OCEAN
MEMORY
PROJECT

A Cross-Disciplinary Approach to Global Scale Challenges

Memory is the faculty of the mind by which information is encoded, stored, and retrieved.

(Atkinson & Shiffrin, 1968)

Ocean Memory: The ability of biological and physical oceanic systems to encode, store, and release information across a variety of timescales, from hourly to geological, impacting the future.

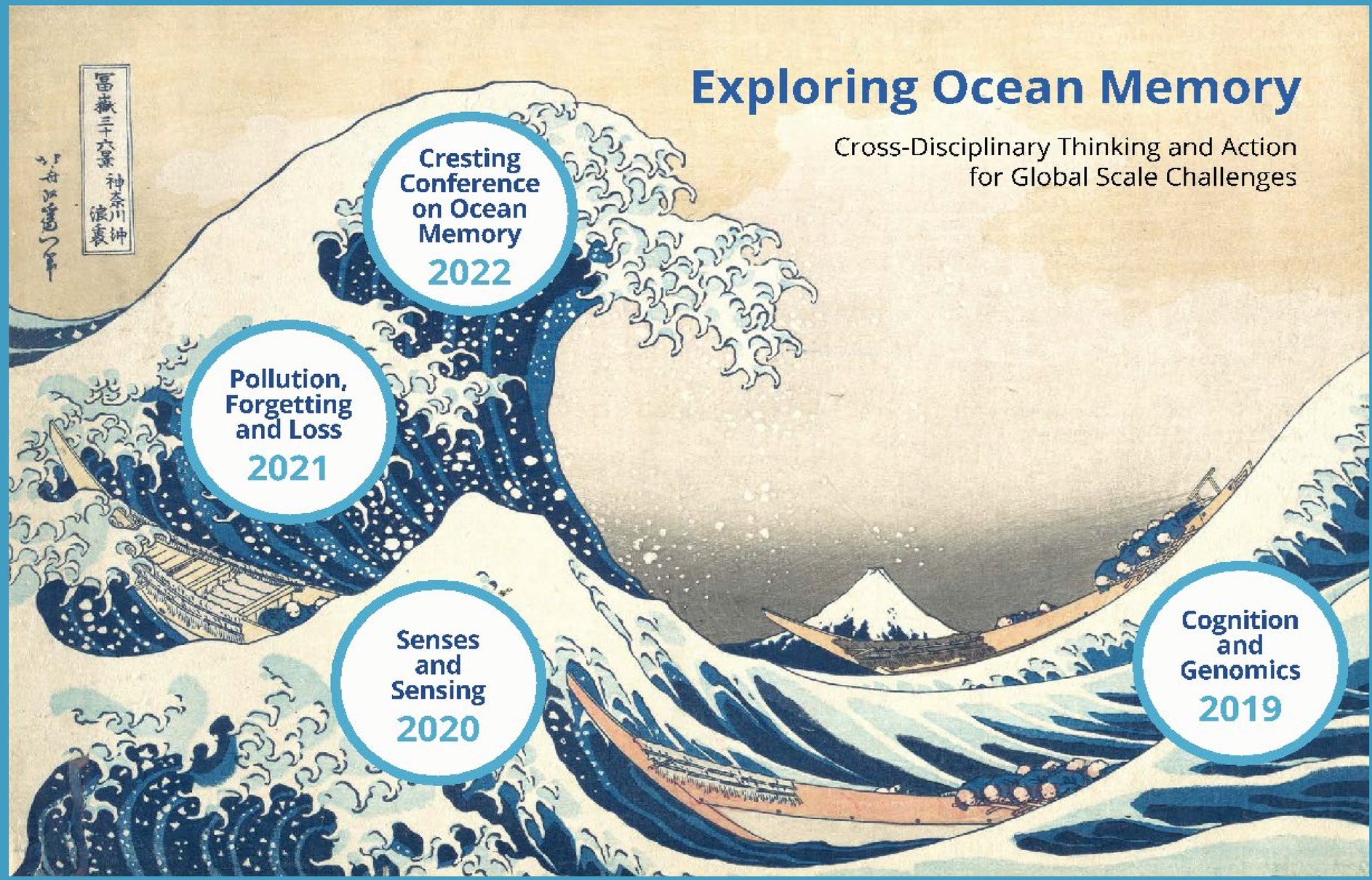
(Predicted Wikipedia entry, 2025)

The Ocean Memory Project

What is the OMP?

We are a collaborative network of researchers across the Sciences, Arts and Humanities dedicated to exploring the intersection of Ocean and Memory, and advancing a new field of scholarship and creative expression.

The OMP creates means and methodologies for shared experience across cultural, disciplinary, and economic boundaries.



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Perspectives and opinions within our collective are wide - ranging and not always compatible.

We find that they spark creativity.

We believe that this diversity of viewpoints is a strength, one that enriches the ways in which we can understand the ocean and the world.

