



LAGUNA LAKE DEVELOPMENT AUTHORITY

"Ibalik ang Diwa ng Lawa"

Data Availability and Quality for the Laguna Lake Basin

Adelio Rico

Policy Planning & Information Management Division

Alvin Faraon

Project Development, Management, and Evaluation Division

Laguna Lake Development Authority



Outline of the Presentation:

- I. Data Sources**
- II. Data Availability and Sources**
 - a. Socio-Economic Data**
 - a. Watershed/Land Resources Data**
 - b. Water Resources Data**
 - c. Other Data**
- II. Data Availability and Quality Issues**

Data Sources

Data Sources

Topographic and
other basic spatial
boundaries

National accounts

Protected area data
and protected
species list

Forest
statistics

Fisheries
statistics

Land
cover






Soil data

Socio-
economic
data


Water
statistics

Data Availability

Website: <http://www.nscb.gov.ph/stattables/>



SiteMap • Links • jobs@nscb.gov.ph



REPUBLIC OF THE PHILIPPINES
NSCB NATIONAL STATISTICAL
COORDINATION BOARD
Integrity • Independence • Professionalism

Search...

HOME ▾ NEWS ▾ STATISTICS ▾ EVENTS ▾ PRODUCTS AND SERVICES ▾ CONNECT WITH US ▾

Statistics

Statistical References
[System of Designated Statistics](#)
[Survey Review and Clearance System](#)
[Statistical Laws](#)
[Standards and Classification Systems](#)
[Directory of Government Statistical Services in the Philippines](#)

Indicators produced and compiled by the NSCB

Economic

- [National Accounts](#)
- [Regional Accounts](#)
- [Input Output Tables](#)
- [Quarterly Economic Indices](#)
- [Leading Economic Indicators](#)
- [Foreign Investments](#)
- [Tourism Satellite Accounts](#)

Social

- [Poverty](#)
- [Human Development Index](#)
- [National Health Accounts](#)
- [National Education Expenditure Accounts](#)
- [Gender and Development](#)
- [Children](#)

Environment

- [Economic-Environmental and Natural Resource Accounts](#)

Multisectoral





- [Millennium Development Goals](#)
- [Statistical Indicators on Philippine Development](#)
- [Economic and Financial Data of the Philippines](#)
- [Flash Indicators](#)

Governance

- [Good Governance Index](#)
- [Indigenous People's Rights](#)


Major indicators released by other agencies

Economic

[StatWatch](#)
[Metadata](#)
[Visualizations](#)
[Release Calendar](#)

Website:

<http://www.nscb.gov.ph/grdp/2012/dataCharts/default.asp>




REPUBLIC OF THE PHILIPPINES
NSCB NATIONAL STATISTICAL
COORDINATION BOARD
Integrity • Independence • Professionalism

Search... Go

HOME ▾ NEWS ▾ STATISTICS ▾ EVENTS ▾ PRODUCTS AND SERVICES ▾ CONNECT WITH US ▾

Gross Regional Domestic Product - Data and Charts



Regional Accounts
Main Page

GRDP Main Page

Press Release

Highlights

Past and Future
Releases

Data and Charts





Publication

Metadata

- Technical Notes

Contact Information



Time Series Data

Title	File
2012 (as of July 2013)	
GRDP by Region (2010-2012, at constant 2000 and current prices)	 [2.00MB]
GRDP by Industrial Origin (2010-2012,, at constant 2000 and current prices)	 [1.66MB]
2011 (as of July 2012)	
GRDP by Region (2009-2011, at constant 2000 and current prices)	 [1.55MB]
GRDP by Industrial Origin (2009-2011, at constant 2000 and current prices)	 [1.26MB]

Maps

- [Gross Regional Domestic Product by Industrial Origin](#)
In Percent (at constant 2000 prices)
- [Growth Rates](#)
In Percent (at constant 2000 prices)
- [GRDP Per Capita](#)

Website: <http://www.census.gov.ph/statistics/quickstat>



REPUBLIC OF THE PHILIPPINES
**NATIONAL
STATISTICS OFFICE**

PeopleBusinessCivil RegistrationQuickStatContact Us

[Home](#) » [Quickstat](#)

Quickstat

Compilation of NSO's Most Requested Statistics

Quickstat is NSO's most requested statistics. Published every month, it contains the previous month's estimates of CPI and inflation rate plus the most recent foreign and domestic trade figures. It also contains statistics on labor and employment, manufacturing indices, family income and expenditures, population statistics and private building construction. All statistics presented are the results of various censuses and surveys conducted, and administrative forms processed by the NSO.

Search Quickstat


You can search from below the National/Regional /Provincial Quickstat editions by Year/Region /Province.

Gender Quickstats reflect national figures only.

National Quickstat by Year


Latest Gender Quickstat

Download PDF

[Gender Quickstat - 2nd Quarter 2013](#) [Gender Quickstat - 2nd Quarter 2013](#)

Latest National Quickstat

Download PDF

[National Quickstat - August 2013](#) [National Quickstat - August 2013](#)

Website: <http://www.bles.dole.gov.ph/beams/index.php/about-beams>

[Login](#) | [Register](#)



Bureau of Labor and Employment Statistics

BEAMS

BLES Electronic Archived Microdata System



[About BEAMS](#)

[Policies and Procedure](#)

[Data Catalog](#)

[Our Activities](#)

[Acknowledgement](#)

[Contact Us](#)

[BLES Homepage](#)

About BEAMS

The **BLES Electronic Archived Microdata System (BEAMS)** is a web-base repository system on the survey and administrative data generated by the Bureau of Labor and Employment Statistics (BLES). It was developed to preserve, systematically store and retrieve statistical data including records on their methodology, concepts and other metadata.

This repository system was developed with the technical and financial support from the Accelerated Data Program (ADP), a satellite program of the PARIS21 Secretariat at the OECD, which aims to make rapid improvements in the quality and availability of survey data in developing countries. It is supported by the World Bank's Marrakech Action Plan for Statistics (MAPS) Development Grant Facility.

The **BEAMS** endeavors to promote proper use and interpretation of data given the context in which these were generated and the available resources at the time of their production. It ensures that the data generation activities of BLES are documented and preserved thus allowing the future generations of producers to improve on what have been done and for users to understand and access historical data.

Presently, the **BEAMS** contains thirty-six (36) data systems covering six (6) BLES surveys and one (1) administrative data system. These systems were documented using the Microdata Management Toolkit and are disseminated through the National Data Archive (NADA), both developed by the International Household Survey Network (ISHN), also established as an offshoot of the MAPS.

Website: <http://countrystat.bas.gov.ph/>



BUREAU OF AGRICULTURAL STATISTICS

Enter keywords...



