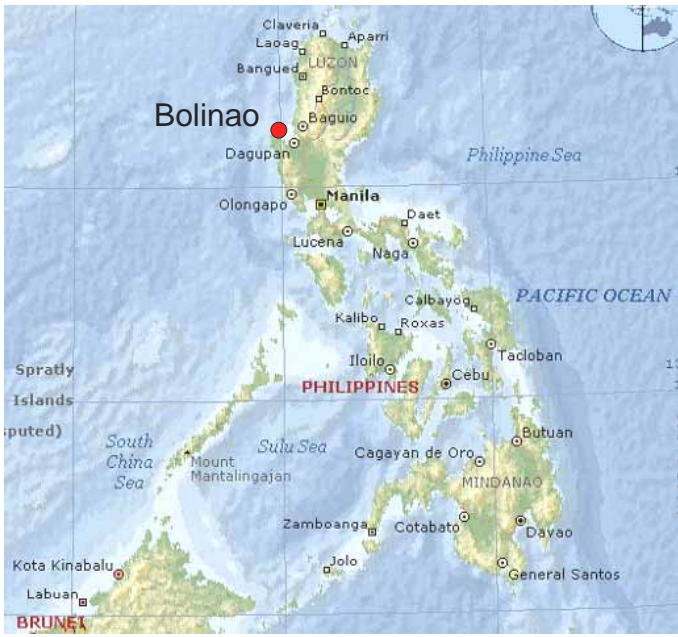


Bolinao Marine Laboratory, Marine Science Institute, University of Philippines, Philippines

Institutional setting	
1.Name and affiliation	Bolinao Marine Laboratory (BML), Marine Science Institute, College of Science, University of Philippines
2.Contacts details	<p>Principal address: Marine Science Institute, University of Philippines Dilliman, 1101 Quezon City, Philippines Tel: +632 922 3962 Fax: +632 924 7678</p> <p>Website: http://www.msi.upd.edu.ph/</p> <p>Contacts:</p> <p>COE Rep: Professor Edgardo Gomez, email: edgomez@upmsi.ph Director: Gil S. Jacinto, PhD, email: gilj@upmsi.ph Deputy Director for the Bolinao Marine Laboratory: Edna G. Fortes, PhD, email: ednaf@upmsi.ph Deputy Director for Research: Marilou San Diego-McGlone, PhD, email: mcglonem@upmsi.ph Deputy Director for Instruction: Laura T. David, PhD, ldavid@upmsi.ph</p>
3.Mandate and background, UPMSI	<p>The Marine Science Institute work to achieve the following objectives:</p> <ul style="list-style-type: none"> • To generate basic information necessary for optimal and sustained utilization, management, and conservation of the marine environment and its resources. • To provide graduate-level training and extension services • To develop human resource requirements in the marine sciences. • To develop appropriate and environmentally sound marine based technologies for industrial and economic development. <p>UPMSI undertake research, teaching and projects in marine biology, marine chemistry, physical oceanography, marine geology, and related disciplines.</p> <p>UPMSI represents a leading national institution in marine science, and in 1995 had the highest publication rate of per-reviewed papers among academic institutions in the country. At the national level, these contributions form the bases of policies that guide the research and development programs of the country.</p> <p>In recognition of its achievements in research and instruction, the Institute has received numerous awards from both government and private organizations. In 1994, UPMSI was designated the "National Center of Excellence in the Marine Sciences". The faculty has the country's largest concentration of Ph.D. scientists, and its undergraduate, graduate, and research programs conform to international standards of excellence.</p>

4. Institutional setting (within University)	<p>The executive officer is the Director, who carries out policies and programs approved by the Executive Council or the Senior Staff as a whole. The Director is assisted by Deputy Directors, one each for Research, Instruction, and for the Bolinao Marine Laboratory.</p> <p style="text-align: center;"><i>See diagram page 8</i></p>
10. Management structure, UPMSI	<p style="text-align: center;"><i>See diagram page 8</i></p>
5. Financial management and auditing, through central service? Responsibility, contact office?	<p>The ICML has its own administrative department in charge of managing finances under the responsibility of the Director. The University has a central administrative unit, under the control of the Administrative vice-chancellor, the regents of the university and an independent internal auditing office. In addition, an external auditing service is contracted every year for the whole University. The finance management in the University is strictly done according to the University Legislation, which complies with common international procedures in order to assure the correct and transparent financial administration.</p> <p>The director of the ICML, with the approval of the Vice-chancellor of Science, is responsible for celebrating research and service agreements with other Institutions.</p>
