

## Fjord Ecosystems and Climate Change

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This course, designed for graduate and advanced undergraduate students, will focus on fjord ecosystems, which are common coastal features from polar to temperate latitudes (~5000 globally), serve as major interfaces between the cryosphere and the ocean, provide a broad range of ecosystem functions and services to natural and human communities, and are very sensitive to climate change. Fjord ecosystems are influenced by various physical and biogeochemical drivers, they are often coastal hotspots of productivity and biodiversity, they harbor an extraordinary range of habitats, and they are the foci of fisheries, waste disposal, and ecotourism. In addition, fjords provide model ecosystems to understand basic oceanographic forcing, to illustrate interactions between disturbance/productivity gradients in driving biodiversity, to test how horizontal subsidies across ecosystem boundaries structure food webs, to examine the influence of larval source-sink dynamics on metacommunities, and for elucidating how anthropogenic stressors (from waste disposal to climate warming) are altering coastal ecosystems. Thus, fjords provide outstanding exemplars to illustrate and model how physical and biogeochemical processes influence pelagic and benthic ecosystem structure and function, and to show how climate warming will alter key coastal ecosystems.

Our course goals are to (1) provide basic understanding (including hands-on experience) of the structure, function, and climate-sensitivity of fjord ecosystems from poles to temperate zones, (2) introduce state-of-the-art oceanographic, ecological and modeling methods and tools for their study (ranging from shipboard sampling, through remote sensing and cabled observatories, to ecosystem modeling), (3) highlight the influence of climate warming (and other anthropogenic impacts) on fjord ecosystems, and (4) foster critical thinking about environmental issues related to coastal ecosystems and climate change. Laboratory exercises, field trips, and student projects will be centered on comparing and contrasting key ecological drivers in polar and temperate fjords using new data sets from polar fjords on the West Antarctic Peninsula and temperate fjords around Friday Harbor (including Patricia Bay) as end-members in climate forcing. The contrasting of newly acquired data from polar and temperate fjord ecosystems will provide our students with a unique opportunity to work with state-of-art methods to explore ecosystem drivers and the influence of climate warming on coastal ecosystems.

Friday Harbor Laboratories (FHL) is beautifully situated in the middle of an extensive network of temperate fjords and provides outstanding field, laboratory and computer facilities for study of fjord organisms and ecosystems. For information about FHL see: <https://fhl.uw.edu/courses/course-descriptions/course/fjord-ecosystems-and-climate-change-2018/>

Fellowships are available to cover partial course costs (funded by the US National Science Foundation and the Scientific Committee on Antarctic Research). Students are also encouraged to seek their own funding. Course and fellowship applications must be submitted to FHL by 1 Feb 2018 (for details see above URL). For further information on the course, please contact Craig Smith: [craig.smith@hawaii.edu](mailto:craig.smith@hawaii.edu)