14.2.1. Strengthening Skills for Freshwater and Land Water Stewardship

Strengthening freshwater and land water stewardship begins with the people who generate, interpret, and share environmental information. DOrSU's capacity is being built in practice: laboratory training in soil physics, water chemistry, and rapid soil testing; hands-on soil-testing sessions with farmers, cooperatives, local government personnel, and students; a regional convention that brought freshwater and marine science into shared conversation; and earlier research that provides methodological context for assessing connected water systems. Together, these activities illustrate a practical approach to stewardship—one that invests in analytical competence, creates opportunities for shared learning, and strengthens the foundation for informed decisions about land and water resources.

Strengthening the People Behind Soil and Water Testing

DOrSU's Dr. Janeth C. Tayone and Geralph Sam P. Villarubia strengthened their analytical skills through the Bureau of Soils and Water Management–Laboratory Services Division training in Quezon City. Sessions on October 14–18, 2024 addressed soil physics and water chemistry; October 21–25 sessions focused on rapid soil testing.

These skills support more consistent laboratory work and strengthen the university's capacity to examine local environmental conditions. The immediate achievement is trained personnel and improved testing capability, providing a foundation for reliable research and technical support.



Figure 1. Laboratory work featured in DOrSU's report on the October 2024 BSWM training. Photo credit: DOrSU–Public Information Office.

The value of this training extends to the quality of advice the university can provide. Consistent analytical procedures make results easier to compare and give researchers a firmer basis for investigating a suspected problem. This is an enabling contribution to freshwater stewardship:

laboratory competence supports later assessment, while community outreach and field application remain separate activities to document (DOrSU PIO, 2024).

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Learning to Read the Land Before It Reaches the Water

At DOrSU's University Research Complex–Institute for Soil and Water (UResCom–iSaW), farmers, cooperative members, local government representatives, PAGRO–Davao Oriental personnel, faculty, and students worked with Soil Test Kits on February 12, 2025. The Department of Agriculture–Regional Soils Laboratory XI supported the activity, with Bureau of Soils and Water Management specialists guiding the participants.

The practical lesson was how to assess soil fertility and build information for crop management. This gives local stakeholders a stronger basis for decisions about fertiliser use and land care—decisions relevant to the waterways receiving runoff from farms.

The activity brought several groups into the same practical learning setting. Farmers and cooperatives could relate testing to crop decisions, while LGU and PAGRO personnel could connect those decisions with agricultural support. For students and faculty, working alongside these stakeholders created a setting for explaining scientific procedures in terms relevant to local land management. Reduced fertiliser runoff was not measured by the training record (DOrSU PIO, 2025).