6. Bolinao Marine Laboratory overview	<p>Bolinao Marine Laboratory (BML) is the marine laboratory of the University of the Philippines Marine Science Institute. BML is located on the northwestern shore of the Lingayen Gulf, 275 km from Manila. The marine laboratory of the University of the Philippines Marine Science Institute has facilities for mariculture, field sampling and diving. In addition to wet laboratories, modest facilities for conferences are also available, as well as housing for resident and transient researchers or trainees. Telephone and internet connections are available.</p>
7. Location	<p>Bolinao Marine Laboratory : 16°22' -16°27'N latitude, 119°52' -120°00' E longitude</p>
8. Regional map	
9. Local area	Location area

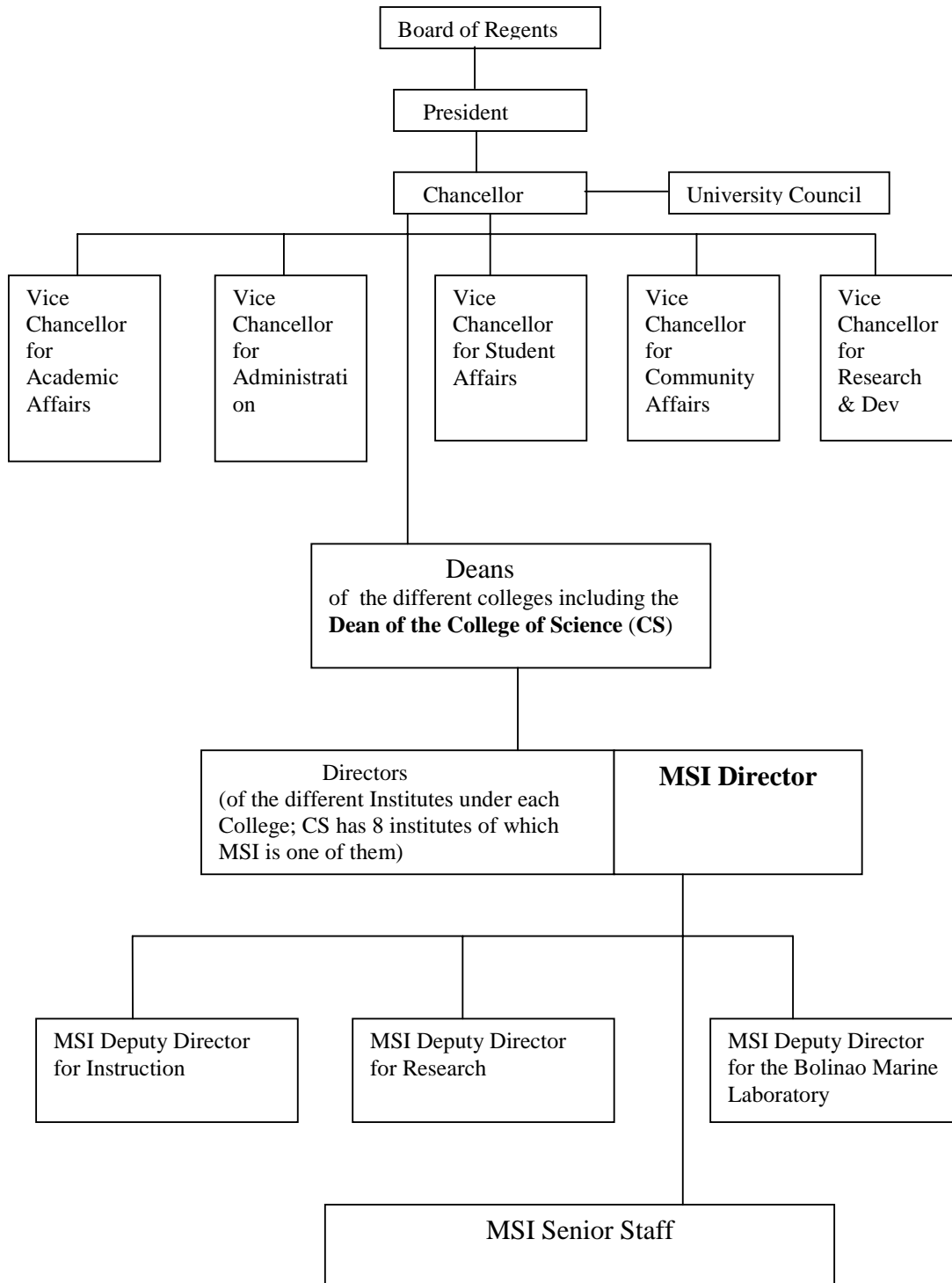
description	<p>Bolinao, Pangasinan is a coastal town in northwestern Philippines. It lies along the eastern edge of the South China Sea and experiences the northeast monsoon from November to March, the southwest monsoon from June to October, and weak easterlies from April to May.</p> <p>Reef type The reefs of Bolinao are of the fringing type, with slopes dropping to 120m in certain areas. Reef flats are mostly sandy-muddy and covered with seagrasses and seaweeds while some forereefs extend up to several km from the shore, with coral cover in certain places reaching down to about 30 m.</p> <p>Live coral cover averages about 20%. There are more than 100 fish species. However, important fish groups and mammals, such as sharks and dolphins that were previously observed along the Bolinao Channel (ca. 1950's) are no longer common in the area (Nanola 2002).</p> <p>Economic Value Coral reef fisheries represent an average of 15% of the total Philippine fisheries production, although in certain municipalities like Bolinao, their contribution may be as high as 25-30%. If properly conserved, the potential sustainable fisheries from coral reefs may be estimated at US\$31,900 to \$113,000 per square km (White and Cruz-Trinidad 1998). Of several towns along Lingayen Gulf, Bolinao has the highest number of municipal fishermen, (about 3,000 in 1985, representing ~20 % of the total municipal fishers in the Gulf) and accounts for about one-third of the total number of fishing boats operating in the area.</p> <p>Disturbances The Bolinao reef complex has been subjected to destructive fishing practices such as blast and cyanide fishing. Strict enforcement of the fisheries laws by the municipal government from the mid 80's to the present appears to have reduced the number of blasts. Cyanide is still being used to catch fish in the area but there is insufficient information to gauge the degree of use. Over fishing has been documented as another major stress factor and natural calamities such as storms also cause major disturbance. Thus, the reefs are in need of rehabilitation and restoration.</p> <p>Legal Protection At present, there are two protective zones established in Bolinao through a municipal ordinance --- one fronting the UPMSI marine laboratory (see below) and a community-initiated sanctuary in Binabalian. Other marine protected areas are currently being planned.</p>
10. Local area map	<p>[Insert local aerial photo of PM-reef with pilot survey sites]</p>
Research	
11. Research priorities	Overview of research area

