

NATIONAL MAPPING AND RESOURCE INFORMATION AUTHORITY

FY-2012 Annual Accomplishment Report

I. Executive Summary

In 2012, NAMRIA contributed to the overall thrusts and programs of the DENR and the national government through provision of geographic data and information as basic references for planning and decision-making.

The agency implemented 18 regular projects under the following major functions: (a) Hydrographic Surveys and Nautical Charting; (b) Topographic Mapping; (c) National Geodetic Network Development; (d) Land Evaluation and Mapping; and (e) Information Management. The agency also continued implementation of the Extended Continental Shelf (ECS) Project for the defense of the Benham Rise Submission in accordance with the United Nations Convention of the Law of the Sea (UNCLOS).

Under Hydrographic Surveys and Nautical Charting, NAMRIA conducted surveys of major ports and harbors to gather data for the updating of existing nautical charts, and the compilation of new charts, including electronic nautical charts (ENC's). Nautical charts are essential for the safety of maritime navigation and serve as references for various maritime activities. Notices-to-Mariners containing updates on the status of chart features such as lights, buoys and other aids to navigation, and various warnings and other critical information for the guidance of mariners were published. NAMRIA also maintained its nationwide network of tide stations to gather sea level data which are primarily used for the determination of tidal datum planes (or reference levels for elevation), and the prediction of tide levels in various ports, harbors and other localities as an important reference for a wide range of maritime activities, including shipping, coastal engineering and fisheries, and scientific research.

Topographic base mapping at different scales was undertaken to provide updated information on topography, vegetation, drainage systems, infrastructure such as road networks, major landmarks, and other land features. These maps are also being widely used by various government agencies, including LGUs, the private sector and the academe as reference for local development planning, business and research activities. In 2012, under the Topographic Mapping, a special project funded by JICA, NAMRIA validated the new base maps at scale 1:50,000 for the whole of Mindanao. Also in 2012, NAMRIA pushed for the approval of the Unified Mapping Program which aims to provide detailed, up-to-date, reliable and accurate geospatial information so as to serve the requirements of the government as basic reference for planning and decision making.

Under Land Evaluation and Mapping, NAMRIA provided technical assistance to DENR regional offices on the Forestland Boundary Assessment and Delineation (FLBD) including the drafting of bills for the reclassification of lands in the public domain; delineated NIPAS areas; produced land cover maps using recent remote sensing data; mapped low-lying areas to delineate the extent of coastal areas vulnerable to flooding, coastal erosion, and salt water intrusion, in various scenarios of sea level rise due to climate change and other causes; conducted coastal resource mapping and assessment to produce resource maps and database of coastal areas susceptible to sea level rise.

Under information management, NAMRIA developed and maintained web-based systems and databases to support its regular and special projects. These support components include map integration; information systems development; and information, education, and communication (IEC) campaigns. Geographic information services were made available through the NAMRIA

Geomatics Training Center (GTC) and the NAMRIA One-Stop-Shop (OSS). The GTC conducted trainings for different government offices, local government units, the academe and the private sector on GIS, map updating and database development. The OSS provided geographic and ENR information services to various clients. The 20 Map Sales Offices also in the different regions continued to enhance the accessibility of NAMRIA products to map users all over the country.

Special projects with other government agencies and the private sector were also undertaken on base mapping, geodetic surveys and systems development, namely: (a) CSCAND (Collective Strengthening of Community Awareness for Natural Disasters) Project; (b) Topographic Mapping for Peace and Development in Mindanao Project; (c) Generation of Data on Upland/Forestland Population; (d) The Philippine Geoportal Project; and (e) Philippine Climate Change Adaptation Project (PhilCCAP).

During the year, the agency responded to many requests of various government agencies, the academe and from private institutions for digital base maps/satellite images, aerial photographs, certification on land classification status, tidal data, sea level and predictions, and provision of related geographic and natural resource data.

Pursuant to EO 605, and to improve delivery of the agency's services, NAMRIA, with assistance from Development Academy of the Philippines continued the development of its Quality Management System (QMS) toward certification to ISO 9001:2008. NAMRIA successfully achieved the certification on October 02, 2012.

