# BASIN-SCALE EVENTS & COASTAL IMPACTS PROJECT

*Uniting the North Pacific to Better Understand the Ocean We Share*

## The North Pacific Challenge: Connecting the Pieces of a Changing Ocean

The North Pacific Ocean is experiencing unprecedented transformation. Marine heatwaves are growing more frequent and intense, ocean chemistry is changing rapidly, and species are shifting their distributions across political boundaries. These climate-driven changes threaten fisheries worth billions of dollars, conservation efforts, and coastal communities throughout the Pacific Rim.

**Despite substantial research across the region, we face a critical integration challenge.** Knowledge about these changes exists but remains fragmented across different countries, institutions, and databases. No single entity currently connects this knowledge at the scale needed to develop comprehensive understanding of emerging patterns and support coordinated responses across jurisdictions.

**This fragmentation has real consequences:**

- Marine heatwaves cause over $100 million in fisheries losses before we fully understand their scope
- Fish populations shift across borders faster than management systems can adapt
- Protected areas become ineffective as species move away from designated conservation zones
- Research efforts duplicate work while critical knowledge gaps remain unfilled

**This matters because the North Pacific operates as a connected system.** When ocean conditions change in one region, effects ripple throughout the ecosystem—creating new predator-prey interactions, shifting fishing grounds, and transforming coastal communities.

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## The Solution: A Comprehensive Ocean Knowledge Network

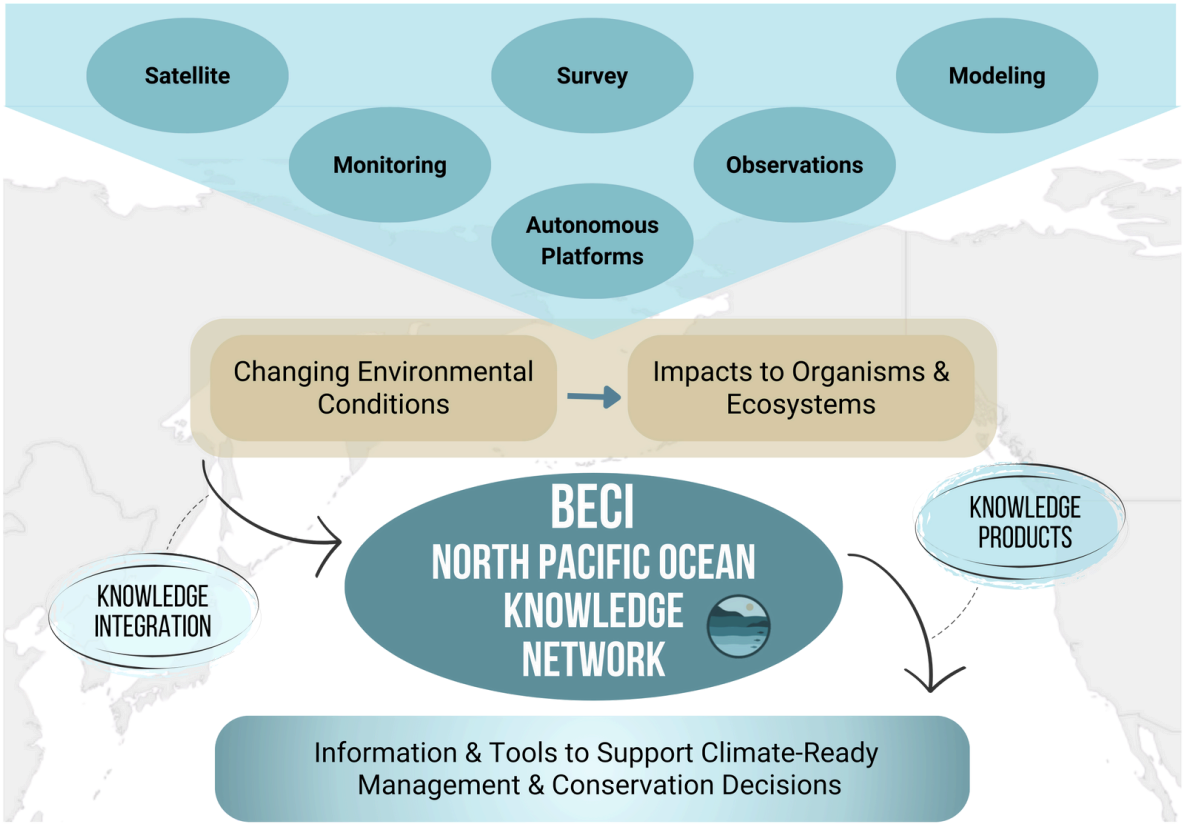
The BECI project is creating the **North Pacific Ocean Knowledge Network**, a groundbreaking collaborative framework that transcends traditional boundaries—connecting researchers, managers, and communities across the Pacific Rim.

**BECI's approach aims to:**

- **Integrate diverse knowledge types** – from scientific monitoring and satellite data to local and traditional knowledge
- **Span political boundaries** – creating timely information flow across jurisdictions

- **Connect time horizons** – linking historical context with current observations and future predictions
- **Bridge disciplines** – combining physical, biological, and social science perspectives
- **Transform knowledge into action** – creating practical tools to support decision-making

This unified approach enables us to identify emerging patterns more rapidly, develop deeper understanding, and respond more effectively to environmental challenges across the entire North Pacific region.




