Marco B. A. Hatch, Ph.D.

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Director, National Indian Center for Marine Environmental Research and Education at Northwest Indian College

Updated: 2/16/16

Education

Doctorate of Philosophy	Scripps Institution of Oceanography 2012
Masters of Science	Scripps Institution of Oceanography 2007
Bachelor of Science (Magna Cum Laude)	University of Washington 2005

Academic Positions

2012-present Director, National Indian Center for Marine Environmental Research and Education, Northwest Indian College (Associate Director 2012-2013) also directs Salish Sea Research Center

2014- 6/2016 Postdoctoral Fellow, National Science Foundation, Jointly appointed with Simon Fraser University and Northwest Indian College, co-advised by Anne K. Salomon and Dana Lepofsky

Research and Teaching Grants

PI or co-PI on nearly $7 million of funded awards, of which $2.65 million I authored or co-authored.

1) **Hatch, M.B.A.**, A.R. Thurber, G. Cook, J. Donatuto. *Pending.* Coastal SEES Collaborative Research: Cultural and Ecological sustainability in dynamic seascapes: Reviving clam gardens and their role in Indigenous society. National Science Foundation. (PI Hatch **$850,000**, total $2 million)

2) **Hatch, M.B.A**. 2016. Travel award to participate in NSF GEO Opportunities for Leadership in Diversity Ideas Lab. National Science Foundation. (**$2,000**)

   One of thirty people selected to participate in a five-day workshop to develop proposals that will increase diversity in geosciences.

3) Stanely, C., **M.B.A. Hatch**, J. Toft, S. Grossman, B. Bennett. 2016-2017. Mapping Shoreline Biological Communities: furthering present understanding and informing future planning Bureau of Indian Affairs. ($250,000 co-PI Hatch **$27,000**)

   Assisting a climate change impact study of nearshore ecosystems at the request of Tulalip and Swinomish tribes

4) Newton, J., M. Kosro, E. Mayorga, A. Baptista, J. Allan, T. Hallenbeck, **M.B.A. Hatch**, A. Helms, D. Jones, G. Kaminsky, D. Martin, J. Mickett, T. Tanner. 2016-2020. Sustaining NANOOS, the Pacific Northwest component of the US IOOS. NOAA, U.S. IOOS Program Office ($20 million, **co-PI Hatch $50,000**)

   Leading the tribal outreach by providing marine science experiences and internships to NWIC students.

5) Norman, E., **M.B.A. Hatch**, J.M. Rybczyk, B.L., Bingham, D.O. Wallin**.** 2015-2018 Collaborative Grant: Partnerships for Geoscience Education: Paddling Together in Shared Waters. National Science Foundation ($1.65 million total, co-PI Hatch **$825,000**)

   Partnership project to bridge NWIC BSNES students into Huxley M.S. Environmental Science.

6) **Hatch, M.B.A.** A.R. Thurber. 2015-2017. Hydrogen sulfide induced reduced growth rates in manila clams (*Venerupis philippinarum*) on Lummi tide flats. National Institute of Food and Agriculture (**$220,000**)

   Tests the impact of geochemistry on manila clam growth rates

7) **Hatch, M.B.A.,** A.R. Thurber. 2015-2017 Seasonal diet changes for manila clams (*Venerupis philippinarum*) on Lummi tide flats: Building NWIC capacity for isotopic diet analysis. National Institute of Food and Agriculture (**$85,000**)

   Determines seasonal and spatial diet changes of clams based fatty acid and stable isotopic biomarkers

8) **Hatch, M.B.A.,** J. Campbell, J Green, J, Apple. 2013-2016 Effects of Nutrient, Sediment and Bacterial Pollution on Salish Sea Waters, and Potential Implications of Climate Change. National Institute of Food and Agriculture (**$200,000**)

   Investigates the seasonal formation of hypoxia and relationship to bacterial activity and phytoplankton communities.

