This handbook is designed to be a living document that will undergo periodic review and updates as the program evolves. Please visit our [website](http://waterdiplomacy.tufts.edu) to obtain the most recent version [updated January 2015].
1. **Program Overview**

The Integrative Graduate Education and Research Traineeship (IGERT) program of the National Science Foundation (NSF) has been developed to meet the challenges of educating U.S. Ph.D. scientists, engineers, and educators with the interdisciplinary backgrounds, deep knowledge in chosen disciplines, and technical, professional, and personal skills to become leaders and creative agents for change. The program is intended to catalyze a cultural change in graduate education for students, faculty, and institutions by establishing innovative new models for graduate education and training in a fertile environment for collaborative research that transcends traditional disciplinary boundaries. The program seeks to create new graduate programs that provide selected trainees with the resources and environment needed for interdisciplinary scholarship.

2. **Vision and Goals**

The demand for purely scientific and engineering approaches to address major challenges in managing water resources has reached its limit and a new approach is needed. Effective synthesis of societal and political solutions with engineering and scientific formulation is an integral part of long-term and adaptive resolutions to many unresolved yet pressing water problems. Water issues are complex due to their intricate coupling among natural, societal, and political domains where people and problems interact to shape the framing and formulation of the issue. Many water problems are the result of competition, interaction, and feedback among Natural (water quantity, quality, and ecosystems) and Societal (economy, social values and political norms, and governance) Domain (NSPD) variables. Water, as a limited resource, lends itself to conflicts over its division. A synthesis of explicit (scientific water information from natural domain) and tacit (contextual water information from societal domain) knowledge of water is needed to transform fixed water quantity into a flexible resource.

The Water Diplomacy program strives to prepare the next generation of highly competent, in-demand water professionals who will create adaptive and actionable knowledge to resolve water problems through negotiated solutions. The group aims to develop the intellectual foundation to integrate knowledge from natural and societal domains through collaborative and continuous learning, and create a community of water scholars, diplomats, scientists, and engineers at Tufts University. The program nurtures this community of water scholars by housing them all in one space, and through synergistic resources provided by the interdisciplinary graduate program in Water: Systems, Science and Society. Students have the opportunity to work with national and international partners to synthesize water information and contextual knowledge by examining real world case studies through the NSPD framework. Through these experiences, the Water Diplomacy program can promote interactive dialogue among producers and users of knowledge to combine disciplinary, contextual, and pragmatic perspectives in exploring negotiated solutions, and generate actionable knowledge.

3. **Fellows and Associates**

Students receiving stipends from the IGERT project are considered IGERT fellows. Students who do not receive NSF IGERT stipends, but are participating in the Water Diplomacy program’s classes and activities—including IGERT surveys and other trainee evaluation requirements—are considered IGERT associates. Water Diplomacy courses and special events are open to all interested Tufts graduate students. All are welcome to participate.

3.1. **Funding: IGERT Funding**

Each trainee will be supported for a 24-month period from NSF funds. It is the responsibility of the IGERT trainee and his/her advisor(s) to identify funding for beyond the two-year IGERT funding period. IGERT trainees are advised to consult early on in their studies with the graduate program.
director of their academic department to discuss departmental sources and levels of support available to them in the out-years. Please note that as a requirement of accepting NSF traineeship, it is expected that trainees commit to remain actively involved beyond two-year NSF funding and complete their Ph.D. requirement in Water Diplomacy at Tufts University. Students are responsible for following the proper procedures to obtain travel funds and reimbursements. Please see the appendices for additional guidance.

**Stipends:** A stipend of $30,000 per year per trainee is allocated. First year funding will be provided upon admission to the program; second year funding will be dependent on academic performance.

**Travel:** $4,000 per trainee is allocated for travel and for presenting results at interdisciplinary conferences. These conferences will be outside trainees’ primary discipline and will expose them to interfacing disciplines relevant to their Water Diplomacy-related Ph.D. dissertation topic.

**Research Experience Allowance:** Trainees will participate in a research- or professional development-oriented traineeship with either a domestic or international partner. We have budgeted $5,000 per trainee for domestic internship allowances, and $7,500 per trainee for international internship allowances.

While the goal of the Research Experience Allowance is to encourage new, collaborative research partnerships outside the University, proposals to engage in other professional development activities (e.g., workshops and training courses) will be accepted in the interest of facilitating a broader range of opportunities for trainees prior to the May 31st, 2017 program funding deadline. An internship proposal and a budget with a brief justification will be required for all internship funding requests.

