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

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**FCL
LAB**

**FREE-CHOICE
LEARNING**

at the Hatfield Marine Science Center



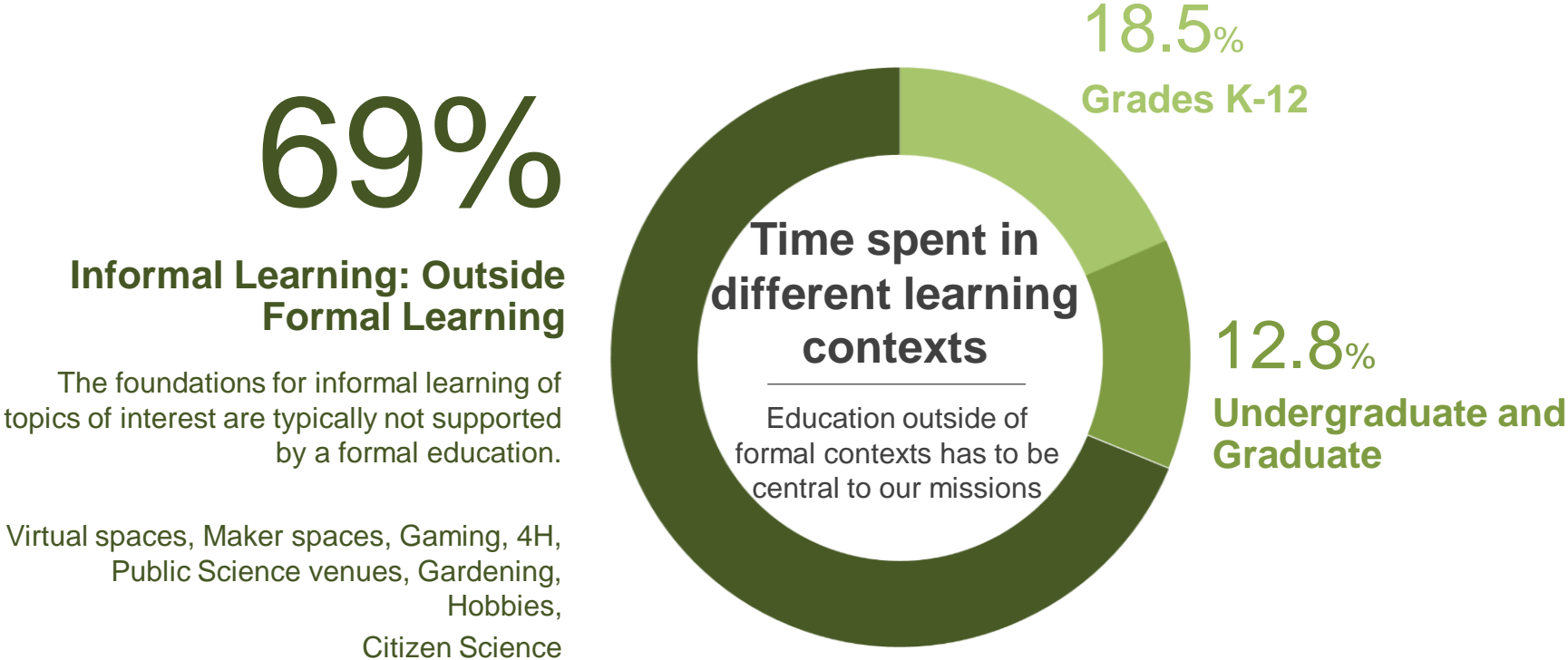
**Oregon State
University**

Most of what you
know you didn't
learn in school.