CountrySTAT

Philippines



[Home](#) [About CountrySTAT](#) [Metadata](#) [Agri in Figures](#) [Updates](#) [Calendar](#) [Resources](#) [User's Guide](#) [FAQs](#)

Database



National Core

- ☐ Production
- ☐ Trade
- ☐ Food Consumption
- ☐ Prices
- ☐ Fertilizer and Pesticides
- ☐ Land Use
- ☐ Labor and Employment
- ☐ Costs and Returns
- ☐ Others



Details (Sub-national)

- ☐ Production
- ☐ Trade
- ☐ Food Consumption

Labor and Employment

- ✧ [Employment by Major Industry Group, 2001-Jan 2013 \(P50LETEP\)](#)
- ✧ [Employment in Agriculture by region 1990-2011 \(P70LETEP\)](#)
- ✧ [Total Employment by Region, 1990-2011 \(P90LETEP\)](#)
- ✧ [Agricultural Wage Rates of Farm Workers by Type of Wages, Type of Farm Workers, Period, Region, Year and Sex, 1975-2011 \(Q10LEWRS\)](#)

[Details](#) [RSS](#) [Twitter](#) [Facebook](#) [Download](#) [Print](#) [Feedback](#)

Watershed and Land Resources Data

LAND COVER

1993 vs 2003 Land Cover

Water bodies ↑

Agri ↑

Forest ↓

Built-up ↑

Open areas ↓

water bodies increased by 1% in the span of 10 years

agriculture expanded by 4% in 10 years

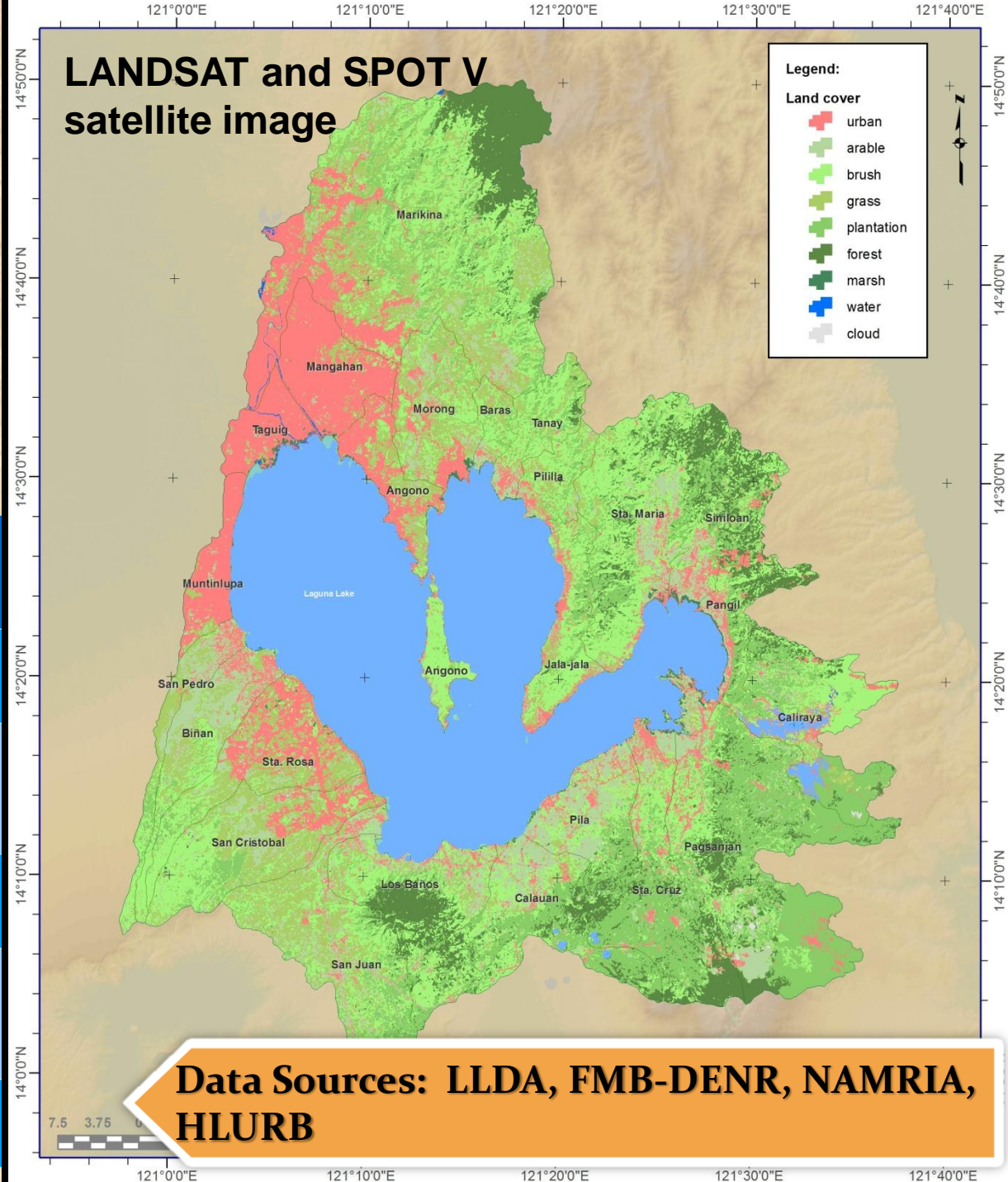
the forest area reduced by 7% or 29,562 hectares over the period of 10 years

the built up area increased by 6% or 21,630 hectares

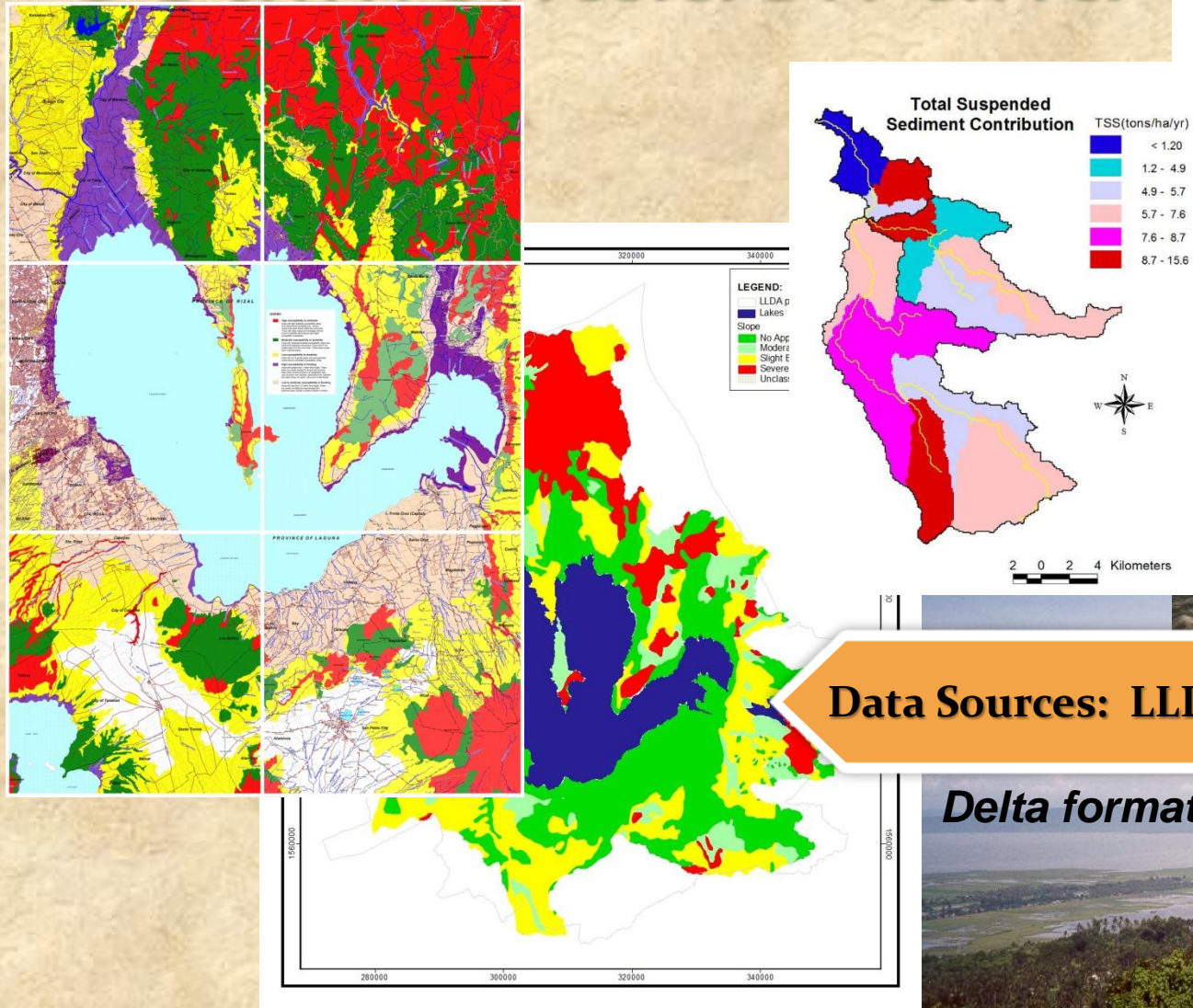
the open area reduced by 3% or 10,454 hectares, either used as built up or agri. purposes