II. Physical Accomplishments by Function/Program

NAMRIA has the following core functions: (a) Hydrographic Surveys and Nautical Charting; (b) Topographic Base Mapping; (c) National Geodetic Network Development; (d) Land and Evaluation Mapping; and (e) Information Management. Accomplishments for 2012 are as follows:

A. Regular Programs and Activities

1. Hydrographic Surveys and Nautical Charting

Under this program, NAMRIA conducted hydrographic and oceanographic surveys; produced nautical charts and maritime publications; operated and maintained survey vessels, tide stations and other related facilities. Technical data generated contribute to ensure safety of life at sea, support climate change mitigation and adaptation, and are used to delineate the country's different maritime zones. These also support the requirements for infrastructure development, environmental management, resource exploration and scientific research.

- **Hydrographic Surveys:** This involves systematic field measurement of depths of various points at sea and the geographic positions of these points to depict the configuration of the sea bottom, determination of the position and character of various dangers and aids to navigation, as well as the conduct of coastline topographic survey, to obtain data for the compilation or updating of nautical charts. For the year, NAMRIA surveyed Ports and Harbor of Balanacan, Dalahican and Masbate; performed routine preventive and corrective maintenance on motor vehicles including the preventive maintenance of BRP Bantay Kalikasan; collected 12-month continuous record of the earth's magnetic elements at magnetic observatory in

Muntinlupa City; and re-observed twelve (12) repeat stations.

- **Nautical Charting:** For this activity, compiled were: eight (8) ports and harbor charts, two (2) approach charts, seven (7) coastal charts, two (2) harbor ENC cell, and one (1) approach ENC cell; enhanced on: four (4) coastal charts, one (1) EEZ chart, and one (1) overview chart; printed six (6) nautical charts, published 2,000 books of 2013 TCTs, and 200 chart catalog; and manually corrected navigational information updates on nautical charts.
- **Maritime Publication:** Published were: the 12th editions of Notices-to-Mariners (NTM); 2013 Edition of List of Lights; one (1) chart with maritime zones; and assisted 92 LGUs on the delineation of municipal waters.
- **Operation and Maintenance of National Oceanographic Data Center (NODC):** NAMRIA's oceanographic survey activities are on physical oceanography, or the measurement and analysis of parameters such as tides and current, and the variation of temperature, and salinity or conductivity with depth. Tidal data are inputs to the publication of the annual Tide and Current Tables. The other sea parameters are used to determine sound velocity in sea water, an essential input in hydrographic surveys. Accomplishments of this function were: the astronomical computations, prediction, editing, and final tabulation of the 2013 Tide and Current Tables (TCTs); releveled and inspected 47 tide stations; collected and processed 564 monthly tidal datasets; updated tidal information for the 15 target nautical charts.

Aside from the above regular activities, special and intervening projects/activities were accomplished under this program in order to generate data for use in scientific research in the field of oceanography and provide technical assistance to LGUs and private institutions. These were as follows:

- Collected 12-month record of the earth's magnetic elements using the magnetometers installed at the Magnetic Observatory for the Circum-Pacific Magnetic Network Project (Kyushu University, Japan) and Ocean Hemisphere Network Project (University of Tokyo, Japan);
- Provided technical assistance/support and coordination on the following:
 - Verification survey of Leyte and Boton Wharves in SBMA, Olongapo City;
 - Educational Tours applied for by SBMA, Tourism Department for various colleges and universities;
 - Joint hydrographic survey with United States NAVOCEANO concerning the hydrographic surveys aboard USNS BOWDITCH in Luzon Strait, Batanes and Manila Bay;
 - Maintenance of near-real time tide stations; and
 - Extended Continental Shelf (ECS) submission to the UN.
- Other clientele services rendered include:
 - Issuances on: a) tidal information (extremes, benchmarks, elevations, mean sea level and predictions); b) Nautical Distance; and c) navigational warnings to mariners through NAVAREA XI Coordinator in Japan; and

- Provision of Notice-to-Mariners free of charge to the maritime public, including foreign hydrographic offices to ensure safety of life at sea and environmental protection.

