SEAFDEC

THE MFRDMD/SEAFDEC FIRST REGIONAL WORKSHOP ON REMOTE SENSING OF PHYTOPLANKTON

Kuala Terengganu, Malaysia, 17-18 November, 1998

COUNTRY STATUS REPORT

PHILIPPINES

STATUS OF MARINE REMOTE SENSING APPLICATIONS IN THE PHILIPPINES

By:

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1.0 Introduction

Philippines interest in participating in the First Regional Workshop on Remote Sensing of Phytoplankton is due to the recognized need of fishery scientists to gain awareness on the application of marine remote sensing and to be involved in this regional initiative to determine research priorities.

The Philippine fisheries scientific community recognizes that the remote sensing is a tool in resource and environmental assessment. This technology would farther advance their capacity to undertake more precise data and information of their fishery resources and oceanographic conditions, which would provide assistance in their programs on resource conservation and management.

2.0 Application of marine remote sensing

Most applications of remote sensing have been on coastal zone resources. In the Philippines, a multi-disciplinary program on conducting pilot studies for coastal resources and environment using LANDSAT MSS data have been completed. The program has focused on the information generation capacity of existing LANDSAT system for the fisheries and aquatic resources, forestry and vegetation, geology and hydrology, and land use sectors of the pilot study areas in Lingayen Gulf, Northern Luzon. These multi-disciplinary informations are being used for the integrated coastal zone management program of the government.

Multi-level remote sensing had been applied to provide different levels of information needed for specific mangrove related management decisions. The mangrove management program of the government had used LANDSAT data in its assessment studies. In one such study on mangrove assessment the remaining mangrove forests were grouped according to their proximity to the nearest fishing grounds on the assumption that mangroves play important ecological roles in the marine productivity of the out-laying bodies of water. The boundary of each fishing ground was delineated using surface current data.

Remote sensing had been used in the assessment and mapping of the corals on Apo Reef. Digital analysis of LANDSAT MSS data was used. The major physiographic zones and bottom cover of Apo Ref in Mindoro Island, were categorized and mapped out, using combinations of unsupervised (without ground truth) and supervised (with extensive ground truths using transects, bounce dives, under water sled transects, and shallow surface reconnaissance) techniques of digital processing, using interactive computer-assisted processing systems.

Before conducting a detailed mapping of coral reefs, the major bottom and bathymetric variations of the reefs surface were first determined and mapped to arrive at more detailed categories and also to provide quantitative and qualitative information on the reef's major structures.

The actual stratification and classification of submerged features of a coral reef can be a difficult and tedious process. Reflectance features defining coral reefs represent a

summation of signals due to bottom reflection, signals due to sea surface and atmospheric influences.

The oceanographic and marine biological studies conducted were mainly in the Lingayen Gulf areas. They were aimed at maximizing the use of LANDSAT imageries for detecting and monitoring dynamic processes. Water movement, changes in water quality, bathymetric configuration and siltation were monitored. The extent of the effects of suspended sediments coming from mine tailing on marine life was determined. Mapping of major biotic communities in shallow waters was also of particular interest since such information have been useful in delineating areas for mariculture and in assessing our marine resources. The different studies conducted under this sector have as a whole established a methodology on the future characterization of the saltwater bodies in the project areas, from mapping the bottom of shallow waters to determining the quality of the water above it.

The botanical studies were mainly concerned with the mapping of natural vegetation using LANDSAT MSS data in contrast with cultivated crops, discriminating major plant communities and determining their growth conditions and studying the effects of the seasonal changes in the spectral signatures of natural vegetation. Both aerial photographs and LANDSAT imageries were used in these activities.

The fishery resource studies involved the discrimination and delineation of various types of fishponds for inventory purposes using LANDSAT imageries and correlating LANDSAT spectral properties of sea water with planktonic production for possible use to fish stock assessment. Also included is the integration of all parameters detectable from LANDSAT imageries to predict the fishery potentials of selected coastal sites.

3.0 Monitoring of Coastal Environment

Brackishwater fishponds are scattered in the major islands of the Philippines. Pond culture, the improved technology, as one of the fish production industry in the Philippines, has been contributing significantly to the total annual fish production. However there is a need to monitor fishponds operation and development and assess changes in development. LANDSAT remote sensing data have been used to determine important information. Visual interpretation of LANDSAT photo products has indicated that these two important parameters can be extracted using properly selected date of coverage.

Changes in the country's bay areas are being monitored using remote sensing data. Multidate imageries are being used to study and measure environmental changes. In Manila Bay, extensive areas have been reclaimed and filled and are now occupied by hotels, business offices, trading sites, recreational facilities and others. LANDSAT data are being used to determine the extent of the reclaimed land in the bay area.

In the Philippines, soil erosion has been identified as a critical environmental problem. Soil erosion contributes to the siltation/sedimentation of our bay caused mainly by intensive farming, mining, deforestation and other forms of human activities. Analysis of LANDSAT imagery of Manila Bay and surrounding area taken

during the rainy season at the time of heavy rainfall showed the heavy load of silts being carried by the waters into the Bay.

4.0 Proposals from the Philippines

1. Acquisition of archive data for the Philippines from NOAA and agencies of countries which have satellite data.

2. Training of personnel on the following fields:

   • Computerized image processing systems for oceanographic application
   • Software system for oceanographic applications.

3. Acquisition of computerized image processing systems for relevant agencies and institutions, like BFAR (Bureau of Fisheries and Aquatic Resources)

4. Establishment of data communication network among institutions engaged in oceanographic studies.

5. Establishment of receiving station for the Philippines