

# Water Resources in a Warming World – Instructor Notes

Thank you for your interest in using some or all of this curriculum in your programs. To begin this project in a good way, please take a few minutes to listen to the words of U.S. Poet Laureate Joy Harjo in her reflection called “A Sacred Connection to the Sun”. <https://thisibelieve.org/essay/31008/>

This curriculum is a **survey course**. It was designed for sophomore-level community college students. However, some of the material is appropriate for general audiences and may be of use in Extension Programs. Students who have completed a freshman-level writing course, College Algebra, and at least one laboratory science class will be more successful at completing the course assignments.

Exciting work is being done in Tribal Communities and at Tribal Colleges & Universities to tackle water resource problems and address climate resilience. Each module highlights a case study.

Modules are stackable. Taken together, the modules provide enough content for a 3-credit college science course. An **optional laboratory exercise** has been provided for each module topic which can be added to expand this into a 4-credit laboratory science course. The only lab exercises that require any equipment beyond a computer workstation are those for Module 1. For other labs students will rely heavily on samples or data collected by government agencies to complete the lab assignments.

The Syllabus document provides information about course content. Instructors will need to add their own/institution’s policies about instructor contact & communication, Netiquette, grading, formatting requirements for assignment submittals, late work, academic integrity, accommodations, attendance, etc. to the Syllabus. **Embedded in some modules in red ink are instructions to Instructors; these should be removed when preparing the student copy.**

The course can be delivered in a traditional classroom & lab setting, via a hybrid instructional model, or fully on-line (synchronous or asynchronous). Once the delivery method has been selected, minor edits to the syllabus will be required to provide guidance to students about how/where to complete assignments (e.g. in-class discussion vs on-line discussion board; class presentation vs posts to class website, etc.) It is assumed that students will complete the assigned readings prior to the class session(s) for each module.

**There is no textbook** for the course. Required resources (readings, videos, slides, datasets, etc.) are all available through the world wide web. Students will need a computer with screen, keyboard, and camera (if participating via video link), as well as reliable access to the internet. They will also need the following software: internet browser, *Adobe Reader*, word processing package capable of opening .docx files and saving files in pdf format, *MS Excel*, and video viewer/media player.

In locations where internet service is poor or unreliable, instructors may wish to download the reading assignments and save them as pdf files. (These can then be emailed to students without using too much data). Note that many of the videos have transcripts available, so those too could be downloaded and provided to students. There are some lessons which require a media player to view model results, watch

video lectures, etc. If internet service is limited, instructors should advise students in advance to make plans to obtain good access for certain dates.

Each module has several **optional** “Assessment Tools”. There won’t be time for all of these to be assigned. Instructors should select the tools which best meet the needs of their students and include those as the required resources.

Students should expect to spend, on average, 2-4 hours per week on assigned readings and 2-4 hours per week on assignments (e.g. approximately 2-3 hours of independent work for each hour of class time). Students should be able to complete the lab assignments within 2-3 hours once they become adept at preparing an IMRAD style lab report.

Many of the exercises require the students to **use data from government datasets** and instruct the students to use data for their region/community/home. This is intentional; the students access and use data for sites that they know. Course designers are aware that the target audience is distributed across areas with water surplus and others with water scarcity, rural and urban settings, a wide variety of changing conditions related to the Climate Crisis, as well as communities with and without significant water pollution challenges. Instructors may choose to narrow the data search in some assignments for their students and assign them to use data from a particular location/well/HUC code/sub-watershed/stream gauge/weather station.

**Supplemental Resources** have been provided for each module. In general, these resources were selected as another way to review key concepts, although some of them introduce additional issues or case studies that the instructor may want to add to the module. Instructors should substitute and/or supplement these into the modules **as time and preferences allow**.

Options of different Assessment Methods are provided for each module. Instructors will need to decide which ones to use, how many points to assign to each, and what factors to include in their grading rubric. **Traditional “discussion questions”** are provided for each module along with numerous **assessment alternatives**.

This curriculum introduces many topics which individually comprise entire courses for upper level undergraduates. Some modules can be completed in a single 90-minute class period. Others will require 2 or 3 class periods to complete. For planning purposes, the following schedule might be suitable (total of 20, 90-minute class meetings).

- Module 1: 1 class period
- Module 2: 2 class periods
- Module 3: 2 class periods
- Module 4: 1 class period
- Module 5: 3 class periods
- Module 6: 3 class periods
- Module 7: 1 class period
- Module 8: 1 class period
- Module 9: 3 class periods
- Module 10: 3 class periods

It is recommended that each class period include time for students to review/present key findings from their most recent assessments/assignments, ask questions about the assigned readings, and review the **key vocabulary** terms for the module topic. Instructors may wish to highlight key graphs/graphics from the assigned readings to review in class. In addition, instructors may wish to use class time to introduce some of the “**Supplemental Content**”.