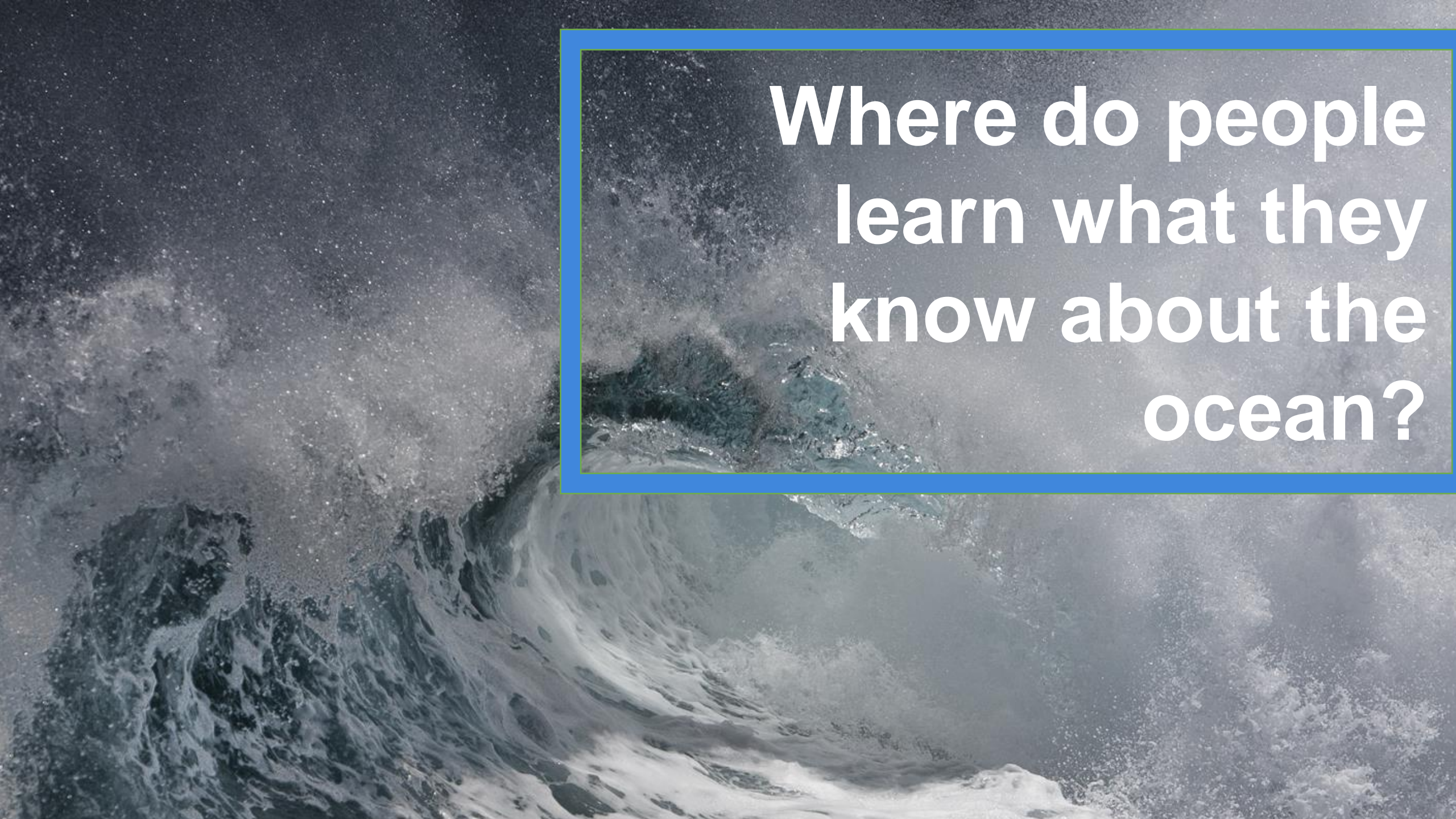


Life-long, Life-wide, Life-deep Learning:

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



Adapted from Banks, J., Au, K., Ball, A. F., Bell, P., Gordon, E., Gutierrez, K., Brice-Heath, S., Lee, C., Mahiri, J., Nasir, N., Valdes, G., Zhou, M. (2007). *Learning in and out of school in diverse environments: Life-Long, Life-Wide, Life-Deep*. The LIFE Center (University of Washington, Stanford University and SRI) & the Center for Multicultural Education, University of Washington.