2. Topographic Base Mapping

NAMRIA produced topographic base maps at various scales using photogrammetry, satellite remote sensing, digital cartography and Geographic Information System (GIS) technology. These serve as base data used by other agencies such as MGB, PAGASA and PHIVOLCS in the production of geohazard maps.

- **Large-scale Base Mapping (1:10,000):** This project involves the large scale mapping of urban and high-growth areas of the country to provide references for various detailed planning activities, e.g. for infrastructure planning, preparation of land use plans, and other applications, maps. The maps serve as base layers for the production of large-scale hazard maps. The maps are compiled from aerial photographs. The map production process includes photo or image control points survey, photogrammetric compilation, cartographic enhancement, field verification, final editing, and printing. The corresponding digital topographic map databases are also compiled for use in various GIS applications. Compiled 45 out of 43 sheets at scale 1:10,000; enhanced the target 43 sheets; mapped 60 sheets; and 60 map sheets were converted to GIS ready spatial information. Evaluated aerial photographs covering Northeastern Mindoro, Tagaytay City, and Northern Bicol River Basin; and a total of eighty 80 PCPs and 72 ICPs were established.
- **Medium Scale Mapping (1:50,000):** Topographic base maps at this scale support general planning and operational needs, and are also used as base maps for the production of geohazard and other thematic maps. The target of 35 map sheets at scale 1:50,000 and one (1) map sheet at scale 1:250,000 were converted into digital format; and 50 map sheets were inputted into the topographic database.
- **Administrative/Special Mapping:** This activity involved the production of two (2) regional maps covering Regions VI and XI and publication of Philippine Road Atlas. Two (2) regional maps were cartographically enhanced using freehand format; and 63 inset city maps for Luzon and 43 inset city maps for visayas were color separated for the Philippine Road Atlas.
- **Printing of Topographic/Administrative Maps:** Reproduced/printed 115 out of 100 target map quadrangles; and completed physical inventory of printed medium-scale 1:50,000 topographic maps, updated stock cards and delivery reports.

On intervening activities, NAMRIA undertook special mapping projects with LGUs and other government agencies to serve their requirements for specific map products and services. Private entities were also provided various services through Memorandum of Agreement (MOA). These were as follows:

- a) Special Projects:
 - CSCAND Project – prepared large scale base maps; and
 - Topographic Mapping for Peace and Development in Mindanao Project – conducted Technical Coordinating Committee (TCC) meetings, GIS training and orientation to Davao Oriental LGUs regarding the validation of 227 draft topographic maps.
- b) Established Image Control Points (ICPs) for rectification and transformation of SPOT5 Satellite Imageries into PRS92 for use of Medium-Scale 1:50,000 map revision and updating for the province of Occidental Mindoro;
- c) Implemented 187 Memorandum of Agreement (MOA) and fourteen (14) Memorandum of Understanding (MOU) with different government, private and individual entities; and
- d) On clientele services, the following were issued:
 - Certification of 1,285 Control stations;
 - Evaluation of 4,081 GCPs; and
 - Calibration of 422 GNSS receivers.

3. National Geodetic Network Development

The development of the national geodetic network through the Philippine Reference System of 1992 (PRS92) Project continuously provided a homogeneous geodetic reference for accurate survey and mapping of natural resources, and administrative and cadastral boundaries. The project was undertaken through the collaboration of the Regional Offices of the DENR. Accomplishments under this program were as follows:

- **Geodetic Network Development:** Observed the targeted seven (7) clusters of inter-island benchmark connections; surveyed 76 zero elevation points; readjusted 1,500 GCPs to ITRF 2005 coordinates; updated 100 GCPs; established two (2) active geodetic stations, 306 out of 300 2nd order gravity stations, and 100 kilometers 1st order level lines on small islands; unified 6,503 out of 5,000 kilometers of level lines; updated descriptions of 300 out of 100 BMs; releveled 3,547 out of 1,000 kilometers 1st order level lines.
- **Data Transformation and Integration of Lands Datasets:** Provided technical assistance for DENR-LMB for the ARMM on the derivation of local transformation parameters and operation of Hi-target RTK GNSS dual-frequency receiver to expedite delayed activities on densification of geodetic controls and data integration; and completed quality control and editing of encoded and plotted cadastral lots for sixteen (16) municipalities and one (1) city.

