# Teaching Notes & Implementation Plan

**Case study or module title:** Globally endangered sea turtles of the Palmyra Atoll National Wildlife Refuge: A Focus on Scientific Analysis (adapted from the original publication by Eugenia Naro-Maciel, Katherine Holmes, Peter J. Ersts, Katherine McFadden, Nora Bynum and Eleanor Sterling)

**Course/Course format: "**Research Methods in Environmental Studies", sophomore/junior major/minor only, 35 students, 3 hours lecture time plus 2 hours lab time each week

**Abstract:** Based on the sea turtle case, students will (1) work on a worksheet by analyzing existing survey data, (2) conduct a literature review of two relevant research, and (3) draft a proposal for a research project on sea turtle conservation at the Palmyra Atoll.

**Quantitative learning objective:**

- The ability to search and identify peer-reviewed research papers related to the sea turtle conservation topic.
- The ability to understand and comprehend scientific data and research methods used in published studies.
- The ability to compare, contrast, and evaluate the quality of research design and data analysis of published studies.
- The ability to write a research proposal on a specific topic related to the sea turtle conservation project.

**Socio-environmental learning objective:**

- The ability to situate the sea turtle conservation project within the broader socio-environmental context.
- The ability to formulate management and conservation objectives.

**Expected dates of implementation**: Winter Quarter, 2018

1. **What learning objectives (content) are you planning to address in your course using the selected materials?**
   The entire teaching unit was implemented with the goal to address all the learning objectives outline above.

2. **Briefly describe the pedagogical techniques you plan to use to facilitate the case/module and reinforce the learning objectives you identified above.**
   Three parts -
   **(1) Introduction and background worksheet**: Use the worksheet in the Exercise section of the teaching packet. (2-hour class period for background introduction and group time working on the worksheet.)
   **(2) Literature review:** Focus on one aspect of the sea turtle conservation project and compare and evaluate two existing published studies in terms of research design, results, and data presentation. (2-hour class period for the presentation. Additional time for group work and research.)
   **(3) Research proposal:** Write a research project proposal building upon existing knowledge of the topic. (Assignment submission, no class time required.)

3. **Are you planning on making any adaptations to the case/module? If yes, please describe them here. If no, please indicate why.**
   The entire teaching unit was implemented. Before the proposal section (Part 3), a literature review section (Part 2) was added.

4. **Do you think you will need to incorporate any supplemental materials with this module? If yes, please either describe what you are planning or include any materials you have already found.**
   The original case contains both the teaching notes and answer keys to the worksheet. Additional background information is included in the PowerPoint presentation slides.

   Helpful background videos:
   - Palmyra Atoll Research Consortium: https://www.youtube.com/watch?v=VG3LJZ7I5FY
   - TNC Dateline NBC: On Assignment at Palmyra Atoll: https://www.nature.org/photos-and-video/video/dateline-nbc-on-assignment-at-palmyra-atoll
   - Sea Turtle Research: https://www.youtube.com/watch?v=zRrv1Ujps1c

5. **What assessments are you planning on using to measure student progress? If possible, describe, attach, or provide a link here.**

   **(1) Introduction and background worksheet**: Students work in small groups to fill out the worksheet that came with the teaching module

   **(2) Literature review** - Comparing two articles (group oral presentation)
   - **Format:**
     - 10 minutes using PowerPoint plus 5 minutes for Q&A
     - Everyone should have a speaking role
   - **Components:**
     - Introduction: a brief overview of your chosen aspect of the sea turtle conservation project
     - Strategies for identifying relevant and high-quality articles
     - Summary of the two articles
     - Comparison and evaluation: in terms of methods, results, and data presentation
     - Brief overview of proposal ideas
   - **Evaluation Rubric:**

| ***Project Oral Presentation*** | ***40 Points*** |
|---|---|
| ***Group Grade*** | ***Points*** |
| **Content** | |
| Introduction & Article identification strategies | 5 |
| Summary of the two articles | 5 |
| Comparison & Evaluation: methods, results, and data presentation | 10 |
| Proposal ideas | 5 |
| **Organization & Group Participation** | 5 |
| **Slides: Layout & Visuals** | 5 |
| ***Individual Grade*** | |
| **Delivery** | 5 |

### (3) Research proposal:

- **Format:**
  - Model after the Introduction and Methods sections of a scientific paper
  - 1.5 spacing, 12-point font, approximately 3-5 pages in length
  - Please use “we” and write in the future tense
  - Must be written professionally
  - If there are figures or tables, please provide a caption/heading and cross-reference those in the texts (e.g. Figure 1)
  - Use APA format for citations and references
- **Components:**
  - Introduction & background (including reviewing findings from the two articles analyzed in the oral presentation)
  - Research questions (& hypothesis – optional)
  - Study design and data collection plan:
    - Must include sampling plan & justification (How often? Where? How many samples? Diagrams, tables, or maps would be helpful)
    - Data collection plan (How do you plan to collect data in the field? What specific kinds of data will you collect? Will you use remote-sensing data or data from existing data bases? If so, how? Include specific data sources if appropriate.)
    - Time line and overall feasibility of the project
  - Expected results and significance
- **Evaluation Rubric:**

| ***Research Project Proposal*** | ***40 Points*** |
|---|---|
| ***Group Grade*** | ***Points*** |
| **Content** | |
| Introduction & background | 7 |
| Research questions | 3 |
| Study design & data collection plan | 20 |
| Expected results & Significance | 5 |
| **Writing Quality and Professionalism** | 5 |

6. **Please provide any additional notes here (i.e. a to-do list of items that you need to accomplish before your implementation)**

The teaching modules has been fully implemented and I was impressed by the quality of student work. I think this case worked perfectly well with my Research Methods course. Although this case was not something that we were familiar with, the background worksheet provided enough context. From this foundation, students moved on to identify high-quality and relevant scientific articles, critique, compare, and evaluate the articles, and then come up with their own proposal. Each part of the module connected well to the previous part and students gained experience on literature review, research design, and proposal writing.