An aerial photograph of a coastline, showing a dark, rocky shore on the left and a lighter, sandy beach on the right. The ocean is visible in the lower right. A blue rectangular box is overlaid on the right side of the image, containing white text.

**Where do people
learn what they
know about the
ocean?**



The biggest source of our STEM knowledge is beyond school.

23%

Work

We learn a lot of science and technology from our jobs.

34%

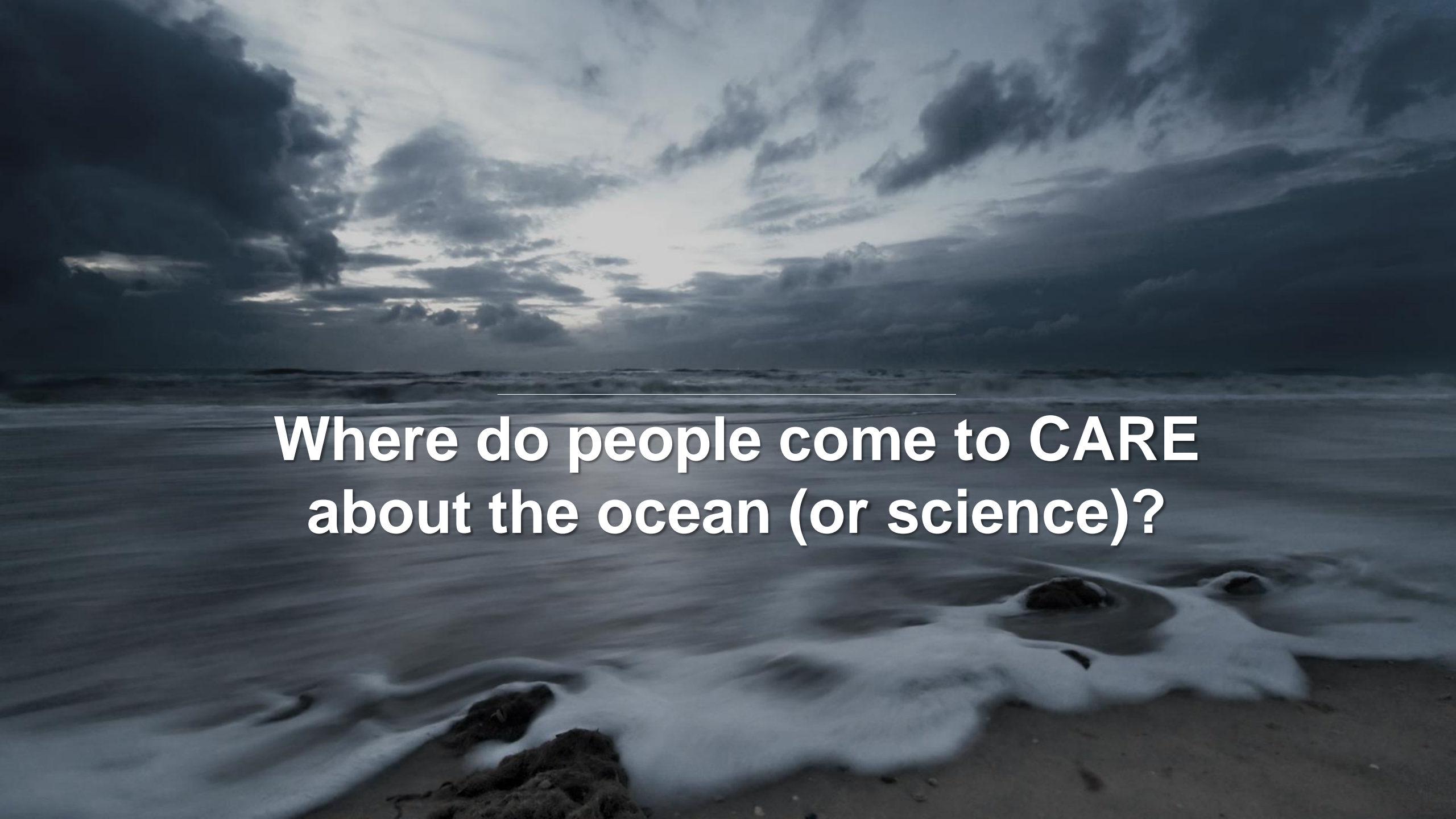
School

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

43%

Free-Choice Learning

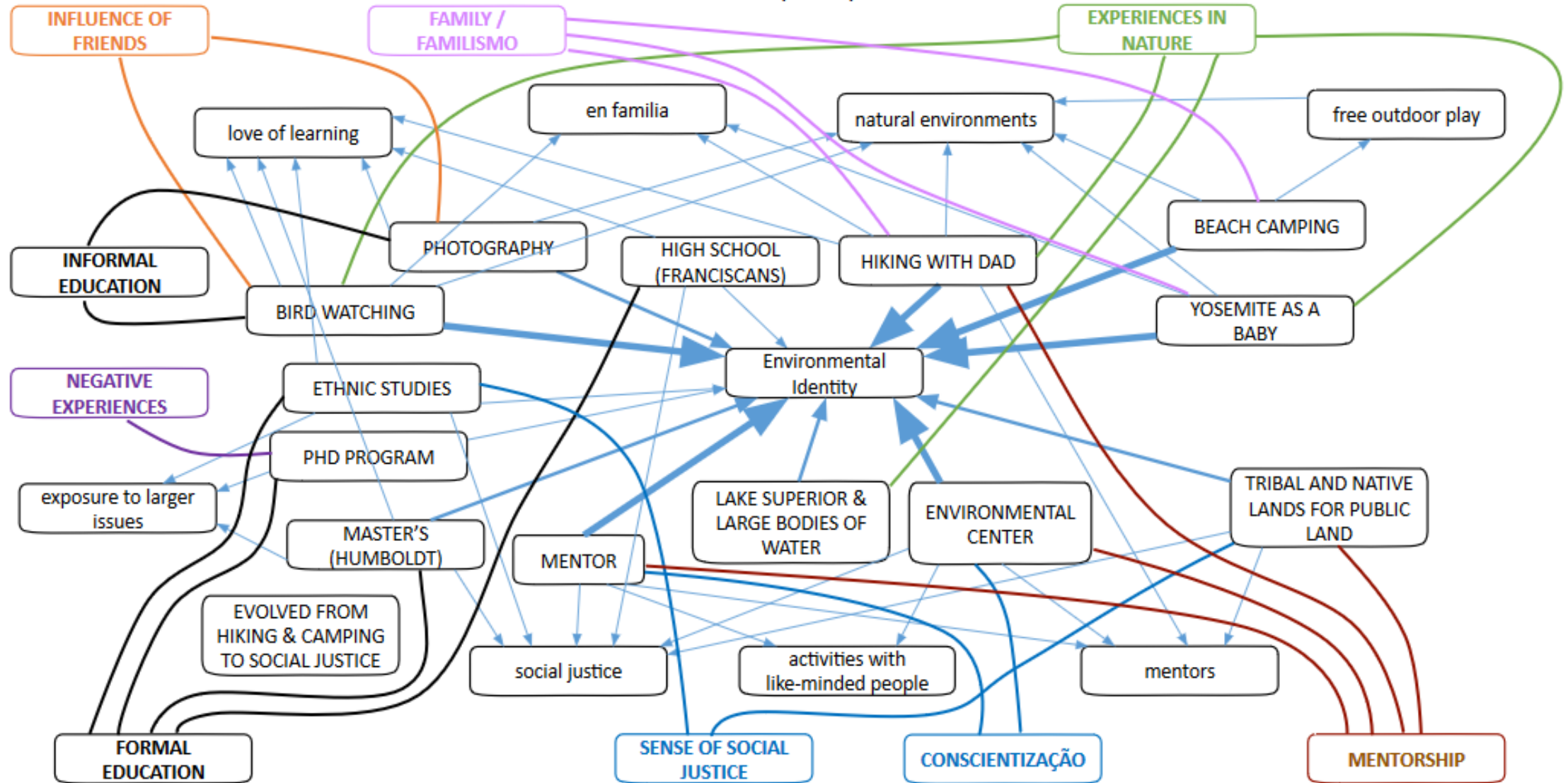
Learning from the internet, television, reading, travel, spending time at the beach, seeing the ocean.