4. Land Evaluation and Mapping

The following were undertaken under this program:

- **Forestland Evaluation and Mapping:** In relation to the Forestland Boundary Delineation of the DENR, finalized regional map outputs and technical descriptions (TDs) of 40

provinces, unified 32 provinces, and replotted 30 provinces including manual replotting, checking, digitizing, editing, attribute entry and integration; validated 33 NIPAS maps; digitally converted 20 provinces; and updated LC statistics on the targeted 20 provinces.

- **Land Cover Mapping:** Completed image interpretation, analysis and validation; preparation of final land cover maps, and statistics for 30 provinces.
- **Mapping and Assessment of Low-lying Areas Vulnerable to Sea Level Rise:** Validated the elevation of one (1) meter contour intervals within the 0-12 meter elevation range and land use/cover maps extracted from ifSAR for the twelve (12) clusters in Mindanao and five (5) clusters in Luzon. Included in Mindanao clusters are the cities of Butuan, Cagayan de Oro, Cotabato, Davao, Dipolog, General Santos, Iligan, Pagadian, Surigao, Tangub-Tubod, Ozamis City, and Zamboanga. Conducted GPS-RTK elevation survey within the 0-12 meter elevation in Luzon clusters that cover the five (5) provinces of Ilocos Norte, Ilocos Sur, La Union, Pangasinan and Cagayan.
- **Coastal Resource Mapping and Assessment:** Conducted satellite image processing using AVNIR2 and LANDSAT image both taken in 2010; field validation and assessment survey on coral and seagrass; and completed layout and printing corals and seagrass map, land cover and slope maps within coastal zone for the province of Aklan.
- **ENR Data Integration:** Completed data conversion and field validation for the provinces of Palawan and Bataan; continued updating inventory of geospatial data including metadata and archiving system within RSRDAD; and ortho-rectified three (3) scenes PALSAR image for the provinces of Bohol and Leyte.

Intervening activities accomplished under this program include projects with government and private agencies relating to land survey, evaluation and assessment, and provision of GIS-produced maps. These were as follows:

- CSCAND Project – completed barangay boundary collection for Pasig, Taguig, Pateros, Makati, Mandaluyong and Marikina; continued integration of themes, layout preparation, preliminary map printing, final editing of themes and final map printing for Iloilo, Catanduanes, Ilocos Norte, Abra, Taguig, Parañaque, Pasig and Pasay;
- Generation of Data on Upland/Forestland Population – completed data image acquisition, processed RS/GIS for 66 out of 40 provinces; data collection and base map preparation for 48 out of 35 provinces; validated 19 provinces, and generated statistics for 13 provinces;
- Manila Bay Coastal Strategy Project – replotted LC lines and corners for Bataan;
- Conducted evaluation/review of Regional Assessment and Delineation Team's map outputs on the assessment and delineation of boundaries for drafting House Bills defining the final limits of the public domain in the provinces of Benguet, Mt. Province, Abra, Kalinga, Batangas, Quezon, Camarines Sur and Norte, Albay,

Masbate, Bohol, Cebu, Negros Oriental, North Cotabato and Sarangani;

- Prepared slope map for the portion of barangays Sonlon and Buan in Asuncion, Davao del Norte; and
- Acted on different LC cases/requests by different government and private entities.

5. INFORMATION MANAGEMENT

NAMRIA continued development and maintenance of information systems, management of databases, conduct of geomatics training activities, and provision of other geographic information services to government agencies, business sector, non-governmental organizations, the academe and private individuals.

