, $75,000, 2015-2016, PI);  - Virtual Ecological Inquiry (VEI): A virtual environment for inquiry-based learning and education research (NSF, $199,950, 2010-2014, PI);  - Strengthening educational capacities in geospatial science and technology for agricultural and natural resources management (USDA, $290,000, 2008-2010, co-PI);  - Development of database validation framework for state-and-transition models (USDA, $464,000, 2007-2010, co-PI);  - Scaling soil C and N storage in a changing savanna parkland landscape: Spatial structure, prediction and uncertainty assessment (NSF, $398,000, 2001-2005, PI).

**e) Collaborators & Other Affiliations**

- Collaborators and Co-authors:  
  Archer SR (U Arizona), Acheson G (S Illinois U), Armstrong F (National Park Service), Bagchi S (Indian Institute of Sci), Bai E (Chinese Academy of Sci), Bai Y (Chinese Academy of Sci), Bestelmeyer BT (USDA), Boutrou TW (Texas A&M), Briske D (Texas A&M), Fernández-Giménez ME (Colorado State), Fowler D (Texas A&M), Gilad O (University of Sydney), Griffing L (Texas A&M), Herbert B (Texas A&M), Knight SL (Peen State), Li F (Lanzhou University), Liu F (Chinese Academy of Sci), Matthews PR (Texas A&M), Schielack J (Texas A&M), Simmons ME (U Minnesota), Sun G (Lanzhou University), Webb RC (Texas A&M), Whisenant SG (Texas A&M).
- Graduate Advisor and Postgraduate-Scholar Sponsor:  
  Served as chair/co-chair for 16 PhD and 16 MS students, committee member for 59 PhD and 36 MS students, and sponsor for 7 postdoctoral scholars.
I. Letters of Support

Attached are the letters of support from:

College of Architecture, Texas A&M University
College of Geosciences, Texas A&M University
Memo

Date: November 11, 2016

To: Dr. Kyeong Park, Professor and Head, Department of Marine Sciences

From: Jorge A. Vanegas, Dean

Subject: Ph.D. Program in Marine and Coastal Management and Science

Dear Dr. Park,

Howdy. On behalf of the College of Architecture (CARC) at Texas A&M University (TAMU), I want to express my appreciation for the chance to review the proposal from the Department of Marine Science at Texas A&M University at Galveston (TAMUG) for a new Ph.D. program in Marine and Coastal Management and Science. The proposed program’s interdisciplinary nature, and its focus on the policy and social science aspects of coastal management, are well articulated. I believe that the broad focus of the program, which includes geospatial analysis, human impacts on coastal areas, natural and technological hazards, and legal/ethical issues, will offer students the training necessary to make informed policy decisions in multiple areas of future employment. In my opinion, I can envision that faculty from various departments and programs at TAMU will encourage and provide strong support for this new Ph.D. program.

As presented, the proposed Ph.D. program does not compete with, and actually complements, existing degree programs in CARC, specifically our Bachelor and Master Programs in Urban Planning, and our Doctoral Program in Urban and Regional Sciences. In addition, it clearly has the potential to provide new educational opportunities for students in both TAMU’s College Station and Galveston campuses. Consequently, CARC has no objections, and fully supports, the Ph.D. program in Marine and Coastal Management and Science.
MEMORANDUM

TO: Dr. Kyeong Park  
Professor and Head, Department of Marine Sciences

FROM: Dr. Debbie Thomas  
Interim Dean, College of Geosciences

SUBJECT: Ph.D. Program in Marine and Coastal Management and Science

The College of Geosciences enthusiastically endorses and supports the Department of Marine Sciences’ application for a Ph.D. program in Marine and Coastal Management and Science. This program’s unique focus on the policy and social science dimensions of coastal management, geospatial analysis, human impacts on coastal areas, natural and technological hazards, and legal/ethical issues renders it a tremendous complement to the educational offerings at Texas A&M University and directly promotes the Land and Sea grant mission of TAMU. This program will offer students the training and analytical techniques to create new knowledge and make informed policy decisions at the highest levels. The expertise of the participating faculty from various departments and programs at Texas A&M (Marine Sciences, Marine Biology IDP, Maritime Administration, Liberal Studies, Landscape Architecture & Urban Planning, Ecosystem Science & Management, and Bush School of Government and Public Service) will strongly support this new Ph.D. program, which will offer new opportunities to students on both the College Station and Galveston campuses.