9) Mickett, J.B., S. Moore, J. Birch, G. Doucette**, M.B.A. Hatch**, J. Newton, B. Hickey, D.M Anderson, R McCabe. 2015-2018 IOOS: Operational Ecological Forecasting of Harmful Algal Blooms in the Pacific Northwest Using an Environmental Sample Processor. National Oceanic and Atmospheric Administration. ($1.9 million, co-PI Hatch **$45,000**)

   NWIC is leading the outreach and Native American internships as part of a larger project

10) Becker, B.J., **M.B.A. Hatch**, B. Vadopalas, B. Peabody, H. Carson. 2015-2017. Recovery of the native Olympia oyster, *Ostrea lurida*, in Northern Puget Sound: tracking larval import to and export from a restored subpopulation. Washington Sea Grant. ($200,000: co-PI Hatch **$35,000**)

    Uses trace elemental fingerprinting to determine larval source of Olympia oysters utilizing the LA-ICP-MS at WWU

11) **Hatch, M.B.A.,** 2015-2016 CMOP: Native student internships. (**$32,000**)

    Partnership with UW to offer oceanographic internships and cruises

12) **Hatch, M.B.A.** 2014. Recruitment for Scripps Institution of Oceanography Fellowship. National Science Foundation. (**$15,000**)

    Funded outreach and recruitment for SURF REU program

13) **Hatch, M.B.A**., 2014-2017. Salish Sea Research Center: Transforming STEM education in Native Environmental Sciences. National Science Foundation. (**$500,000**)

    Supports Indigenous scholars and Infuses research into science courses and funds equipment

14) **Hatch, M.B.A.,** 2014-2016. Quantifying the ecological role of pre-contact aquaculture in Pacific Northwest Indigenous societies. National Science Foundation. (**$190,000**)

In partnership with Heiltsuk First Nation, studies the mechanistic function of clam gardens including on clam growth and sediment geochemistry

15) **Hatch, M.B.A.,** 2014-2015 CMOP: Native student internships. (**$32,000**)

Partnership with UW to offer oceanographic internships and cruises

16) **Hatch, M.B.A,** S. Wyllie-Echeverria, V. Trainer, T. Shultz. 2013-2015. Investigation of seasonal variation in presence and abundance of algicidal bacteria in Northern Puget Sound. National Institute of Food and Agriculture (**$200,000**)

Explores the relationship between algicidal bacteria associated with eelgrass beds and frequency of harmful algal blooms

17) **Hatch, M.B.A,** S. Wyllie-Echeverria, T. Shultz. 2013-2014. Classifying the seagrass *Zostera marina* using underwater video, hydroacoustics, aerial images, and low tide transects: An assessment of sampling variation**.** National Institute of Food and Agriculture (**$60,000**)

Offered a co-taught eelgrass course that involved monitoring and hydrosulfide mapping

18) Stevens, D. **Hatch, M.B.A**. 2013-2014 NIH Building Infrastructure Leading to Diversity planning award National Institute of Health (**$10,000**)

Planning grant to create a Tribal – Tribal College network of environmental health research and training

19) **Hatch, M.B.A.,** 2013-2014 CMOP: Native student internships. (**$32,000**)

Partnership with UW to offer oceanographic internships and cruises

20) **Hatch, M.B.A.,** J. Green. 2010-2013. Science Facilities Renovation. National Science Foundation. (**$1.6 million**)

Construction grant to fund the building of the Salish Sea Research Center

21) Rave, C., **M.B.A. Hatch**, J. Green, B Portevint. 2010-2015. Filling the gaps in science and technology education at Northwest Indian College. National Science Foundation. (**$2.5 million**).

Critical funding to support BSNES student services and marine science education

22) **Hatch, M.B.A,** L. Urbanec 2013-2014. EPA Tribal College ecoAmbassador Native Plant Education Utilizing Northwest Indian College Gardens American Indian Higher Education Consortium (**$40,000**)

Creation of the Salish Garden and signage including Lummi names

23) **Hatch, M.B.A.,** 2012-2013. Program Development. Testing of marine biotoxins in shellfish to reduce illness and improve economic opportunities for tribal members. Washington Sea Grant. (**$6,000**).

