

Draft, Feb. 15, 2014
History of Fisheries Science
Department of Fisheries and Wildlife
Oregon State University
Summer, 2014, ecampus

This course combines approximately 90 hours of instruction, online activities, and assignments for 3 credits. This course requires graduate standing.

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"The trail of fishery science is strewn with opinions of those who, while partly right, were wholly wrong."

Michael Graham,
The Fish Gate, 1943,
p. 129.

The role of the Environmental Humanities is to help bridge the traditional divides between the science and the humanities, by bringing together knowledge of the natural world and the place of humans within it. There is growing awareness of the importance of stories in bridging these divides.

At the same time, there is widespread recognition that complex environmental problems require more than just better science. There are important political, social, and economic aspects to natural resource management. Emerging research suggests that communications and collaboration across disciplines is increasingly important in the future work force.

History can play a vital role in these discussions, History questions can reshape how we think about environmental issues, by bringing cultural and philosophical dimensions to legal, scientific, and policy-oriented research, allowing the development of a fuller and more complex picture of the human engagement with the oceans. The class will be about the history of fisheries science, and it will be taught from within the science, linked outward to other historical and cultural themes, such as colonialism, imperialism, labor issues, and issues of social justice within global fisheries.

This class will focus on reading original sources where possible. Students will also collaborate on a group public history project, centered on the investigation of the history of management of a fish species. Students will produce an individual project on a history topic related to their thesis research, intended as a thesis chapter, and they will produce five reflection pieces

The class proceeds from two concepts in pedagogy: students learn best when they are emotionally involved in the material, and that they can remember information when it is linked to what they already know. These conditions allow for a complex synthesis, as new and more complex scientific information is linked to such important societal issues as the role of science in the modern world. The approach draws on literature in a wide range of disciplines including political science, philosophy, economics, sociology, and history.

Fisheries and Wildlife graduate learning outcomes (Masters Level):

1. Students will produce a professionally written thesis that meets peer-review publication standards.
2. Students will be able to prepare and deliver a professional quality oral presentation.
3. Students will be able to effectively communicate in discussions with peers and general public.
4. Students will demonstrate ability to solve problems, evaluate evidence and recognize bias; ability to adjust conclusions/approaches in face of new data or interpretation tools.
5. Students will demonstrate in-depth knowledge of area of expertise and general breadth in the field.
6. Students will demonstrate an understanding of ethical issues in fisheries and wildlife sciences.

Class Learning objectives:

1. To amplify the department goals of comprehending an area of expertise to include an understanding of the role that fisheries management plays within the wider society.
2. To deepen the student's thesis by examining the history of the development of a species that is included in their thesis topic.
3. To reflect on how wider societal forces shape fisheries science, including an examination of the role of patronage.
4. To recognize how science plays a role in shaping the national and international policies that stimulate the development of global fishing, and an appreciation of how these forces have interacted to rapidly escalate fish harvests, and the ethical dilemmas this has created.
5. To use public history tools to research and synthesize information, aimed at creating material for wide set of audiences.
6. Students will grapple with elements of "thinking historically," including an evaluation of sources, setting them in a chronological order, making judgments about evidence, and constructing an argument.

There will also be a pre-assessment of skills and insights, along with a final assessment. This will be assembled with assistance from the Center for Teaching and Learning. This class will also use either a timeline or some sort of

mapping software, which will be chosen in consultation with Technology Across the Curriculum.

This is a graduate level class, to be taught Summer of 2014, through ecampus. Students will participate in several group activities and will produce a final project that examines the history of a fishery, with the intent of forming a chapter in a graduate thesis.

Accommodations are collaborative efforts between students, faculty and Disability Access Services (DAS). Students with accommodations approved through DAS are responsible for contacting the faculty member in charge of the course prior to or during the first week of the term to discuss accommodations. Students who believe they are eligible for accommodations but who have not yet obtained approval through DAS should contact DAS immediately at 737-4098.

Expectations of student conduct:

[Statement of Expectations for Student Conduct](#), i.e., cheating policies

Grading:

There will be two projects involving all students, one small group project, and each student will produce a final project, a five-page paper on the historical background of a thesis topic. Each student will also write reflective journal entries.