0.7% deforestation rate per annum

LANDSAT and SPOT V satellite image

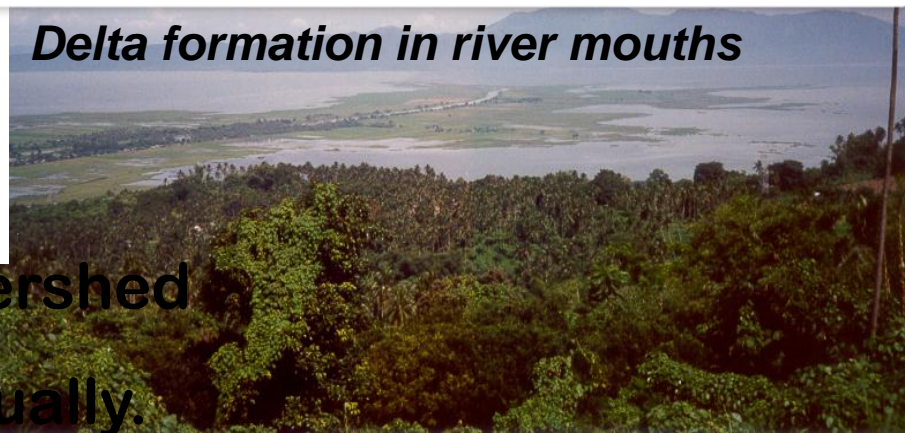


Sedimentation and Erosion



Data Sources: LLDA, MGB-DENR, NAMRIA

Delta formation in river mouths

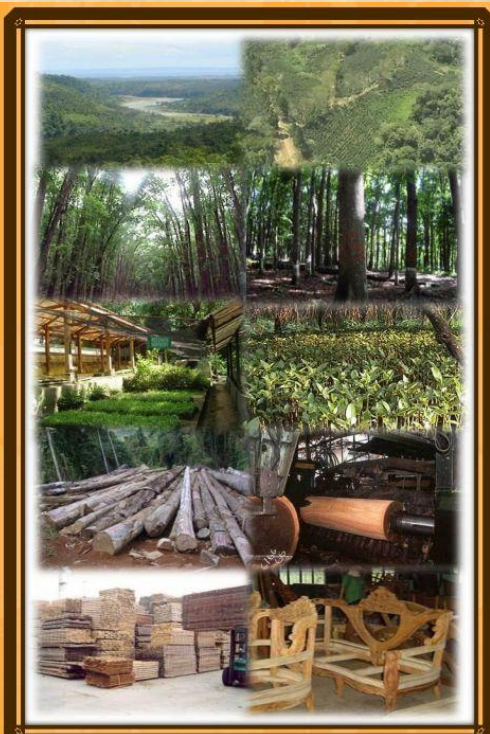


Sediments coming from the watershed
- about 4 million metric tons annually.

Forest and Major Sub-watersheds

Ecological Profiling

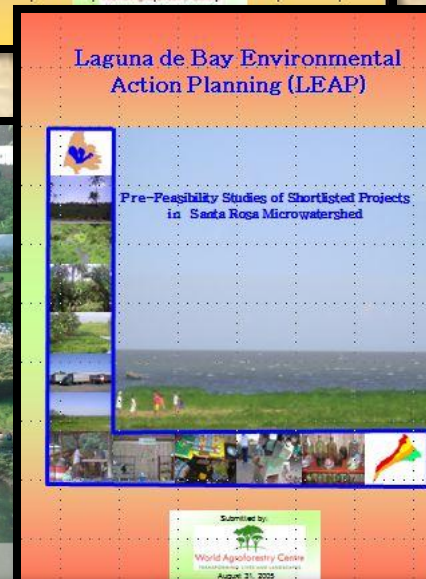
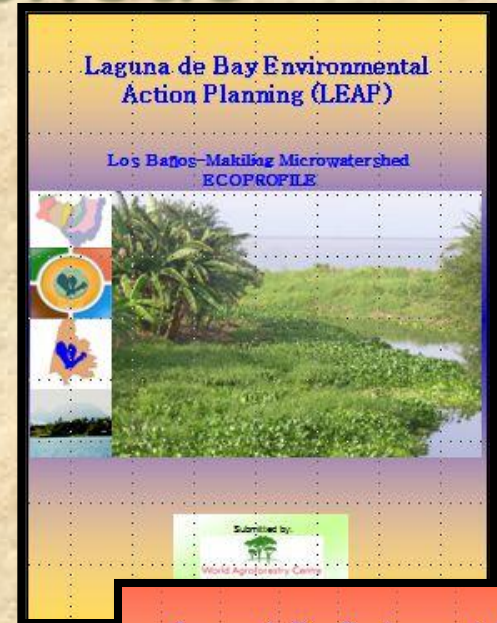
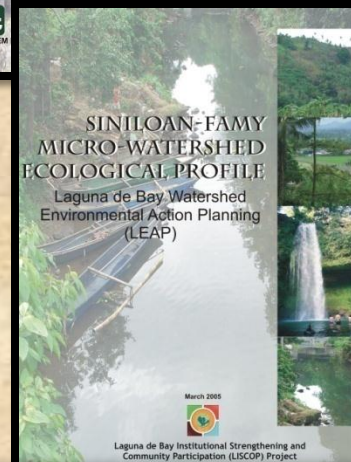
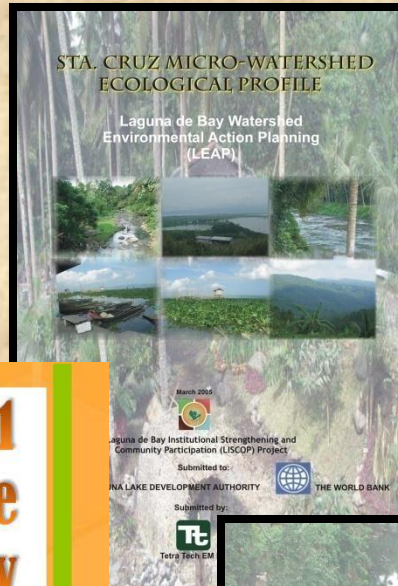
- Bio-physical characteristics
- Socio-economics
- Maps (topog, landcover, soil, among others)
- Forestry statistics
- Issues and concerns



