



PROCEEDINGS 2026-22

Conservation and Biodiversity Program

Biodiversity Sciences for The West Philippine Sea

The What and the How

30 April 2025

University of the Philippine Center for Integrative and Development
Studies (UP CIDS), Bahay Ng Alumni
University of the Philippines Diliman, Quezon City

Rodrigo Angelo C. Ong



UNIVERSITY OF THE PHILIPPINES
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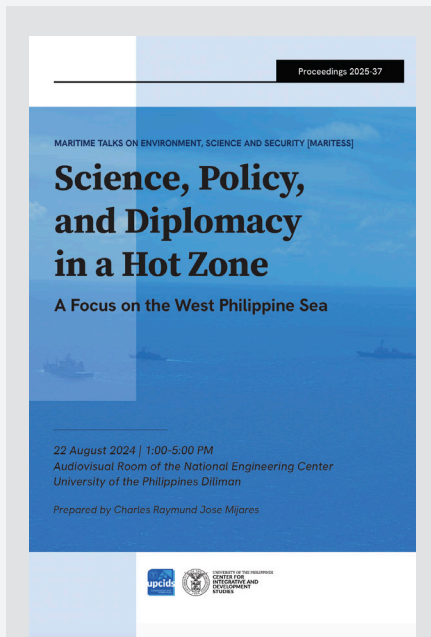
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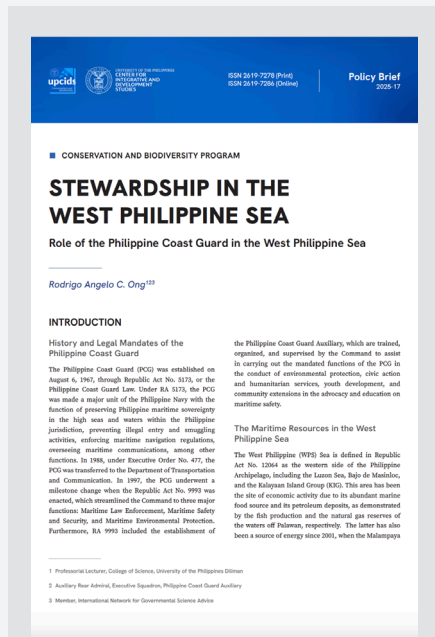
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the West Philippine Sea

About the Roundtable Discussion

The roundtable is a preparatory activity for MariTESS 2.0 talks in September. While MariTESS 2.0 will focus on advancing science and policy for the West Philippine Sea (WPS) in line with the Department of Science and Technology-National Academy of Science and Technology (DOST-NAST) Pagtanaw 2050 and the Blue Economy, the April roundtable will solely focus on Biodiversity Sciences, taxonomy, systematics, biogeography, species inventory, biodiversity databases, and museum studies on the WPS.

The roundtable sets out to establish an understanding of the biodiversity baselines, taxonomic and systematic studies, evolutionary ecology, biogeographic and ecological history aspects of the WPS. The use of biodiversity resources and ethnobiodiversity studies from anthropological and archaeological aspects will be part of the roundtable.

The aims also include a discussion of what needs to be done and the methods of knowing and how this can be applied to policy creation to further Filipino science understanding of the WPS.

Acknowledgement of Members of the Panel

Richard Casiguran, MSc

Senior Research Associate, Conservation and Biodiversity Program, UP CIDS

Members of the panel include experts from academe, government institutions and civil service organizations. They included:

1. **Prof. Harold Monteclaro, PhD**
Dean, College of Fisheries and Ocean Sciences
University of the Philippines Visayas
2. **Prof. Floredel Dangan-Galon**
Unit Head, Marine Science Research Center, Palawan State University
3. **Loida Corpus, PhD**
President and CEO, Quantitative Aquatics Inc.
(Manager of Fishbase and SeaLifeBase databases)
4. **Emily Capuli**
Theme Lead - Taxonomy, Quantitative Aquatics Inc.
(Manager of Fishbase and SeaLifeBase databases)
5. **Kathy Reyes**
Theme Lead - Aquamaps, Quantitative Aquatics Inc.
(Manager of Fishbase and SeaLifeBase databases)
6. **Dr. Joseph Dominic Palermo**
Assistant Professor, Institute of Environmental Science and Meteorology
College of Science, UP Diliman
7. **Dr. Carmela Española**
Co-Founder, Wild Bird Club of the Philippines
8. **Valeriano M. Borja and Ronnie O. Romero**
Senior Science Research Specialists
National Fisheries Research and Development Institute
9. **Dr. Rachel June Ravago-Gotanco**
Professor, Marine Science Institute, UP Diliman

List of Reactors

1. Eunice Lois D. Gianan

Museum Researcher II, Botany and National Herbarium Division
National Museum of the Philippines

2. Emmanuel Rivera

Zoology Division, National Museum of the Philippines

3. LTJG Marc Yondell Saba, PCG

Marine Environmental Protection Command, Philippine Coast Guard

Welcoming Remarks

Prof. Rosalie Hall

Executive Director, UP CIDS

Prof. Rosalie Hall delivered the welcome remarks and introduced the UP Center for Integrative and Development Studies (UP CIDS) to the participants as the policy research arm of the University of the Philippines. UP CIDS covers various topics including Islamic studies, political economy, alternative solutions, etc.

Prof. Hall also explained that the Conservation and Biodiversity Program of UP CIDS have different takes on discussing the issues of the West Philippine Sea, which differs with the Strategic Studies program which focuses on security matters. The main objective of this roundtable discussion included establishing an understanding of the biodiversity baselines, taxonomic and systematic studies, evolutionary ecology, biogeographic and ecological history aspects of the WPS. This discussion seeks how we can further our knowledge using biodiversity resources through rigorous scientific methods. Importantly, Prof. Hall emphasized that the end goal is to translate this knowledge into policy using Filipino scientific expertise and stewardship.

She shared that UP CIDS reinforced this endeavor of fostering informed dialogue with impactful policy outcomes. She underscored that by facilitating this dialogue, we aim to contribute to broader understanding about the complex issues around WPS biodiversity. With constructive dialogues and strengthening research capabilities, we are not putting CIDS goals but also contributing to society in general.

Introduction

Dr. Benjamin Vallejo Jr.

Convenor, Conservation and Biodiversity Program, UP CIDS

Dr. Benjamin Vallejo Jr. explained that the Conservation and Biodiversity Program's (CBP) activities are geared towards giving scientific advice or governmental science advice to our stakeholders such as the government, civil society sectors, and the public at large.

He then explained the importance of discussing biodiversity in creating environmental policies. Dr. Vallejo mentioned that the meaning of biodiversity conservation differs across various stakeholders. Because of this complexity, risk and uncertainty in making and implementing a policy, are inevitable in biodiversity conservation and environmental protection, to which he stressed that the political and stakeholder issues must be investigated.

Dr. Vallejo then recognized that discussants were capable of:

1. Problem definition – we were able to identify the biodiversity crisis as a major issue.
2. Public advocacy – this RTD is an example of what a public advocacy is.

He noted the lack in making workable, scalable, and meaningful solutions. This was coupled with a gap in immersion with complex and interdisciplinary policymaking processes. In addition, he mentioned that science would not resolve different worldviews.

For the biodiversity crisis, we must do something now, he emphasized. This is a priority as the questions must be answered such as options that will meet our broader need. He further stressed the following questions: Does it meet the needs of the stakeholders? What is the risk to different stakeholders? What is the political risk of doing and not doing? And how much will it cost?