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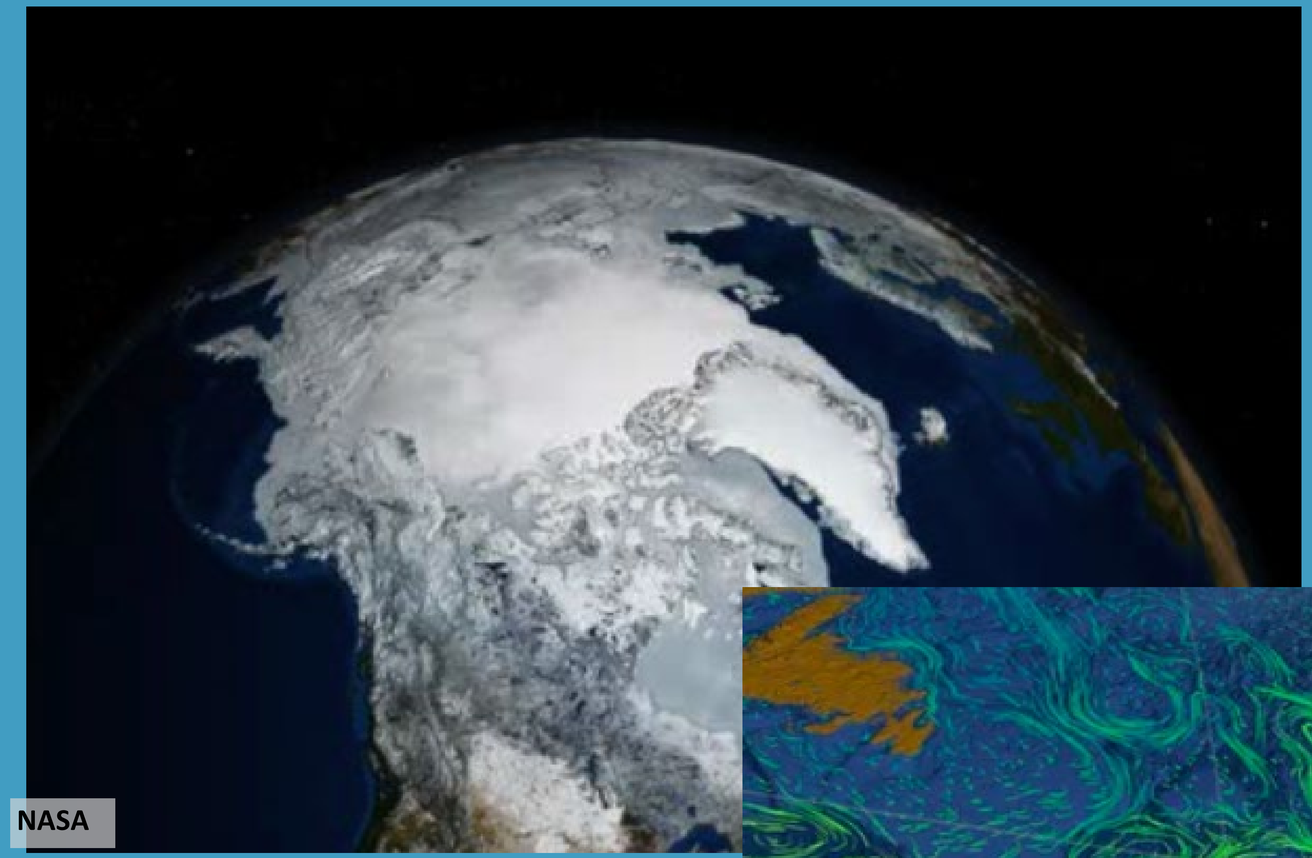
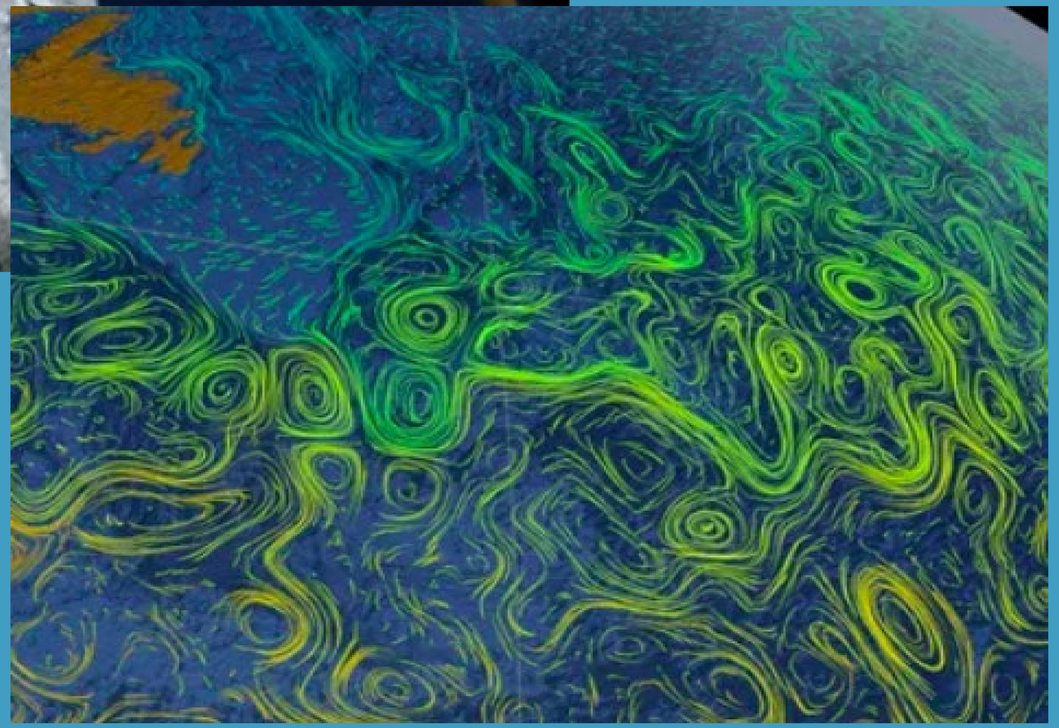
The science underpinning Ocean Memory begins with abiotic systems.