<p>– brief overview</p>	<ul style="list-style-type: none"> • Biology of red tide/harmful phytoplankton (R. Azanza) • Plankton ecology • Coral Reef, Seagrass and Mangrove Ecosystems • Invertebrate biology and mariculture • Seaweed biology, molecular genetics, taxonomy, and culture • Nearshore and offshore oceanographic processes • Biochemical studies of marine organisms • Natural products in seaweeds and invertebrates • Selective breeding of aquacultured and maricultured species • Population genetics of marine organisms 																																										
<p>12. Faculty staff</p>	<p>The Marine Science Institute (UPMSI) The MSI is located on the main campus of the university in Quezon City, Metro Manila. The Bolinao Marine Laboratory (BML) serves as MSI's principal field laboratory. The department has a senior staff of 20 Ph.D.'s covering various fields of marine science, with a strong tradition of coral reef research. The academic, research, and teaching staff total consist of more than 100 full-time regular and contractual personnel supported by an administrative complement. Part-time researchers from other institutions collaborate with the staff.</p> <table border="0" style="width: 100%;"> <thead> <tr> <th style="text-align: left;">UPMSI staff</th> <th style="text-align: left;">Field of research</th> </tr> <tr> <th style="text-align: left;">Name</th> <th style="text-align: left;"></th> </tr> </thead> <tbody> <tr> <td>Porfirio M. Aliño</td> <td>Coral reef ecology</td> </tr> <tr> <td>Rhodora V. Azanza</td> <td>HAB, algal physiology, morphology</td> </tr> <tr> <td>Gisela P. Concepcion</td> <td>Biochemistry, toxinology</td> </tr> <tr> <td>Lourdes J. Cruz</td> <td>Biochemistry, toxinology</td> </tr> <tr> <td>Laura T. David</td> <td>Physical oceanography</td> </tr> <tr> <td>Edna G. Fortes</td> <td>Seaweed physiology, taxon., maricult.</td> </tr> <tr> <td>Miguel D. Fortes</td> <td>Marine plant ecology, restoration</td> </tr> <tr> <td>Edgardo D. Gomez</td> <td>Coral reef ecology and rehabilitation</td> </tr> <tr> <td>Gil S. Jacinto</td> <td>Marine pollution chemistry</td> </tr> <tr> <td>Suzanne M. Licuanan</td> <td>ecophysiology, giant clam mariculture</td> </tr> <tr> <td>Arturo O. Lluisma</td> <td>Genetics, algal biotechnology</td> </tr> <tr> <td>Maria L. San Diego-McGlone</td> <td>Nutrient biogeochemistry</td> </tr> <tr> <td>Marie Antonette Juinio-Meñez</td> <td>Invertebrate ecology, resource mgt.</td> </tr> <tr> <td>Marco Nemesio E. Montaña</td> <td>Marine products, algal, polysaccharides</td> </tr> <tr> <td>Ma. Josefa R. Pante</td> <td>Population genetics, bio-statistics</td> </tr> <tr> <td>Wolfgang T. Reichardt</td> <td>Marine microbial ecology</td> </tr> <tr> <td>Gavino C. Trono, Jr</td> <td>Seaweed taxonomy, ecology</td> </tr> <tr> <td>Cesar L. Villanoy</td> <td>Physical oceanography</td> </tr> <tr> <td>Maria Helena T. Yap</td> <td>Benthic ecology</td> </tr> </tbody> </table>	UPMSI staff	Field of research	Name		Porfirio M. Aliño	Coral reef ecology	Rhodora V. Azanza	HAB, algal physiology, morphology	Gisela P. Concepcion	Biochemistry, toxinology	Lourdes J. Cruz	Biochemistry, toxinology	Laura T. David	Physical oceanography	Edna G. Fortes	Seaweed physiology, taxon., maricult.	Miguel D. Fortes	Marine plant ecology, restoration	Edgardo D. Gomez	Coral reef ecology and rehabilitation	Gil S. Jacinto	Marine pollution chemistry	Suzanne M. Licuanan	ecophysiology, giant clam mariculture	Arturo O. Lluisma	Genetics, algal biotechnology	Maria L. San Diego-McGlone	Nutrient biogeochemistry	Marie Antonette Juinio-Meñez	Invertebrate ecology, resource mgt.	Marco Nemesio E. Montaña	Marine products, algal, polysaccharides	Ma. Josefa R. Pante	Population genetics, bio-statistics	Wolfgang T. Reichardt	Marine microbial ecology	Gavino C. Trono, Jr	Seaweed taxonomy, ecology	Cesar L. Villanoy	Physical oceanography	Maria Helena T. Yap	Benthic ecology
