



University of Idaho
Extension



IDAHO₂O Master Water Steward Hybrid Workshop

Course Details

- Credits:* 1 Professional Development Credit (graded, “Pass/No-pass”)
- Cost:* Online course is provided for free. \$40 Practicum Fee; Optional \$60 UI PD Credit fee
- Instructor:* Jim Ekins, Ph.D., University of Idaho Extension Water Educator
- Office Hours:* No defined hours; generally business hours. Call ahead to schedule.
- Office Location:* University of Idaho Coeur d’Alene Center
- Phone:* 208-292-1287
- E-mail:* jekins@uidaho.edu
- Course web page:* www.uidaho.edu/cda/idah2o

This syllabus is specific to the hybrid IDAH2O Master Water Stewards certification workshop. The traditional classroom portion has been replaced with a free, self-paced online course of study. You can enroll and complete this via the Canvas online learning platform website: <https://canvas.instructure.com/enroll/MG63TJ>. Occasionally, IDAH2O and partnering organizations will teach synchronous online workshops, too (done in real-time where participants interact directly with the instructor and each other). This syllabus is also valid for this type of workshop.

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University Learning Objectives:

1. Learn and integrate: Through independent learning and collaborative study, attain, use and develop knowledge in the sciences and social sciences, with disciplinary specialization in water resources and the ability to integrate information across disciplines.
2. Think and create: Use multiple thinking strategies to examine real-world water related issues, explore creative avenues of expression, solve problems and make consequential decisions.
3. Communicate: Acquire, articulate, create and convey intended meaning of physical and social aspects of water that demonstrate understanding in a complex society.
4. Clarify purpose and perspective: Explore one's life purpose and meaning through transformational experiences that foster an understanding of self, relationships and diverse global perspective.
5. Practice citizenship: Apply principles of ethical leadership, collaborative engagement, socially responsible behavior, respect for diversity in an independent world, and a service-oriented commitment to advance and sustain local and global communities.

Specific Course Objectives:

1. Learn the history of IDAH2O and of citizen science programs;
2. Develop a library of science resources and list safety protocols for water quality monitoring;
3. Learn two sources of water pollution;
4. Learn five common water pollutants in Idaho and the northwest U.S.;
5. List and describe Idaho waterbody beneficial uses and impairments;
6. Develop a watershed monitoring plan;
7. Develop the skills to conduct water monitoring—assessing habitat, physical and chemical parameters of the water and biological components;
8. List four specific aquatic invasive species (AIS) threatening Idaho waterbodies and AIS science;
9. Identify classroom applications for the IDAH₂O Master Water Steward program.

Required material, required assignments, and grading policy:

The online workshop and reference materials are all available to all participants free of charge. K-12 teachers seeking the available Professional Development credit must pay a separate \$60 fee for the PD credit via the University of Idaho Marketplace:

https://marketplace.uidaho.edu/C20272_ustores/web/store_main.jsp?STOREID=9.

Scroll down to find the IDAH₂O Master Water Stewards Online selection from the College of Education, Health, and Human Sciences list of PD offerings.

Curriculum: IDAH₂O Master Water Steward training manual and other assigned readings

<i>Content:</i>	Pre-readings	3 hours
	Online workshop	3 hours
	In-Stream, Hands-On Practicum	3 hours
	Watershed/water quality issue report	3 hours
	Monitoring plan and program application	3 hours

Assessment: One Idaho Professional Development credit will be granted upon satisfactory completion of above tasks (details below).

Assignment Details

Due to the nature of this course, only 4 hours of in-person practicum instruction will be provided. Pre-readings, the online course of study, and two written reports are required to fulfill the state of Idaho requirement of 15 instructional hours. Details about the assignments and training workshop are described below. All assignments must be submitted to the IDAH₂O instructor for grading. A passing grade is earned with a score of at least 80%, based on the completeness, accuracy, creativity, and/or feasibility, as described with each individual assignment.

Pre-readings

To be completed prior to the IDAH₂O Online and Practicum portions.

- Read Chapters 1- 4 of the IDAH₂O Master Water Steward Training Manual, which can be downloaded as a PDF at: www.uidaho.edu/cda/idah2o/education
- The following five readings can be downloaded via the IDAH₂O website: <https://www.uidaho.edu/extension/idah2o/workshops/credit>
 - [Economic Causes of Non-Point Pollution in the Boise River](#) – UI Extension
 - [The Phosphorus Dilemma](#) – OSU Extension
 - [Understanding your Watershed: Dissolved Oxygen](#) – USU Extension
 - [Kids Count: Young Citizen Scientists Learn Environmental Activism](#) – Edutopia
 - [Citizen Science and Youth Audiences: Educational Outcomes of the Monarch Larva Monitoring Project](#) – Journal of Community Engagement
- **Be prepared at the time of the workshop for a reflection assignment** at beginning of the practicum: in small group discussion, (or in a simple email to the IDAH₂O coordinator, Jim Ekins, jekins@uidaho.edu), if you would prefer), describe why you feel integrating the IDAH₂O program into your classroom would be a valuable experience for your students. Reflect on your prior

knowledge about the subject of water quality, and/or stream ecology, before the workshop. Prior scientific knowledge is not necessary; you can consider personal experiences that helped foster your interest in water quality and hands-on investigation/volunteer monitoring.