Dr. Vallejo hopes that the basis of the discussion on the WPS science policy on biodiversity would be established. Stakeholders agree that science information is needed in the management of West Philippine Sea whether it is in resources, environment, or climate resilience aspects. These inform policy options with the cooperation of scientific institutions. This will also include the economic, geopolitical, and the diplomatic aspects. He also emphasized that the efforts are multisectoral and multilateral hence, the science community, civil society and different security and diplomatic communities should be engaged.

Dr. Vallejo then gave a rundown on science policy. This focuses on finding evidence on informed policy making on vast number of issues. The current paradigm needs pluralistic and different skills sets and approaches to address issues. After the Second World War, science policy is currently in use in environmental issues, energy, food, and other aspects that would have impact to the global society. This should be able to support the national economic resource and sovereignty interest in a multilateral and multi-stakeholder framework.

He then maintained that the RTD has two goals:

1. Evidence Synthesis – Knowing what is there in a multi-disciplinary approach; and
2. Knowledge Brokerage – Communicate science, weigh the evidence, assess the uncertainty and risk, and help the decision-makers interpret information for policymaking.

Dr. Vallejo asked: “We need to synthesize the evidence, but where is it located and who has it?” He lamented that scientists believe that presenting data to policymakers would be enough to communicate necessary information. However, he noted that it does not work that way. According to Dr. Vallejo, there must be a narrative for the evidence to identify the data gaps. He highlighted the option to do more research, especially Marine Science Research (MSR) to identify how we can manage and curate information regarding the WPS. Through this, we strengthen collaboration and links between Filipino science diplomacy in the WPS environment. This also fortifies multilateral biodiversity science cooperation within the states involved in this area.

Dr. Vallejo then presented the People’s Republic of China as a country that defined its priorities. He also shared a paper published last 2021 which has the biodiversity inventory, processes, and mechanisms in environmental and ecological factors in China and their biodiversity which boasts their Pandas and the Golden Pheasants. He emphasized that the Philippines can adapt a similar framework to know its biodiversity inventory, specifically in the West Philippine Sea. This allows us to question whether or not we are able to list the threats and the responses we must do. Aside for the ecological aspect, cultural and historic aspects must also be investigated. China, as well as Indonesia have their plans. Dr. Vallejo asked: but what about the Philippines?

In closing, Dr. Vallejo underscored that having an approach on science evidence brokerage will let us list down all possible options that are informed

by science and allow decision makers to consider which is approach is the best. He emphasized the new paradigm of providing new insights to the government moves from being science-based to being science-informed. The former implies a policy prescriptive, where science is the only basis in crafting policy. Meanwhile the latter is a multidisciplinary approach including various knowledge streams to come up with policy proposals that include the community, and not just purely the natural sciences.

Dr. Vallejo then enumerated the outcomes for the RTD, which include 1) initiating the evidence synthesis; and 2) knowing where and what are the evidence of biodiversity in the WPS. This would later allow to determine the potential information that could help in creating policies to manage the West Philippine Sea's biodiversity.

The Roundtable Discussion

What evidence of biodiversity information do we have now for the WPS?

Dr. Rachel Gotanco

Professor, Marine Science Institute, UP Diliman

The discussion opened with a question surrounding biodiversity information on the West Philippine Sea. Dr. Rachel Gotanco was the first to speak. According to her, the Marine Science Institute (MSI) has a long history of studies in the West Philippines. She also pointed out the Pagasa Island Research station, which was recently established and serves as the base for the University to conduct research in Kalayaan Island Group. Among the stakeholder partners are the academe, several local government units (LGUs), the national government, and the Philippine Coast Guard.

Dr. Gotanco also mentioned that the MSI has released a book entitled *State of the Coast: West Philippine Sea*, which is a compendium of different summaries of studies conducted in the WPS. Various aspects of the WPS such as oceanography (physical, chemical), biological diversity based on field collections and surveys and studies on ecology, threats, as well as recommendation and ways forward. In terms of biology, certain groups were targeted, including seaweeds, fish, gastropods, invertebrates.