Large group projects:

1) **Fisheries History Timeline:** Each student will contribute two entries to the timeline on the development of fisheries science. The first entry point is to enter yourself on the timeline. The second entry will be to enter information about a scientist whose research has been formative to you. 10 points each for 20 points.

2) Participation in the 1882 **London Fisheries Exhibition Wiki**, where T. S. Huxley gave his keynote address. Each student will make a contribution on the exhibition and how it shaped fisheries science. 10 points.

3) Small group project: **Regional Fisheries Research.** Each small group will examine one chapter (or the chapters on one region) in the George Brown Goode's massive tome, *The Fisheries and Fishery Industries of the United States*, 7 volumes. (Washington, 1884–1887). 20 points.

4) There will be two individual components:

- A) Five reflective papers, organized around five themes in the class. Ten points each for a total of 50 points.
- B) Development of a five-page chapter, intended for the student's thesis, examining the history of the development of a species that is contained in the student's area of study. 50 points.

5) All students will participate in Discussion board, 10 entries at 5 points each, 50 points.

6) All Students will take part in a pre-assessment and a post-assessment of skills and understanding, 5 points each for a total of 10 points.

Total: 210 points.

Rubrics for each activity are at the end of the syllabus.

Readings:

The Structure of Scientific Revolutions, Thomas Kuhn, 1970.

The Rise and Fall of the British Trawl Fleet, Robb Robinson, University of Exeter, 1996.

The Sea Knows no Boundaries: A Century of Marine Science under ICES, Helen Rozwadowski, University of Washington Press, 2002.

Fishing on the Pacific Ocean Floor: Memoirs of Captain George Moskovita, by George Moskovita (under review for republication by Oregon State University Press, with a new introduction by Carmel Finley and Mary Hunsicker).

The Fisherman's Problem: Ecology and Law in the California Fisheries, by Arthur McEvoy. (chapters)

There will be an additional packet of readings.

Week One: So what's our paradigm?

Weekly Overview:

Thomas Kuhn postulates that "normal science" is the steady accumulation of scientific facts, leading to creation of theories. He argues that this conceptual continuity is interrupted by periods of revolutionary science. What normal science considers anomalies, revolutionary science re-interprets, asking new questions, and postulating new theories or paradigms that can cause shifting to new directions in research. Where is fisheries science today? Normal or revolutionary? Fisheries science has traditionally seen itself as capable of manipulation natural environments for human ends. Some scientists argue today that humans have been more like invasive species, disrupting ecosystems and population structures.

Weekly Objectives

- 1) We will begin our group work by creating a post about yourself and your work, and add it to the **Fisheries History Timeline** that we will be constructing throughout the term.
- 2) Students will read *The Scientific Revolution* and considers its arguments about normal science versus revolutionary science, and make an entry on Discussion Board.
- 3) Students will also undertake the pre-assessment and set personal goals for the quarter.

Lecture/ Powerpoint: Why bother studying history?

Readings:

<http://s-usih.org/2012/03/why-history-matters.html>

Thomas Kuhn, all.

George Moskovita, *Living off the Pacific Ocean Floor*, available online. This memoir of an Astoria trawler, who died in 2004, covers his 60-year career as a commercial fishermen, including fishing for sardines in California, sharks off Oregon, and salmon in Alaska.

Assignment: As an introductory exercise, each student is asked to enter themselves on the Fisheries History Timeline. A complete entry will include your name, major, major professor, links to publications, picture, and several keyword search terms about your work. Due by Sunday at midnight, end of week one.

Discussion board: Where is fisheries science? What's our paradigm?

Week Two: Industrialization and Professionalization

Weekly Overview:

Fishing was essentially unchanged for centuries—until steam engines were installed on fishing boats, starting in the 1860s. Steam set fishermen free from the wind—and greatly increased their capacity to catch fish. The introduction of trawling was followed by complaints of depleted local stocks, forcing the boats to find new sources of fish, in places such as Iceland.