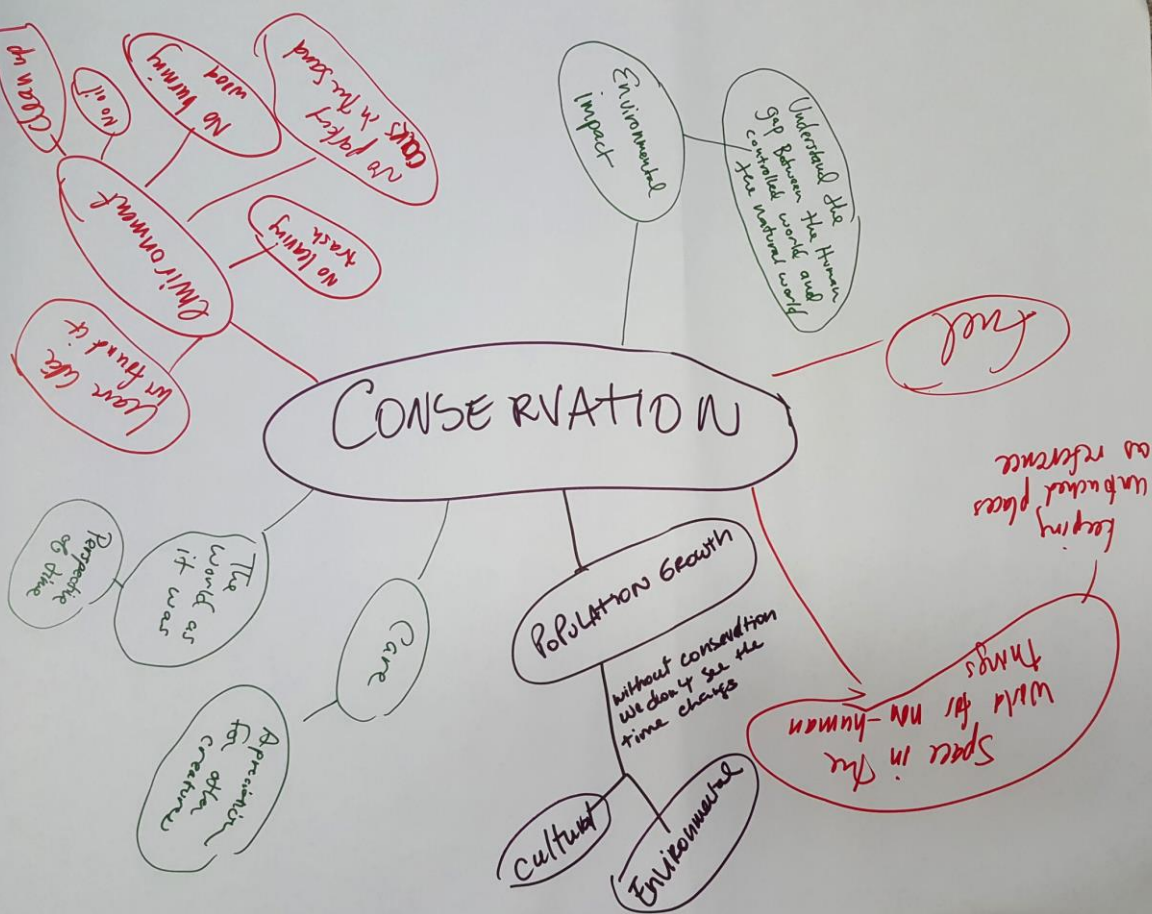


**Where do people come to CARE
about the ocean (or science)?**

Biographical Interview with Environmental Professional

Concept Map





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.**

Rowe, Susan. (2018). Family Engagement in Live Animal Touch Tank Activities: A reflective discourse analysis of family meaning making and conservation talk. Doctoral Dissertation, Oregon State University, Corvallis.