Memory is lost and gained during the annual cycle of sea ice. Preceding months influence the timing and extent of ice formation, in turn influencing ice thickness and onset of melt the next year (Blanchard-Wrigglesworth et al., 2011). People of the North depend upon this ice.

Memory characterizes ocean eddies – their trajectories are more accurately predicted when their prior history is taken into account (Manucharian et al., 2017). Climate models need such accuracy.



NASA



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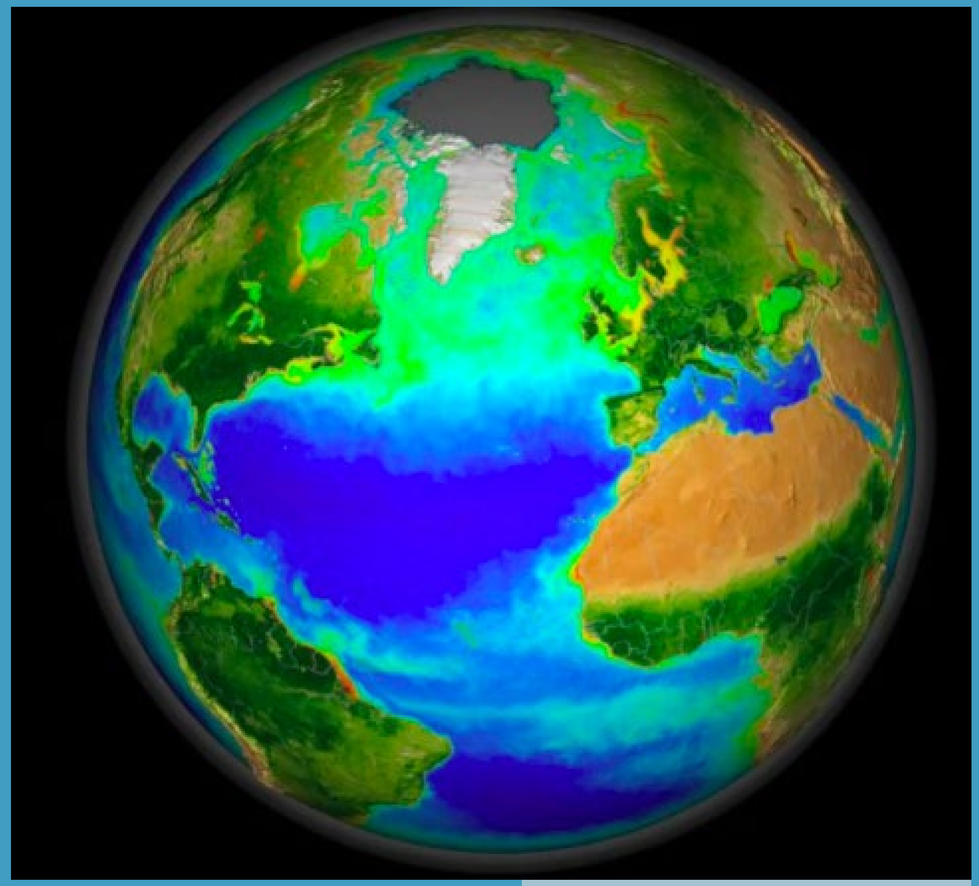
Examples of Ocean Memory extend to biological systems.

Memory clearly exists in ecosystems, where past events influence ongoing trajectories.

Portions of the Great Barrier Reef previously exposed to warming events show resilience in the face of the next exposure (Hughes et al., 2019).