Weekly Objectives:

- 1) This week's reading and large group exercise (the wiki) will focus around the 1883 London Fisheries Exhibition and its keynote address by Thomas H. Huxley. Each student will log onto the class wiki on the Exhibition, and contribute a comment on the Exhibition and how it may have shaped the development of fisheries science. This group project will examine the range of historical material to be found online.

- 2) Readings this week focus on the industrialization of fishing, as part of the second Industrial Age, and how the advent of steam engines exhausted stocks and sent boats to distant waters of Iceland.
- 3) Fishing is discussed as a strategy of imperialism.
- 4) Students will trace the impact of the industrial revolution on the fishing industry by examining the events around the 1883 fisheries exhibition, and contributing the class wiki on the 1883 fisheries exhibit.
- 5) The first of five journal entries will be due. This journal entry should reflect the theme of history, or the dead hand of the past.

Lecture: Thomas Henry Huxley and the professionalization of fisheries science

Readings: Robinson, *Rise and Fall of British trawling*, ch. 3-4.

Jon Th. Thor, *British Trawlers in Icelandic Waters: History of British Steam Trawling off Iceland, 1889-1916, and the Anglo-Icelandic Fisheries Dispute, 1896-1897*. Translated by Hilmar Foss, Reykjavik: Fjölvi Publishers, 1992.

Elizabeth Mancke, "Early Modern Expansion and the Politicization of Oceanic Space," *American Geography Society*, 89 (2) April 1999, 225-236.

A short video on using wikis:

<http://www.youtube.com/watch?v=-dnL00TdmLY>

Assignment: **The 1882 London Fisheries Exhibit Class Wiki**

The purpose of this assignment is explore the vast amount of fisheries history material available on the Internet, and to reflect on the paradigm that Huxley and 1882 exhibit created. Each student should prepare a single entry, consisting of text, photographs, link to scholarly article, or other material, along with a 250-word comment pertaining to some aspect of this pivotal event in the history of fisheries science. This material is due by Sunday of the second week of class and is worth 10 points. Students are encouraged to comment on each other's work.

We will begin our examination of fisheries history with Thomas Huxley.

Here is a link to Huxley's 1882 address:

<http://aleph0.clarku.edu/huxley/SM5/fish.html>

There are also a series of articles about the exhibition, published in *Science* magazine, published during 1883; several were written by George Brown Goode.

On the class wiki, we will examine Huxley's address, and the material about the exhibition. Each student should make one substantive entry, based on observations about the material.

Rubric for class wiki on Huxley and the Exhibition.

Discussion board: Jon Thor places European fishing off Iceland within the context of imperialism. Has the expansion of fishing always been an exercise in imperialism? Does it continue today?

First reflective piece due: The theme of this first two weeks has been paradigms, and the forces of industrialization and how they have shaped fisheries science. We have also looked at factors that shaped the development of patronage and the professionalization of fisheries science. Your reflective piece should be between 500-750 words, should incorporate citations from the readings, should ask questions to which you are seeking answers, and should generally focus on placing fisheries within a wider societal context. Due Sunday of week two at midnight.

Rubric for reflective papers:

Week Three: The development of fisheries science

Weekly Overview:

As populations grew in the Atlantic world, fishing quickly developed—and quickly exhausted local resources. In 1871, the U.S. Fish Commission was created, charged with "determining scientifically" the reason for the diminution of New Jersey fish species.

With the introduction of steam engines into the North Sea, fishing grounds that had sustained communities for centuries were quickly depleted, leading to calls for restorative action. The International Council for the Exploration of the Seas was created in 1902.

Weekly Objectives:

1. Small group activities will begin this week, with students examining the early literature around their chosen fishery, and to trace the development of management of the fishery. You are encouraged to select a regional project that incorporated your thesis topic.
2. This research can also be used to contribute to the Fisheries History Timeline. The creation of keyword search terms should assist in visualizations, depending on software. Selection of this

Lecture/Powerpoint: Formation of Fisheries Science in the United States.

Readings:

Dan Bottom, *To Till the Waters*.