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<p>13. Education, course curricula</p>	<p>MSI offer MSc and PhD degrees in Marine Science with specialization in marine biology, marine physical sciences, and marine biotechnology</p> <p>Examples of graduate courses offered: 95 % are graduate courses; 5% are undergraduate courses:</p>																																										

	<p>OCEAN PHYSICS AND CHEMISTRY PHYSICAL OCEANOGRAPHY CHEMICAL OCEANOGRAPHY GEOLOGICAL OCEANOGRAPHY BIOLOGICAL OCEANOGRAPHY MARINE POLLUTION CHEMISTRY MARINE PHYTOPLANKTON MARINE BIOGEOGRAPHY SEAGRASSES AND MANGROVES MARINE ALGAE</p>	<p>ALGAL PHYSIOLOGY CORAL REEF ECOSYSTEMS MARINE BIODIVERSITY BIOCHEMISTRY OF MARINE ORGANISMS MARINE BIOTECHNOLOGY MARINE ECOSYSTEM DYNAMICS POPULATION GENETICS OF MARINE ORGANISMS OCEAN REMOTE SENSING MOLECULAR PHYLOGENETICS</p>
Regional collaboration		
14. Local / regional partners, linkages to NGOs, government agencies	<p>CMS/UQ has linkages at both state and federal levels. Its scientists are on key advisory committees – including the Biodiversity Advisory Committee (OHG – this feeds into the federal equivalent). This committee sets listing for organisms among other things – e.g. the Convention of Biological Diversity. CMS and UQ are both connected via its officials to state and federal government ministers. IOC has regional representation via the PEA and its Australian delegates. These link directly to the Federal government.</p>	
15. Regional/ international research partners, networks	<p>UPMSI undertakes collaborative research with local, national, and international agencies. UPMSI, for example, has served as a major implementing agency in various ASEAN marine science programs. UPMSI is also represented in a number of national and international committees and organizations concerned with marine resources and the marine environment. Many of the staff are members of professional organizations and editorial boards of local and international journals.</p> <p>Examples include: Regional/International - JSPS (Japanese Society for the Promotion of Science); Centro de Estudios Avanzados de Blanes, Spain; Hokkaido University, University of South Florida, Universiti Putra Malaysia; Netherlands Institute of Ecology; International Institute for Infrastructural, Hydraulic and Environmental Engineering, Netherlands; Coastal Resources Institute, Prince of Songkla University, Thailand; University of New Hampshire, US; James Cook University, Australia.</p>	
16. Linking science to management and policy advise	<p>Local area management Plan</p> <p>A local area management plan has been implemented through the LGCAM Commission to manage the marine resources of the area. The programs and projects under the LGCAM Commission include fisheries management, environmental quality management, coastal zonation, rehabilitation of linked habitats, rehabilitation and enhancement of critical habitats, aquaculture development, alternative livelihood for fishing families, and institutional development.</p> <p>A comprehensive municipal coastal development plan has been formulated by a multi-sectoral committee with the assistance from an IDRC-Canada project on Community-based Coastal Resource Management. This project was implemented by the UP -MSI, Haribon Foundation and the UP College of Social Work and Development (CSWCD). The three-year project (1995-1997) involved resources monitoring, community organizing and livelihood development. Participatory resource monitoring was attempted. Mangrove reforestation was implemented in barangay Pilar. UP-MSI is starting up another 3-yr follow-up project with support from the Netherlands to consolidate resource management initiatives.</p>	