2011 Philippine Forestry Statistics



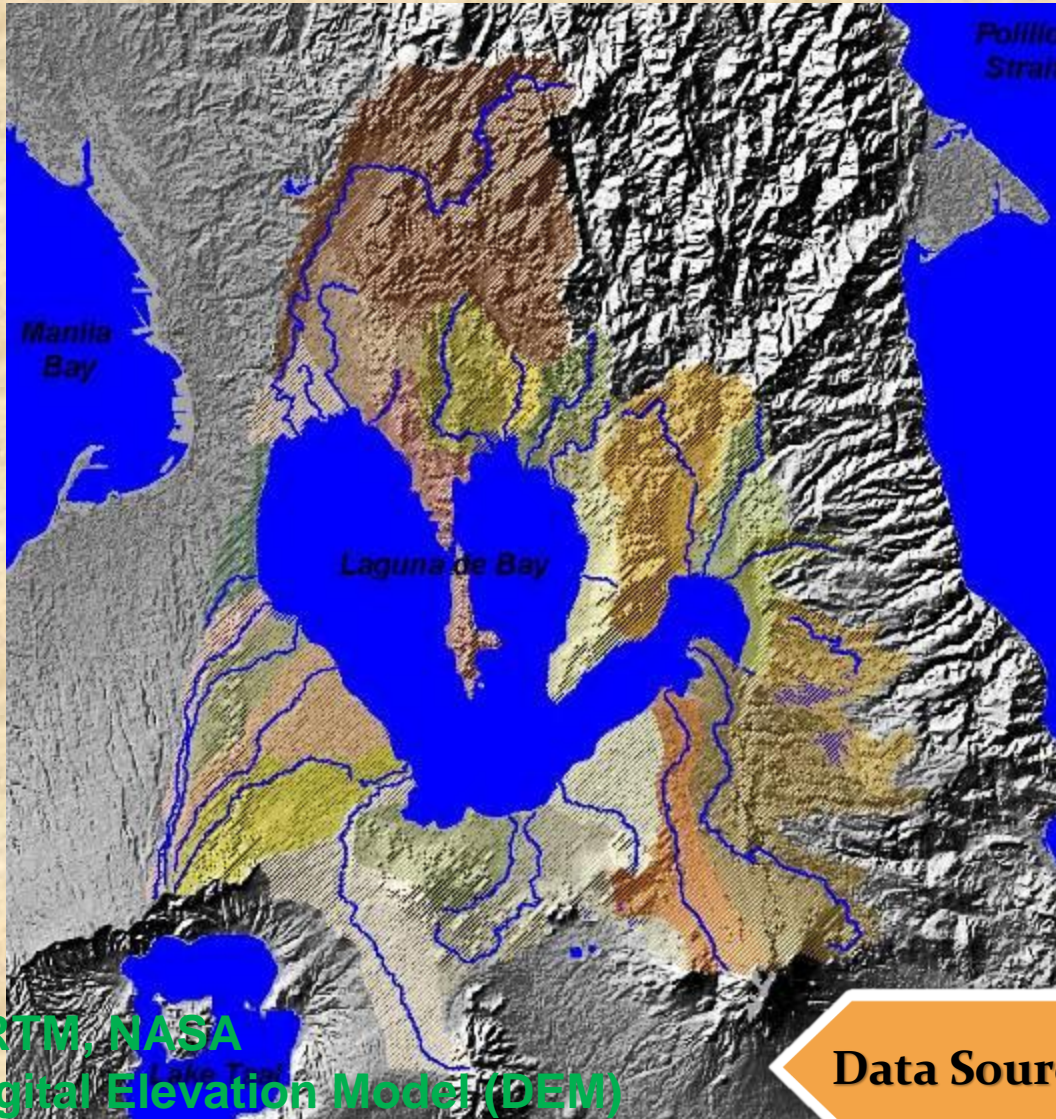
Republic of the Philippines
Department of Environment and
Forest Management Bureau



Data Sources: LLDA, FMB, PAWB-DENR, NAMRIA, WWF, LGU data

Water Resources Data

Topographic Data



- Pasig River is the only outlet of the lake
- Some 100 streams drain into the lake
- divided into twenty-four (24) hydrological sub-basins
- watershed area = approx. 2,920 km²

Data Sources: LLDA, NAMRIA

Bathymetrical studies

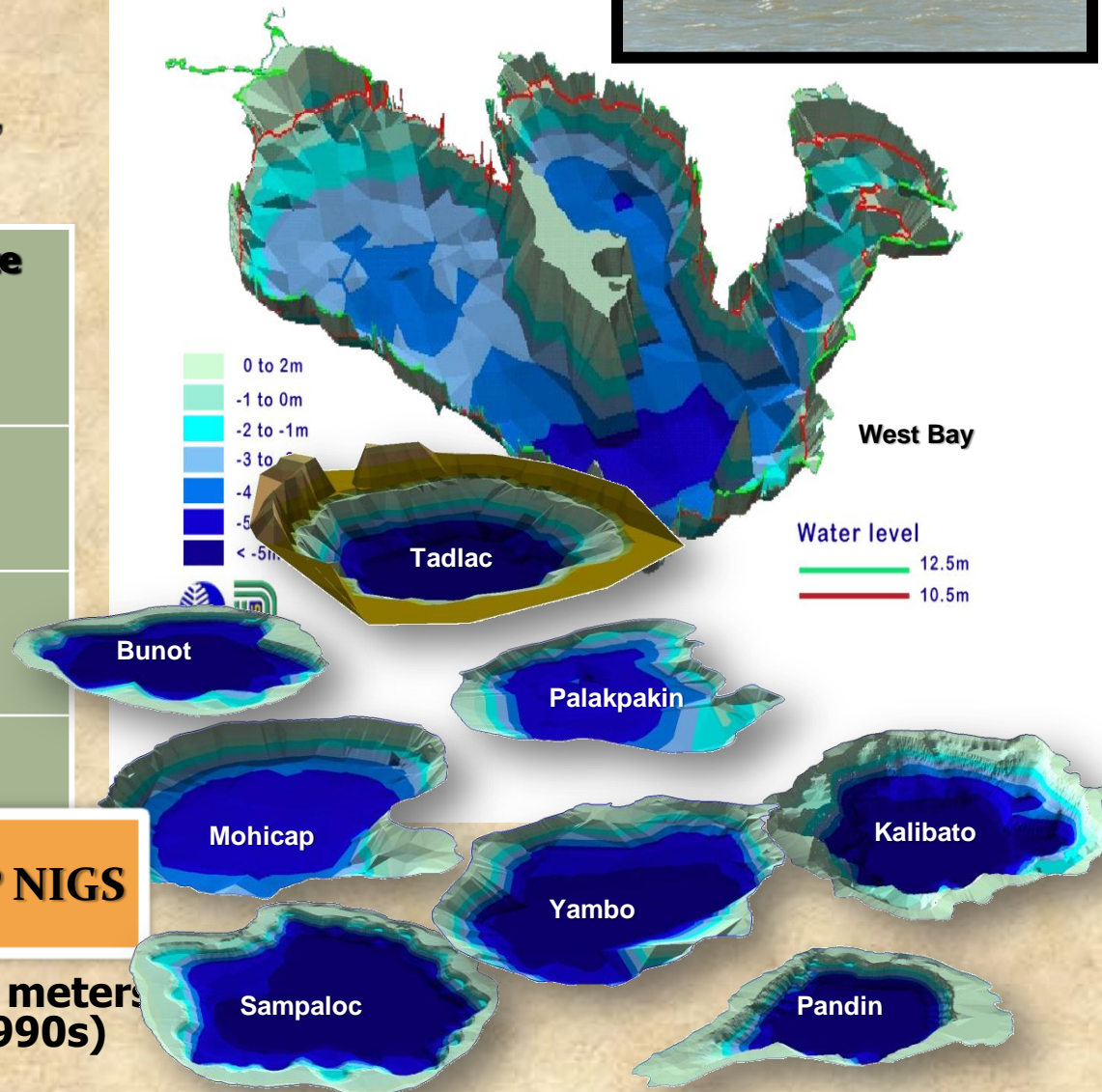
Bathymetry Studies 1963, 1973,
1983, 1997

Year of acquisition of bathymetry data	Shallowing Rate (mm/year)
1963 vs. 1983	3.23
1983 vs. 1997	9.68
1963 vs. 1997	8.36