A more recent study funded by Department of Science and Technology Philippine Council for Agriculture, Forestry and Natural Resources Research and Development (DOST-PCAARRD), the MSI with Dr. Laura David at the helm, in collaboration with UPLB and UPV, Dr. Gotanco noted that resource inventory, valuation, and ecosystem services which are a holistic look on the West Philippine Sea, and several papers are expected to come out from the study. She also highlighted that traditional methods, as well as molecular methods are used for biodiversity inventory in making and implementing them. Modelling connectivity in terms of oceanography are also being conducted by the study. Dr. Gotanco noted that, while there exist packets of information on the WPS, a repository of knowledge or database for the WPS is needed as a way forward.

Dean Harold Monteclaro

*Dean, College of Fisheries and Ocean Sciences
University of the Philippines Visayas*

Meanwhile, Dean Harold Monteclaro stated that because of their geographical location, their research focused on the Visayan Sea, Panay, and their neighboring islands. He was not sure if there were any recent biodiversity studies conducted by UP Visayas on the West Philippine Sea. They do however partner with other institutions or universities for molecular analysis of aquatic resources. He pointed out their research work on the social aspect of fisheries in the Palawan and Calauti Regions. Apart from this, there is also taxonomic study of fish and aquatic organisms including seaweeds and other marine plants using both traditional and molecular analysis.

Emily Capuli

*Theme Lead - Taxonomy, Quantitative Aquatics Inc.
(Manager of Fishbase and SeaLifeBase databases)*

Ms. Emily Capuli from Quantitative Aquatics mentioned that they have global databases not just the Philippines. She added that they have FishBases since 1989 and started 1991. Additionally, they also have started with SeaLifeBase in 2005. For her part, Ms. Capuli works mainly on taxonomy where she makes necessary adjustments in instances of name or classification change. Changing distribution or domains means that the traits publish would also be changed. According to her, these changes will have an effect on conservation and management.

Kathy Reyes

*Theme Lead - Aquamaps, Quantitative Aquatics Inc.
(Manager of Fishbase and SeaLifeBase databases)*

According to Ms. Kathy Reyes, the baseline information in the RTD for the West Philippine Sea was gathered using the FishBase and SeaLifeBase coverage and the AquaMaps models. The data sources for these include the peer-reviewed published data, with an open data policy. As for the West Philippine Sea species list, the AquaMaps occurrence dataset came from FishBase information system (FB), SeaLifeBase information system (SLB), Ocean Biodiversity Information System (OBIS), Global Biodiversity Information Facility (GBIF). Ms. Reyes added that “good” point data within the WPS indicated a total of 1,959 fish and 2,110 non-fish species. As for the FishBase and SeaLifeBase, there are a total of 2,889 species, most of which are gobies.

In SeaLifebase, gastropods and Bivalvia dominate the species identified in the WPS. Moreover, it is important to note that 80.1 percent of these 3,889 species on the SeaLifeBase have not been evaluated for their International Union for Conservation of Nature (IUCN) status.

The Aquamaps uses FishBase and SeaLifeBase data, and other extensive data such as depth range, bounding box coordinate, Food and Agriculture Organization (FAO) areas, feeding breeding environment, point data, and various environmental layers. The standard set of maps it covers include the native range of the species, year 2050, and habitat suitability. This was able to show the changes in the species richness. For example, in Mollusca, 2,272 species were retained out of 2,357 due to the local extinction of 85 species in the Philippines.

Prof. Floredel Galon

Director, Marine Science Research Center, Palawan State University

Prof. Galon shared that “For Palawan State University, we have fragmented research conducted by our students in some coastal municipalities along the WPS. I also have a compilation of the studies conducted during the Phil-Vietnam Joint Oceanographic and scientific research expedition conducted in WPS on 2008.” Moreover, she mentioned an on-going talk with the Philippine Coast Guard and Palawan Council for Sustainable Development Staff (PCSDS) to conduct research in Lawak. According to her, “giant clam gardening and seaweed farming suitability test, reef scan, and benthic survey shall be the primary activities.”