The following were the accomplishments of the project:

- **Information Systems Development and Maintenance:** The project maintained Geodetic Network Information System (GNIS), Land Survey Data Management System (LSDMS), PRS92 website, and NAMRIA website; developed four (4) information systems that will support the functions of the Geomatics Training Center, Map Sales Offices and Photogrammetry Division namely: a) NAMRIA Products and Services Information System; b) Training Evaluation System; c) Collaborative Source Code Management and Issue Tracking System; and d) Clearance Certification System for AO # 16. An additional subsystem (Document Viewer) was also created for the Document and Record Information Management System (DRIMS).
- **Database Development and Maintenance:** For the year, the activity validated LGU GIS capability profile for the period 2001-2011, populated 373 metadata records; and field verified the provinces of Iloilo, Antique, Aklan, Capiz and Guimaras for the Philippine islands database.
- **Geographic Information Services (Component I):** Distributed 420 information materials; conducted 31 trainings on: (a) GIS for Executive; (b) Basic GIS; and c) Advanced GIS; coordinated trainings for Philippine Geoportal; 5 information drive activities; enhanced 6 MSOs; maintained 2 information and training centers; updated databases on archival and SRR-SIS on MSOs; and prepared FY 2011 participants profile, summary of evaluation and training, NGTC Annual Report, and Sales and Analysis Report.
- **Geographic Information Services (Component II):** Published the FY 2011 NAMRIA Annual Report and Infomapper; distributed 77 news articles on Newscoop; drafted coffee table book; set-up photo/map exhibits and prepared photo and video documentation for various NAMRIA projects and events/activities; produced AVP on NAMRIA's 25 Years; published nine (9) press releases in the Manila Bulletin, Philippine Star and Philippine Daily Inquirer; prepared graphic art designs for GAD, ISO, 5S and other activities of NAMRIA; and acted as secretariat on the ISO 9001:2008 activities.

On Special projects/intervening activities under this program, database build-up and management were undertaken and information systems developed. Likewise, IEC activities were conducted on major programs of government. The following were accomplished under this program:

- a) Philippine Extended Continental Shelf (ECS) Project: Developed application system for the West Palawan Region, maintained ECS Viewer for the Benham Rise Region and FTP site, and data collection, packaging of submission reports and systems acceptance documents of all administrative systems;
- b) The Philippine Geoportal: Provided technical assistance in the development of the Philippine Geoportal Web Portal, viewer and maintenance, assisted in the upgrading of internet connection and reconfiguration of network infrastructure, prepared final draft on the core policy and guidelines/standards. In support to Mapping and Geodesy Department, coordination for specifications development, digital surface model data extraction, build-up of multi-scale framework base maps, data attributions and inventory of stakeholder's fundamental datasets were completed;
- c) Philippine Climate Change Adaptation Project (PhilCCAP): For the year, Basic and Advanced GIS training courses including On-the-Job and GIS for Executives training sessions were conducted;
- d) CSCAND Project: Conducted GIS training for MMDA and other CSCAND agencies technical personnel; field validation of barangay data on six (6) LGUs for Metro Manila; prepared layout hazard maps for Antique, Benguet, Ilocos Sur, Marikina and Cainta; and provided printed hazard maps for Abra, Benguet, Ilocos Sur, Marikina and Cainta. In addition to the target, other accomplishments of the project includes provision of printed hazard maps to eight (8) LGUs in Bulacan, and provided resource speaker for Map Appreciation for the 5th Batch of Contingency Planning Formulation Workshop conducted by the Ready for GMMA Project Team; and
- e) NAMRIA Gender and Development (GAD): Prepared Women's Month 2012 Calendar of Activities; and coordinated various GAD activities.

B. Special Projects

1. Locally-Funded

- **"The Philippine Extended Continental Shelf (ECS) Project"**: Conducted series of TWG meetings to discuss the Sub-commission's recommendation on the adjustment of the outer limits of the ECS in the Benham Rise Region; attended four (4) meetings with the UN-CLCS Sub-commission in New York for the defense of the Benham Rise Submission and four (4) workshops on the editing of the manuscript of the ECS Submission on Reed Bank-KIG area; and studied on other possible extended continental shelf areas.
- **"The Philippine Geoportal: One Nation, One Map"**: A Final Report was prepared for the Phase 1 of the Project with the following accomplishments: 1) Data Component