Data Sources: LLDA, DPWH, UP NIGS

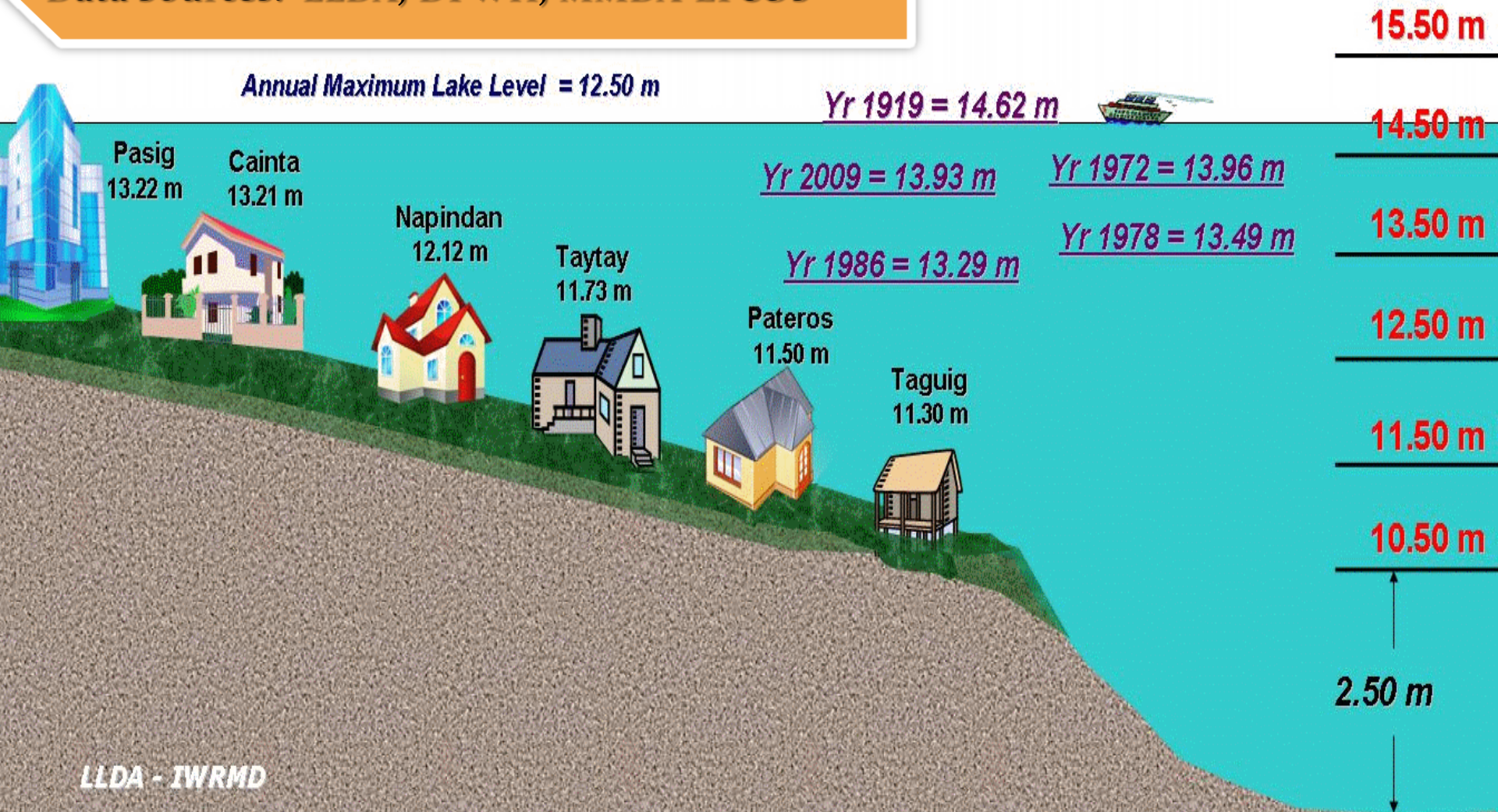
**The lake became shallower by 0.30 meters
or about one foot (from 1960s to 1990s)**

Bathymetry



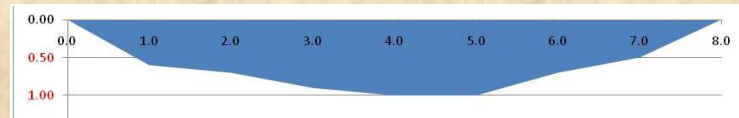
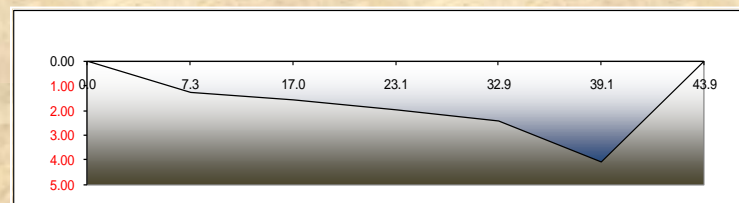
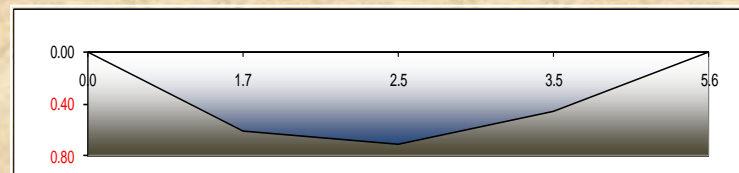
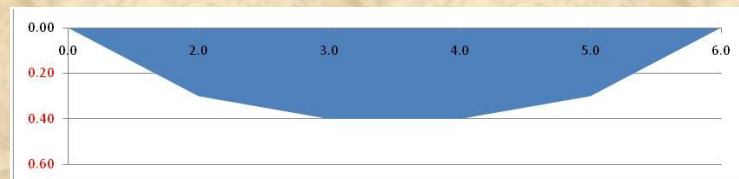
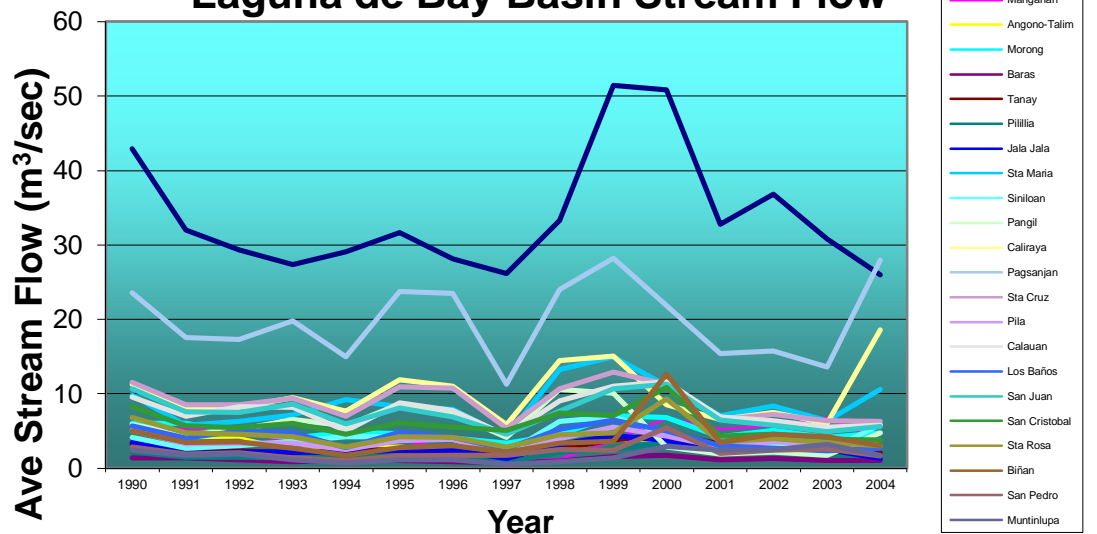
Lake Level Under Extreme Weather Conditions