Our development follows three progressive phases:

### Phase 1 (Years 1-2): Building Connections

- Map existing data sources and research activities across the North Pacific
- Establish data sharing protocols and standards
- Create initial synthesis products for priority issues

### Phase 2 (Years 2-3): Enhancing Integration

- Develop cross-regional analysis capabilities
- Create standardized frameworks for comparing information
- Build visualization and analysis tools
- Integrate AI and machine learning approaches to analyze cross-regional patterns, detect anomalies, and enhance data integration across diverse sources

### Phase 3 (Years 3+): Advanced Applications

- Add forecasting capabilities where scientifically appropriate
- Develop comprehensive decision support tools

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## Real-World Applications

Our knowledge network addresses urgent management priorities through specific use cases that translate research into practical solutions for both fisheries and conservation managers. For example:

### Understanding Marine Heatwaves Before They Devastate Fisheries

**Problem:** Marine heatwaves can devastate fisheries worth hundreds of millions of dollars, but managers often don't understand their full impact until it's too late.

**BECI Solution:** We're systematically connecting research from past and current marine heatwave events across the North Pacific to help managers understand which species are most vulnerable, what impacts to expect, and which response strategies have proven effective in similar situations.

### Transboundary Species Distribution Shifts

**Problem:** As ocean temperatures change, valuable fish populations are shifting to new areas, but countries often don't recognize these shifts until fishing communities are already affected.

**BECI Solution:** We're combining species distribution research from across the Pacific to map where important fish stocks are likely to move next, helping managers coordinate across borders and prepare fishing communities for changes before they happen.

### Climate-Adaptive Spatial Conservation Planning

**Problem:** Many marine protected areas no longer contain the species they were designed to protect, as changing ocean conditions force wildlife to move to new areas.

**BECI Solution:** We're developing planning tools that help conservation managers design protected area networks that can adapt as species distributions shift with changing climate conditions.

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## Knowledge Products

BECI transforms fragmented information into practical knowledge products that managers and conservationists can actually use:

**Knowledge Integration Platforms** - Interactive dashboards, maps and databases that connect research from across the Pacific, revealing basin-wide patterns and successful management

approaches that no single country could identify alone.

**Planning Resources** - Guidelines and frameworks that help managers design adaptive strategies for fisheries and conservation, incorporating climate projections to ensure effectiveness even as ocean conditions change.

**Response Toolkits** - Evidence-based guidance synthesized from experiences across the North Pacific, helping managers quickly implement proven solutions when facing marine heatwaves, species shifts, and other climate challenges.

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## Benefits for Partners

BECI provides tailored advantages to key partner groups:

- **Researchers:** Connect your data with international partners, enable cross-regional comparisons, and enhance your research impact through translation into management tools.
- **Fisheries Managers:** Access comparable data from similar ecosystems, understand how local changes fit into basin-wide patterns, and learn from approaches that have worked in similar situations elsewhere.
- **Conservation Organizations:** Identify emerging conservation priorities through integrated climate and biological data, access climate-adaptive planning frameworks, and coordinate conservation efforts across national boundaries for migratory species.
- **Indigenous Communities:** Share traditional ecological knowledge while maintaining data sovereignty, access broader scientific context for local observations, and connect with other communities facing similar ocean changes.

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## Our Collaborative Network

BECI is built on collaborative relationships spanning the North Pacific. Co-developed by the North Pacific Marine Science Organization (PICES) and the North Pacific Anadromous Fish Commission (NPAFC), our network aims to bring together:

- **Research institutions** from all Pacific Rim nations
- **Government agencies** responsible for marine resource management
- **Fishing industry and seafood sector partners**
- **Indigenous communities** with deep knowledge of coastal ecosystems
- **Industry partners** dependent on healthy marine environments
- **Conservation organizations** working across international boundaries

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# Join Us in Building Climate Resilience

The climate crisis demands unprecedented collaboration. Your participation strengthens our collective ability to understand and respond to ocean change across the North Pacific.

## Get Involved Today:

- **Connect with us:** Contact BECI@pices.int to discuss your interests and how our work aligns with your priorities
- **Participate in our community:** Join our monthly workshops, complete our needs survey, or explore our pilot projects
- **Choose your engagement path:** Whether as a Knowledge Partner sharing data, a Use Case Contributor shaping initiatives, an Early Adopter implementing tools, or a Resource Partner supporting expansion

Early participants help shape BECI's priorities while gaining first access to integrated knowledge products and analytical capabilities.

## Some of our current partners include:

FishMIP Fisheries & Marine Ecosystem Model Intercomparison Project
BLUE FOOD FUTURES
Smart Net
FishSCORE 2030 Fisheries Strategies for Changing Oceans and Resilient Ecosystems
NOAA
SUPREME Sustainability, Predictability and REsilience of Marine Ecosystems
Pacific States Marine Fisheries Commission
2021 2030 United Nations Decade of Ocean Science for Sustainable Development
MARTIN CONSERVATION DECISIONS LAB
LONG LIVE THE KINGS
PICES
THE UNIVERSITY OF BRITISH COLUMBIA Faculty of Forestry
Fisheries and Oceans Canada
Pêches et Océans Canada
NPAFC
North Pacific Research Board

## Interested in Exploring Partnership Opportunities? Contact us.

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