Water Resources Minor (Non-Teaching)

The Water Resources Minor is designed to encourage a student from any discipline to explore water resources beyond course work in their major. As a result, the minor includes courses from the College of Agriculture, the College of Engineering, and the College of Letters and Science. The minor is administered by the Water Resources Committee (WRM) under the guidance of the Montana Institute on Ecosystems. Any committee member may serve as an advisor for the minor (see list of Faculty Advisors below). The chair of the committee, IoE Director, serves as the curriculum review officer and signs the application for a Non-Teaching Minor after approved and forwarded by departmental advisors. This minor requires a minimum of 21 credits. The courses are grouped into basic and applied research and social sciences courses. Students are expected to create a diverse program, with course selections from both science and social science areas. No more than 12 credits may be used to simultaneously fulfill Water Resources Minor requirements, University Core and the student’s major (at least 9 credits must be unique to the minor). The student’s major advisor must certify that the 12-credit restriction is not exceeded. Course substitutions are allowed only by appeal to and approval by the WRM advisor and should be sent to the committee chair. The written appeal should identify the substitution and present a brief rationale.

### Required Courses
- **ENSC 272CS** Water Resources (classroom in Fall, online in Spring) 3
- Choose one of the following: 3
  - **ENSC 498** Internship
  - **GPHY 498** Internship
  - **ECIV 498** Internship
  - **PSCI 498** Internship

### Restricted Electives
Take 15 credits; at least one from each subject area

#### Basic Science Courses
- **BIOE 428** Freshwater Ecology 3
- **BIOM 360** General Microbiology 5
- **BIOM 415** Microbial Diversity, Ecology, and Evolution 3
- **BIOM 452** Soil & Environmental Microbiology 3
- **CHMY 311** Fundamental Analytical Chem 4
- **EENV 434** Groundwater Supply/Remediation 3
- **ENSC 444** Watershed Hydrology 3
- **ENSC 445** Watershed Analysis 3
- **ENSC 454** Landscape Pedology 3
- **ENSC 465** Environmental Biophysics 3
- **ENSC 468** Ecosystem Biogeochim 3
- **ERTH 303** Weather and Climate 3
- **ERTH 307** Principles of Geomorphology 4
- **ERTH 450R** Snow Dynamics and Accumulation 4

#### Applied Science Courses
- **ECIV 331** Engineering Hydrology 2
- **EENV 340** Princ of Envir Engineering 3
- **EENV 441** Natural Treatment Systems 3
- **ENSC 353** Environmental Biogeochim 3
- **ENSC 407** Environmental Risk Assessment 3
- **ENSC 448** Stream Restoration Ecology 3
- **ENSC 461** Restoration Ecology 3
- **GPHY 384** Adv GIS and Spatial Analysis 3
- **GPHY 426** Remote Sensing 3
- **GPHY 429R** Applied Remote Sensing 3
- **GPHY 457** Adv GPS Mapping for GIS 3
- **GPHY 484R** Applied GIS & Spatial Analysis 3
- **NRSM 455** Riparian Ecology & Management 3
- **WILD 301** Princ of Fish & Wildlife Mgmt 3

#### Social Science Courses
- **ECNS 332** Econ of Natural Resources 3
- **ECNS 432R** Benefit-Cost Analysis 3
- **HSTA 470** American Environmental History 3
- **NRSM 421** Holistic Thought/Mgmt 4
- **NRSM 430** Natural Resource Law 3
- **PSCI 362** Natural Resource Policy 3
- **SOCI 470** Environmental Sociology 3
- Any 290, 490, 291, 491, 292 or 492 course(s) related to water may be used in the minor

**Note:** A C- minimum is required in all curriculum courses to graduate by Regents’ policy. This includes electives in the curriculum. All students are responsible for meeting prerequisites for upper division courses.

## Water Resources Minor Faculty
- Cathy Whitlock, Chair - IoE/Earth Sciences
- Clayton Marlow - Animal & Range Sciences
- Al Cunningham - Center for Biofilm Engineering
- Paul Sturman - Center for Biofilm Engineering
- Anne Camper - Center for Biofilm Engineering/CoE
- Joel Cahoon - Civil Engineering
- Otto Stein - Civil Engineering
- Jordy Hendrikx - Earth Sciences
- Jamie McEvoy - Earth Sciences
- Wyatt Cross - Ecology
- Tom McMahon - Ecology
- Rob Payn - Land Resources and Environmental Sciences
- Paul Stoy - Land Resources and Environmental Sciences
- Linda Young - Political Science
- Duncan Patten - Water Center