Funded equipment needed to preform biotoxin analysis at NWIC

24) **Hatch, M.B.A.,** 2012-2013. EPA Tribal College ecoAmbassador Testing of marine biotoxins in shellfish to reduce illness and improve economic opportunities for tribal members. American Indian Higher Education Consortium (**$51,000**)

Investigated the biotoxin levels in shellfish on the Lummi Reservation based on enzyme-linked immunosorbent assay methods

25) **Hatch, M.B.A.,** 2012-2013 Student to Academic Professoriate for American Indians (SAPAI) First Year at the Tribal College placement. National Science Foundation. (**$40,000**)

Fellowship placement at NWIC

26) **Hatch, M.B.A.,** 2012-2013 Student to Academic Professoriate for American Indians (SAPAI) Faculty Preparation Fellowship. National Science Foundation. (**$4,000**)

Training for new Tribal College faculty

27) **Hatch, M.B.A.,** 2008-2010. Graduate Research Fellowship. National Science Foundation. (**$120,000**)

Graduate research Fellowship

28) **Hatch, M.B.A.** 2006-2009. Ford Foundation Pre-Doctoral Fellowship. (**$66,000**).

Pre-doctoral fellowship

Peer-Reviewed Journal Publications

Legend: Students under my supervision

Augustine, S., **M.B.A. Hatch**. (*Submission deadline 3/10*) Place-based research courses enhance the engagement of Native American students in STEM**.** Science Education.

Hatch, M.B.A., S. Wyllie-Echeverria (*in review*). Historic distribution of *Ostrea lurida* (Olympia oyster) in the San Juan Archipelago, Washington State. Tribal College Research Journal

Hatch, M.B.A., R.M. Hunter, J.W. Emm, (*in review*). Spatial and Temporal Distribution of Olympia oyster, (*Ostrea lurida*) Larvae and Settlers within Fidalgo Bay, Washington. Tribal College Research Journal

Hatch, M.B.A., S.A. Schellenberg, M. Carter. 2013. Utilization cross-dated sub-annul growth increments to date Ba/Ca variations in the modern intertidal bean clam *Donax gouldii*. 373: 98-107 *Palaeogeography, Palaeoclimatology, Palaeoecology*.

Winter, R.N., **M.B.A. Hatch**, 2010. Investigating the parasitism of Southern California bean clams (*Donax gouldii*) by the trematode *Postmonorchis donacis*. *Bulletin: Southern California Academy of Sciences*. 109(3) 144-152

Braje, T.J., J.M. Erlandson, T.C. Rick, P.K. Dayton, **M.B.A. Hatch.** 2009. Fishing from Past to Present: Continuity and Resilience of Red Abalone Fisheries on the Channel Islands, California. *Ecological Applications*. 19(4)906-919.

Non-Refereed Technical Reports

Hatch, M.B.A. 2015. Heiltsuk Territory Clam Garden Field Report. Heiltsuk Nation.

Hatch, **M.B.A,** H. Hatch, S. Wyllie-Echeverria, R. Barsh. 2003. Puget Sound / Georgia Basin Historic Conditions Project: Literature Review and Analysis. U.S. Army Corps of Engineers, Seattle District.

Reeves, R. B. Sewell, S. Wyllie-Echeverria, R. Wright, H.D. Berry, C. Young, **M.B.A. Hatch**. 2004. Classifying *Zostera marina* from underwater video: a customized assessment of accuracy. Washington State Department of Natural Resources.

NON-REFEREED GENERAL PUBLICATIONS

Augustine, S., **M.B.A Hatch.** 2015. Salish Sea Research Center: Engaging Indigenous Scholars. NWIC Biannual Report (2pg)

THESES

1) **Hatch, M.B.A.** 2012 The sclerochronology of *Donax gouldii* and *Chione undatella*: Environmental archives of the past and present Southern California Bight. PhD Thesis. Scripps Institution of Oceanography. Supervisor Dr. Paul K. Dayton
2) **Hatch, M.B.A.** 2005 Identification of archeological sockeye salmon remains as a proxy for reef-net fishing. Capstone. University of Washington. Supervisor Dr. Kerry Naish.