FCL
LAB

FREE-CHOICE
LEARNING

at the Hatfield Marine Science Center

**To advance the art and science
of Free-Choice Learning**

We reimagined the Visitor Center and Marine Education Program as research labs.

We started small

Holt Award of \$5,000

Matched by Confederated Tribes of Siletz, Georgia Pacific, and an anonymous donor.

5.7 Million Dollars
Grant funding

52
Graduate Students doing research

40
Publications about learning research done at HMSC

2004

2019



We started pretty basic...

Surveys and lurking helped us track visitors' talk and learning.

Your initials _____ obs. # _____

Focused Observation

Exhibit name _____

Date: _____ Time of day: _____

Location:

• Passers by:

• Individual or Group interaction

- Number in group
- Multigenerational peers: adults kids
- Who is doing the interaction: Who is observing:
- Who initiates the activity?

• What are they doing? (make a column per person and fill them out sequentially to see co-occurring actions)

• Total engagement time:

• Notes



Handwritten notes and a floor plan diagram. The notes include:

Time 1:49-2:14
Date 15 Oct Survey # 3
M (F)
under 6 (6-10) 11-14 15-17
18-24 25-32 33-45 46+
Group size: 2 3 4 (5) 6 6+
Type: Peer (Multigener)
Language: English
Multicultural group? EA

1)
2) RAL I D / QK
3) <10
4) <10
5) KPA / I + A / DesA / AQ / KA / Des (with wife)
6)
7)
8)
9) KQ
10)
11) DesA / I D / RAL A I
12) K Des / AQ / KQ / DesA / (slow)
13) DesA / I D / RAL A I
14)
15)
16)
17)

The floor plan diagram shows a layout with numbered points (1-17) and labels like 'Octopus', 'PG1', and 'PG2'. Handwritten notes on the diagram include 'Crowding light', '# staff 4', '7:46 T:38', 'pulling away', and '40'.