(Geodatabase Design, Data Migration Plan, Geospatial Database Design Driven Cartographic Design, LIDAR Data and Orthophoto for Metro Manila, and Thematic Data from Various Agencies); 2) Applications Development (The Philippine Geoportal System, and System Documentation); 3) ICT Infrastructure (The Philippine Geoportal Data Center, The GIS Enterprise License Agreement, and Hardware and Software for the Agency Stakeholders); 4) Training and Capability Development (GIS Training, Network-related Training, and User's and System Administration Training); 5) Policy Framework and Planning/Institutionalization (SDI Implementation Plan, The General Policy, Change Management Plan, and Change Readiness Survey); 6) Phases 2 and 3 Planning (Phases 2 and 3 Implementation Plan); 7) Technical Support and Warranty; and 8) Project Management and System Integration (Structures and Mechanisms, The Fundamental Stakeholders' Agreement, and Consultative Meetings).

C. General Administration and Support Services (GASS)

Supporting the operations and implementation of NAMRIA's mandates is the Engineering Services which undertook repair and maintenance of buildings and facilities, as used as technical, communications and IT equipment. For this period, the program was able to accomplish the following:

- Performed preventive and corrective maintenance, including installations on 64/7 technical units; 1,932/135 communications equipment; 78/12 office machines; installed telemetry instruments on 5 tide stations and AGS instruments on 5 active geodetic stations; and maintained DORIS Beacon;
- Performed preventive maintenance on 1,154 computer system; corrective maintenance on 200 hardware/software; 18 hardware and 29 software assistance; and installed 31 wireless local area network;
- Maintained and repaired buildings, appurtenances, grounds and air conditioning/plumbing facilities; and
- Performed 218 preventive and 336 corrective maintenance on NAMRIA vehicles, and servicing transportation needs of officials and employees.

Planning, Policy and Development Studies encompasses overall strategic and operational planning, policy formulation and strategic studies. The following activities were accomplished during the period:

- Prepared/updated planning guidelines; FY 2012 Work and Financial Plan; Budget proposal for FY 2013 for Senate Technical Budget hearing; and Forward Estimates (FEs), MTEP, MTPIP and MTPDP;
- Collated and evaluated Daily Journal accomplishments and activities submitted by Line Departments to cull NAMRIA weekly accomplishments and significant events for the generation of weekly reports for the DENR Secretary;
- Prepared FY 2011 Annual Accomplishment Report and January to December 2012 Accomplishment Report; and
- Continuously monitored accomplishments on regular and special projects/intervening activities.

Administrative/staff and security services provided support to line departments, and formulated policies, programs, guidelines, rules and regulations pertaining to personnel, human resource development, medical, dental services, logistics and procurement. The following were achieved during the period:

- Prepared/processed documents for: 259 Contractual; employees benefits (Productivity Incentive Bonus, Loyalty Awardees, and Clothing Allowance); quarterly leave credits; NPAS Commitment Sheets; Statement of Assets, Liabilities and Networth (SALN); and CSC, DBM, CESB, DENR requirements/reports; and continued coordination on the identified core/universal, technical, functional cross cutting and Leadership competencies on Competency Based System Program;
- On Human Resource Development: implemented 12 training and seminar programs with 432 participants and 5 GAD with 169 participants; availed 5 training programs with 12 participants and 5 scholarship programs with 9 participants; continued coordination and participation with the Philippine Australian Human Resource Organizational Development Facility, Emergency Response Committee and ISO 9001:2008 certification; and development of Human Resource Information System (HRIS);
- Continuously maintained the operations of NAMRIA Day Care Center;
- Maintained and supervised NAMRIA Library and Museum;
- Provided medical, dental services and assorted medicines to NAMRIA personnel; coordinated with various health institutions; and issued certifications on Gemba and FOSLA Loans, bonding on Special Disbursing Officers (SDOs);
- Implemented rules and regulations on the wearing of prescribed uniforms, security tags for NAMRIA employees and visitors, and vehicle control tags for guests/clients;
- Provided 24 hour security to NAMRIA facilities and equipment; and
- Coordinated with various government agencies relative to the security and intelligence operations of the agency.