TEACHING EXPERIENCE

Implementation of Problem Based Learning in Chemistry (CHEM 111), Biology (BIOL 201) and Natural History (BIO 104) at NWIC for Fall 2015, this included creating and coordinating a problem based research project between all three classes.

Natural History of Place (BIOL 104) NWIC Fall 2015

Research Capstone (NESC 498-499 A-B) NWIC 2013-2015

Native Environmental Science Seminar (NESC x93), NWIC Fall 2014

Field study methods for ecology (ENVS 370), NWIC Spring 2014

Marine Biology (BIOL 140), NWIC Winter 2014

Marine Biology, Graduate teaching assistant, UCSD Fall 2010

Instructor: Hands on introduction to the marine invertebrates, UCSD

SERVICE OUTSIDE THE UNIVERSITY

2016	Co-Organizer Strengthening Connections to Place in Changing Times: Clam Garden Knowledge, Research, and Stories, Salish Sea Ecosystem Conference
2015	Co-Organizer Role of Traditional Ecological and Cultural Knowledge and Science in Tribal and First Nation Research and Restoration. Coastal and Estuarine Research Federation.
2014-present	Research Advisor, Stephanie Moore, JPB Environmental Health Fellows Program, Harvard School of Health
2014-present	Cohort Project Advisor, University of Washington IGERT Program in Ocean Change.

REVIEWER

Reviewed for NSF Graduate Research Fellowship x2, various NSF ad hoc view panels

Administrative and Committee Responsibilities at NWIC

1) Leadership Team, Member: Sept 2012-present
2) Internal Review Board (IRB), Special Member: Sept 2014-present
3) Land Grant Planning Team, Member: Sept 2014-present
4) Accreditation Core Team Group, Co-Chair Sept 2013-present
5) Strategic Planning Core Group, Member: June 2015-present

Invited Academic Talks

1) **Hatch, M.B.A**. 2016. Traditional Ecological Knowledge to Advance Marine Science: Balancing Two Worlds. Ocean Ecology & Biogeochemistry Seminar Series – Oregon State University.
2) **Hatch, M.B.A**. 2016. Salish Sea Research Center: Making Science Matter. Lummi Natural Resources Seminar Series.
3) **Hatch, M.B.A**. 2016. Balancing Two Worlds: Grounding Marine Science in a Native American Context. Monster Seminar JAM Winter Series – Northwest Fisheries Science Center.
4) **Hatch, M.B.A.** 2015. My re-education at a Tribal College: Making marine science matter, SACNAS
5) **Hatch, M.B.A.** 2015. Reinvigoration of traditional practices in a changing climate. 2015. IGERT Program on Ocean Change, University of Washington.
6) **Hatch, M.B.A.**, F.Dooley, S. Augustine, J. Emm, S. Wyllie-Echeverria. 2015. The submerged landscapes of Portage Bay: A pilot study to identify features and boundaries using remote sensing platforms, grid sampling and in situ H_2S concentration. State of Bellingham Bay.
7) **Hatch, M.B.A.**, S. Augustine 2014. Learning from Traditional Technologies in the Salish Sea. (Keynote) Our Food is Our Medicine, Suquamish, WA.
8) **Hatch**, **M.B.A.,** S. Augustine. 2014. The Satoumi of Sche'lang'en: Culturally relevant science across the Pacific. (Invited Lecture) Shannon Point Marine Station.
9) **Hatch, M.B.A.** 2010. Sifting baselines: the construction of a pre-European ecological baseline for San Diego, CA. San Diego Archaeological Center.