Preceding winter events both trigger and constrain the North Atlantic spring bloom that influences local fisheries and global climate (Behrenfeld, 2010; Lacour et al., 2017).



http://oceancolor.gsfc.nasa.gov/

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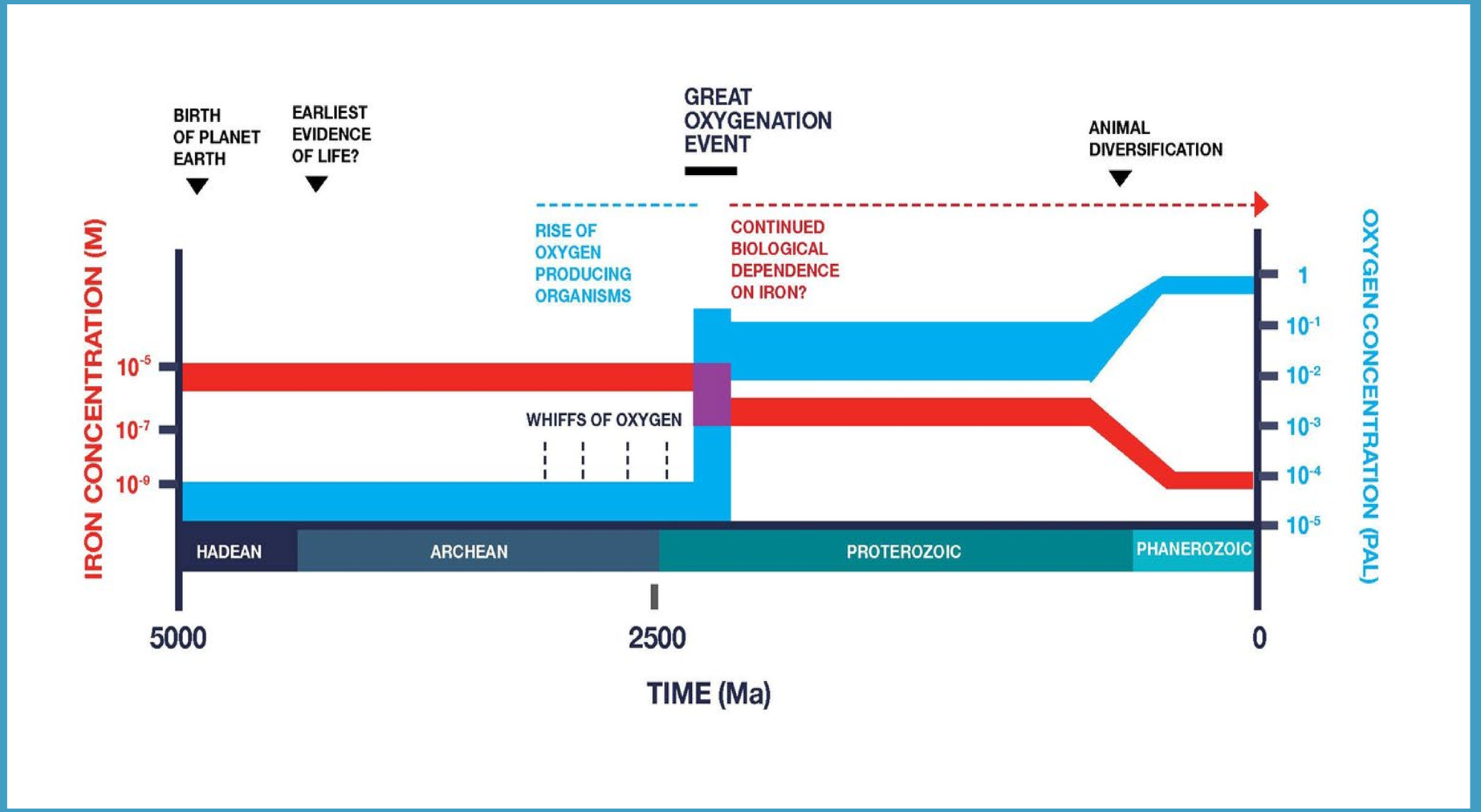
Overall, the memories of our ocean – more than 4 billion years old – must be boundless.

Lineages of microbial life that evolved in an ancient ocean under different chemical conditions flourish in specific niches today.

Through their viruses and metal-requiring enzymes, microbes retain genetic memories of past conditions. Some memories may be triggered as the ocean warms, acidifies and deoxygenates with climate change, increasing their fitness for the roles they will play in future ecosystems.