**Student Publication Costs:** A total of $22,000 ($1,000 per trainee) in publication costs—including page charges and abstract fees for national and international conferences—are budgeted for IGERT students.

### 3.2. Funding: Out-year and Levels of Support

It is the responsibility of the IGERT trainee and his/her advisor to identify funding for the trainee when not supported by IGERT. It should be noted that stipends for other forms of funding are typically below the IGERT stipend rate, so the trainee should plan accordingly. Trainees are advised to consult early with their advisors to discuss departmental sources of support and other funding opportunities.

### 4. Program Requirements

Each student in the IGERT program has a “primary department” at Tufts University where the student is pursuing a Ph.D. degree. The Water Diplomacy program creates a layer of structure on top of the requirements of the primary department. Thus, the students must complete the IGERT requirement in addition to all of the requirements of his/her primary department. Students are advised to review both their primary department and Water Diplomacy program requirements with their advisors as early as possible to develop an appropriate plan.

In order for the program to meet its goal in students’ development of interdisciplinary scholarship and research, the requirements of the program can be divided into three main areas (1) Ph.D. advisors and committees, (2) coursework, and (3) interdisciplinary research. The following section provides details on these requirements along with additional recommended activities and opportunities to enrich your doctoral preparation.
4.1. Advisors/Doctoral Committee Requirements

Upon admission to Tufts and the Water Diplomacy program, each trainee will be assigned a temporary advisor from their academic department, if they have not already identified a faculty advisor. Each student should schedule a meeting with his/her advisor as soon as possible after arrival on campus.

At this meeting, the following points should be discussed:

a) The sequence of courses to be taken that meets the requirements of both the Water Diplomacy program and Ph.D. granting academic program.

b) The responsibilities associated with a Water Diplomacy traineeship.

c) An academic plan with tentative timeline for completing the program (overall duration, course load per semester, thesis requirements, etc.). Students are asked to submit their individualized academic plan and identify their primary thesis advisor to the Water Diplomacy Committee by December 31 of their first year.

d) Whether and what credits the student may seek to transfer from other programs.

e) How often the student should meet with the advisor.

Students are encouraged to choose a primary thesis advisor with whom they will undertake dissertation research by December 31 of their first year at Tufts. Students will need to establish active relationships with prospective thesis advisors and secondary thesis advisors by working in a professor’s research group on a project, taking the courses offered by the faculty members of interest, and by pursuing mutually agreeable interdisciplinary research problems with the faculty members. To ensure cross-fertilization of ideas and encourage integrative research, the Water Diplomacy program requires trainees to choose a PRIMARY advisor (from their Ph.D. granting academic program) and a SECONDARY advisor from a separate discipline (e.g., a student from the natural domain will choose a faculty member from the societal domain like political science) based on his/her interests and proposed dissertation topic. SECONDARY advisors will be identified concurrently with the completion of the Water Diplomacy Research Proposal Defense in the beginning of the student’s second academic year (August 31). This advisor arrangement will formalize a jointly defined dissertation topic for Water Diplomacy students.

A faculty member who serves as a student’s primary thesis advisor or secondary advisor should: (a) allow the student to take the required Water Diplomacy Program courses, (b) annually provide a short summary of the student’s academic progress to the IGERT Program Committee, and (c) agree to participate in various Water Diplomacy program activities including participation in the Colloquium, and helping to organize the Water Diplomacy seminar series.

4.2. Colloquium

The Water Diplomacy Colloquium is intended to help students define/refine their interdisciplinary Water Diplomacy research hypothesis/questions through focused presentation and feedback from advisors, faculty, and Water Diplomacy peers.

The Colloquium presentations are focused on the following three main questions: (a) What is the key hypothesis/research question? What is the water problem? What do we know about this water problem? What do we not know about this water problem? Why do we need to know about this water problem? Why does addressing this problem require an interdisciplinary approach? In what ways is this problem related to Water Diplomacy? (b) What kind of data
and/or analysis will help answer the question(s) or hypothesis? How will the data and or analysis help you answer the question/hypothesis? and (c) What specific feedback are you seeking to refine/revise your question/hypothesis and proposed method?

The Colloquium offers an opportunity for all participants to develop a common language across disciplines, and further expand the employment of multidisciplinary methods to address complex water research questions.

