

# WATER RESOURCES MANAGEMENT, DOCTORAL MINOR

Any student enrolled in a University of Wisconsin–Madison doctoral program can pursue a doctoral minor in Water Resources Management. Meeting the increasing human demand for water while ensuring its future availability and quality is a significant societal challenge. The Water Resources Management (WRM) program prepares students to face the complexities of managing this critical natural resource. Students complete coursework that integrates the biological and physical sciences (which identify and measure problems) with engineering (which provides technological alternatives), law, and the social sciences (which assess needs and potential for institutional response). Each WRM student gains breadth in relevant planning and management areas while developing depth in an area specialty. WRM students participate in a summer group practicum workshop with a water resources management focus.

## ADMISSIONS

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Students interested in a doctoral minor should consult the chair of the Water Resources Management graduate program.

All Graduate School students must utilize the Graduate Student Portal in MyUW to add, change, or discontinue any doctoral minor. To apply to this minor, log in to MyUW, click on Graduate Student Portal, and then click on Add/Change Programs. Select the information for the doctoral minor for which you are applying.

## REQUIREMENTS

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#### REQUIRED COURSES

Students select courses in consultation with their doctoral minor advisor and departmental advisor. Students must earn a B or better in courses used to satisfy doctoral minor requirements. Minor and major requirements cannot overlap or double-count.

Code	Title	Credits
Students must complete the following courses.		
CIV ENGR/ ENVIR ST/ URB R PL 718	Water Resources Management Practicum Planning Seminar II	2
CIV ENGR/ ENVIR ST/ URB R PL 719	Water Resources Management Summer Practicum	4
<b>Breadth</b>		<b>5</b>

Students must complete two courses numbered 300 or above from the categories below. The course lists below are not meant to be all-inclusive, and students are not restricted to the courses listed here. This is a sample of appropriate courses for these categories that are offered through various departments/programs. Breadth courses should complement the doctoral major and academic background as well as address any gaps in training within the curriculum breadth categories.

**Total Credits** **11**

#### Category A: Natural Science & Technology courses

Code	Title	Credits
AGROECOL/ AGRONOMY/ ENVIR ST 724	Agroecosystems and Global Change	3
AGRONOMY/ ATM OCN/ SOIL SCI 532	Environmental Biophysics	3
AGRONOMY 632		1
ATM OCN/BOTANY/ CIV ENGR/ ENVIR ST/GEOSCI/ ZOOLOGY 911	Limnology and Marine Science Seminar	1
BOTANY 330	Algae	3
BOTANY/ENVIR ST/ F&W ECOL/ ZOOLOGY 651	Conservation Biology	3
BOTANY/ F&W ECOL 402	Dendrology: Woody Plant Identification and Ecology	3
BOTANY/GEOG 338	Environmental Biogeography	3
BOTANY/ ZOOLOGY 725	Ecosystem Concepts	3
BSE 571	Small Watershed Engineering	3
BSE/CIV ENGR/ SOIL SCI 372	On-Site Waste Water Treatment and Dispersal	2
BSE/ENVIR ST 367	Renewable Energy Systems	3
CIV ENGR 310	Fluid Mechanics	3
CIV ENGR 311	Hydroscience	3
CIV ENGR 320	Environmental Engineering	3
CIV ENGR 415	Hydrology	3
CIV ENGR 500	Water Chemistry	3
CIV ENGR 618	Special Topics in Hydraulics and Fluid Mechanics	1-3
CIV ENGR 619	Special Topics in Hydrology	1-3
CIV ENGR/ ENVIR ST/ URB R PL 717	Water Resources Management Practicum Planning Seminar I	1
ENVIR ST 901	Graduate Orientation Seminar	1
ENVIR ST/ F&W ECOL/ ZOOLOGY 360	Extinction of Species	3
ENVIR ST/ GEOG 339	Environmental Conservation	4
ENVIR ST/ GEOSCI 411	Energy Resources	3