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**



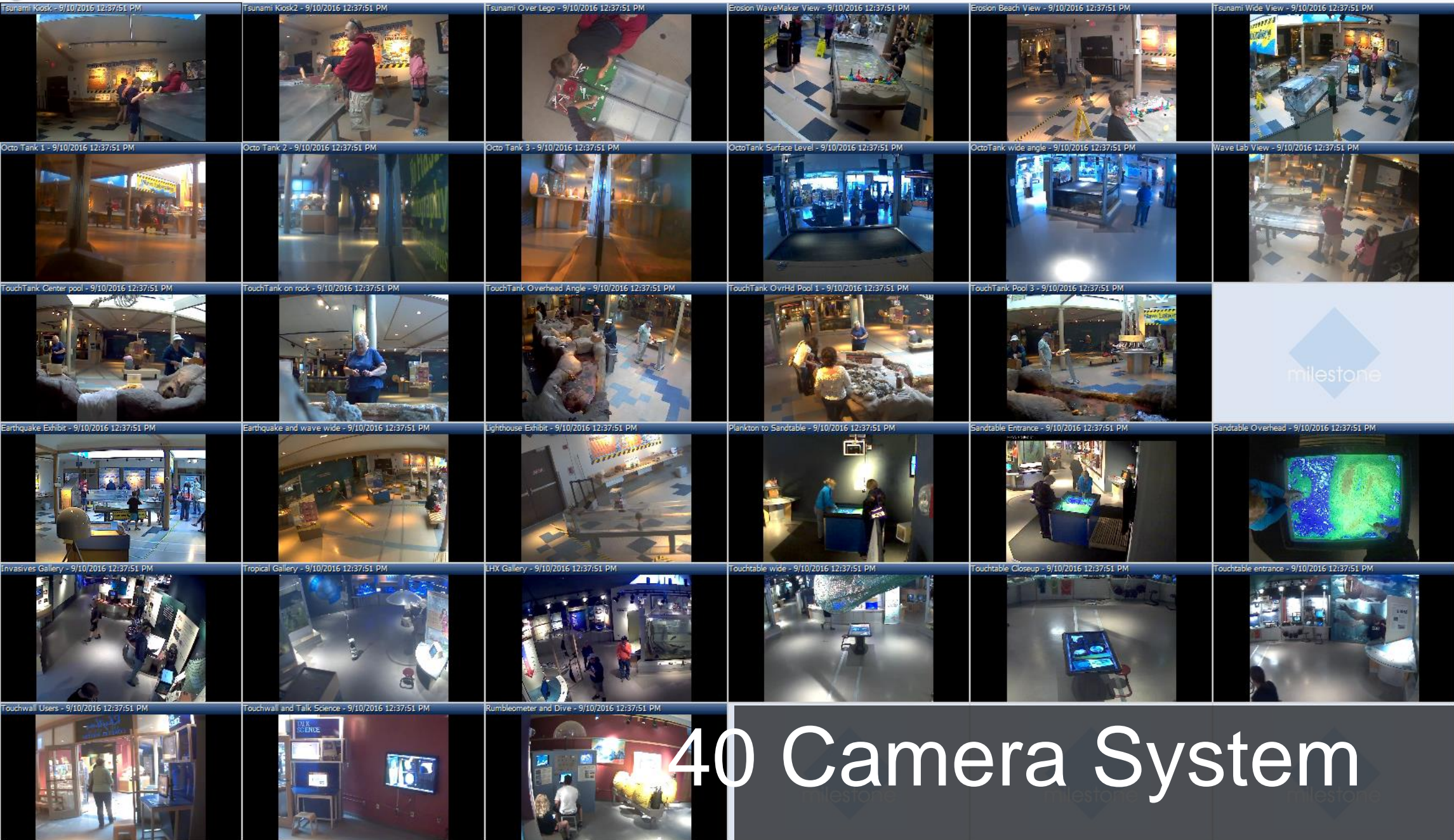
**Microphones: Audio
Capture**



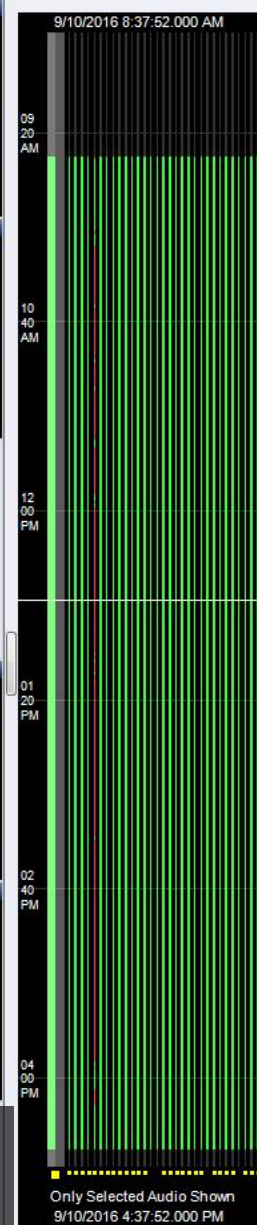
**Face
Recognition**



All_2



40 Camera System



Span
 8 hours
 Newest images at top

Mobile Cyberlab: Making the platform international





But, why do it here?

Why do Marine Labs matter in the landscape of lifelong STEM learning?



~~But, why do it here?~~

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.

- K-Grey
- Big Data
- Retention
- Recruitment
- Authenticity
- Student Success
- Learning Ecologies
- Experiential Education
- Place-based Education
- Landscapes of Education
- Trans-disciplinary Education

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

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