Data Sources: LLDA, DPWH, MMDA-EFCOS



Streamflow Measurement

Laguna de Bay Basin Stream Flow



Data Sources: LLDA, DPWH, DENR

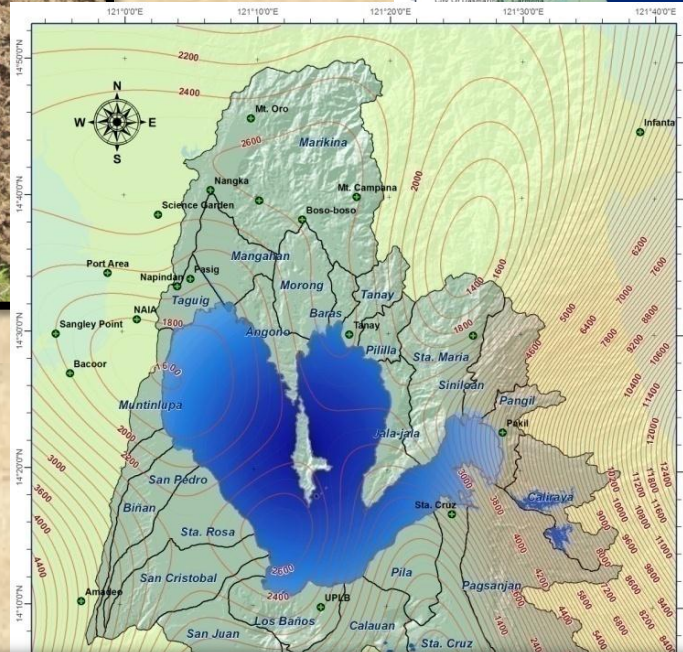
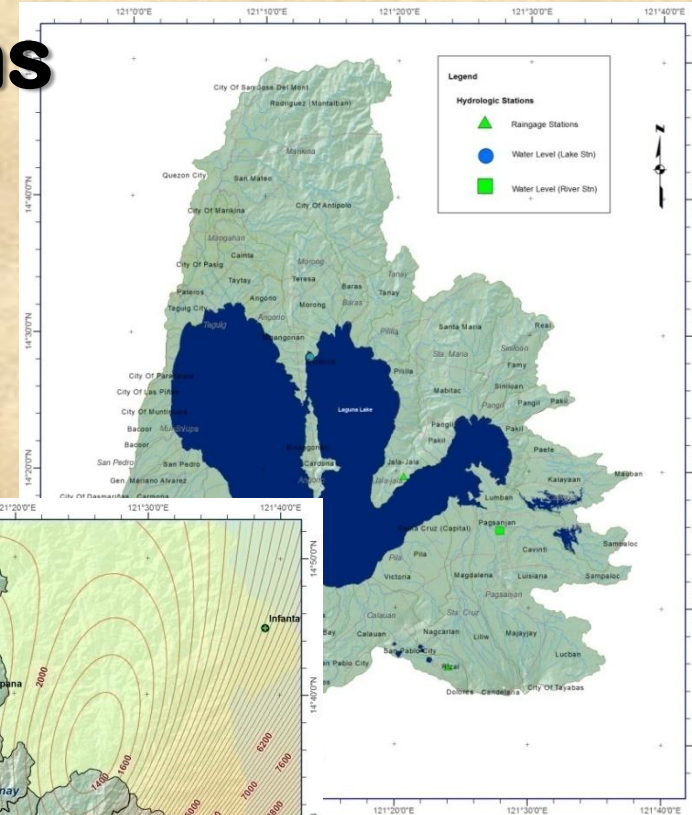
- Inputs to the DSS Hydrological module
- Inputs to the TMDL study for Laguna de Bay Basis for the issuance of surface water permit

Rainfall, Water Level stations and other meteorological stations

ASTI Station at Looc, Cardona

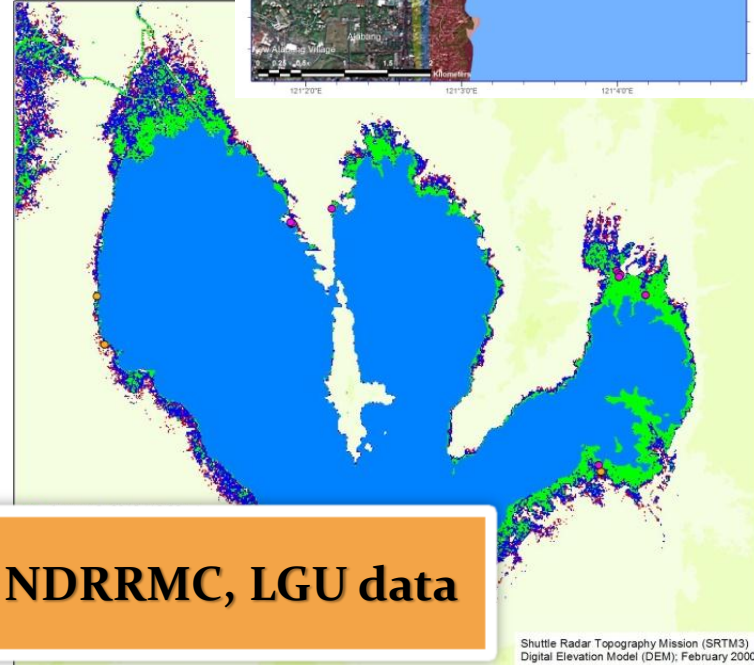
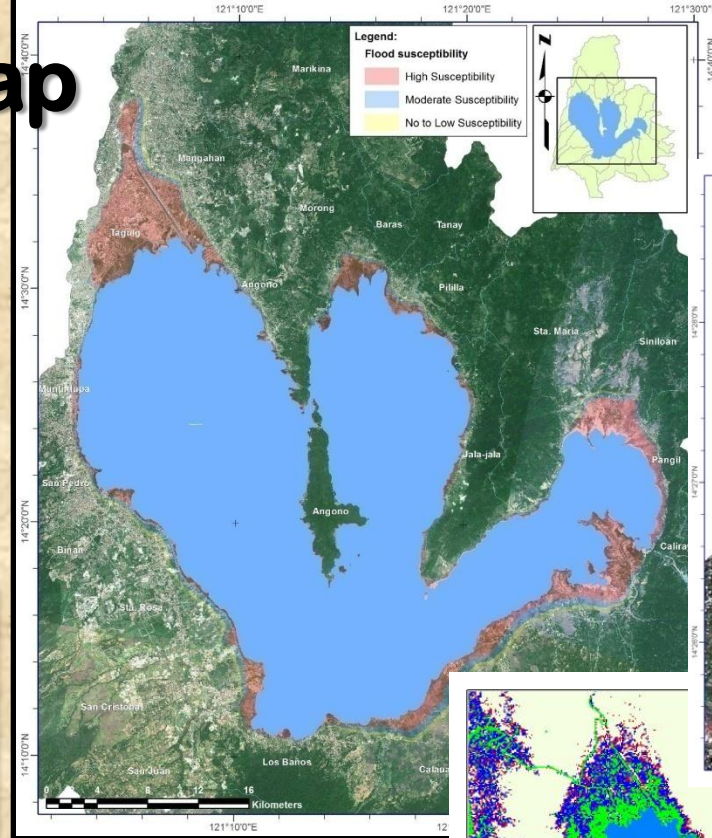