4.3. Coursework

Students will have the flexibility to follow an individualized educational path that builds on depth in their chosen major, a foundation in negotiating water conflicts, and a working knowledge in water science and systems (for societal domain students) or in policy sciences and ecological economics (for natural domain and engineering students). During the fall of the students’ first year they are required to complete **Water Diplomacy I Synthesis of Science, Policy & Politics of Boundary Crossing Water Problems.** The Water Diplomacy program requires trainees to take either **WDII:** **Water Policy & Economics** or **WDIII:** **Water Science and Systems** (based on their academic preparation) during their first year at Tufts in the spring. Students audit the third Water Diplomacy course they have not taken for credit, and have the option of doing so in their second year, when they will have more freedom to contribute their experience and learning to the class. Students also have the option to work with the Water Diplomacy course instructors to lead 1 or 2 modules of the Water Diplomacy courses in their second year.

**Water Diplomacy I Synthesis of Science, Policy & Politics of Boundary Crossing Water Problems:** This course is a synthesis of science, policy and politics of water and builds on the concepts and methodologies covered in Water Diplomacy I and II. It was taught by Drs. Islam and Moomaw in spring 2013. It focuses on water conflicts, negotiations, and cooperation, and integrates scientific origins of water conflicts with emerging ideas from theory and practice of complexity and negotiation. It emphasizes both quantitative and qualitative approaches to analyzing water conflicts through negotiations using recent advances in collective actions in managing common pool resources with a mutual gains approach within an analytical framework of Water Diplomacy.

**Water Diplomacy II Water Policy & Economics:** This course is required of all natural science and engineering students and taught by Drs. Roach and Portney in fall 2012. Topics include introduction to the legal and regulatory foundations of environmental and natural resource policy at the national and international levels, with specific attention to water and issues of externalities, property rights, public goods, public choice, and trust. This course also covers identification of alternative options, economic assessment of those options, role of vested interests that might oppose particular rational strategies, and how to develop policies that take political realities into account.

**Water Diplomacy III Water Science and Systems:** This course is required of all social science students and was taught by Drs. Islam, Levine and Reed in fall 2012. Water Diplomacy I is a four-module, team-taught course with a focus on water in the natural domain (water quantity, quality, ecosystems). Faculty with expertise in module content and commitment to interdisciplinary pedagogical approaches ensure that course content is rigorous, but not necessarily filled with disciplinary jargon. It brings in real world examples and perspectives to offer the content in a contextually relevant format. It emphasizes concepts and methodologies as well as tools and implementation. Topics focus on (a) hydrologic cycle and processes at various scales; (b) modeling of hydrologic and climatic processes; (c) wetland ecology, ecosystem values, and services; and (d) water systems planning and decision making under uncertainty.
4.3.1. Development of an AquaPedia Case

AquaPedia is a free, community-created, case study of water issues to:

- Organize and search information presented on case studies for complex water problems that cross boundaries (e.g. spatial, temporal, cultural, etc.)
- Incorporate and organize opposing views from existing case studies
- Provide a method for distilling knowledge that is useful to water managers, offer knowledge that is useful for water scholars in a simplified format
- Develop case studies that will function as living documents and can be updated as our understanding of the case and related events develop.

AquaPedia is intended to be an interactive learning platform that is constantly evolving and growing, both in content and in management. It is meant to provide reliable, relevant, and readily available water information and wisdom from users and producers of explicit and tacit water knowledge. The potentially transformative and collaborative power of AquaPedia will, we hope, make water a flexible and expandable resource.

Water Diplomacy students are asked to develop and maintain an AquaPedia Case of their choice throughout their participation in the Water Diplomacy program. The case offers students an opportunity to communicate complex information from various sources in an interactive online format. IGERT Water Diplomacy students are actively involved in shaping the development of AquaPedia. More information about AquaPedia is available here.

4.4. Water Diplomacy Research Proposal Defense

In addition to the Ph.D. Qualifying Exam (QE) requirement for the home department, a research proposal and defense component is required for all Water Diplomacy Ph.D. students. The goal of this proposal is to assess the ability of a student to formulate and articulate an interdisciplinary research question. Students are encouraged to build off of their Water Diplomacy Research Proposal to develop grant and fellowship proposals with their advisors, as well as explore potential research areas for their dissertation topic. It is not expected that the student’s Water Diplomacy Research Proposal be their dissertation proposal. The student will select a research question to address in the research proposal. The proposal is limited to five pages and should demonstrate significant understanding of a water problem including: (a) what is known and not known about the problem; (b) why it is an important problem; (c) why addressing this water problem will require an interdisciplinary approach; and (d) how solving the problem will serve science and society. Upon completion of the Water Diplomacy Research Proposal, students are expected to have identified both their primary and secondary thesis advisors. The proposal will be evaluated by the Water Diplomacy Faculty Committee and the student’s advisors. Please see the appendices for detailed instructions on the Research Proposal Defense.