Mr. Valeriano M. Borja

Senior Science Research Specialist, National Fisheries Research and Development Institute

Mr. Valeriano Borja recalled that 20 years ago, together with Dr. Joseph Dominic Palermo, they were able to have an expedition where they identified more than 100 species of fish. Tissue samples of various fishes were collected as well as mollusks. Microbial and phytoplankton communities were also observed.

Dr. Carmela P. Española

Co-Founder, Wild Bird Club of the Philippines

Dr. Española noted that there have been several expeditions—not only by the Wild Bird Club of the Philippines but also by other volunteer ornithologists

and bird watchers—who traveled to Tubbataha to record and inventory the bird species there.

Approximately 100 bird species have been recorded in the area. Tubbataha is primarily a flat island with minimal vegetation, consisting of a few bushes. Out of these hundred species, around 35 are considered resident birds of the Philippines, yet only 11 of them actually inhabit the islands of Tubbataha. When referring to "resident birds of the Philippines," she acknowledged that only 11 species breed in the islands.

Tubbataha is recognized internationally as an Important Bird Area due to its significant biodiversity. One remarkable example is the endemic subspecies of the black noddy, which is at considerable risk. If its habitat were lost, the entire global population of this particular bird could disappear. Other notable bird species in the area include sooty terns, brown noddies, greater crested terns, and the brown booby—somewhat common, yet typically found only in remote islands with minimal human habitation. Additionally, species such as the red-footed booby and the masked booby thrive in this environment.

A major risk faced by these ground-nesting birds is the introduction of cats and dogs to the islands. Since these birds lay their eggs on the ground, such animals can prey upon their nests, posing a serious threat to their survival. Natural predators, such as monitor lizards and certain snake species, also exist, though they align with the island's natural ecological balance. This inventory and conservation initiative largely depends on the availability of wildlife ecologists and dedicated bird watchers who visit these islands to document the bird populations. Many of them travel to Tubbataha out of passion for nature and conservation, while others are simply drawn to the island's beauty. However, human habitation presents a potential risk to this fragile ecosystem.

Dr. Joseph Dominic Palermo

*Assistant Professor, Institute of Environmental Science and Meteorology
College of Science, UP Diliman*

Dr. Palermo stated that efforts in the West Philippine Sea have been ongoing, with the MSI initiating an expedition in 2001. At that time, collaboration extended from Subic Bay to Ho Chi Minh, involving surveys, sample collection, archiving, and processing for identification. These records remain accessible, allowing us to revisit and analyze past findings.

He added that in 1997, an extensive marine ecological study was conducted. By 2001, the oceanographic surveys focused primarily on corals and physical water parameters. However, during that time, the waters appeared unusually turbid. Most of the data collected in 2001 is archived with the Department of Foreign Affairs (DFA), in collaboration with institutions such as Silliman University, the University of the Philippines Visayas, and the Bureau of Fisheries and Aquatic Resources (BFAR).

During that period, Dr. Palermo was involved in surveying the physical parameters of the waters, working in collaboration with the National Geographic Institute of Korea, specifically in the Luzon Strait.

Reactors' Comments

Eunice Gianan

*Museum Researcher II, Botany and National Herbarium Division
National Museum of the Philippines*

According to Eunice Gianan, based on the records in the database, specifically from the herbarium, there is currently no dedicated collection for the West Philippine Sea for seaweeds and phytoplankton. The records indicate that the Philippine National Herbarium (PNH) primarily focuses on terrestrial specimens. As for coastal sites in the West Philippine Sea, only specimens sourced from water have been recorded. Ms. Gianan stated that the National Museum is now planning to seek grants and collaborate with other institutions focused on the West Philippine Sea. The goal is to establish a collection and introduce people to the rich biodiversity of the region.