Digital Raingauge



Data Sources: LLDA, PAGASA, ASTI-DOST, UPLB-Hydromet stations

Flood Hazard Map



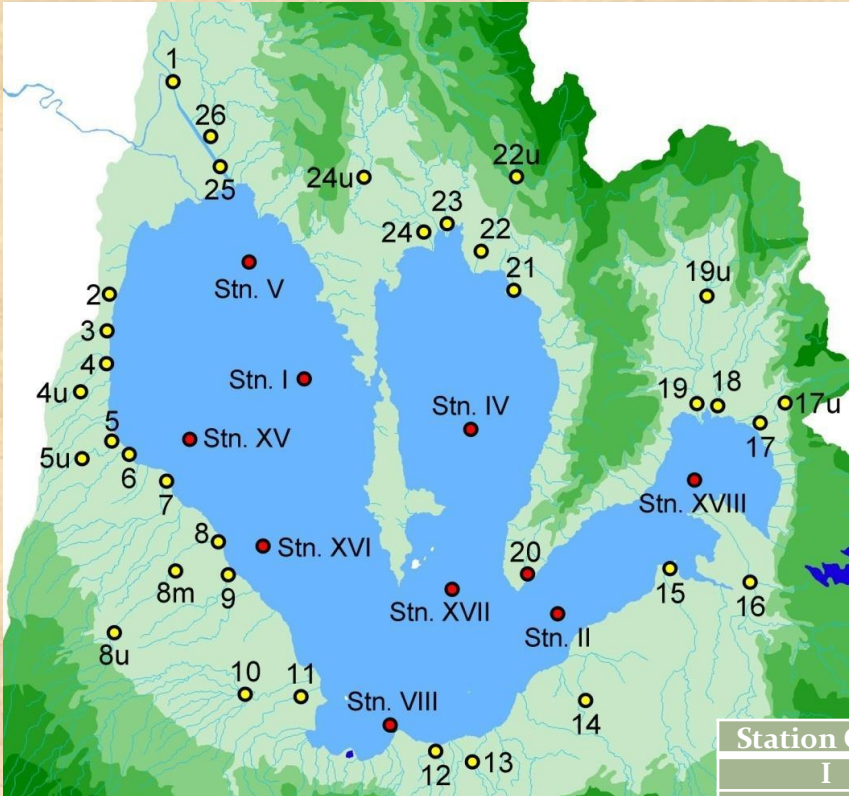
Data Sources: LLDA, MGB-DENR, NDRRMC, LGU data

Shuttle Radar Topography Mission (SRTM3)
Digital Elevation Model (DEM); February 2000

FLOOD ASSESSMENT IN THE LdB REGION (After Typhoon Gener and Habagat)