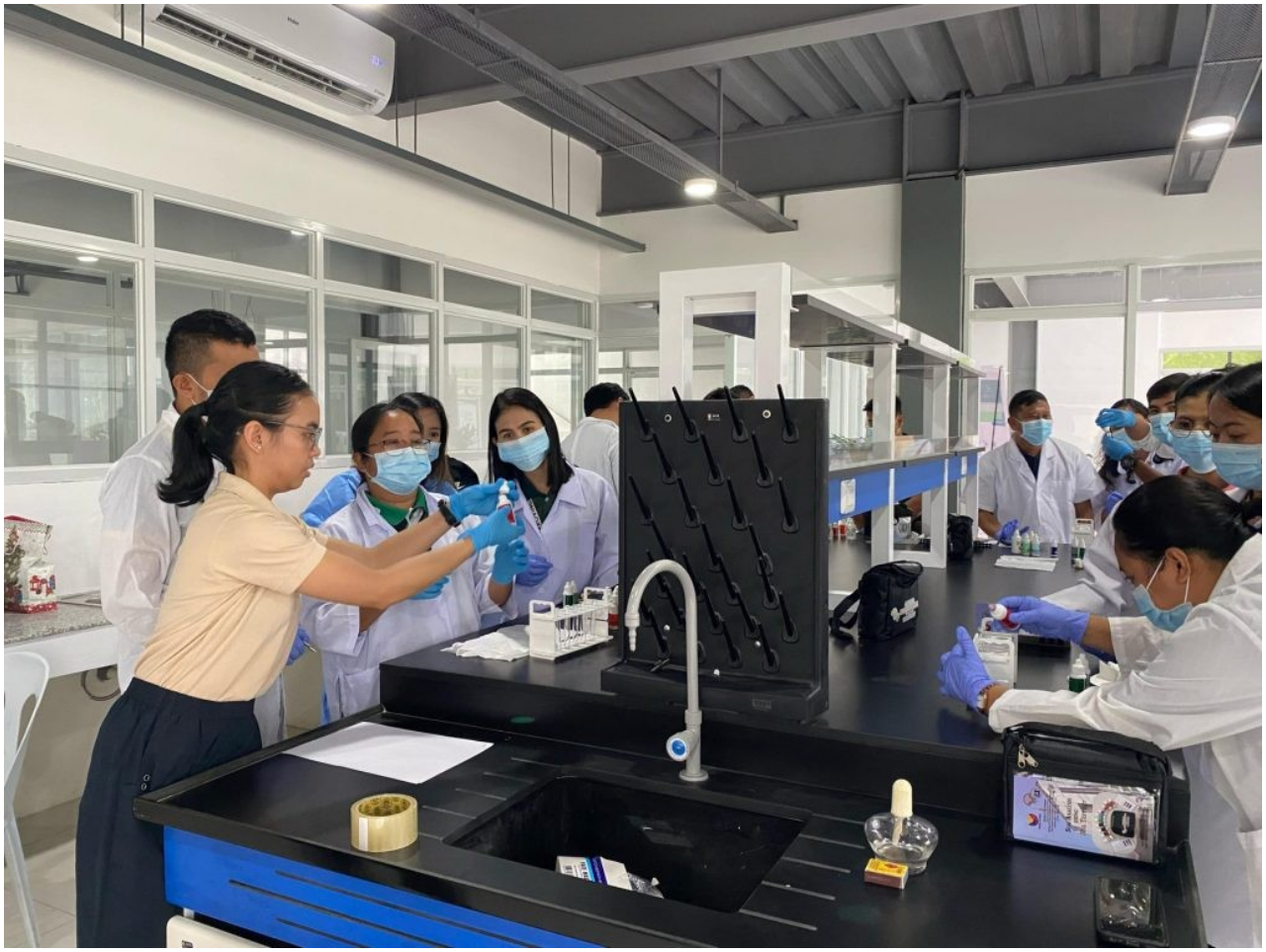

Figure 2. Participants practise soil testing at UResCom–iSaW during the February 12, 2025 training. Photo credit: DOrSU–Public Information Office.

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14.2.1 Bringing Aquatic Science Into a Shared Conversation

DOrSU, through the Regional Integrated Coastal Resource Management Center XI (RIC-XI), hosted the 56th convention of the Federation of Institutions of Marine and Freshwater Sciences in Mati on October 22–24, 2024. Researchers and stakeholders exchanged knowledge on fisheries, artificial reefs, plastic pollution, and blue carbon.

Adelina C. Santos-Borja's discussion of integrated lake-basin management also connected the gathering with freshwater stewardship. The convention gave participants access to expertise and contacts that can inform education and aquatic resource management.

The mix of subjects helped place aquatic conservation within a wider management conversation. Fisheries depend on habitats, pollution affects organisms and resource users, and lake-basin decisions can influence waters beyond a single administrative boundary. By bringing these themes together, RIC-XI created an opportunity for participants to compare approaches and identify possible collaborators. Subsequent projects or participant uptake need their own records (DOrSU PIO, 2024; Coastal Conservation and Education Foundation, 2025).



Figure 3. Opening activities at DOrSU's FIMFS convention in Mati, October 22–24, 2024. Photo credit: DOrSU–Public Information Office.

