

Portland State University
Environmental Science & Management Department
Lake and Reservoir Management Certificate

PSU has a range of expertise in managing watersheds, lakes and reservoirs for ecological and water resources. PSU also has the Center for Lakes and Reservoirs that was established by the Oregon State legislature to address lake management and invasive species issues. Many of our faculty are active in the North American Lakes Management Society (NALMS) and the local chapters of the Oregon Lakes Association and Washington State Lake Protection Association.

This is a rigorous certificate that will require eight 400-level courses. The courses are split between aquatic ecology, watershed processes, management, and policy areas. Although the certificate could be earned by any student, they will have to have had many pre-requisites (or equivalent preparation) in Environmental Science & Management or Geography. Students who complete the certificate will be prepared to take active roles in and contribute to management of lakes and reservoirs. In addition, this certificate is designed to provide the academic background required by the NALMS Professional Lake Manager certification program.

Certificate requirements

The certificate requires 33 to 34 credits total and 22 of these credits must be in ESM. The student must complete courses in each of the following five areas:

Aquatic Ecology (10 credits)

Required

<u>ESM 475</u>	Limnology and Aquatic Ecology	4
<u>ESM 477</u>	Limnology Laboratory	2

Choose one from the following:

<u>ESM 424</u>	Wetland Ecology	4
<u>ESM 426</u>	Ecology of Streams and Rivers	4
<u>ESM 474</u>	Fish Ecology and Conservation	4

Watershed Science (8 credits)

Required

<u>ESM 425</u>	Watershed Hydrology	4
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Choose one from the following:

<u>ESM 427</u>	Watershed Biogeochemistry	4
<u>ESM 479/CE 479</u>	Fate and Transport of Toxics in the Environment	4

<u>GEOG 414</u>	Hydrology	4
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Business and Management (8 credits)

Choose two from the following

<u>ESM 483</u>	Marine Conservation and Management	4
<u>ESM 485</u>	Ecology and Management of Bio-Invasions	4
<u>GEOG 446</u>	Water Resource Management	4
<u>GEOG 494</u>	GIS for Water Resources	4

Policy Legal and Governmental Aspects (7-8 credits)

Required

<u>ESM 429</u>	Environmental Impact Assessment	4
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Choose one from the following:

<u>ESM 435</u>	Natural Resource Policy and Management	4
<u>USP 571</u>	Environmental Policy	3

Students must take required courses for a differentiated grade and earn a C- or better for it to count toward the certificate.

TOTAL CREDIT HOURS: 33-34