Rozwadowski, *The Sea Knows no Boundaries* (chapters).

Second Large Group Assignment: The fisheries history timeline. Each student is requested to post an entry of a fishery scientist, either from the Goode regional project, or from the early days of your own research. Each entry will include a name, dates, some biographical detail, at least one significant paper, photographs if available, and keyword search terms. The objective is to situate ideas within a historical perspective, to trace lines of influence among scientists, and to see what relationships can be uncovered using a range of analytical tools. 10 points and due by the end of week six.

Online Resources: *The Fisheries and Fishery Industries of the United States*, 7 volumes. George Brown Goode, (Washington, 1884-1887).

Small Group Assignment: Each group will read a portion of a chapter of George Brown Goode's massive tome, *The Fisheries and Fishery Industries of the United States*, 7 volumes. (Washington, 1884–1887). There are various versions of it online:

http://archive.org/stream/fisheriesfishery0502good/fisheriesfishery0502good_djvu.txt

<https://archive.org/details/fisheriesfishery52goodrich>

It is also available from the Valley Library and will be placed on reserve for the term (this is because it is housed at the Guin Library in Newport). [SH221 .G6](#)

Students who are not in the United States, or students with an interest in studying the development of fishing in another area of the world, are welcome to substitute a similar volume or set of papers, such as might have been published in ICES, the fisheries journal.

Discussion board: The work of both Huxley and Goode comes together in one area, the professionalism of fisheries science, and the institutional structure necessary to manage fisheries. How much has the system changed since the 1880s? Has it changed in essential ways

Week Four: W.F. Thompson, sardines, and the start of fishery statistics

Weekly Overview:

Fishing drove the development of fisheries science. The California Fish and Game commission hired William F. Thompson in 1917 to conduct research on the largest American fishery, for sardines. Thompson began compiling fishery statistics.

Weekly Objectives:

- 1) Students will read several of Thompson's papers from his research on California sardines, and trace the development of fisheries statistics.
- 2) Students will examine historical photographs from the George Moskovita collection to trace the development of fishing gear and technology.
- 3) As part of the preparation for the Small Group Project and the individual thesis project, students will consider what it means to think historically.
- 4) Second Large Group Project: Who's who in fisheries science? Each student will provide one entry about a historically significant scientific figure, either from Goode's volume, or a figure involved in early research on the student's individual topic. Due at midnight, Sunday, week six.

Lecture: Getting a handle on thinking about the past.

Readings:

Ch. 1, of T. Miles Kelly, with special reference to his 15-points on thinking historically.

[Teaching History in the Digital Age](#), T. Miles Kelly, available by ebook (free!).

J. Richard Dunn, "William Francis Thompson (1888-1965) and the Dawn of Marine Fisheries Research in California." *Marine Fisheries Review* 63, no. 2 (2002): 15-24.

Will F. Thompson, "The Scientific Investigation of Marine Fisheries, as Related to the Work of the Fish and Game Commission in Southern California" *State of California Fish and Game Commission Fish Bulletin* 2, (1919).

Will F. Thompson, "Errors in the Method of Sampling Used in the Study of the California Sardine," in *Fish and Game Commission of California Fish Bulletin* 11 (1926): 159-189.

Will F. Thompson. "The Marine Fisheries, the State and the Biologist." *The Scientific Monthly*. No. 15, 1922. 542-550. 549.

Second reflective piece due: The theme these two weeks has been how fisheries science has struggled to create enough information to manage. Has fisheries

science succeeded in this objective? Will there ever be enough information to manage? Or does the science even matter?

Discussion board: What would you have done if you were W. F. Thompson?

Week Five: Thompson, halibut, Burkenroad, and the current halibut crisis.

Weekly Overview:

One of the current critical controversies is the state of the Pacific halibut resource. The International Pacific Halibut Commission, created in 1923, and headed by W. F. Thompson, is considered one of the best managed fisheries in the world. But there has always been criticism of the early science by the Commission. The IPHC is currently involved in a deep dispute about its science and the decline of halibut, in terms of both size and numbers.