4.5. Research Opportunities and Fieldwork

Real-world field work experience is an integral part of the IGERT Water Diplomacy initiative. Each student will choose their field research work site from a range of domestic and international water issues based on their interests and expertise. Under guidance from the IGERT Program Committee and discussion with partner organizations, each student will select an emerging area of water research for their internship. This internship and related research experience are expected to: (a) provide freedom to choose a problem that connects theory and practice of a water issue; and (b) allow a maturation phase before finalizing the Ph.D. dissertation. Students can
spend a semester (or longer, as appropriate) at a field site working with partners, develop a jointly defined water issue that highlights Water Diplomacy components from an interdisciplinary perspective, and build on the development of their individual research.

4.6. **Interdisciplinary Water Diplomacy Component in Ph.D. Dissertation/Water Diplomacy Committee Oversight**

At least one chapter from the student’s dissertation needs to include a paper directly related to Water Diplomacy. Students are expected to work closely with their primary and secondary advisors and take advantage of the Water Diplomacy Colloquium to develop their interdisciplinary research.

5. **Student Responsibilities**

5.1. **Participation in Water Diplomacy Retreat and Regular Activities**

Throughout the year, the Water Diplomacy program hosts and coordinates seminars and guest speakers. Students are expected to participate in the annual fall retreat and other program activities throughout the year, including preparations for the 2016 Water Diplomacy Symposium.

5.2. **Interdisciplinary Office Space in the Tufts Institute of the Environment**

Students are provided with a computer and workspace in an interdisciplinary environment of multiple Water Diplomacy cohorts. It is expected that this will be the student’s primary work space on campus, and will encourage a cross-disciplinary educational setting.

5.3. **Online Presence**

Each participating student should submit and keep current a biographical statement and photo for the Water Diplomacy and IGERT.org websites. Please see examples of current students. These bios can be useful for potential employers and collaborators, in addition to prospective students and donors. Along with maintenance of their AquaPedia case, trainees are expected to contribute at least one article per semester to the student blog and take advantage of other online platforms to develop their presence.

5.4. **Evaluation Activities**

Trainees are expected to conduct semiannual self-assessments using the T-Competency model and outcome journal exercises. In addition, students are asked to contribute to the ongoing program evaluation and annual reporting process, including keeping an up-to-date list of publications and conference presentations. Please contact the Program Coordinator for details.

6. **Related Activities and Opportunities**


Tufts University established the Water: Systems, Science, and Society (WSSS) graduate research and education program in 2004 to provide the interdisciplinary perspectives and tools to manage water-related problems around the world.

Students of the WSSS program must enroll in and fulfill the requirements of a graduate degree within one of the participating schools to ensure a strong knowledge base in their chosen field. The WSSS requirements are completed in addition to the student’s degree requirements, but through the use of electives and co-listed courses, the WSSS program usually will not add significant time to a graduate degree program. Upon completion of these activities, students receive a Certificate in Water: Systems, Science, and Society along with their graduate degree. Please visit the WSSS website to learn about events, fellowship opportunities, and other Tufts water announcements.
6.2. **Mentoring & Teaching Experience: Tufts Graduate Teaching Program (GIFT)**

Future professors must not only be trained as productive researchers, but also as effective classroom teachers. For this reason, the Graduate School of Arts and Sciences offers doctoral students the opportunity to participate in the Graduate Institute for Teaching. This program is unique because it focuses graduate students on an often overlooked but integral component of their professional lives—teaching and evaluating undergraduates.

Please visit the GIFT program online to apply as a graduate student teaching fellow.

6.3. **Presenting at Conferences:**

Students are strongly encouraged to apply to present posters and papers at conferences as early as possible. In addition, the faculty committee will select highly competitive posters to submit to IGERT.org’s poster competition.

6.4. **IGERT.org**

The IGERT Resource Center (IGERT.org) provides comprehensive information about IGERT and each of its actively funded projects. The Resource Center provides an e-community for current IGERT students and faculty to share resources, research, presentations, challenges, and best practices.