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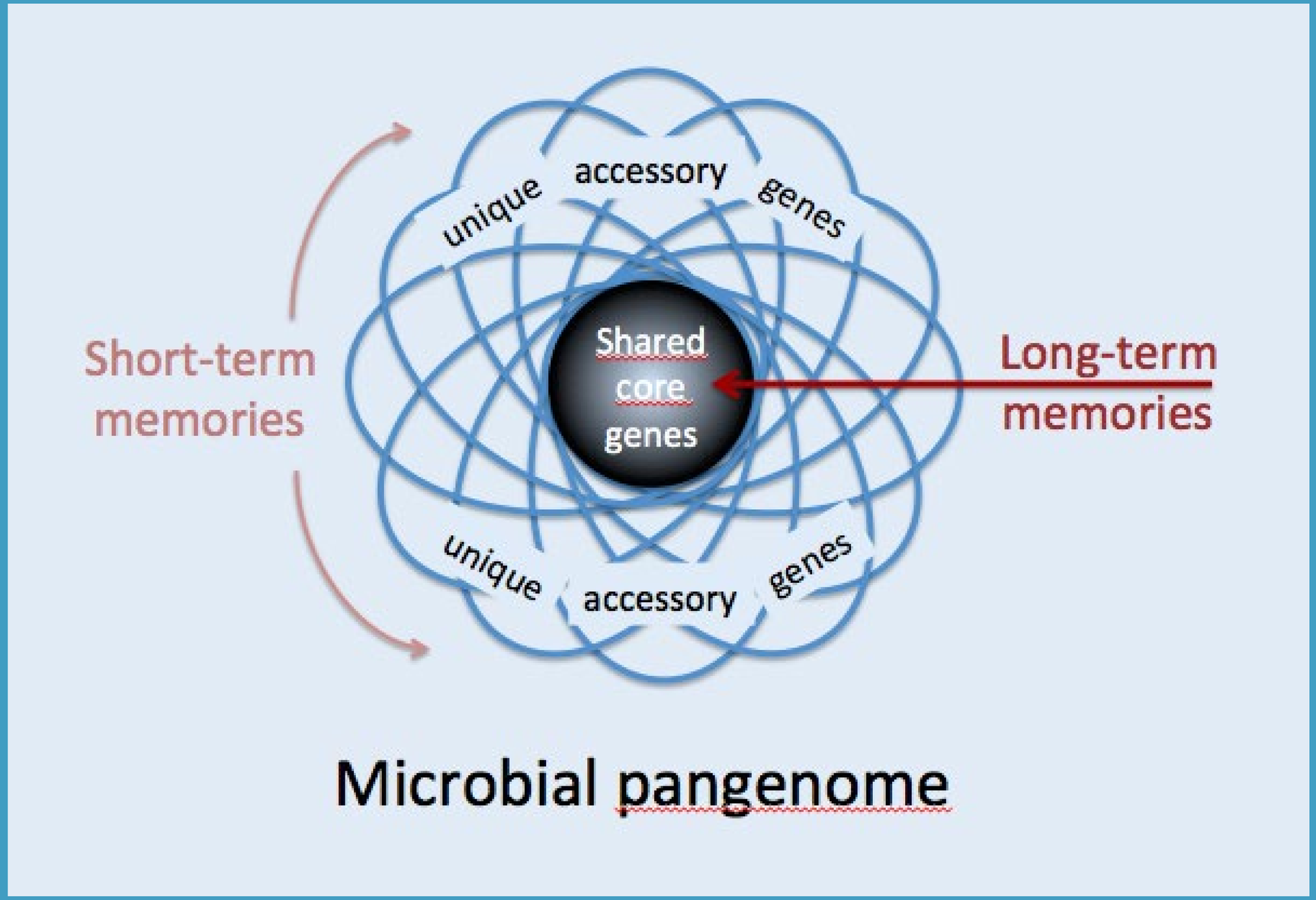
Memories held by the ocean's microbes can be accessed through their pangenomes.

DNA sequencing reveals core genes shared by a population and accessory genes unique to the individual experience.

Core genes represent long-term memories of living under past oceanic conditions; accessory genes, short-term memories of what they need to thrive today.

...just as we rely upon short- and long-term memories for our individual and collective well-being.