Weekly Objectives:

- 1) Students will read some of the early literature on halibut, and consider the roots of the current controversy.

Lecture: The formation of American fisheries science.

Readings:

International Pacific Halibut Commission, Report No. 8, Biological Statistics of the Pacific Halibut Fishery, by W. F. Thompson and F. Heward Bell, 1934.

<http://www.iphc.int/publications/scirep/Report0008.pdf>

J. Richard Dunn, "William Francis Thompson (1888-195) and his pioneering studies of the Pacific Halibut, *Hippoglossus stenolepis*. *Marine Fisheries Review*. 63 no. 2 (2002):

Discussion Board: Do fishery controversies ever get settled? Can everybody agree on what the data means?

Week Six: The Post-war Expansion of Fishing and Assumptions about Fish Stocks

Weekly Overview:

The world of fishing was transformed by World War II. The war stimulated demand for fish products, and after the war, technologies such as radar and sonar, were transferred to the non-military sector. With the creation of the Food and Agricultural Organization of the United Nations in 1945, there was an emphasis on the development of fishing to increase the supply of protein.

Governments greatly expanded their investment into fishing, for a variety of domestic and international policy reasons.

Weekly Objectives:

- 1) Students will explore the post-war context of fishery development, including trade patterns and the development of subsidies to build boats and processing equipment.
- 2) The expansion of fishing also represented the expansion of certain Western ideas about how fishing should be conducted. Students will explore the Western assumptions in the expansion of fisheries to Third World Countries.

Readings:

George Moskovita and development of West Coast fisheries.

A Crime Against the World, by Vladil Lysenko, a Soviet fishing captain, published in 1973.

Michael E. Latham, *Modernization as Ideology: American Social Science and "Nation Building" in the Kennedy Era*, Ch. 1-2.

Third journal theme due: the expansion of fisheries raises many issues, including technological determinism, role of the state in creating programs for the expansion of fishing and the export of fisheries technology. States had many reasons to expand fishing: to create jobs in coastal communities, provide fish for export, but also to make a territorial claim.

Discussion Board: Exporting fisheries technology meant exporting Western ideas about nature and the role of humans in society. What ideas about nature have been incorporated within state ideology about expansion?

Seven: The Cold War: the Soviet and Japanese expansion

Weekly Overview:

With the signing of a treaty between Japan, Canada, and the United States in 1953, the Japanese greatly expanded fishing the North Pacific; their factory processing boats were joined by Soviet vessels in 1958, setting off one of an explosive development of fisheries.

Weekly Objectives:

- 1) Successful fisheries depend on a cheap supply of fish. Students will look at how the expanded industrialization of fishing created impacted both fishermen and fish stocks.

2) Cheap fish mean low wages for fishermen and poor working conditions.

Lecture/PowerPoint: The Environmental History of the Cold War

Readings:

Hiroshi Kasahara, Fisheries Resources of the North Pacific Ocean (1961).

Takihi Kobayashi, The Factory Ship.

Discussion board: Why has cheap fish meant so little money for fishermen?

Week Eight: The 200-mile limit

Weekly Overview:

With the development of factory trawlers, fishing expanded greatly during the 1960s, creating national movements to restrict fishing. During the 1970s, many nations, including the United States, moved to 200-mile territorial limits. In the U.S. this led to a greatly expanded series of subsidies to expand fishing.

Weekly Objectives:

- 1) To trace the impact of the 200-mile expanded jurisdiction on the development of American fisheries, especially in Alaska.
- 2) To trace the changing objectives in post-war fisheries expansion.

Lecture/PowerPoint: The Americanization of Fishing

Readings:

'From Mare Liberum to Mare Reservarum', *Marine Policy*, Vol.27, pp.75-78.
Russ, G.R. and Zeller, D.C. (2003)

Lecture: After the Soviets take all the POP, the U.S. Struggles to come up with federal legislation to control foreign fishing.

Discussion board: The Magnuson-Stevens Act is up for reauthorization. In a perfect world, what would you have Congress do?

Fourth Reflective paper due: Institutional formation in fisheries and how it shapes/constrains fisheries science.