ENVIR ST/ LAND ARC 361	Wetlands Ecology	3	ENVIR ST 349	Climate Change Governance	3
ENVIR ST/ POP HLTH 471	Introduction to Environmental Health	3	ENVIR ST 402	Special Topics: Social Perspectives in Environmental Studies	1-4
ENVIR ST/ SOIL SCI 324	Soils and Environmental Quality	3	ENVIR ST 901	Graduate Orientation Seminar	1
ENVIR ST/ SOIL SCI 575	Assessment of Environmental Impact	3	ENVIR ST/ F&W ECOL 515	Natural Resources Policy	3
ENVIR ST/ ZOOLOGY 315	Limnology-Conservation of Aquatic Resources	2	ENVIR ST/ GEOG 337	Nature, Power and Society	3
ENVIR ST/ ZOOLOGY 510	Ecology of Fishes	3	ENVIR ST/ GEOG 339	Environmental Conservation	4
ENVIR ST/ ZOOLOGY 511	Ecology of Fishes Lab	2	ENVIR ST/ GEOG 439	US Environmental Policy and Regulation	3-4
GEOG 342	Geography of Wisconsin	3	ENVIR ST/HISTORY/ LEGAL ST 430	Law and Environment: Historical and Contemporary Perspectives	3
GEOG/GEOSCI 420	Glacial and Pleistocene Geology	3	ENVIR ST/JOURN/ LSC 823	Science and Environment Communication	3
GEOSCI 875	Advanced Topics in Geology	1-3	ENVIR ST/ PHILOS 441	Environmental Ethics	3-4
GEOSCI/G L E 627	Hydrogeology	3-4	ENVIR ST/POLI SCI/ PUB AFFR 866	Global Environmental Governance	3
LAND ARC 668	Restoration Ecology	3	ENVIR ST/ SOIL SCI 575	Assessment of Environmental Impact	3
SOIL SCI 301	General Soil Science	3	ENVIR ST/ URB R PL 843	Land Use Policy and Planning	3
SOIL SCI 321		3	ENVIR ST/ URB R PL 865	Water Resources Institutions and Policies	3
ZOOLOGY 316	Laboratory for Limnology-Conservation of Aquatic Resources	2-3	ENVIR ST/ URB R PL 917	Public Participation for Planning and Policy Making	3
ZOOLOGY 955	Seminar-Limnology	1	GEOG 340	World Regions in Global Context	3
<b>Category B: Water Resources Institutions &amp; Public Decision-Making Processes courses</b>			GEOG/ HISTORY 932	Seminar in American Environmental History	3
<b>Code</b>	<b>Title</b>	<b>Credits</b>	ISY E/M H R 729	Behavioral Analysis of Management Decision Making	3
A A E/ECON/ ENVIR ST 343	Environmental Economics	3-4	INTER-HE 801	Special Topics in Human Ecology	1-3
A A E/ECON/ ENVIR ST/ URB R PL 671	Energy Economics	3	JOURN 566	Communication and Public Opinion	4
A A E/ECON/ F&W ECOL 531	Natural Resource Economics	3	LAW 845	Water Rights Law	2-3
A A E/ENVIR ST/ POP HLTH/ PUB AFFR 881	Benefit-Cost Analysis	3	LAW 848	Introduction to Environmental Law	3
ANTHRO 477	Anthropology, Environment, and Development	3	LAW/URB R PL 830	Land Use Controls	3
C&E SOC 375	Special Topics	1-4	LSC 560	Scientific Writing	3
C&E SOC/CURRIC/ ENVIR ST 405	Education for Sustainable Communities	3	POLI SCI/ PUB AFFR 871	Public Program Evaluation	3
C&E SOC/SOC 541	Environmental Stewardship and Social Justice	3	POLI SCI/ PUB AFFR/ URB R PL 874	Policy-Making Process	3
C&E SOC/SOC/ URB R PL 617	Community Development	3	POLI SCI/ PUB AFFR/ URB R PL 878	Public Management	3
CIV ENGR/ ENVIR ST/ URB R PL 717	Water Resources Management Practicum Planning Seminar I	1	PUB AFFR 974	Topics in Public Affairs	3
CSCS 460	Civil Society and Community Leadership	3	URB R PL 590	Contemporary Topics in Urban and Regional Planning	1-3
ECON/ENVIR ST/ POLI SCI/ URB R PL 449	Government and Natural Resources	3-4	URB R PL 601	Site Planning	3
ENGL/ ENVIR ST 305	Rhetoric, Science, and Public Engagement	3	URB R PL 731	Introduction to Regional Planning	3
			URB R PL 741	Introduction to Planning	3

URB R PL 841	Urban Functions, Spatial Organization and Environmental Form	2-3
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STAT 301	Introduction to Statistical Methods	3
URB R PL 841	Urban Functions, Spatial Organization and Environmental Form	2-3

### Category C: Analytical & Design Tools in Water Resources courses

Code	Title	Credits
A A E/ENVR ST/ POP HLTH/ PUB AFFR 881	Benefit-Cost Analysis	3
BSE 571	Small Watershed Engineering	3
CIV ENGR 310	Fluid Mechanics	3
CIV ENGR 415	Hydrology	3
CIV ENGR 416	Water Resources Systems Analysis	3
CIV ENGR 515	Hydroclimatology for Water Resources Management	3
CIV ENGR/ ENVR ST/ GEOG 377	An Introduction to Geographic Information Systems	4
CIV ENGR 516	Hydrologic Data Analysis	3
CIV ENGR/ ENVR ST/ LAND ARC 556	Remote Sensing Digital Image Processing	3
ECON/PUB AFFR/ URB R PL 734	Regional Economic Problem Analysis	3
ENVR ST/ F&W ECOL/G L E/ GEOG/GEOSCI/ LAND ARC 371	Introduction to Environmental Remote Sensing	3
ENVR ST/GEOG/ LAND ARC/ URB R PL 532	Applications of Geographic Information Systems in Planning	3
ENVR ST/ LAND ARC/ SOIL SCI 695	Applications of Geographic Information Systems in Natural Resources	3
ENVR ST/ SOIL SCI 575	Assessment of Environmental Impact	3
F&W ECOL/STAT 571	Statistical Methods for Bioscience I	4
F&W ECOL/ STAT 572	Statistical Methods for Bioscience II	4
GEOG 378	Introduction to Geocomputing	4
GEOG 500	Qualitative Strategies in Geography	3
GEOG 579	GIS and Spatial Analysis	4
GEOG 970	Seminar in Geographic Information Science	1-3
GEOSCI/G L E 627	Hydrogeology	3-4
GEOSCI/G L E 724	Groundwater Flow Modeling	3
M H R 728	Bargaining, Negotiating and Dispute Settlement for Managers	3
PUB AFFR 818	Introduction to Statistical Methods for Public Policy Analysis	3
PUB AFFR 819	Advanced Statistical Methods for Public Policy Analysis	3
REAL EST/ URB R PL 720	Urban Economics	3
SOC WORK/ URB R PL 721	Methods of Planning Analysis	3

## PEOPLE

### PEOPLE FACULTY EXECUTIVE PROGRAM COMMITTEE

Kenneth Genskow (Program Chair), Francisco Arriaga, Anna Bierbrauer, Paul Block, Michael Cardiff, Matthew Ginder-Vogel, Rebecca Larson, Steven Loheide, Sue Swanson, Anita Thompson, Daniel Wright, Steph Tai (Ex Officio)