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14.2.1 Educating Decision-Makers on Freshwater Biodiversity

The university's knowledge-sharing role also extends to local legislation. On official invitation from the Sangguniang Bayan of Maco, Davao de Oro, Ms. Amy G. Ponce, project leader of the Eastern Mindanao Biodiversity Corridor (EMBC) Project, together with faculty and researchers from DOrSU's BS Biology and BS Environmental Science programs, presented the summarized results of a freshwater biodiversity assessment at a committee hearing on the proposed ordinance declaring the Bilawa Mainit Hot Waterfalls and Lake Leonard as LGU-managed conservation areas in Barangays Mainit and New Leyte.

As an educational contribution, the session gave legislators, Indigenous Peoples communities, and barangay officials direct access to site-specific evidence about their own freshwater ecosystems: documented species groups including bats, birds, herpetofauna, coleoptera, trees, and shrubs, many of them endemic and keystone species with high conservation value. The hearing functioned as informal science education for decision-makers, showing how field data enters policy discussion, and complemented the university's conventions and trainings by carrying the same knowledge to the officials who translate it into local ordinances.

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14.2.1 Research Context for Connected Water Systems

Earlier research by DOrSU collaborators developed an adaptive coastal-zone health-index framework. Its relevance here is methodological: examining ecosystem condition requires a structured approach to pressures and environmental information. The 2024–2025 soil and water training strengthens one part of that wider capacity to generate and interpret evidence.

This earlier publication is supporting scientific context, rather than an AY training output. It helps explain the connection between reliable analysis and informed aquatic management, while the dated training records establish what the university actually delivered during the



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Article

Coastal Zone Environment Integrity Assessment for Sustainable Management: Part 1. Development of Adaptive Expert-Driven Coastal Zone Health Index Framework

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Abstract: The coastal zone is the environment that connects terrestrial and marine environments. It is the most productive ecosystem on the planet. It has been estimated that 23 percent of the population lives in the coastal regions. The attractive landscape and seascape of the coastal zone environments attract human settlement and increase the economic activities in the area. Unfortunately, massive human urbanization is also attributed to coastal zone ecosystem degradation. In addition, water-related phenomena due to the changing climate also affect the said environment. The negative impacts of human activities and the water-related phenomena typically deplete the environment's health. Thus, this study developed an adaptive index framework to assess the coastal zone environment condition. The principle of this framework is the sustainable co-existence of human development with the coastal zone environment. The identified coastal cities in the Philippines were utilized as the case study for developing the framework. The results show that the decision-makers are conservationists while extractive. In contrast, environmental educators are conservationists in nature. Moreover, each city has its own unique framework and signifies that the framework is adaptive to the perspective of the decision makers in their city.

Keywords: coastal zone sustainable management; CoZHI; multicriteria decision analysis; analytic hierarchy process; the Philippines

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reporting period (Cabrera & Lee, 2022).

Figure 4. Scholarly article proposing the Adaptive Coastal Zone Health Index (CoZHI) for coastal health assessment.

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Cabrera, J. S., & Lee, H. S. (2022). Coastal zone environment integrity assessment for sustainable management: Part 1. Development of adaptive expert-driven coastal zone health index framework. *Journal of Marine Science and Engineering, 10*(9), Article 1183. https://doi.org/10.3390/jmse10091183

Conclusion

Across laboratory training, practical soil-testing workshops, scientific exchange, and supporting research, DOrSU's work demonstrates a consistent commitment to building capability for freshwater and land water stewardship. By strengthening analytical skills, giving local stakeholders hands-on experience with soil assessment, and connecting researchers and practitioners around shared aquatic and land-based concerns, these efforts help create a stronger base for reliable research, technical support, and informed resource management. The year's contribution was stronger capability: trained analysts, practical soil-testing experience, and access to freshwater and marine expertise. These foundations support informed care of connected land and water resources.