Emmanuel Rivera

Zoology Division, National Museum of the Philippines

Adding further insight, Emmanuel Rivera mentioned that they aim to develop and manage a national reference collection focused on oological specimens. Some data has already been checked and entered into the database. The collection includes shells, corals, and echinoderms, with specimens dating back to 1983 and 1989 from the Zambales area of the West Philippine Sea.

LTJG Marc Yondell Saba, PCG

Marine Environmental Protection Command, Philippine Coast Guard

There are international efforts including International Maritime Organization Marine Pollution (MARPOL) related initiatives. Currently, in partnership with Palawan State University, the PCG is actively engaged in various initiatives. There are also strategies that focuses on maritime security, environmental protection, and the critical role of marine science in collaboration with the Philippine Coast Guard.

At present, the PCG is developing a broad and diverse joint exploration initiative in the WPS, particularly around Pag-Asa Island. The entire Philippines will contribute to creating an Environmental Index, which will provide valuable data for disaster response and research. Marine Scientific Research (MSR) efforts in this region encompass studies on mangroves and avian biodiversity. As of now, these initiatives are being carried out in coordination with the Coast Guard.

The research initiatives have an allocated budget of PHP 180 million. The PCG is currently in the process of designing and selecting a research vessel that fits within the budget.

Open Forum

1. What are being done with the data overlays since, for almost 40 years, FishBase and SealifeBase have different formats?

Ms. Emily Capuli of Q-Quatics answered that they manage their own data, while others have theirs. Their work has spanned 36 years so far, and every time new genetic data from the Indo-Pacific arrives, it is divided into four categories. As a result, the Philippines continues to expand and contract in terms of its contributions. For instance, even a single newly recorded fish from the Indo-Pacific found in the Philippines enriches its collection. Globally, funding efforts are still ongoing, but they want to have a project that focuses solely on the Philippines. Newly published data will be prioritized. Under Dr. Perry Alinio's leadership, the initiative was conducted for two years, primarily concentrating on the country. Since different players are involved, we must make a real effort to collate and centralize all available data within the Philippines. Additionally, their database mirrors terrestrial records, and they also maintain corresponding fish data in the Philippine Clearing House Mechanism (CHM).

Dr. Gotanco then asked, "It takes time for 15 species to be officially named and recorded in your databases. Has this species been flagged?"

Ms. Capuli of Q-Quatics answered, "It has been reported as a complex, possibly consisting of more than one distinct species. We are working on it. We closely examine newly published data and revisions to ensure they are properly documented."

Dr. Vallejo added, "It synthesizes the data—much of which is now molecular. The ability to interpret DNA data requires advanced skills. As science progresses, the standards and requirements continue to rise. For example, the local GenBank for biodiversity, particularly for newly discovered species, plays a crucial role in biofouling management. While we can identify these species, the question remains—how will we manage and utilize the data? Biofouling is not a major area of interest, but one of the key issues related to conservation."

Dr. Palermo shared that there was previously data at the MSI, but it is not publicly available. The oceanographic data needs to be digitized, but issues have arisen in publishing it. Due to security concerns regarding the dataset, approval from the DFA is required.

2. What are the challenges in conducting marine science research?

Dr. Gotanco answered that she had noticed that developing research capacity has taken years. Previously, all studies conducted before 2000—particularly those from the mid-1990s—were carried out using BFAR vessels. Ideally, if the academic research fleet were utilized more, a greater number of oceanographic studies could be conducted. The goal is to provide access to these assets and further develop shared resources so that academic institutions can benefit from them

Dr. Benjamin Vallejo also added that securing permits has been a longstanding challenge. A paper published in the last three decades highlights the difficulties ecologists face in obtaining the necessary permits. This issue warrants further discussion.