17. Linkages to local or regional NGOs, projects with relevance to TR	<ul style="list-style-type: none"> • Sustaining Management of Coastal Resources in Lingayen Gulf Project (Coastal resource management project, 2003-2007, further details in separate annex). 	

18. Linkages to GEF TR working groups	Four faculty staff are represented in GEF TR working groups: Edgardo D. Gomez (RRWG); Laura David (RSMW); Helen T. Yap (BWG); Porfirio Aliño (MDSWG)																																																										
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21. Research facilities & equipment for lab and field work	<p>Existing research facilities and equipment:</p> <ol style="list-style-type: none"> 1. One main research laboratory building 2. Land-based nursery/hatchery with running seawater system 3. Equipment - In BML, there is 'communal' equipment (some have rental fees), which are the property of BML, and 'project' equipment, which are property of certain research projects. Use of the latter type needs permission from project leaders. <p><u>List of communal equipment/gears (field use):</u></p> <table style="width: 100%; border: none;"> <tr> <td>4 small boats,</td> <td></td> </tr> <tr> <td>2 compressors</td> <td></td> </tr> <tr> <td>66 SCUBA tanks</td> <td></td> </tr> <tr> <td>2 regulators</td> <td>2 masks</td> </tr> <tr> <td>5 BC</td> <td>3 snorkels</td> </tr> <tr> <td>2 back packs</td> <td>7 wt belts</td> </tr> <tr> <td>2 prs booties</td> <td>22 pcs weights</td> </tr> <tr> <td>5 prs fins</td> <td>24 life jackets</td> </tr> <tr> <td>2 wet suits</td> <td></td> </tr> <tr> <td colspan="2">unit sound system w' amplifier</td> </tr> </table> <p><u>List of communal equipment (laboratory use):</u></p> <table style="width: 100%; border: none;"> <tr> <td>1 distilling apparatus</td> <td>2 chest freezers</td> </tr> <tr> <td>1 automatic autoclave</td> <td>2 upright freezers</td> </tr> <tr> <td>3 autoclaves, pressure cooker types</td> <td>1 fumehood</td> </tr> <tr> <td>3 drying oven</td> <td>2 stereomicroscopes</td> </tr> <tr> <td>1 analytical balance</td> <td>1 inverted microscope</td> </tr> <tr> <td>1 hand refractometer</td> <td>1 photomicrograph</td> </tr> <tr> <td>1 DO meter</td> <td>1 pH meter</td> </tr> </table> <p><u>List of BML –owned computers and accessories, audio-visual equipment:</u></p> <p>1 LCD projector, 3 unit computers, 2 printers, 1 slide projector 1 overheard projector</p> <p><u>List of project-owned equipment:</u></p> <table style="width: 100%; border: none;"> <tr> <td>1 spectrophotometer,</td> <td>1 dissecting microscope</td> </tr> <tr> <td>1 analytical balance</td> <td>1 compound microscope</td> </tr> <tr> <td>2 units redox meter</td> <td>1 eyepiece micrometer</td> </tr> <tr> <td>2 osterizer / blender</td> <td>1 stage micrometer</td> </tr> <tr> <td>micropipettes</td> <td>2 vacuum pumps</td> </tr> <tr> <td>2 GPS</td> <td>filtration set-up</td> </tr> <tr> <td>1 secchi disk</td> <td>1 rambo corer</td> </tr> <tr> <td>2 hand refractometer</td> <td>1 