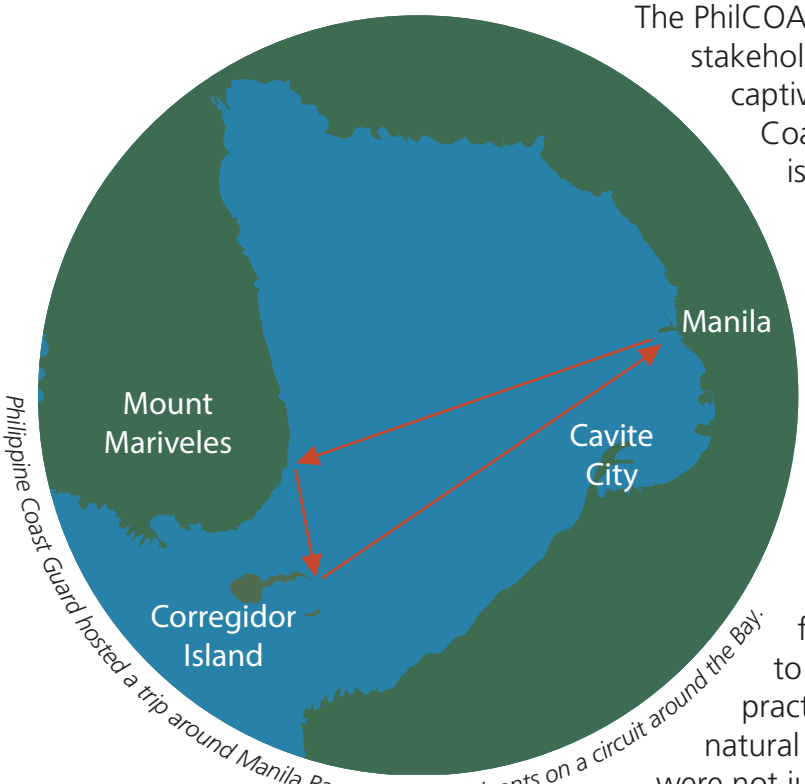
Manila Bay Stakeholder Workshop and Conference

Getting to know Manila Bay, Philippines



Philippine Coast Guard hosted a trip around Manila Bay, taking participants on a circuit around the Bay.

The PhilCOAST team, the COAST Card members, and stakeholders from Manila Bay ventured onto a captivating maritime adventure led by the Philippine Coast Guard upon the *BRP Capones*. Manila Bay is a crucial maritime trade hub, evident from the cargo ships and freighters anchored in the port the trip departed from. The Bay's local fishing industry was on full display, with a fleet of fishing boats nestled serenely but actively fishing in the middle of the Bay.

The trip's climax was a stunning panoramic view from the mouth of the Bay, the historical Corregidor Island, which showcased the Bay's complex and multifaceted role in the region—from supporting the region's economy to exemplifying the need for sustainable practices to protect and preserve the Bay's natural beauty and resources. The day's experiences were not just about observing from afar; they were about understanding the harmony and conflicts within this waterbody that serves as a lifeline for millions.

The five countries within COAST Card work in collaboration to implement the projects three main goals first at each study site, then in more locations across the globe.

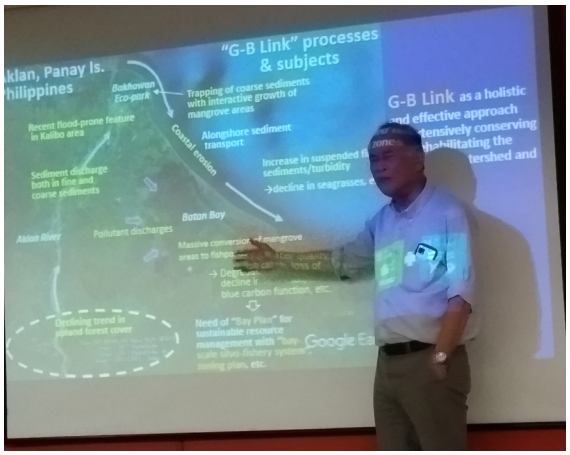
Manila Bay as a key coastal area of an archepelagic country

Manila Bay, with 150 meters of coastline, is 50 meters at its deepest and connected to the freshwater Laguna Lake. The watershed is bounded by three administrative regions—the National Capital Region (NCR), Central Luzon (Region III), and the Southern Luzon Cluster 1 (Region IV-A).