Online Course of Study

Location: Canvas Online Learning System: <https://canvas.instructure.com/enroll/MG63TJ>

Length: 3 hours

Topics covered: The following list was developed from the complete script for the IDAH2O classroom and online workshop.

Module 1: Introduction to IDAH2O (20 minutes)

- Workshop logistics, day one and day two, homework assignments
- Daily objectives and participant expectations
- How this virtual training works
- Introductory poll via chat or poll feature: What grade level(s) do you work with?
- Introductory poll via chat or poll feature: where are you (state and school)?
- IDAH2O's History
- IDAH2O and Project WET
- Steward Responsibilities
- IDAH2O Code of Ethics
- Resources
- How it Works
- Safety
- Module 1 Content Quiz

Module 2: Key Water Quality Concepts in Idaho (30 minutes)

- Clean Water Act
- Beneficial Uses
- Pollution Sources
- Common Pollution Types in Idaho
 - Sediments*
 - Nutrients: Phosphorous*
 - Nutrients: Nitrates*
 - Nutrients: Lake Metabolism*
 - Thermal Pollution*
 - Lake Stratification*
 - Metals and Hypoxia in Lakes*
 - Oils, Gas, and Petroleum Products*

Module 2 Content Quiz

Module 3: Getting Started as an IDAH2O Citizen Scientist (30 minutes)

- Watersheds
- Watershed Mapping
- Quantify your site location
- Planning your monitoring
- Why are you monitoring?
- Background and Site Information
- Monitoring Methodologies
- Data Credibility

Module 3 Content Quiz

Module 4: Stream Habitat Assessment (40 minutes)

Transect and Reach

Stream Habitat Types

Streambed Substrate

Wolman Pebble Count

Embeddedness

Stream Banks

Canopy Cover

Riparian Zones

Stream Sinuosity

Microhabitats

Adjacent Land Uses

Human Use

Module 4 Content Quiz

Module 5: Physical and Chemical Stream Assessment (15 minutes)

Water Color, Odor, and Transparency

pH and Dissolved Oxygen

pH, or Acid v. Base

Dissolved Oxygen

Other Water Chemistry to Consider

Stream Width, Depth, and Velocity

Module 5 Content Quiz

Module 6: Stream Biology (20 minutes)

Aquatic Life as a Pollution Indicator

Aquatic Macroinvertebrates, Defined

Why Study Aquatic Macroinvertebrates?

How to Catch Aquatic Macroinvertebrates

Catch and Identify Aquatic Macroinvertebrates

Group 1 Taxa: Pollution Intolerant, Good Water Quality

Group 2 Taxa: Moderate Pollution Tolerance, Moderately-Polluted Water

Group 3 Taxa: Pollution Tolerant, Lower Quality Water

Stream Biology Assessment Metadata

Module 6 Content Quiz

Module 7: Standing Water Assessment, Aquatic Invasive Species, and Closing Thoughts (15 minutes)

Limnology, or Lake Science

Aquatic Invasive Species

Eurasian Watermilfoil

New Zealand Mudsnails

Quagga and Zebra Mussels

Idaho Aquatic Invasive Species Program Info

Crayfish Citizen Science

NOAA Phytoplankton Monitoring Network

Closing Thoughts

Module 7 Content Quiz

Workshop Evaluation (your critique helps us continually improve the workshop)

In-Stream, Hands-On Practicum

There is a separate, \$40 Practicum Fee for this opportunity. Pre-register and pre-pay for this opportunity via the University of Idaho Marketplace.

https://marketplace.uidaho.edu/C20272_ustores/web/store_main.jsp?STOREID=101. Scroll to find the IDAH2O Practicum selection. This fee supports instructor travel and equipment resupply needs. It also enables the program to assign one kit to each active volunteer in a given geographic area.

Formative Hands-on practice assignment. If an in-stream practicum is offered near you, you can participate in this portion of the IDAH2O workshop to gain specific skills related to stream monitoring. This assignment can replace the formative written Issue Report assignment.