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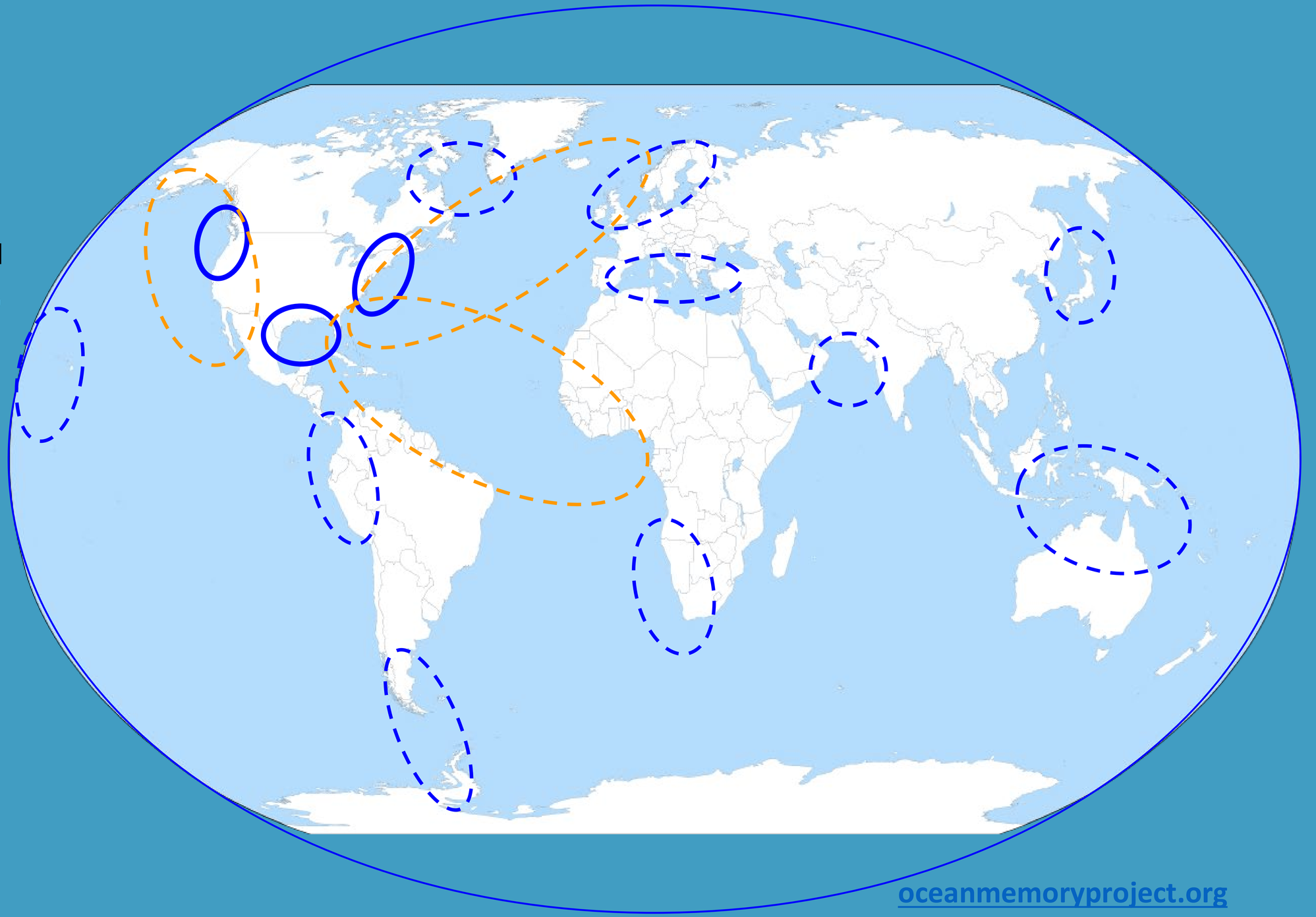
A Network of Nodes

OMP's vision is to grow a network of interconnected regional or themed nodes, each able to engage with an array of local challenges and partners while remaining in dialog with our larger community of thought and practice, thus allowing for engaged community growth that links people, and a growing knowledge base, from local to global scale.



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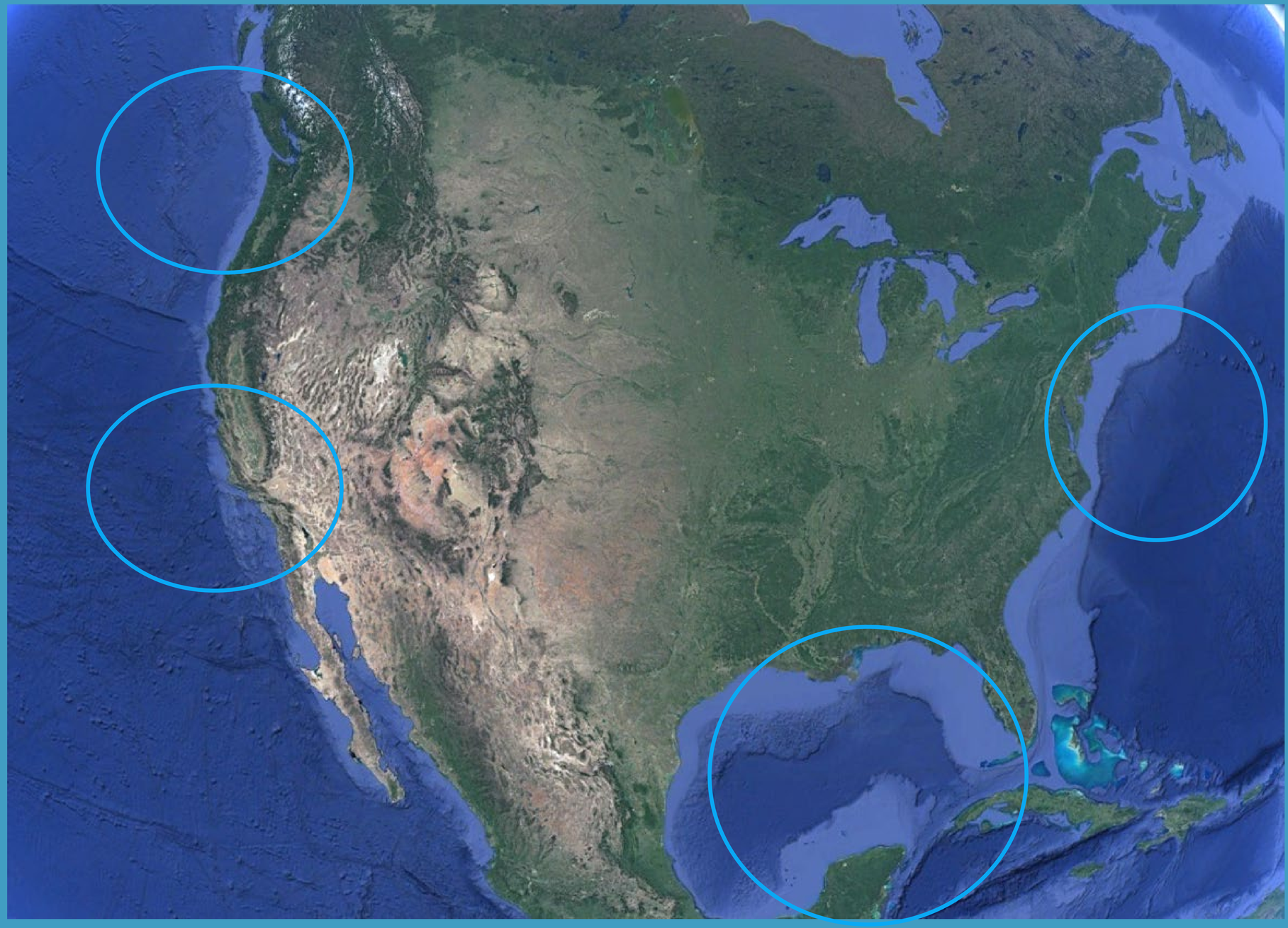
A Network of Nodes to connect us Locally