Fishing is prevalent in the southern NCR and coastal areas of Cavite, while aquaculture occurs in Bulacan and Pampanga. Manila Bay is considered one of the world's great harbors, with two ports—North and South Harbors—protected by breakwaters. Rapid urbanization has resulted in environmental degradation such as solid waste management, water pollution, land reclamation, and intense aquaculture that has largely changed its ecological and physical features.

BlueCARES and Green-Blue Link

The "Comprehensive Assessment and Conservation of Blue Carbon Ecosystems and Services in the Coral Reef Triangle" (BlueCARES) is a tri-lateral project between Japan, the Philippines, and Indonesia under the SATREPS program co-funded by Japan International Cooperation Agency (JICA) and Japan Science and Technology Agency (JST). The project establishes and proposes a "Blue Carbon Strategy," including the introduction of the Green-Blue Carbon Ecosystem Linkage Framework (G-B Link) at selected sites in the Core-and-Network System (CNS). The G-B Link seeks to achieve a holistic and integrated resource management and ecosystem conservation policy and plan. The results of a study in Aklan, Panay Island, Philippines were presented as an example of the success of the G-B Link implementation.



Professor Nadaoka presents on the G-B Link, BlueCARES project. Photo credit: Sidney Anderson.

Transdisciplinary collaboration promotes progress

Addressing Manila Bay's challenges requires a multi-tiered approach through local, regional, national, and international partnerships. These partnerships combine community-driven action, policy innovation, and scientific research, ensuring a holistic approach to restoring and protecting Manila Bay's socio-environmental systems.

Participants and speakers present on various work. Photo Credit: Sidney Anderson.

- Locally, partnerships with communities and local governments support sustainable waste management, fisheries protection, and ecological monitoring, as seen in Oceana Philippines' efforts. This reinforces compliance with the Supreme Court's Writ of Mandamus (2008), which mandates government agencies to rehabilitate Manila Bay.
- Nationally, Future Earth Philippines (FEPP) and agencies such as Department of Environment and Natural Resources, Bureau of Fisheries and Aquatic Resources, and National Economic Development Authority align science-based governance with policy, reducing ecological footprints, improving environmental enforcement, and promoting sustainable fisheries and climate resilience strategies.
- Regionally, organizations like PEMSEA (Partnerships in Environmental Management for the Seas of East Asia) integrate coastal and river basin management. Projects that target plastic waste reduction and marine pollution mitigation complement coastal restoration policies.
- Internationally, initiatives like BlueCARES (Japan-Philippines-Indonesia) and the Belmont Forum COAST Card project contribute to blue carbon conservation, climate mitigation, and marine sustainability, reinforcing the Philippines' commitments to the UN Sustainable Development Goals (SDGs) and the Paris Agreement.

Get the Grade! showed the value of cooperation

Get the Grade! is an interactive workshop activity in the form of a game. The original development of this game targeted river basins, and was co-developed by World Wildlife Fund, Emerson College, and the University of Maryland Center for Environmental Science. Get the Grade! was adapted to coastal systems for use in the Manila workshop. The game involves role playing with voting, decisions, and partnerships. External events also affected the outcomes, but the central lesson that Get the Grade! provided was that cooperation was beneficial for obtaining the best result. Eight competitive teams vigorously vied for prizes.

Get the Grade! game board.

Participants play Get the Grade! Photo Credit: Thong Nguyen.

Participants identified more areas for collaboration

Manila Bay's governance network involves government agencies, academic institutions, NGOs, private sectors, and international organizations addressing coastal management, pollution control, climate resilience, fisheries sustainability, and maritime governance.

Participants discuss results of the Manila Bay Listening Session. Photo Credit: Sidney Anderson.