Selected Presentations

1) Augustine, S., **M.B.A. Hatch,** N. Smith, C. McIntosh, N. Cardinal. 2016 Clam Gardens: Stories about eco-cultural revival in the Salish Sea. Salish Sea Ecosystem Conference. Vancouver B.C.
2) **Hatch, M.B.A.** 2016. Navigating ecology, culture, and education in the Salish Sea Research Center. Salish Sea Ecosystem Conference. Vancouver B.C.
3) **Hatch, M.B.A.** 2016. The future of clam garden research and revitalization. Salish Sea Ecosystem Conference. Vancouver B.C.
4) **Hatch, M.B.A.** 2015. Navigating ecology, culture, and education in the Salish Sea Research Center. Coastal Estuarine Research Federation. Portland OR.
5) **Hatch, M.B.A.** 2015. Navigating ecology, culture, and education in the Salish Sea Research Center. Tribal College Research Symposium, Washington D.C
6) **Hatch**, **M.B.A,** S Augustine 2014. Supporting Resilience in the Salish Sea, First Americans Land-grant Consortium. Minneapolis, MN

7) **Hatch, M.B.A.** 2014. Culturally relevant research at the Salish Sea Research Center, Tribal College Research Symposium, Washington D.C
8) **Hatch, M.B.A.** 2014. Workforce Potential: Good, Relevant, Locally Driven Research, Tribal College Leaders Symposium, San Antonio, TX.
9) **Hatch, M.B.A.** 2014. American Indian Student-Driven Research at the Salish Sea Research Center. Ocean Sciences Meeting, Honolulu HI.
10) **Hatch, M.B.A.** 2013. American Indian student-driven research at the Salish Sea Research Center. Coastal and Estuarine Research Federation, San Diego, CA.

11) **Hatch, M.B.A.** 2013. Real-time Detection of Harmful Algae at a Tribal Marine Aquaculture Site. US HAB Symposium, Tampa Bay, FL.
12) **Hatch, M.B.A.** 2012. Research at a Tribal College. Western Society of Naturalists, Seaside, CA.
13) **Hatch, M.B.A.** 2012 Using historical ecological data knowledge for a sustainable ocean. Seattle, WA
14) **Hatch**, **M.B.A.,** SA Schellenberg. 2010. Donax do and don't tell: The relationship of isotopic and elemental variations to environmental conditions in the shell chemistry of a common intertidal bivalve. American Geophysical Union, San Francisco, CA,
15) **Hatch**, **M.B.A.,** SA Schellenberg, JA McGowan, M Carter. 2010. Ba/Ca variations in the modern intertidal bean clam Donax gouldii: An upwelling proxy? International Sclerochronology Conference, Mainz Germany.
16) **Hatch**, **M.B.A.,** SA Schellenberg. 2010. Sclerochronological assessment of the common bean clam Donax gouldii in San Diego, CA. Ocean Sciences Meeting, Portland OR.
17) **Hatch, M.B.A.** 2008. The history of fishing in the Channel Islands: interactions between human societies and ecological systems. Seventh California Islands Symposium, Oxnard CA.
18) **Hatch, M.B.A.**, 2007. Interactions between human societies and ecological systems: it goes both ways. California World History Association, Fullerton, CA.
19) **Hatch**, **M.B.A.,** R. Barsh, H. Hatch, S. Wyllie-Echeverria. 2005. The Salish Sea: Historic Conditions. Puget Sound Georgia Basin Research Conference Seattle, WA.
20) **Hatch**, **M.B.A.,** K. Naish. 2005. Identification of archeological sockeye salmon remains as a proxy for detecting the initiation of reef-net fishing. Western Society of Naturalists 86th Annual Meeting, CA.