This proposed Ph.D. program complements, but does not compete with, existing degree programs at the College of Geosciences including Oceanography, Geography, Environmental Programs in Geosciences, and the Water Management and Hydrological Sciences Interdisciplinary graduate programs. We have a strong and established record of collaborating with the Department of Marine Sciences in both teaching and research and strongly believe that the proposed program will even further strengthen this collaboration. We absolutely have no objections to the creation of the proposed Ph.D. program in Marine and Coastal Management and Science, and we are very excited to contribute in any way to its success.
AGENDA ITEM BRIEFING

Submitted by: Michael K. Young, President
Texas A&M University

Subject: Approval of a New Doctor of Philosophy (Ph.D.) Degree Program in Marine and Coastal Management and Science and Authorization to Request Approval from the Texas Higher Education Coordinating Board

Proposed Board Action:

Approve the establishment of a new degree program at Texas A&M University at Galveston (TAMUG) leading to a Doctor of Philosophy (Ph.D.) in Marine and Coastal Management and Science, authorize the submission of this degree program to the Texas Higher Education Coordinating Board (THECB) for approval and certify that all applicable THECB criteria have been met.

Background Information:

The new Ph.D. degree program in Marine and Coastal Management and Science will be administered by the Department of Marine Sciences at TAMUG. TAMUG currently offers two Bachelor of Science (B.S.) degrees in Marine Sciences and Ocean and Coastal Resources and a Master’s of Marine Resources Management. A logical extension of TAMUG’s current strength is to have a Ph.D. program to meet the growing need for doctoral level training in coastal and marine management and policy and to provide students with the training to create new knowledge and make informed management and policy decisions at the highest levels.

Increasing population growth and development in coastal areas in Texas and around the world are impacting ecological systems while placing human communities at risk from anthropogenic and natural hazards. Protecting critical coastal resources and economic productivity, in the face of increasing natural hazards and environmental change, demands a new breed of advanced skillsets in the policy and management sciences. Today’s coastal leaders need to take an interdisciplinary approach to research and problem solving like never before. Employers hence are increasingly looking to hire graduates with advanced degrees that can address some of the most critical issues of our generation, including increasing intensity of coastal storms, sea level rise, loss of wetlands, and threats to our diverse coastal economy.

The major goal of the proposed program is to train Ph.D. students to acquire knowledge and research techniques related to coastal management, geospatial analysis, human impacts on coastal areas, natural and technological hazards, and legal/ethical issues. Texas A&M’s peer institutions across the country are recognizing the growing need for doctoral level training in coastal and marine management by establishing their own programs and making major investments in their coastal facilities. There are currently no programs in the state of Texas (only five programs nationally but none along the Gulf of Mexico States) that train students at the doctoral level in coastal and marine resources management and policy.

A&M System Funding or Other Financial Implications:

Estimated costs over the first five years of the program are $2,734,089 and estimated funding over the same time period is $3,521,111, including $2,475,778 in reallocated funds.
Members, Board of Regents
The Texas A&M University System

Subject: Approval of a New Doctor of Philosophy (Ph.D.) Degree Program in Marine and Coastal Management and Science, and Authorization to Request Approval from the Texas Higher Education Coordinating Board

I recommend adoption of the following minute order:

“The Board of Regents of The Texas A&M University System approves the establishment of a new degree program at Texas A&M University at Galveston leading to a Doctor of Philosophy (Ph.D.) in Marine and Coastal Management and Science.

The Board also authorizes submission of Texas A&M University’s new degree program request to the Texas Higher Education Coordinating Board for approval and hereby certifies that all applicable criteria of the Coordinating Board have been met.”

Respectfully submitted,

(CEO’s SIGNATURE)

Michael K. Young
President

Approval Recommended:    Approved for Legal Sufficiency:

John Sharp
Chancellor

Ray Bonilla
General Counsel

Billy Hamilton
Executive Vice Chancellor and Chief Financial Officer

James R. Hallmark, Ph.D.
Vice Chancellor for Academic Affairs
Texas A&M University

Doctor of Philosophy (Ph.D.)
in Marine and Coastal Management and Science
(CIP 03.0201.00)

Program Review Outline

BACKGROUND & PROGRAM DESCRIPTION

Administrative Unit: Department of Marine Sciences, Texas A&M University at Galveston (TAMUG)

The new Ph.D. degree program in Marine and Coastal Management and Science (MCMS) will be administered by the Department of Marine Sciences at TAMUG. TAMUG currently offers two Bachelor of Science (B.S.) degrees in Marine Sciences and Ocean and Coastal Resources and a Master’s of Marine Resources Management. A logical extension of TAMUG’s current strength is to have a Ph.D. program to meet the growing need for doctoral level training in coastal and marine management and policy.