- Government agencies collaborate with local government units, academia, and environmental groups on coastal conservation, fisheries compliance, and waste management. The Department of the Interior and Local Government ensures policy enforcement, and the Manila Bay Coordinating Office manages integrated coastal strategies. The Philippine Authority, the Maritime Industry Authority, and Philippine Coast Guard regulate maritime operations and pollution control.
- Academic institutions, such as the University of the Philippines Marine Science Institute, provide research on climate resilience and system modeling.
- NGOs and international groups like Partnerships in Environmental Management for the Seas of Eastern Asia (PEMSEA), Oceana, and the Belmont Forum COAST Card project focus on integrated coastal management, plastic waste reduction, and blue carbon conservation, enhancing sustainability efforts.

While collaborations exist, stakeholders seek broader engagement with international organizations, private industries, global research networks, and community-driven citizen science to enhance governance and policy implementation and improve resilience and long-term sustainability for Manila Bay.

Identifying goals for the future of Manila Bay

Environmental Economic Evaluation

Participants evaluated the environmental economic value of Manila Bay, highlighting the need to incorporate both use and social value for holistic evaluation.

They recommended:

- Formulating a comprehensive Research Agenda for Manila Bay, integrating biophysical/ environmental and socio-economic aspects.
- Creating an enabling environment and governance system that can translate science-based recommendations to evidence-based decisions.
- Pursuing a theory-of-change-based socio-cultural promotion of the value of Manila Bay to the general public to generate behavioral change.
- Promoting science-based law enforcement and repercussions.

Community involvement and management

The group emphasized the importance of providing capacity building for coastal communities, particularly in the monitoring and evaluation of their resources. In addition, the group agreed that there should be a support mechanism to develop a sustainable livelihood and a recognition of equity in access and control of resources, indigenous knowledge, and multi-sectoral partnerships.

Top left: Group work during the workshop; Top right: View of Manila Bay Coastline and cargo ship; Bottom left: Participant at listening session: bottom right: Reporting back on STI Support. Photo Credits: Sidney Anderson

Coastal and Ocean Hazard and Risks

The Philippines is the third most vulnerable country to natural disasters due to its location, geology, and high population density. Manila Bay is crucial for the country's economy, but it faces severe risks from anthropogenic factors and natural hazards, experiencing the country's highest relative sea level rise due to rising sea levels and land subsidence.

Stakeholder consultations recommend documenting existing and historical hazards and risks, reviewing relevant policies, identifying vulnerable infrastructure, and developing action plans.

Science, Technology, and Innovation Support for an Archipelagic Country

Enhancing formal and informal education on the country's untapped potential for sustainable development and transforming its vast natural endowments—from the coastal to the marine environments, should be prioritized. Stakeholders from various sectors within the Manila Bay Area, which is currently a hub of socio-political activity, and across the entire archipelago would benefit from digital and other educational materials created through the PHilCOAST/COAST Card project.

Training sessions for project members and partners will help develop clear and engaging communication materials for local communities. Universities, NGOs, and local governments should analyze and create strategies to drive behavior change in order to achieve a broader nationwide impact.