7. **Program Organization**

The administrative structure of the IGERT program is designed to facilitate implementation of the program elements, develop Ph.D. requirements, encourage mutually productive departmental and interdisciplinary affiliations, and establish a fair allocation of resources. The IGERT Program Committee (IPC), composed of the five principal investigators (see below) will manage the program. The committee is responsible for all decisions affecting the structure or implementation of the program, including acceptance of students into the IGERT program, approval of common doctoral qualifying procedures, approval of a student’s individual study plan and Ph.D. Committee, and selection of interdisciplinary internship topics for collaborative research. Dr. Islam will serve as the Program Director. Specific components of the IGERT program will be overseen by subcommittees, and outside advice will be provided by the IGERT External Advisory Board. Subcommittees will oversee and manage specific components of the IGERT program, and their membership will include IGERT participating faculty.

7.1. **Executive Committee**

- **Shafiqul Islam**  
  Professor, School of Engineering and Fletcher School of Law and Diplomacy  
  Director of the Water Diplomacy Program

- **Tim Griffin**  
  Associate Professor, Friedman School of Nutrition Science and Policy  
  Director of the Agriculture Food & Environment Program

- **Bill Moomaw**  
  Professor Emeritus, Fletcher School of Law and Diplomacy

- **Kent Portney**  
  Professor, Political Science, School of Arts & Sciences

- **Michael Reed**  
  Professor, School of Arts & Sciences Biology Department

- **Alva Couch**  
  Professor, School of Engineering Computer Science Department

7.2. **Program Coordinator**

The Water Diplomacy Program Coordinator is Theresa Silver (617-627-5522).
8. **Participants**

We are open to and continue to seek the active engagement of other Tufts faculty members and partners with interest and expertise in interdisciplinary water scholarship.

8.1. **Participating Schools**

- Graduate School of Arts & Sciences
- School of Engineering
- The Fletcher School of Law and Diplomacy
- Friedman School of Nutrition Science and Policy
- Interdisciplinary Doctoral (IDOC) Program

9. **Resources and Websites**

9.1. **Water Diplomacy**

- Program Website (http://ase.tufts.edu/igert/waterDiplomacy/Default.htm)
- Student Experience Blog (http://www.students-waterdiplomacy.org)
- AquaPedia (http://aquapedia.waterdiplomacy.org)
- Trunk (https://trunk.tufts.edu)

9.2. **Graduate Handbooks**

- Graduate School of Arts & Sciences
- School of Engineering
- Fletcher School of Law and Diplomacy
- Friedman School of Nutrition Science and Policy

10. **Other Guidance and Questions**

10.1. **Acknowledgement**

Please acknowledge all IGERT related publications and presentations involving research conducted while you were a graduate student (during and after your IGERT support years) clearly by stating: “This research was supported by NSF 0966093”.

10.2. **Questions**

Any student, faculty member, researcher, or staff who cannot find the answer to their question in this handbook should contact Theresa Silver (Theresa.Silver@tufts.edu) IGERT Program Coordinator, for guidance.
11. Appendices

11.1 Program Timeline

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**Fall**
- Retreat
- Water Diplomacy class
- IGERT colloquium
- Aquapedia Case & Exploratory Research
- Home Department Courses
- Research Development

**Spring**
- Water Diplomacy class
- IGERT colloquium
- Aquapedia Case & Exploratory Research
- Home Department Courses
- Research Development

**Summer**
- Field Research Experience
- IGERT Qualifying Exam
- Field Research Experience
- Ph.D. Research
- Conference and publication
- Peer-led teaching
- IGERT colloquium
- Ph.D. Research
- Conference and publication
- Peer-led teaching
- IGERT colloquium
- Ph.D. Research
- Conference and publication
- Peer-led teaching
- IGERT colloquium
- Ph.D. Research
- Thesis preparation
- Conference and publication
- Ph.D. research
Water Diplomacy Individualized Ph.D. Program and Advisors

Directions for student: Please complete this form by the end of your first semester (12/31) of entering the Water Diplomacy Program. Identify your main thesis advisor and suggest names of potential secondary advisors and committee members with your advisor’s approval. Each trainee will be supported for a 24-month period from NSF funds. It is the responsibility of the IGERT trainee and his/her advisor(s) to identify funding for beyond the two-year IGERT funding period. Out-year funding may be in the form of teaching assistantships, research assistantships, or fellowships.

