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 certifying 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 sciences and social sciences courses. Students are expected to create a diverse program, with the guidance of their faculty advisor, using courses from both the 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 must be sent to the committee chair. The written appeal should identify the substitution and present a brief rationale.

For more information, please visit the Water Resources Minor website (http://www.montana.edu/water-resources-minor/).

### Required Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENSC 272CS</td>
<td>Water Resources (classroom in Fall, online in Spring and Summer)</td>
<td>3</td>
</tr>
</tbody>
</table>

### Restricted Electives

Take 18 credits, at least one from each subject area; internship course is optional.

### Basic Science Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOE 427RN</td>
<td>Research in Freshwater Ecology</td>
<td>3</td>
</tr>
<tr>
<td>BIOE 428</td>
<td>Freshwater Ecology</td>
<td>3</td>
</tr>
<tr>
<td>BIOM 360</td>
<td>General Microbiology</td>
<td>5</td>
</tr>
<tr>
<td>BIOM 415</td>
<td>Microbial Diversity, Ecology, and Evolution</td>
<td>3</td>
</tr>
<tr>
<td>BIOM 452</td>
<td>Soil &amp; Environmental Microbiology</td>
<td>3</td>
</tr>
<tr>
<td>BIOO 418</td>
<td>Ecological Physiology of Aquatic Organisms</td>
<td>3</td>
</tr>
<tr>
<td>CHMY 311</td>
<td>Fundamental Analytical Chemistry</td>
<td>4</td>
</tr>
<tr>
<td>EENV 434</td>
<td>Groundwater Supply/Remediation</td>
<td>3</td>
</tr>
<tr>
<td>ENSC 444</td>
<td>Watershed Hydrology</td>
<td>3</td>
</tr>
<tr>
<td>ENSC 445</td>
<td>Watershed Analysis</td>
<td>3</td>
</tr>
<tr>
<td>ENSC 454</td>
<td>Landscape Pedology</td>
<td>3</td>
</tr>
<tr>
<td>ENSC 465</td>
<td>Environmental Biophysics</td>
<td>3</td>
</tr>
<tr>
<td>ENSC 468</td>
<td>Ecosystem Biogeochemistry and Global Change</td>
<td>3</td>
</tr>
<tr>
<td>ERTH 303</td>
<td>Weather and Climate</td>
<td>3</td>
</tr>
<tr>
<td>ERTH 307</td>
<td>Principles of Geomorphology</td>
<td>4</td>
</tr>
<tr>
<td>ERTH 450R</td>
<td>Snow Dynamics and Accumulation</td>
<td>4</td>
</tr>
</tbody>
</table>

### Applied Science Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECIV 333</td>
<td>Water Resources Engineering</td>
<td>4</td>
</tr>
<tr>
<td>EENV 340</td>
<td>Principles of Environmental Engineering</td>
<td>3</td>
</tr>
<tr>
<td>EENV 432</td>
<td>Advanced Engineering Hydrology</td>
<td>3</td>
</tr>
</tbody>
</table>

### NSF Courses

- EENV 441 Natural Treatment Systems 3
- ENSC 353 Environmental Biogeochemistry 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 484R Applied GIS & Spatial Analysis 3
- GPHY 491-002/591 Spatial Analysis of Snow and Water Resources 3
- NRSM 455 Riparian Ecology & Management 3
- WILD 301 Princ of Fish & Wildlife Mgmt 3
- WILD 401RN Fish and Wildlife Capstone 4

### Social Science Courses

- ECNS 332 Econ of Natural Resources 3
- ECNS 432R Benefit-Cost Analysis 3
- GPHY 402 Water and Society 3
- GPHY 491-003 Environmental Planning and Management Toolkit 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

### Internship Courses

- BIOE 498 Internship 1-4
- ENSC 498 Internship 2-4
- ECIV 498 Internship 3
- GPHY 498 Internship 2-12
- PSCI 498 Internship 2-12
- WILD 498 Internship 1-4

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 Advisors

- Lindsey Albertson - Ecology
- Eric Austin - Political Science
- Joel Cahoon - Civil Engineering
- Sarah Church - Earth Sciences
- Wyatt Cross - Ecology
- Clayton Marlow - Animal & Range Sciences
- Bruce Maxwell, Chair - IoE/Land Resources and Environmental Sciences
- Jamie McEvoy - Earth Sciences
- Tom McMahon - Ecology
- Rob Payn - Land Resources and Environmental Sciences
- Kathryn Plymesser - Civil Engineering
- Eric Sproles - Earth Sciences
- Christine Verhille - Ecology
Font Notice

This document should contain certain fonts with restrictive licenses. For this draft, substitutions were made using less legally restrictive fonts. Specifically:

Times was used instead of Adobe Garamond Pro.

The editor may contact Leepfrog for a draft with the correct fonts in place.