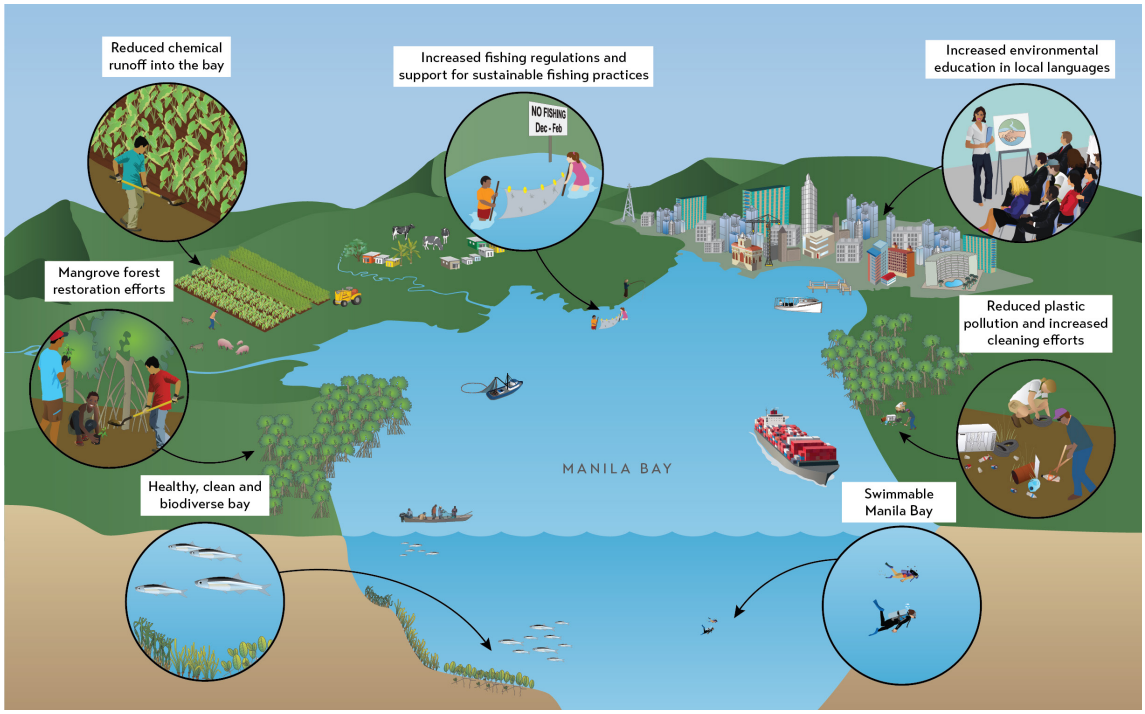
Manila Bay is highly valued for natural resources, but threatened by pollution and land reclamation

One of the first steps in the COAST Card framework is to develop a shared understanding with stakeholders and identify their perspectives of current conditions, including values and threats facing the watershed. The word clouds below represent the main values and concerns of Manila Bay citizens, with larger words representing a concern or value more participants submitted.

Manila Bay residents highly value natural resources like biodiversity, water quality and fisheries, but also intangible aspects like scenery, iconic sunsets, and culture/history.

Residents are concerned about pollution and land reclamation stemming from population pressures.

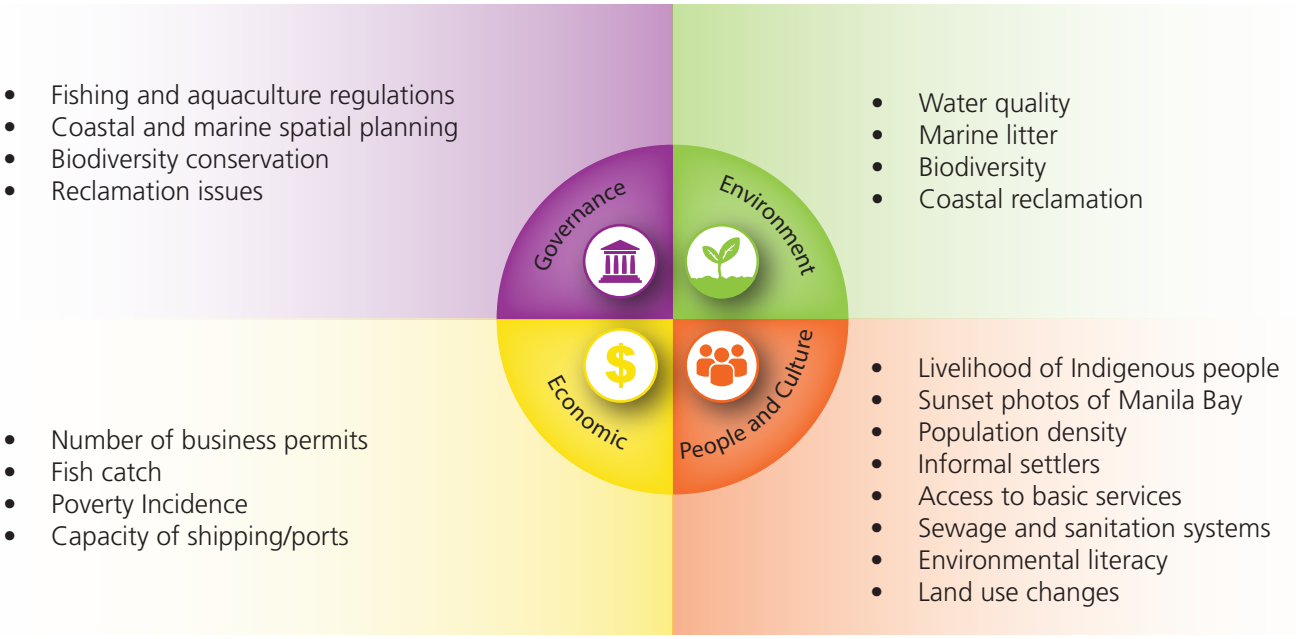
A shared vision is necessary to ensure that the Manila Bay and Watershed COAST Card will be useful to the community. During the Listening Session, participants provided characteristics they hope to see in a sustainable Manila Bay and specific actions to achieve those goals. Overall, watershed residents desire an accessible, swimmable bay, with increased biodiversity, regulated fisheries, reduce plastic pollution and chemical runoff, mangrove restoration efforts, and more environmental education.