Ms. Capuli of Q-quatics added there are feedback mechanisms in what they are doing, and taxonomists have informed us when an image is incorrect.

Dr. Loida Corpus of Q-quatics shared that they already have the information, and it has been processed and analyzed. She added that they can also identify key elements, but it would be beneficial to equip themselves with what is missing. She further noted that they discussed the economist's perspective, where there is an overwhelming amount of data. However, the way it is processed does not always yield optimal results. This begs the question: Does this indicate a lack of proper processing, or is it a sign that free-loading has been happening all along? For Dr. Corpus, one of the things they are doing well is ensuring the pursuit of a better quality of life.

Dr. Vallejo said that there is a need to review the Environmental Science program at an international level. Experts have advised that there is a lack of understanding regarding the close relationship between biomass and biodiversity. The geopolitical landscape makes this issue even more contentious. We have a substantial amount of data, but the key question remains—how do we effectively present it to the government and Congress to secure funding for this initiative?

Dr. Corpus also mentioned the exploration of carbon markets. Currently, existing markets primarily focus on terrestrial ecosystems. However, for equitable distribution, there has to be a deepened understanding of how this system works. In this context, localizing carbon sinks becomes essential.

Dr. Palermo explained that our messaging is focused on distribution, particularly within environmental science. Biodiversity operates at different levels, and its value proposition should not rely solely on species distribution. Instead, it should be framed within the ecosystem to highlight the benefits of ecosystem services. From an anthropocentric perspective, investors, corporate social responsibility (CSR) programs, and CWTS initiatives can showcase the importance of the blue economy by linking it to biodiversity and ecosystem services.

Summary

Dr. Rodrigo Angelo C. Ong detailed that our approach is multi-sectoral and multi-stakeholder, emphasizing science-informed decision-making rather than purely science-based methods.

Several institutions are actively contributing to research on the West Philippine Sea (WPS):

- UP MSI has published a book on WPS' marine environment.
- UPV is conducting studies on fisheries' social sciences and taxonomy.
- Aquatics maintains a global species database, which could benefit from a dedicated focus on WPS. Currently, 80.1 percent of species (n=3,899) in SeaLifeBase lack an IUCN status evaluation.
- Palawan State University is collaborating with students in coastal municipalities and working with the Philippine Coast Guard (PCG) to conduct research.
- The NFRDI is studying microbial and phytoplankton communities while also identifying fish species and collecting tissue samples.
- The Wild Bird Club has recorded 100 bird species across WPS islands, emphasizing the ecological importance of endemic subspecies and the risks posed by habitat alterations.
- The National Museum plans to digitize its collections to improve accessibility.
- The PCG is working with universities to design a research vessel that fits the budget for upcoming studies.

These efforts collectively aim to strengthen the scientific understanding and conservation initiatives within the WPS.

Center for Integrative and Development Studies

Established in 1985 by University of the Philippines (UP) President Edgardo J. Angara, the UP Center for Integrative and Development Studies (UP CIDS) is the policy research unit of the University that connects disciplines and scholars across the several units of the UP System. It is mandated to encourage collaborative and rigorous research addressing issues of national significance by supporting scholars and securing funding, enabling them to produce outputs and recommendations for public policy.

The UP CIDS currently has twelve research programs that are clustered under the areas of education and capacity building, development, and social, political, and cultural studies. It publishes policy briefs, monographs, webinar/conference/forum proceedings, and the Philippine Journal for Public Policy, all of which can be downloaded free from the UP CIDS website.

The Program

As biodiversity is essential in providing the sustainable base for agriculture and fisheries and its strategic dimensions, three foci of policy research in this program include assessing 1) the nexus between fisheries, aquaculture, and environmental sustainability, 2) the effectivity of protected areas governance and ecological outcomes in the context of resiliency in global anthropogenic climate change and, 3) Policy and strategic dimensions in marine science research (MSR). These areas have all relevance to food, environment, and national security.

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