Initial experimental Nodes will be developed by the Ocean Memory Project in the United States, with partners in Canada and Mexico, as prototypes for a larger global network.
nodes will develop from local knowledge and issues and learn from each other.



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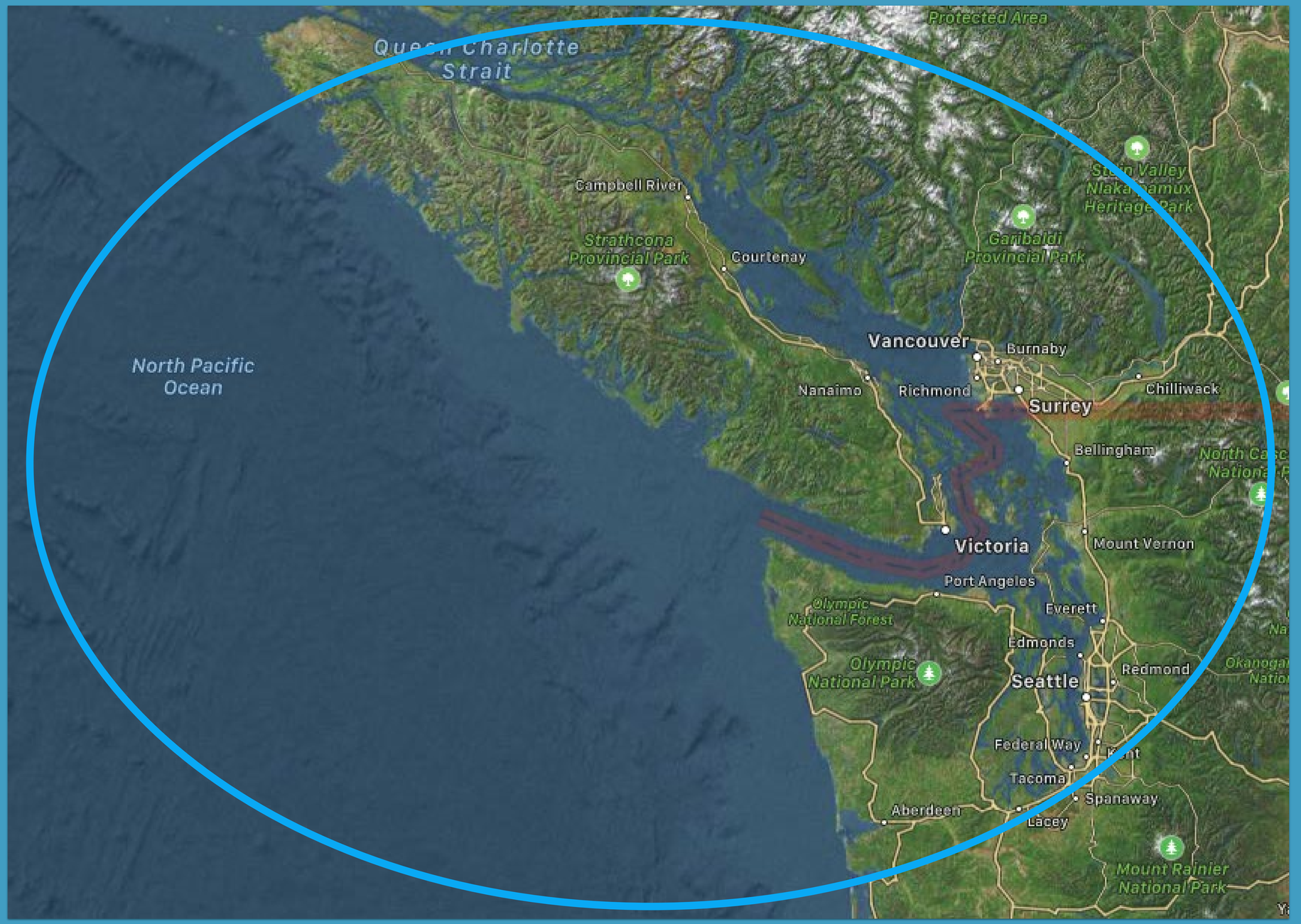
A Network of Nodes to connect us Locally and Globally