The purpose of this form is to help initiate meaningful interdisciplinary student – advisors contact and its aims are to: (a) help you seriously start planning for what you need to do to prepare yourself for a Ph.D. dissertation topic; (b) design your own individualized curriculum consistent with your research goals, requirements of your Ph.D. granting department/program, and IGERT Water Diplomacy program requirements; (c) prepare for your Ph.D. Qualifying Examination; (d) plan for your internship; (e) enable you to initiate closer contact with your advisor/future dissertation committee members and to solicit their input; and (f) encourage faculty members to play a closer role in helping you prepare for dissertation research and finding financial support for you beyond two years of NSF support. Please use additional space as necessary.

Student:       Email:

Proposed Individualized Curriculum and Tentative Timeline for Completing Ph.D.  (Please list courses and semester you plan to enroll, overall duration, thesis requirements, etc.)

Proposed Individualized Committee (pending approval by IGERT Program Committee)

Natural Domain Advisor:    Societal Domain Advisor:

Other Proposed Committee Members:

STUDENT SIGNATURE       Date

PRIMARY ADVISOR SIGNATURE Date

Approval and Signature of the IGERT Program Committee
**Guidelines for IGERT Water Diplomacy Research Proposal Defense**

The Water Diplomacy Research Proposal Defense is a process that is designed to assess the preparation and ability of doctoral students in the IGERT Water Diplomacy Ph.D. program.

**Water Diplomacy Research Contribution**

This part of the Research Proposal and Defense is required for all IGERT Water Diplomacy Ph.D. students and will occur in 4 stages. The goal is to assess the ability of a student to formulate and articulate a research question.

**Stage 1 – Identify a Research Question**

The student will choose a specific water-related research topic or area in consultation with their natural and societal domain advisors. Within this research topic, again in consultation with your advisors, select a single research question to address. It makes the most sense if this topic is part of the student’s intended Ph.D. research. Submit this research question for approval by the IGERT Committee within nine months of starting the IGERT Water Diplomacy Traineeship. The document that should be submitted to the Committee for approval can be as short as 3 or 4 well written sentences, but should be no more than 1 page (single spaced). It should include:

- A clear, definitive statement about what general problem is being addressed by the research and why it is a problem. It must be a water-related problem.
- A statement about the specific research question or hypothesis to be addressed. It needs to be a specific statement that is testable by gathering data or by generating a model, or equivalent.
- A statement of what, specifically, makes it an interdisciplinary problem. Explain why the problem you are addressing requires an interdisciplinary approach – don’t just assert that it does, or say that ‘by definition it is’ – actually explain it.

Depending on feedback from the IGERT Committee, you might be asked to make revisions on Stage 1 and resubmit it for further review. Once approved, the student will move to Stage 2.

**Stage 2 – Proposal Development**

Once your research question is approved, develop your proposal. This should be ready for peer review (Stage 3) by 1 August. The exception is if the student will be in the field in their first summer, in which case the proposal should be ready for peer review at least 1 month before leaving for the field.

The proposal should be 5 pages, single-spaced, NOT including references, and should demonstrate a significant understanding of the current state of research on the topic and the importance of crossing disciplinary fields. The proposal should include the following sections, in order:

a. Introduction and objectives that include the context, motivations, and problem statement.

In this section, please answer these six questions in sequence: What is the water-related problem? What do we know about this problem? What do we not know about this problem? Why do we need to know about this water problem? Why addressing this problem requires an
interdisciplinary approach? In what ways this problem is related to Water Diplomacy? This should be in the form of a narrative that flows – not as a list of questions and answers. This entire section should be well supported by citations, demonstrating your knowledge in this field.

b. Research Methods and Approach
In this section tell us exactly what kind of data and/or analysis you will use to answer the research question or hypothesis. You must articulate how the data and/or analysis will answer the question/ hypothesis. You should also discuss under what scenarios you would reject your hypothesis and/or reformulate your question.