Inverted m axiovert</td> </tr> <tr> <td>1 DO meter</td> <td>1 interplay cpd microscope</td> </tr> <tr> <td>1 centrifuge</td> <td>1 hand pump</td> </tr> <tr> <td>1 vortex mixer</td> <td>1 grinder/cutter</td> </tr> <tr> <td>1 Digital camera</td> <td>1 refrigerator</td> </tr> </table>	4 small boats,		2 compressors		66 SCUBA tanks		2 regulators	2 masks	5 BC	3 snorkels	2 back packs	7 wt belts	2 prs booties	22 pcs weights	5 prs fins	24 life jackets	2 wet suits		unit sound system w' amplifier		1 distilling apparatus	2 chest freezers	1 automatic autoclave	2 upright freezers	3 autoclaves, pressure cooker types	1 fumehood	3 drying oven	2 stereomicroscopes	1 analytical balance	1 inverted microscope	1 hand refractometer	1 photomicrograph	1 DO meter	1 pH meter	1 spectrophotometer,	1 dissecting microscope	1 analytical balance	1 compound microscope	2 units redox meter	1 eyepiece micrometer	2 osterizer / blender	1 stage micrometer	micropipettes	2 vacuum pumps	2 GPS	filtration set-up	1 secchi disk	1 rambo corer	2 hand refractometer	1 Inverted m axiovert	1 DO meter	1 interplay cpd microscope	1 centrifuge	1 hand pump	1 vortex mixer	1 grinder/cutter	1 Digital camera	1 refrigerator
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22. Training and seminar facilities	<p>BML</p> <ul style="list-style-type: none"> • One audio-visual room (in Main Lab bldg): 7.70 x 12.44 m; Capacity – 110 persons • One auditorium (in Admin bldg), Capacity – 180-200 persons
23. Accommodation	<ul style="list-style-type: none"> • Dormitories, with 40-bed capacity each = 80 people total • 7 staff houses, 6-8 persons capacity each = 42-56 people total
24. Research background data/ routine environmental data being logged at field station?	<ul style="list-style-type: none"> • Environmental data <u>regularly</u> monitored in BML: temp. and salinity • Other environmental data gathered by research projects in BML: <ul style="list-style-type: none"> ○ Dissolved oxygen ○ Nutrients (phosphate, nitrate, nitrite, ammonia) ○ Light
25. Historical data and background data on BML area?	(Listing of available literature on Bolinao and adjacent areas are included in separate annex, ~200 titles)
26. Scientific library at COE	<p>The MSI library has a collection of more than 1,600 books and monographs, mainly on marine biology, geology, ecology, oceanography, environmental management, fisheries and other related fields</p> <p>Data/literature available at BM: (list of available literature in BML library is presently being done in line with the computerization of the BML library)</p>
27. Internet facilities	Low speed connection, need upgrading
28. Video-conference facilities:	No facilities in BML, only in MSI, Diliman
29. Catering arrangements	Arranged upon request.
30. Other relevant information – suggestions for needed logistics supported by GEF TR	<p>Support would be needed for upgrading:</p> <ul style="list-style-type: none"> • internet facilities • telephone system (PABX) • intercom facilities • audio-visual room • computer units, printers, UPS, scanners • small boat
31. References	<ul style="list-style-type: none"> • Nanola, CL 2002. Bolinao. Pp. 31-34 <i>In</i> Alino, PM et al. (eds.) Atlas of Philippine Coral Reefs. Manila, Goodwill Trading Co. • White, AT and A Cruz-Trinidad 1998. The Values of Philippine Coastal Resources: Why Protection and Management are Critical. Coastal Res. Mngt. Proj. Cebu City, Philippines, 96 p.



Organizational structure of the University of the Philippines DILIMAN and of Marine Science Institute