

Looking inside the Marine Research Center for Verde Island Passage after Five Years



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November 09, 2022

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The Verde Island Passage or VIP encompasses the five provinces of Batangas, Marinduque, Oriental Mindoro, Occidental Mindoro, and Romblon. Owing to its central location in the Coral Triangle and its high marine biodiversity, it was labeled as the world's center of the center of marine shore fish biodiversity (Carpenter and Springer 2005, CI-Philippines 2009). The VIP is identified as one of the highest priority areas in the Coral Triangle for conservation and management (Asaad et al. 2018). It has recently gained attention after being nominated as a Hope Spot by the Mission Blue Organization. However, the VIP is under threat due to increasing industrialization, increasing human-related activities, and even climate change which poses serious and detrimental effects to this marine corridor and its vast biodiversity.

In order to protect the VIP and its marine resources, continuous biodiversity assessment and monitoring, including an extensive biodiversity database, would play a key role in measuring and understanding the changes happening to the marine environment. This understanding is crucial for policy formation that would prevent further negative effects on the marine environment. Secondly, monitoring bioindicator species would be a practical approach to biosurveillance, which gives a heads-up regarding possible threats facing a specific marine environment. Lastly, issues like food security and livelihood need to be addressed in response to the threats facing the VIP. Such issues can be resolved through culture technology development of economically important marine organisms (*i.e.*, seaweed, sea cucumbers, oysters).

The Batangas State University - the National Engineering University (BatStateU - The NEU) through its marine research center - the Verde Island Passage Center for Oceanographic Research and Aquatic Life Sciences or VIP CORALS addresses these pressing concerns of our marine environment. VIP CORALS was established on February 14, 2018 (Res No. 004, S. 2018) and aims to provide research, teaching, and extension services of the Batangas State University on the marine resources and the environment in the VIP. To date, VIP CORALS has implemented six (6) externally funded projects from various funding agencies such as Nagao Natural Environment Foundation (NEF) Japan, the Department of Science and Technology (DOST), DOST- Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development (PCAARRD) and five (5) internally funded projects from BatStateU - The NEU.

The marine biodiversity assessment^{1,2,3} in selected sites in Verde Island Passage showed that the VIP is still in good condition based on good coral cover and high biodiversity among most of the sites, some of which are not Marine Protected Areas (MPAs) and can be endorsed for MPA status based on coral cover and biodiversity (Figure 1). Although in good condition, the marine environment is still vulnerable as highlighted by decreases in seagrass cover in some sites and the proliferation of some green-tide blooming species⁴ (Figure 2). This green-tide blooming species such as *Ulva* spp. has the potential to be used for biosurveillance⁵. These species were shown to tolerate a wide range of temperatures and light intensities prompting their proliferation year-round. These biomonitoring data are stored in a database for use in forecasting and documentation^{1,5,6}.

¹DOST-GIA Marine Biodiversity Assessment in Selected Areas along the Verde Island Passage (MBioAssess-VIP)

²BatStateU Survey of vulnerable, threatened, endangered, and economically important marine organisms in Verde Island, Batangas City

³BatStateU Biodiversity Mapping of Marine Protected Areas of Brgy. Papaya, Nasugbu

⁴NAGAO Biodiversity of seaweeds and associated flora in Verde Island, Batangas City, Batangas Philippines

⁵DOST-PCAARRD Understanding Physiological Vulnerability of *Ulva* spp.: Implication to Green Tide Blooms

⁶BatStateU VIP CORALS Marine Repository Hub



Figure 1: The research staff of the marine biodiversity assessment (upper pictures) and the actual assessments (lower picture).

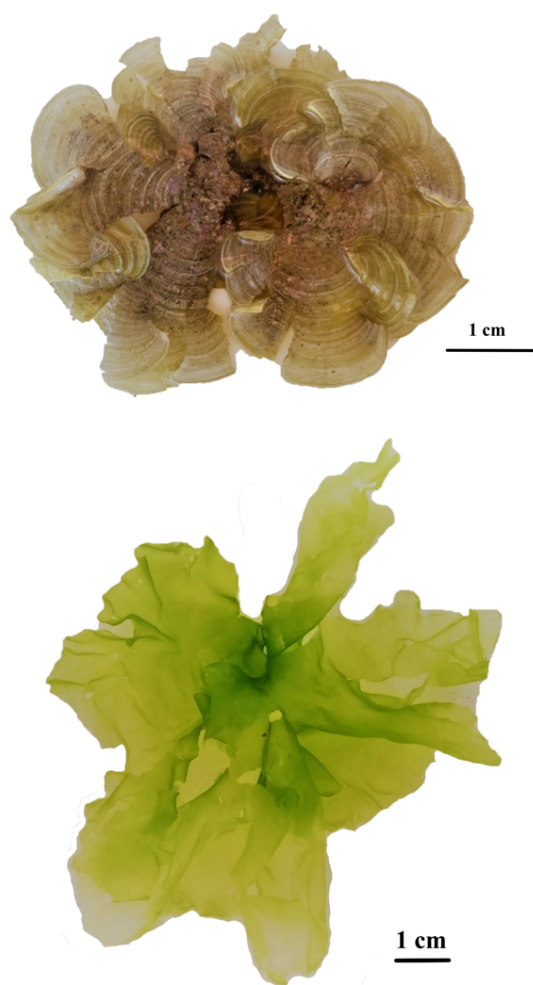


Figure 2: Some bloom-forming seaweed species – *Padina* sp. (upper picture) and *Ulva lactuca* (lower picture)

To address food security and livelihood in coastal areas, economically important marine organisms were identified for culture technology development (*i.e.*, seaweeds⁷, sea

⁷DOST-PCAARRD Biological and ecological studies on *Asparagopsis taxiformis* for culture technology development (BEAT)

⁸BatStateU Upscaling the Sea Cucumber Aquafarming Sustainability: Phase 1: Optimization of sea cucumber aquaculture and post-harvest processing method

cucumbers⁸). In addition, training of the culture of economically important freshwater organisms (*i.e.*, tilapia) was done for local communities in four municipalities of Batangas, producing four (4) tons of fresh tilapia to augment fish supply in the province⁹ (Figure 3).



Figure 3: Backyard Tilapia Farming in Response to the COVID-19 Pandemic

There are still many gaps in understanding today's threats to the marine environment, and collaborations with other universities and institutions are essential in order to successfully conduct studies that focus on these threats. Another issue that is being addressed is the remoteness of many sites with good coral reefs, which makes it difficult for scientists to access regularly for assessment studies. VIP CORALS collaborated with ABS-CBN foundation for the INSPIRE project with the objective of training reef assessment methods to citizen scientists and coastal communities in remote areas of the VIP (*i.e.*, Lubang, Oriental Mindoro, Romblon).

Currently, VIP CORALS is implementing research projects on the following: 1) Pilot testing of economically important seaweed species such as *Halymenia durvillei*, *Kappaphycus* sp., and *Eucheuma* sp. for seaweed farming; 2) Stock assessment, reproductive biology, and life history of *Siganid* spp. for science-based input for management plan; 3) Coral reef assessment and biodiversity mapping of MPAs in Nasugbu. These research projects are funded by DOST-PCAARRD and BatStateU – The NEU.

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⁹DOST-PCAARRD Backyard Tilapia Farming in Nasugbu, Batangas in Response to the COVID-19 Pandemic