Location: Outdoors at a representative stream site

Length: 3 hours

Topics covered: All IDAH2O monitoring protocols are practiced by participants while instructor observes for QA/QC

1. Selecting a monitoring site
2. Safety protocols when monitoring streams
3. Describing your monitoring site
4. Stream Habitat Assessment (conduct assessment)
5. Physical Assessment (conduct assessment)
6. Chemical Assessment (conduct assessment)
7. Biological Assessment (conduct assessment)

Watershed water quality issue report: Formative written assignment

- Class participants must choose a watershed, and a water quality issue within that watershed, that they will write a report on.
- Report should cover:
 - Watershed description (HUC, size, landuse, land cover, etc.)
 - Clearly identified water quality issue within the chosen watershed
 - Potential sources of water quality impairment
 - Management strategies to lessen the affects of the impairment
- Report should be about 2 pages in length, double-spaced, with 1" margins and no greater than 12 pt. font
- **Report will be due:**
 - Asynchronous Workshops: 2 weeks from completion date of practicum
 - Synchronous Workshops: between weekly sessions if organized as multiple session, or 2 weeks from completion of a single-session workshop
- Report will be graded on:
 - Completeness (40%)
 - Accuracy (40%)
 - Technicality (20%)

Monitoring plan and program application: Summative Written Assignment

- Class participants must develop a customized monitoring plan that would allow them to apply the IDAH₂O program in their classroom; this can certainly include a lesson plan

- Potential monitoring sites should be visited to ensure feasibility and access
- Report should cover monitoring plan components covered in class:
 - Why?
 - What?
 - Where?
 - When?
 - Who?
 - Monitoring methodology
- The program application portion will be a developed lesson plan, connecting to any Idaho Common Core, ISS, or NGSS standard for your grade level. Use whatever lesson plan template is best for you. Your lesson plan can be in the format you are most used to. Any lesson plan outline or template may be used as long as it contains:
 - Key Concepts and Learning Objectives
 - Standards
 - Logistics (Materials, setup time, classroom time, etc.)
 - Outline of the guided discussion, plus questions to ask of students
 - Description of the activities the students will do]
 - Outline of assessment strategy or tool
- Report should be between 2 – 4 pages in length;
- **Report will be due:**
 - Asynchronous Workshops: 2 weeks from completion date of practicum
 - Synchronous Workshops: between weekly sessions if organized as multiple session, or 2 weeks from completion of a single-session workshop
- Report will be graded on:
 - Completeness (40%)
 - Accuracy (40%)
 - Feasibility (20%)

Post-classroom/online portion video resources

The content for the online portion of the workshop can be found in video format, with closed captioning, via YouTube. After participating in the workshop, please feel free to review any portions of any modules that you feel less confident in the content or application. You may provide these links to your students as an educational opportunity. You can figure out ways to practice some of the techniques in the classroom if you have a water source (like a sink).

IDAH2O Prezi Slide Sets:

Informational Slides:

<https://prezi.com/view/MZyga3alQdbiKSPIkee1/>

Module 1: Introduction to IDAH2O Master Water Stewards

<https://prezi.com/view/ojDzjhgCbTb2exwoFfNF/>

Module 2: Key Water Quality Concepts in Idaho

<https://prezi.com/view/qTx4K4BXTDIV5d66BrQp/>

Module 3: Getting Started as an IDAH2O Master Water Steward

<https://prezi.com/view/WTwlc3HuZ2V1slrsWqFI/>

Module 4: Stream Habitat Assessments

<https://prezi.com/view/Cp26HP6gXEenAFakFz2e/>

Module 5: Physical and Chemical Stream Assessments

<https://prezi.com/view/enKLvUbs3J6HhhQCvLhv/>

Module 6: Stream Biology

<https://prezi.com/view/aScN8Rm3PyzxEGFqGR3L/>

Module 7: Standing Water Assessments, Aquatic Invasive Species

<https://prezi.com/view/G6Nv1wxrwSzzseEVrgBu/>

IDAH2O Master Water Stewards Videos; full playlist:

https://youtube.com/playlist?list=PLC08Q36A7DnlvDF_1jBT-ficWWXgl6a-F

Intro and Welcome (optional)

2:27

<https://youtu.be/j82CVqdNKEM>

Module 1: Introduction to IDAH2O Master Water Stewards

15:32

https://youtu.be/kXal_EO6YQ

Module 2: Key Water Quality Concepts in Idaho

26:08

<https://youtu.be/47Kh6ZLqZXU>

Module 3: Getting Started as an IDAH2O Master Water Steward

24:43

<https://youtu.be/LsaitPnT-Dc>

Module 4: Stream Habitat Assessments

35:13

<https://youtu.be/mtwDTcTo0Zs>

Module 5: Physical and Chemical Stream Assessments

15:03

<https://youtu.be/kvAVnfeB23k>

Module 6: Stream Biology

17:47

https://youtu.be/NYFGCwINZ_I

Module 7: Standing Water Assessments, Aquatic Invasive Species

12:52

<https://youtu.be/Qt1GOMFI4cw>

Total IDAH2O viewing time (H:M:S):

2:29:33