Week Nine: Fishing in the EU fisheries

Weekly Overview:

Studies of European Union fisheries management show that scientific advice is not incorporated into management, often because of short-term political gain in member countries.

Weekly Objectives:

1) Different management systems can often have similar results.

Lecture: International Management of Trans-boundary resources.

Readings:

Khalilan, Setareh, Rainer Froese, Alexander Proelss, and Till Requate.
"Designed for Failure: A Critique of the Commons Fisheries Policy of the European Union." *Marine Policy* 34 (2010): 1178-82.

Discussion Board:

Week Ten: Ethical issues in modern fisheries management

Fishing is something that traditionally took place out of the sight of land. As technology has made fishing more visible, it has also revealed wide-scale dumping of bycatch, destruction of fragile marine communities by trawl nets, and how easy it is to catch fish drawn to FADS in the ocean. This has created a new series of controversies for fishermen and for fishery scientists and managers.

Learning objectives:

- 1) To finish researching individual fishery histories.
- 2) Completion of all readings and assignments.

Lecture: Fish, Fisheries Science, and Food Security

Readings:

Ethical issues in fisheries,
Food and Agricultural Organization of the United Nation, 2005, downloaded
15/2/2014.

<ftp://ftp.fao.org/docrep/fao/008/y6634e/y6634e00.pdf>

Who is Right to Fish? Evolving a Social Contract for Ethical Fisheries, Mimi E. Lam and Daniel Pauly, Ecology and Society, 15 (3), downloaded 15/2/2014.

<http://www.ecologyandsociety.org/vol15/iss3/art16/>

Final Reflective Paper: On a topic of your choice.

Week Eleven:

Final Paper due on Monday of finals weeks.

Final papers should have the following:

Cover (Title) Page

Abstract (300 words)

Table of Contents

Body of paper should be no more than 5 double-spaced (or 1.5 spaced) pages plus references

Appendices: Charts, Figures, Tables, Maps, or Other Illustrations

Citation format: Use a citation format with which you are familiar and comfortable. If you are using an internet reference, you must provide the name of the organization, the name of the page or document, the date you visited the website, and the URL (http: etc.) – not the URL alone!

Strong Abstract means the abstract accurately reflects the content of the paper, including your results or conclusion, as a synopsis and the abstract is succinct and well crafted.

Organization means that the paper has an engaging introduction and research questions and the paper's content flows logically from idea to idea, and section to section. It also means that by the conclusion you have maintained consistency; i.e. you answered the research questions and followed the roadmap you established in the introduction.

Rationale is an important part of papers, grant proposals, and oral presentations. Convince us why should we care about topic.

Research Effort, Scope, and Quality measures the time you invested and depth of inquiry, and synthesis evidenced by your ideas, writing as well as the quality and range of the references you chose.

Insight or Original Analysis (Beyond Facts Alone): your paper is not a superficial journalistic style account but is on par with what is expected of

graduate students and professionals because it analyzes and synthesizes all of your reading on the topic and presents your own ideas and conclusions with their foundations (showing how you arrived at them—don't assume we know).

Papers should demonstrate historical thinking: this includes a critical analysis of sources, the authority of sources, proper chronological order, an original argument, and making judgments about evidence. The paper should look not only at what happened, but ask questions about why it happened, and why it might have happened differently.

High Quality Writing means you have crafted your communication thoughtfully to your topic and audience; includes concise explanations with varied sentence structure, free of jargon and fluff or padding. Provide definitions, examples or analogies; express your assumptions, the research gaps, and explain complex information stepwise. Make it fun to read instead of a chore. Proofread with your eyes, read it aloud to yourself, or ask a friend to critique. Spell check is useful but misses many errors, so don't rely on spell check exclusively.

Conclusion and Recommendations: A well (tightly) written conclusion is an art and presents your paper in miniature. Learn to write excellent conclusions as opposed to a last minute, tossed-off, or cut-short effort. A good conclusion quickly and coherently summarizes your main points (the points you would most like your audience to take away from reading your paper). Learn to write conclusions attentively and effectively.