Helping Publics Make Sense of Ocean Sciences: 15 Years of Research at HMSC

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Most of what you know you didn’t learn in school.
Life-long, Life-wide, Life-deep Learning:

Most of your (waking) life is spent outside of school.

69%
Informal Learning: Outside Formal Learning

The foundations for informal learning of topics of interest are typically not supported by a formal education.

Virtual spaces, Maker spaces, Gaming, 4H, Public Science venues, Gardening, Hobbies, Citizen Science

18.5%
Grades K-12

12.8%
Undergraduate and Graduate

Time spent in different learning contexts

Education outside of formal contexts has to be central to our missions

Where do people learn what they know about the ocean?
The biggest source of our STEM knowledge is beyond school.

- **Work**: 23%
  We learn a lot of science and technology from our jobs.

- **School**: 34%
  Ocean science is barely taught in elementary schools in US (for some students only a total of about 6 hours by high school graduation).

- **Free-Choice Learning**: 43%
  Learning from the internet, television, reading, travel, spending time at the beach, seeing the ocean.

Where do people come to CARE about the ocean (or science)?
Biographical Interview with Environmental Professional

Concept Map

- Influence of Friends
- Family / Familismo
- Experiences in Nature
- Informal Education
- Negative Experiences

INFORMAL EDUCATION:
- Bird Watching
- Photograph

PHOTOGRAPHY:
- Love of learning

HIGH SCHOOL (FRANCISCANS):
- En familia

EXPERIENCES IN NATURE:
- Natural environments
- Free outdoor play

ENVIRONMENTAL CENTER:
- Lake Superior & large bodies of water
- Environmental identity

ETHNIC STUDIES:
- Social justice
- Activities with like-minded people
- Mentors

FAMILY / FAMILISMO:
- MENTORSHIP

TRIBAL AND NATIVE LANDS FOR PUBLIC LAND

FORMAL EDUCATION:
- MENTOR
- PhD program
- Master’s (Humboldt)

ENVIRONMENTAL PROFESSIONALS:
- Evolved from hiking & camping to social justice

SUSTAINABLE LANDSCAPES:
- Mentors

Visitors to HMSC merge these in complex ways. Visitors draw freely on both what they know and what they care about in making sense out of their experiences at places like HMSC in ways that schools just don’t allow. And this is powerful for learning science and identities.

To advance the art and science of Free-Choice Learning
We reimagined the Visitor Center and Marine Education Program as research labs.

- Holt Award of $5,000
  - Matched by Confederated Tribes of Siletz, Georgia Pacific, and an anonymous donor.
  - Matched by
  - 2004

- Grant funding
  - 5.7 Million Dollars

- Graduate Students doing research
  - 52

- Publications about learning research done at HMSC
  - 40

- 2019

We started small
We started pretty basic...
Surveys and lurking helped us track visitors’ talk and learning.
The Cyberlab Observation Network

Like sensor arrays in the ocean, the CyberLab’s observation network gathers layers of data and allows researchers remote access.

- Surveillance Cameras
- Microphones: Audio Capture
- Face Recognition
Mobile Cyberlab: Making the platform international
Why do Marine Labs matter in the landscape of lifelong STEM learning?

But, why do it here?
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Why do Marine Labs matter in the landscape of lifelong STEM learning?

Answering that question requires a ramped up approach.
Networks of research sites allow us to address issues of equity, access, and pathways into and through marine sciences in ways no single lab can do.

They also allow us to seriously frame research to address the long list of contemporary educational issues for universities.
Learn more at the website or email me shawn.rowe@oregonstate.edu