You do NOT need to go into detail about exactly HOW you will gather the data. HOWEVER, it is important to make it clear – via citations and brief explanations – whether the methods already exist that would allow you to gather the data, and briefly describe them, or whether you need to create new methods, and what form they would take. Data collection and modeling development need to be feasible during the time frame of a Ph.D.

c. Preliminary Results/Findings/Analysis
It is not necessary for you to have this section in the Research Proposal unless you actually have preliminary results. See comments below about figures and tables.

d. Intellectual Merit and Broader Impact
Please follow NSF guidelines: http://www.nsfgrfp.org/how_to_apply/review_criteria

e. References
Please cite sufficient number of references to demonstrate a relatively deep and nuanced understanding of both the disciplinary and the interdisciplinary aspects of the water problem you are addressing

Stage 3 – Peer Review

An integral part of science is peer review – both having your work peer reviewed, and doing peer review. Therefore, once you have finished an advanced draft of your proposal, it will undergo peer review. ‘Advanced’ means that you have written your complete proposal, let it sit for several days, and reread it critically and revised it – and repeated as necessary. Each student will review the research proposals of 2 other students and provide written feedback specific to the criteria listed in Stage 2. Reviews should be returned within 7 days.

After you receive your reviews, revise your proposal. You do not need to make all suggested revisions – indeed, different reviewers might suggest conflicting things, and sometimes you may not agree with reviewers, assessments. You should, however, be able to explain why you do not agree with a particular reviewer’s assessment.

Reviewers – You can be as detailed and critical as you like, but be constructive and courteous.
Once the Research Proposal is revised, turn it in to the IGERT Program Committee for review by August 31.

Stage 4 – Oral proposal defense

Oral Proposal defense will occur in early September. You will spend about an hour answering questions about your Research Proposal before the IGERT Program Committee, your advisors, and any additional members of your Ph.D. advisory committee that you might have.

The Role of the Faculty Advisors and IGERT Program Committee

The proposal after Stage 1 is expected to represent the work of the student. The student is allowed to discuss the proposal with their advisor, but the work must be their own.

General Advice on Proposal writing:

1) Read the directions
2) Make sure flow and transitions in the proposal are clear
3) Make sure assertions are supported by cited references
4) Do not make general or vague statements when you can make specific statements
5) Proofread, including grammar and avoiding slang; use metric units
6) Write in active voice (unless your field of specialty does not allow it), and refer to yourself in the singular (e.g., ‘we’ are not proposing something)
7) If your work tests a hypothesis: A note about hypotheses because it can take practice to write hypotheses that are tractable:

   What is a hypothesis? (Or, if you want to be pedantic, ‘a hypothesis’)
   a. A tentative explanation for an observation, phenomenon, or scientific problem that can be tested by further investigation.
   b. Something proposed to be true for the purpose of argument or investigation.
8) Provide sufficient background information, with comprehensive citations supporting your statements and assertions. Show that you are immersed in the literature of the research question.
9) Figures or tables can enhance a proposal, or they can waste limited space. If you do include a figure or table, make sure it adds to the paper in a substantive way – don’t use up your limited space on material that is nice but superfluous.
Guidelines for Field Research Topic/Institution Selection

The IGERT Water Diplomacy trainee will choose a field research experience in consultation with their natural and societal domain advisors. The experience may be carried out with one of our national or international partner organizations or at a site of the student’s choosing. Funds for travel to the site will only be released to the student after the IGERT Program Committee approves the proposal with the following components.

Each student will prepare a concisely written proposal that outlines the problem to be investigated, demonstrates the novelty of the proposed project, poses specific research questions to be answered, and describes the methodology that will be used to address the research question. The following format should be used to prepare the internship proposal:

- The proposal must include information about the potential site including the name of a mentor, expertise/strengths of the institution related to Water Diplomacy, duration of the visit, and possible support from the institution (e.g., office space, travel support, etc.).

- The proposal must demonstrate how travel to the chosen site will help to meet the objectives of the student’s Ph.D. plans as well as future career plans. The student will submit the proposal to the IGERT Program Committee at least a month before they plan to begin their internship.

Reimbursement Procedures

Procedure to Obtain Travel Funds: Each trainee must keep track of their stipends, travel funds, internship allowances, and publication costs in a Google Doc that is shared with the Program Coordinator. Before travel, work with your advisor(s) to prepare an outline of your travel plans. The student can pay the costs out of pocket and be reimbursed. To be reimbursed, they must present original receipts or credit card statement listing all costs to the Program Coordinator within 30 days AFTER the purchase or event. For meals, a detailed receipt is required that shows the costs of all ordered items. For airfare to be reimbursed, original boarding passes must be returned for all flights. Make sure to check that your airline is approved by Tufts and NSF using this chart. Tufts will not reimburse the cost of alcohol.