MENTORED STUDENT PRESENTATIONS

Legend: Students under my supervision *this only a subset of mentored presentations

1) Emm, J.W., **M.B.A. Hatch**, R.M. Hunter. Early Life History of Olympia oysters (*Ostrea lurida*) within Fidalgo Bay, Washington. American Indian Science and Engineering Symposium. Phoenix, AZ (11/2015)
2) Emm, J.W., **M.B.A. Hatch**, R.M. Hunter. Olympia oyster research presentation "Early Life History of Olympia oysters (*Ostrea lurida*) within Fidalgo Bay, Washington". MJ Murdock Charitable Trust Science Conference. Vancouver, WA (11/2015)
3) Emm, J.W., **M.B.A. Hatch**, R.M. Hunter. Olympia oyster research presentation "Spatial and Temporal Distribution of Olympia oyster, (*Ostrea lurida*) Larvae and Settlers within Fidalgo Bay, Washington". SACNAS National Conference. Washington, DC (10/2015)
4) Emm, J.W., **M.B.A. Hatch**, S. Wyllie-Echeverria. Eelgrass research presentation

"Quantitative Analysis of Grid, Transect, Aerial Photography, and Hydroacoustic Monitoring of eelgrass (*Zostera marina*) within Portage Bay, Washington". Vine Deloria Jr. Symposium. Bellingham, WA (7/2015)

5) Emm, J.W., **M.B.A. Hatch**, S. Wyllie-Echeverria. Eelgrass research presentation "Quantitative Analysis of Grid, Transect, Aerial Photography, and Hydroacoustic Monitoring of eelgrass (*Zostera marina*) within Portage Bay, Washington". Northwest Indian College Capstone Presentation. Bellingham, WA (3/2015)
6) Emm, J.W., **M.B.A. Hatch**, S. Wyllie-Echeverria. Eelgrass research presentation "Quantitative Analysis of Grid, Transect, Aerial Photography, and Hydroacoustic Monitoring of eelgrass (*Zostera marina*) within Portage Bay, Washington". Pacific Estuarine Research Society (3/2015)
7) Emm, J.W., **M.B.A. Hatch**, S. Wyllie-Echeverria. Eelgrass research presentation "Quantitative Analysis of Grid, Transect, Aerial Photography, and Hydroacoustic Monitoring of eelgrass (*Zostera marina*) within Portage Bay, Washington". Bellingham State of the Bay Symposium (2/2015)
8) Tadlock S., M.B.A. Hatch, S. Augustine, R.M. Hunter, Emm J.W. *Navigating ecology, Culture and Resilience in the Salish Sea* Panel. Pacific Estuarine Research Society Meeting. March 2015
9) Tadlock S., S. Augustine, M.B.A. Hatch. Research Oral Presentation. Quantifying Food Species Produced by Ancient Clam Garden Technologies of the Salish Sea. National Science Foundation 1994/TCUP Meeting. August 2015
10) Tadlock S., S. Augustine, M.B.A. Hatch. Research Poster Presentation. *Quantifying Food Species Produced by Ancient Clam Garden Technologies of the Salish Sea*. SACNAS National Conference Washington DC. October 2015.
11) Tadlock S., S. Augustine, M.B.A. Hatch. Research Poster Presentation. Quantifying Food Species Produced by Ancient Clam Garden Technologies of the Salish Sea. American Indian Science and Engineering Society National Conference. Phoenix, Arizona. November 2015.
12) Tadlock S., S. Augustine, M.B.A. Hatch. Research Poster Presentation. Quantifying Food Species Produced by Ancient Clam Garden Technologies of the Salish Sea. Emerging Researcher Network Conference. Washington DC. February 2016.
13) Tadlock S., S. Augustine, M.B.A. Hatch. Poster Presentation. Quantifying Food Species Produced by Ancient Clam Garden Technologies of the Salish Sea. Salish Sea Ecosystem Conference, Vancouver, BC 2016.
14) Emm, J.W., **M.B.A. Hatch**, S. Wyllie-Echeverria Eelgrass research presentation "Quantitative Analysis of Grid, Transect, Aerial Photography, and Hydroacoustic Monitoring of eelgrass (*Zostera marina*) within Portage Bay, Washington". National Science Foundation Tribal College and 1994 Land Grant Research Symposium, Washington D.C. (8/2014)