The major objective of the proposed MCMS Ph.D. program is to provide students with the training and analytical techniques to create new knowledge and make informed management and policy decisions at the highest levels. Students will be trained to acquire knowledge and research techniques related to coastal management, geospatial analysis, living and nonliving resources, human impacts on coastal areas, natural and technological hazards, and legal/ethical issues.

The curriculum for the proposed MCMS Ph.D. program is interdisciplinary in nature. This curriculum will draw upon multiple marine and coastal-related courses that will be used to provide a context to traditionally required methodological, quantitative, and theoretical courses. Courses required of all Ph.D. students include:

- one course on research methods;
- three courses in quantitative methods, with one aimed to provide knowledge to a specific field of statistics;
- one course in Geographic Information System (GIS), to provide or increase spatial-analytical capabilities;
- one epistemology course, to provide an understanding of theories of knowledge and learning;
- one coastal management course, to provide a deeper knowledge of the interface between anthropogenic and natural environments from a management and policy perspective; and
- two seminar courses, with the aim of increasing technical, proposal, and research-related writing skills.

The remainder of the curriculum consists of free elective courses that the student will select depending upon the student’s research interests and with input from the student’s graduate advisory committee, and research hours dedicated to successful dissertation writing and defense.
The proposed implementation date is August 1, 2019.

Texas A&M University (Texas A&M) certifies that the proposed new degree program meets the criteria under 19 Texas Administrative Code, Section 5.46 in regards to need, quality, financial and faculty resources, standards and costs.

I. NEED

A. Employment Opportunities

A job market analysis for MCMS graduates by Hanover Research (Labor Market Analysis: Ph.D. in Marine and Coastal Management and Science, March 2016) demonstrates the need for the MCMS Ph.D. program. One of the most indicative characteristics of job market need is open employment opportunities. A recent nationwide job search identified 77 relevant employment opportunities for MCMC Ph.D. graduates. These job opportunities were found in all sectors, including federal, state and local government, non-profit organizations, higher education, and private sector. Over 71% of MCMS related employment opportunities required an advanced degree; 26% required a Ph.D. while the remaining required a Master’s, but with preference toward a Ph.D. Further, there is evidence that this snap-shot of employment opportunities is poised to remain stable or experience growth in the future. Based on a survey of marine and coastal planners, there is an increasing number of coastal and marine planning initiatives emerging in the United States, and these initiatives will likely spur labor market demand for coastal and marine management professionals. For example, the National Oceanic and Atmospheric Administration (NOAA) provides links to employment pages for many organizations involved in coastal resource management, including state and federal agencies and non-profit organizations (see https://coast.noaa.gov/fellowship/jobs.html).

B. Projected Enrollment

Enrollment of four to five students per year for the first five years is projected. With the expectation of two to three graduates and one attrition per year from Year 4, we plan to maintain FTSE (full-time student equivalent) and cumulative headcount limited to 16-18 students during the first five years. Due to an expected increase in research funding and faculty capacity, the Department will work to increase enrollment to around 20-22 students after Year 5. To attract and retain underrepresented students from the start of the program, there will be funding dedicated to minority students (e.g., Merit and Diversity Fellowships at TAMUG).

C. Existing State Programs

There are no existing programs in the state of Texas that educate students at the doctoral level in coastal and marine resources management and policy.
II. QUALITY & RESOURCES

A. Faculty

The Department currently has 16 full-time faculty members. The core faculty for the proposed program are currently in place. There are plans to recruit two new faculty during the first five years, in anticipation of the retirement of two senior faculty, in the fields of remote sensing to strengthen our capability in geospatial analysis and coastal management and interdisciplinary coastal resource management and policy.

B. Program Administration

The proposed program will be administered by the Department of Marine Sciences. Overall management of the program will be led by the Department Head and the Chair of the proposed MCMS Ph.D. program.

C. Other Personnel

A total of four full-time staff members (two at the Department of Marine Sciences and two at the Center for Texas Beaches and Shores) are available to support the proposed program. Specialist staff members are available to support IT, communications and engagement, assessment, and recruitment at TAMUG. No new staff will be required.

D. Supplies, Materials

Adequate supplies and materials are in place within the Department of Marine Sciences and TAMUG. There are procedures and resources available for requesting additional supplies and materials to support teaching if needs arise.