Participants generated 7 vision statements for the future of Manila Bay. Graphic credit: Roshni Nair-Gonzalez.

Indicators help identify areas of concern

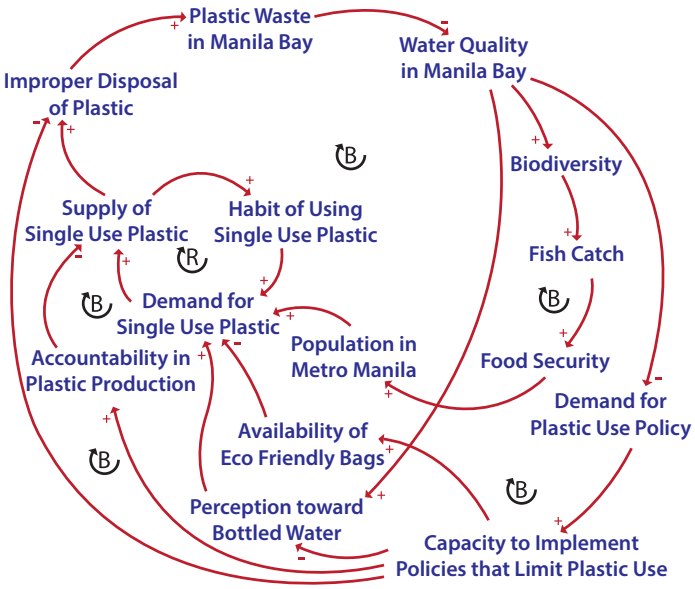
Community members identified potential indicators for Manila Bay from four categories—social and cultural, economic, environmental, and governance. These indicators help develop a comprehensive report card that includes a variety of perspectives.



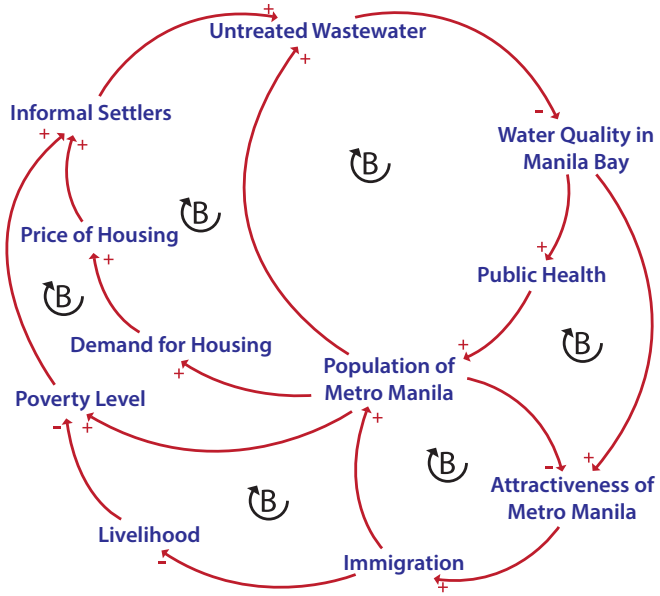
Participants developed indicators for assessment from four categories.

