**NSF Research Traineeship Guidelines for Students for Interdisciplinary Chapter and Transdisciplinary reports**

September 17, 2019

**Outcome of collaborative work**

Each student engaged in the OSU-NRT program will work on a NRT Team Project. The NRT Team Project is a collaborative effort to address a topic / question that all members of the team collectively define and determine. The NRT Team Project must contain elements of the NRT Core Concepts: data analytics, risk and/or uncertainty quantification and communication, and coupled natural-human marine system science.

There are **two products** resulting from the students’ collaborative work on the NRT Team Project (Table 1).

**Interdisciplinary chapter**

Each student will complete an *interdisciplinary chapter* for their MS thesis or PhD dissertation, based on their NRT Team Project. The distinguishing element of the interdisciplinary chapter is that of being **based on a topic or research question that has been collectively defined by your group before addressing it**. This topic or questions must include elements of data (which are big), risk and/or uncertainty quantification, and coupled natural-human marine system science. **However, each individual interdisciplinary chapter does not need to contain all three of these elements**. It is up to the student to decide which of these three elements is covered in the interdisciplinary chapter.

The formatting of the interdisciplinary chapter should reflect that of a typical thesis chapter: introduction / background, method, results and discussion, and conclusion. NRT Team members ***may share similar (even identical) introduction / background, and conclusions* in their interdisciplinary chapters.** It will be **the *methods, results and discussion -- based on their disciplinary expertise and research challenges* – that will be unique.** Note that these chapters may refer readers to (aka cite) the other Team member’s chapters. If the chapter is published, each student should consider including other student team members and/or advisors as co-authors, depending on their level of engagement in developing the question and carrying out the study to a peer-reviewed level of quality (Table 1). We ask that you clearly identify the ID chapter within the thesis, with a sentence: ‘*This chapter was competed in partial fulfillment of the OSU-NRT program in Risk and Uncertainty quantification in marine science and policy*.’

Examples of completed ID chapter from previous NRT students are available through the OSU Scholar Archives portal. Please inquire with us if you want to see past ID chapters.

**Transdisciplinary report**

The students in each NRT Team must also **collaboratively complete a *transdisciplinary report****.* This might be a figurative mixture of the interdisciplinary chapters, and as such it should involve no or minimal use of additional data. However, **in the *transdisciplinary report,* the disciplinary expertise of each student is no longer “traceable” as it’s written in “one voice.”** In other words, all contributions are merged to address the NRT Team Project’s topic / research question and the collaborative effort. While publication might be a desired outcome, publication is NOT a requirement. *However, we recommend depositing the report in a publically accessible repository, such as OSU Scholars Archives*.

The transdisciplinary report *does not exceed* ***40 pages*** *including:*

1. Two-page **executive summary**, containing: a) research questions and relevance, b) methods, c) main results, and d) significance of study to science and societies

2. **Introduction** containing: a) statement of problem, research questions, and intended audience for the report, b) academic and societal relevance, c) need for TD approach, and d) objectives and anticipated results,

3. **Data and Methods**

4.**Results,** with a unified voice.

5. **Discussion and Conclusions**, containing: a) brief summary of main nuggets (1-pragraph) and how they relate back to the research questions,  b) compare/contrasts results with existing knowledge in the field, c) significance of results for academic research and societies, d) caveats and future work

6. **Team reflections**: Clear description of each student’s contribution to the report and team reflection of the TD process (e.g., frequency of meetings, delegation vs team work, major takeaways)

7. **Reference List**

All of this (1-7) **to not exceed 40 pages**. If necessary, students can add an Appendix which goes beyond the 40 pages.

**When and how to write the interdisciplinary chapters and transdisciplinary reports**

The first step is that of collectively identifying the NRT Team Project: the **topic or research question that will be collectively addressed by your Team**. Defining a question before addressing it sounds the obvious thing to do, but when it comes to implementation of inter- or transdisciplinary research, this seemingly logical course of action is not always followed. We request that you will do that by the end of Fall term in your first NRT year.

Once this has been accomplished, Team members should start working on the methods and produce preliminary results. We request that you will do that by the end of the winter term. Lastly, the Team will continue producing results and start writing the discussion section. We request that you provide a two-page Executive Summary of your TD report by the end of the Spring term.

**Table 1: Guidelines for Interdisciplinary chapters and transdisciplinary reports**

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|  | **Interdisciplinary chapter** | **Transdisciplinary report** |
| Who are authors? | Individual student | All students in an NRT team |
| Where does it appear? | In the thesis | As a separate document from thesis |
| How related to each other? | Information in the chapter is an in-depth treatment of each student's contribution to the transdisciplinary report | Transdisciplinary report is based on the research conducted by the team. May have similar introduction of the ID chapters, but the methods, results and discussions are new, and directly address ALL aspects of the NRT Team Project goals |
| What is the topic? | * One aspect of the NRT Team Project that best relates to the student’s individual research topic * May involve new data collection if it was part of the student’s individual research topic, but new data is not required specifically around the Team topic * Contains *at least* one of the NRT Core Concepts: big data, risk and/or uncertainty quantification, and coupled natural-human marine system science. | * Topic of the NRT Team's Project * Minimal or no acquisition of new data in the form of interviews, experiments, or field collections * Contains all three of the NRT Core Concepts: big data, risk and/or uncertainty quantification, and coupled natural-human marine system science. |
| What is the format? | * A typical thesis chapter: introduction / background, method, results and discussion, and conclusion * NRT Team members may share similar (even identical) introduction / background, and conclusions * Must be clearly identified within the student thesis with a sentence: ‘*This chapter was competed in partial fulfillment of the OSU-NRT program in Risk and Uncertainty quantification in marine science and policy*.’ | Includes in **no more than 40 pages**:   1. Executive Summary 2. Intro 3. Data & Methods 4. Results 5. Discussion and Conclusions 6. Team reflections 7. Literature Cited |
| When is it written? | * By the end of Fall term of NRT year: define NRT Team Project topic / question * By the end of Winter term of NRT year: complete Intro * By the end of spring and summer of NRT year: complete the main text (introduction, methods, results, discussion) * Complete chapter by the time the thesis is delivered to graduate school | * By the end of Fall term define research question and intro * By the end of Winter term write methods and produce preliminary results * By the end of the Spring term write two-page Executive Summary * By early summer receive and address comments from NRT curriculum committee * By the end of Summer term complete report |
| Who reads it and provide comments | * Student’s major professor and thesis committee | * NRT Cluster for that Team project (continuously) * NRT curriculum committee (after delivery), see assessment rubric |
| What are the publication goals? | * Student and advisor may try to publish * Student is first author * Students and faculty in the cluster (including minor professor) may need to be included depending on their involvement * Acknowledge NSF-NRT support | * Student team may try to publish * Order of authorship is agreed upon based on contributions to the report * Faculty in the cluster may need to be included depending on their involvement * Acknowledge NSF-NRT support * Need to address reviewers feedback prior to sharing and publishing report |