E. Library

As a branch campus of Texas A&M, TAMUG has superior access to resources compared to other institutions of similar size. The Texas A&M Libraries can readily support the proposed MCMS Ph.D. program. It will not require additional library resources, because the Texas A&M Libraries have steadily acquired resources in the Marine and Coastal Sciences and related fields as part of its aggressive growth campaign.

F. Equipment, Facilities

The Department of Marine Sciences and TAMUG are well equipped to support the proposed program. Facilities include the Ocean and Coastal Studies Building (OCSB), the largest marine research facility on the Texas Gulf Coast (110,000 ft²) which houses the office and lab space of the participating faculty members. The OCSB also offers classrooms and laboratories for both graduate and undergraduate students. The OCSB houses the Center for Texas Beaches and Shores (CTBS), a state-legislated entity that focuses on the protection of the Texas shoreline, bays and waterways through research in
cooperation with government and private sector agencies. CTBS facilities include a geospatial laboratory, established in 2014. In addition, Phase 1 of the new Academic Complex (MAIN) was completed in August 2017, which includes state-of-the-art classrooms and teaching labs for both graduate and undergraduate students, as well as a new graduate student office with distance education rooms instrumented with communication technology.

**G. Accreditation**

There is no national accrediting body for the field of the proposed Ph.D. program. Accreditation will be through the Southern Association of Colleges and Schools Commission on Colleges (SACSCOC) concomitant with the accreditation process that occurs every 10 years for Texas A&M.

**III. NEW 5 YEAR COSTS & FUNDING SOURCES**

The proposed MCMS Ph.D. program will be self-sustainable as the projected funding exceeds the projected costs.

<table>
<thead>
<tr>
<th>NEW FIVE-YEAR COSTS</th>
<th>SOURCES OF FUNDING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faculty $529,588</td>
<td>Formula Income $415,126</td>
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<tr>
<td>Program Administration $47,781</td>
<td>Statutory Tuition $70,200</td>
</tr>
<tr>
<td>Graduate Assistants $2,067,082</td>
<td>Reallocation $2,475,778</td>
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<tr>
<td>Clerical/Staff $79,638</td>
<td>Designated Tuition $221,327</td>
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<tr>
<td>Supplies &amp; Materials $10,000</td>
<td>Other Funding:</td>
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<tr>
<td>Library &amp; IT Resources $0</td>
<td>: Student Fees $168,480</td>
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<tr>
<td>Equipment, Facilities $0</td>
<td>: Board-Authorized Tuition $70,200</td>
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<tr>
<td>Other $0</td>
<td>: Grant Support for GARs $100,000</td>
</tr>
<tr>
<td>Estimated 5-Year Costs $2,734,089</td>
<td>Estimated 5-Year Revenues $3,521,111</td>
</tr>
</tbody>
</table>
Texas Higher Education Coordinating Board - General Academic Institution - Program Funding Estimation Tool

Instructions
Insert the credit hours projected to be taken for all students per semester into the appropriate field. Select the discipline and level from the drop-down menus. The spreadsheet will estimate the total amounts.

Assumptions
1. Calculations are based on hours taken, not Full-Time Student Equivalent (FTSE) or headcount. This model accounts for credit hours taken at different academic levels, across various disciplines, and at different loads during the fall, spring, and summer.
2. Hours used to calculate formula funding are based on the summer and fall of even numbered years and the spring of odd numbered years. For example, summer and fall 2010 and spring 2011 (Base Year 2011) are used to allocated funds for both fiscal years.
3. The program's formula funding forecast will include hours from the various disciplines that a student must take to complete the degree, not just hours from the named discipline of the program.
4. The level of the hours funded is the level of the course or the student's enrollment classification, whichever is lowest.
5. The program's new cost to the state is the funding rate reduced by the institution's estimated statutory tuition.
6. Funding is not generated for the first two years the program generates semester credit hours.
7. The funding rate is held constant into future years.
8. This model's information and assumptions are subject to change, and the estimates are not a guarantee of funding.

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<thead>
<tr>
<th>Designated Tuition Rate</th>
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<td>Statutory Tuition Rate</td>
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<td>All Funds Rate</td>
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<table>
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<th>Five-Year Total</th>
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<th>FY 2019</th>
<th>FY 2020</th>
<th>FY 2021</th>
<th>FY 2022</th>
<th>FY 2023</th>
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Note: The table above converts the table below from calendar year to fiscal year. The general revenue presented above represents the estimated allocated portion based on the “Base Year.” See assumption 2.
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## Estimated Formula Funding: Discipline

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