Causal loop diagrams help inform decisions

Causal loop diagrams show cause and effect relationships among the potential indicators for Manila Bay identified above. The diagrams reveal potential solutions to areas of concern and potential challenges to implementing those solutions in a particular area.



A system map for causes of plastic waste in Metro Manila area of Manila Bay

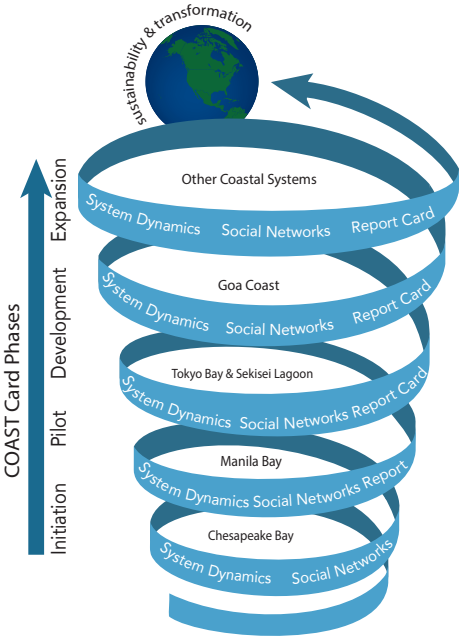


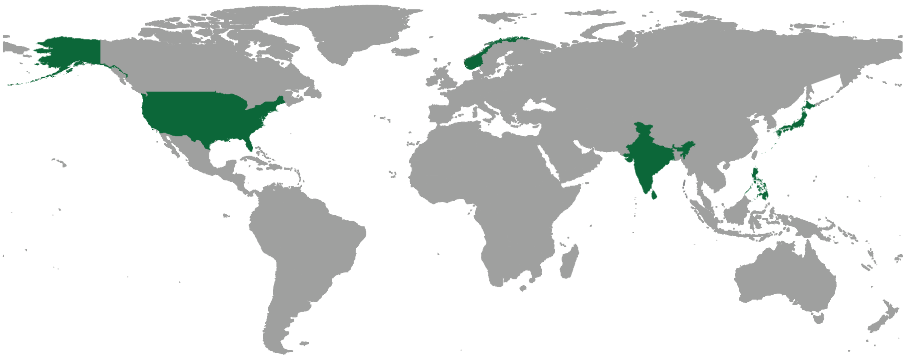
A system map for causes of wastewater in Metro Manila area of Manila Bay

Selected feedback loops are labeled, with "R" indicating a reinforcing feedback loop and "B" indicating a balancing (a counteracting) feedback. The '+'and '-' signs at the end of the arrows indicate the direction of increase or decrease in effect, respectively, given that everything else kept constant.

A new generation of report cards

The **Coastal Ocean Assessment for Sustainability and Transformation** (COAST) Card Project is a Belmont Forum-funded international and transdisciplinary program that aims to foster solutions to global sustainability challenges. It is a new generation of report cards that merges three tools: socio-ecological network analyses, socio-environmental report cards, and system dynamics models. It builds on the report card framework that is popular in the Chesapeake Bay Watershed and is emulated in Tokyo Bay and Sekisei Lagoon in Japan, Manila Bay in the Philippines, and the Goa Coast of India. The combination of the right people (social networks), publicly available synthesized information (report cards), and robust models (system dynamics) can guide what is needed to catalyze positive socio-environmental change.





The five countries of COAST Card—Japan, India, Norway, the Philippines, and the United States—work in collaboration to implement the projects three main goals at each study site, then in more locations across the globe.

Acknowledgments

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Group photos of participants at the Manila Hotel and after the Manila Bay Listening Session.

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