As an example, building on our 2019 research cruise aboard the R/V *Rachel Carson* in the Salish Sea, the Pacific Northwest Node will connect people on both sides of the border, across the cultural and economic spectrum, as well as public and private sectors, to explore local issues through the lens of Ocean Memory: fisheries, conservation, First Nation rights, treaties, shipping, oil, orcas, salmon.



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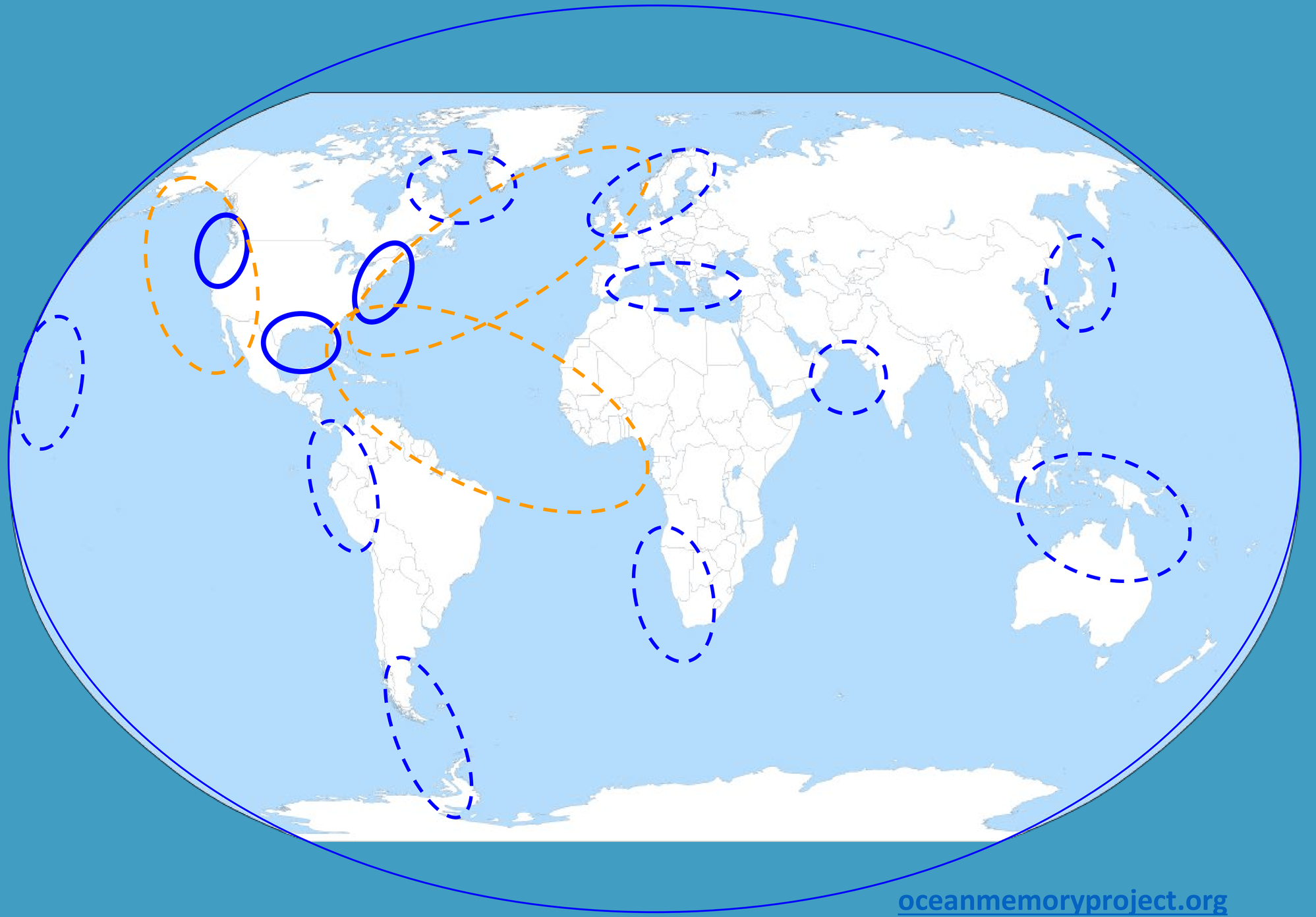
A Network of Nodes to connect us Locally and Globally

Reaching across the global ocean together we can learn from the ocean's memories of past conditions, short - term and long - term, to better prepare for our collective future.



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We are interested in your ideas and potential Nodes

Please contact us

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