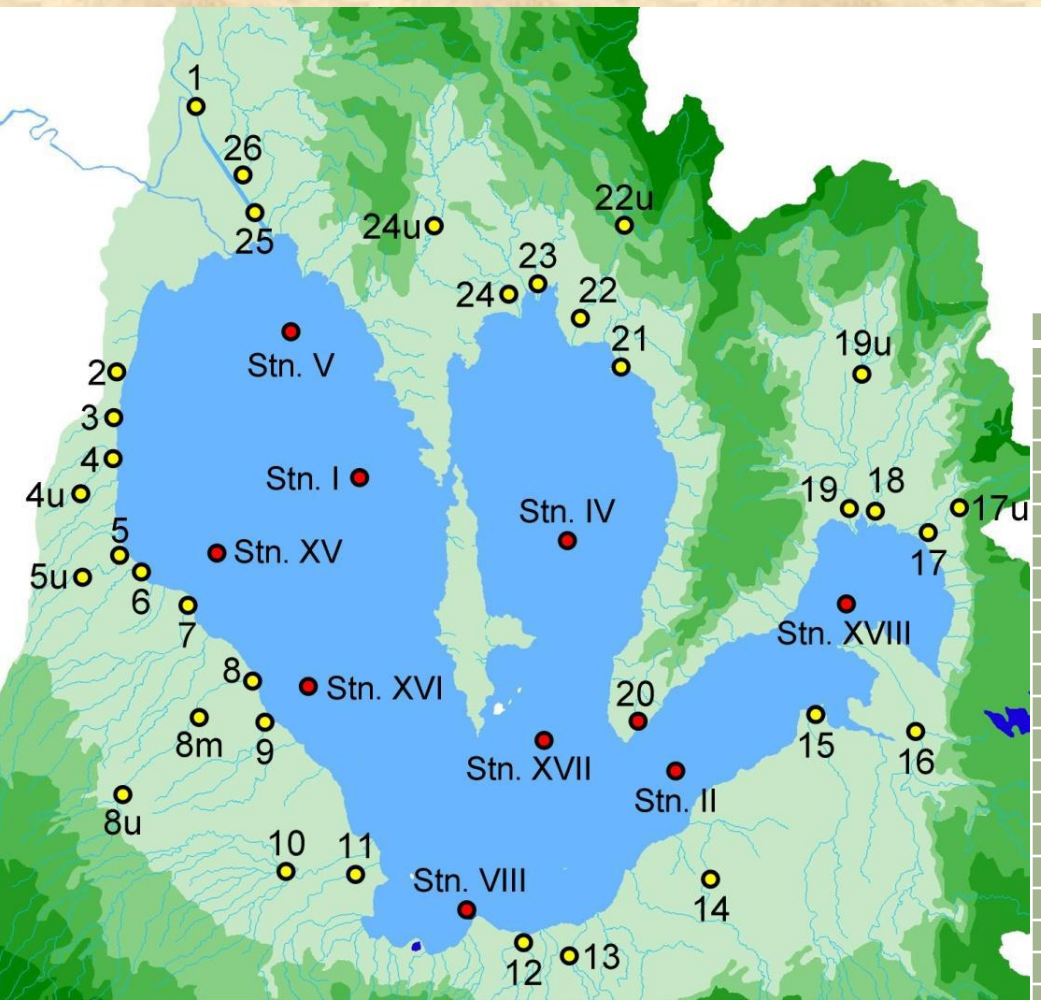
WATER QUALITY MONITORING

Laguna de Bay Stations



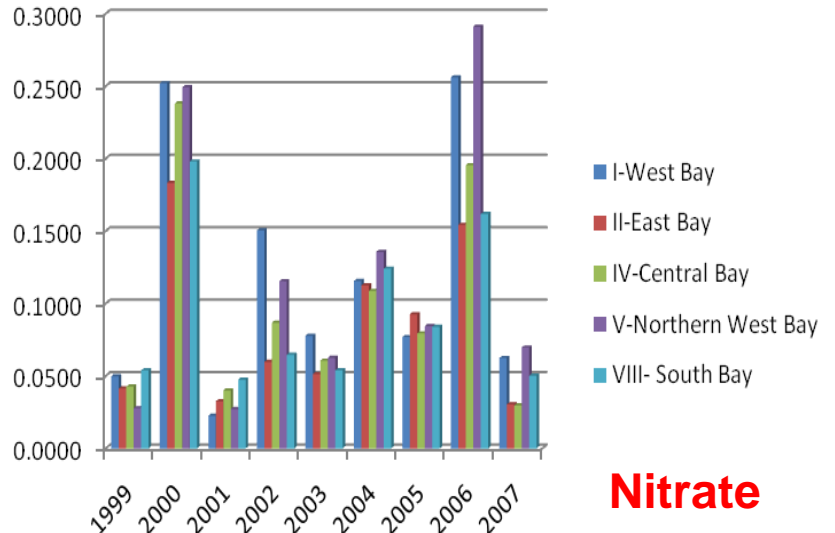
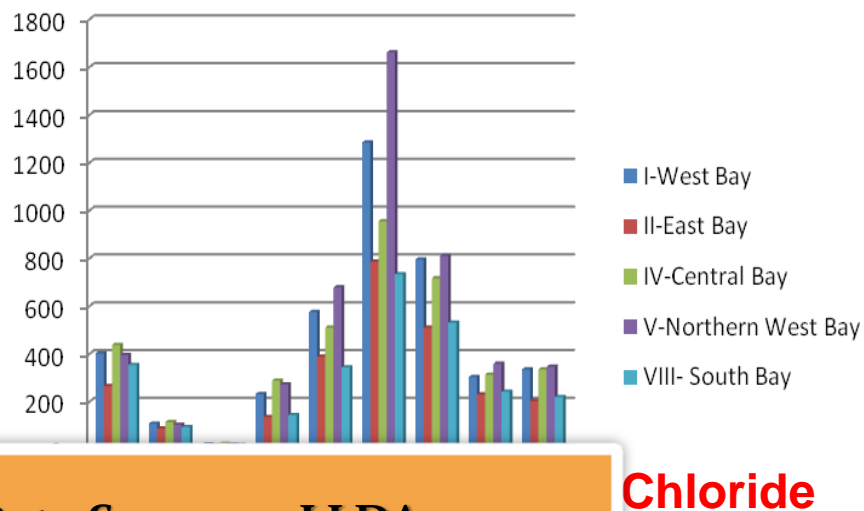
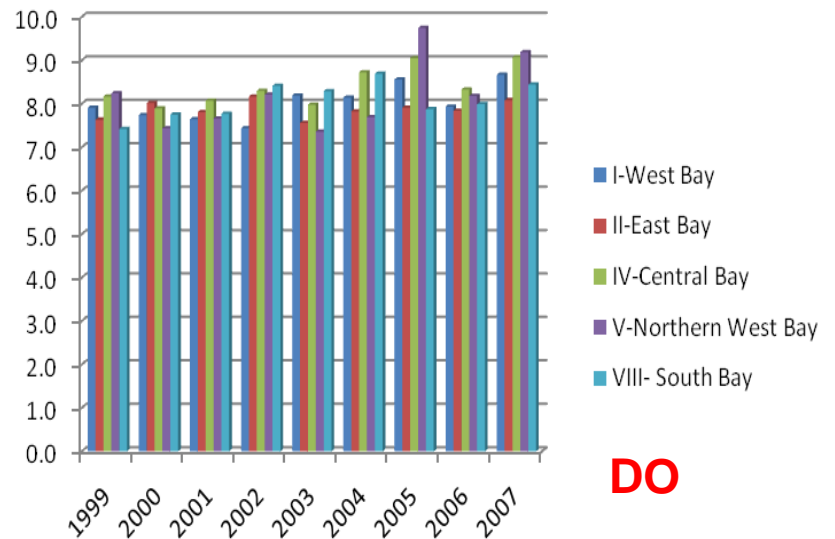
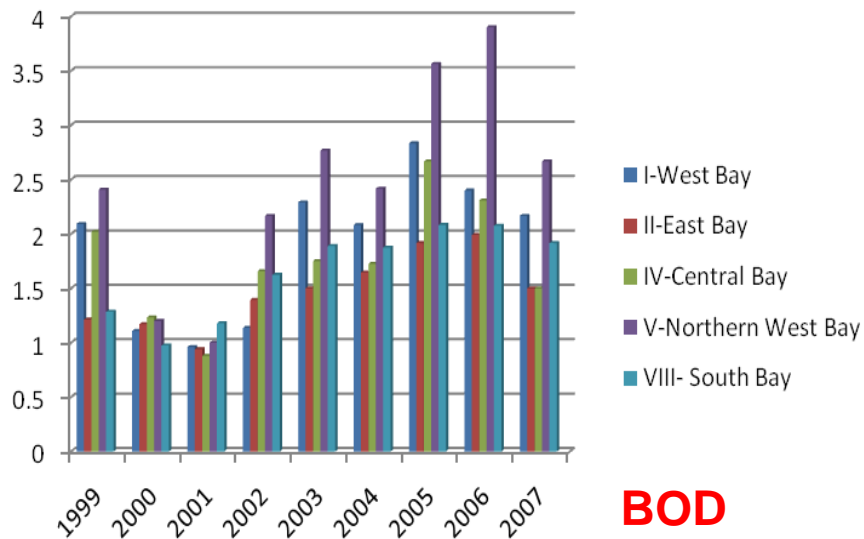
Station Code	Station Name
I	Central West Bay
II	East bay
IV	Central Bay
V	Northern West Bay
VIII	South Bay
XV	WB-San Pedro
XVI	WB-Santa Rosa
XVII	SB – Sanctuary
XVIII	EB-Pagsanjan

Tributary Rivers



Station Code	Station Name
1	Marikina
2	Bagumbayan
3	Buli
4	Mangangate – downstream and upstream
5	Tunasan – downstream and upstream
6	San Pedro
7	Binan
8	Sta. Rosa – down, mid, and upstream
9	Cabuyao
10	San Cristobal
11	San Juan
12	Los Banos
13	Bay
14	Pila
15	Sta. Cruz
16	Pagsanjan
17	Pangil – downstream and upstream
18	Sta.Maria – downstream and upstream
19	Siniloan
20	Jala-jala
21	Pililla
22	Tanay – downstream and upstream
23	Baras
24	Morong – downstream and upstream
25	Sapang Baho
26	Manggahan Floodway

Water Quality Monitoring



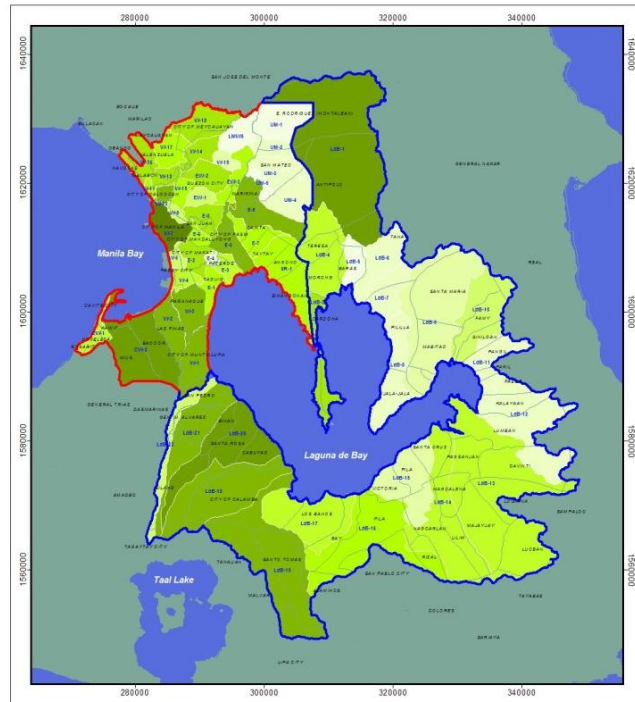
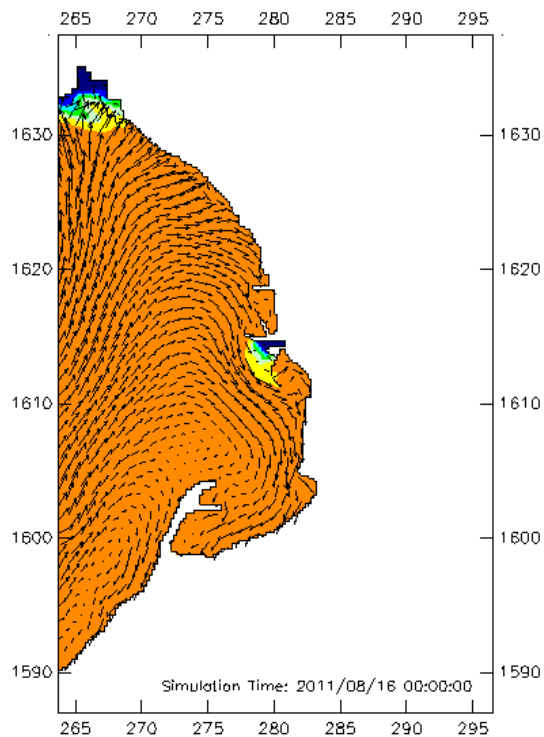
Data Sources: LLDA

ESTIMATION OF TOTAL POLLUTION LOADING

• MANILA BAY – PASIG RIVER – LAGUNA DE BAY WATERSHED

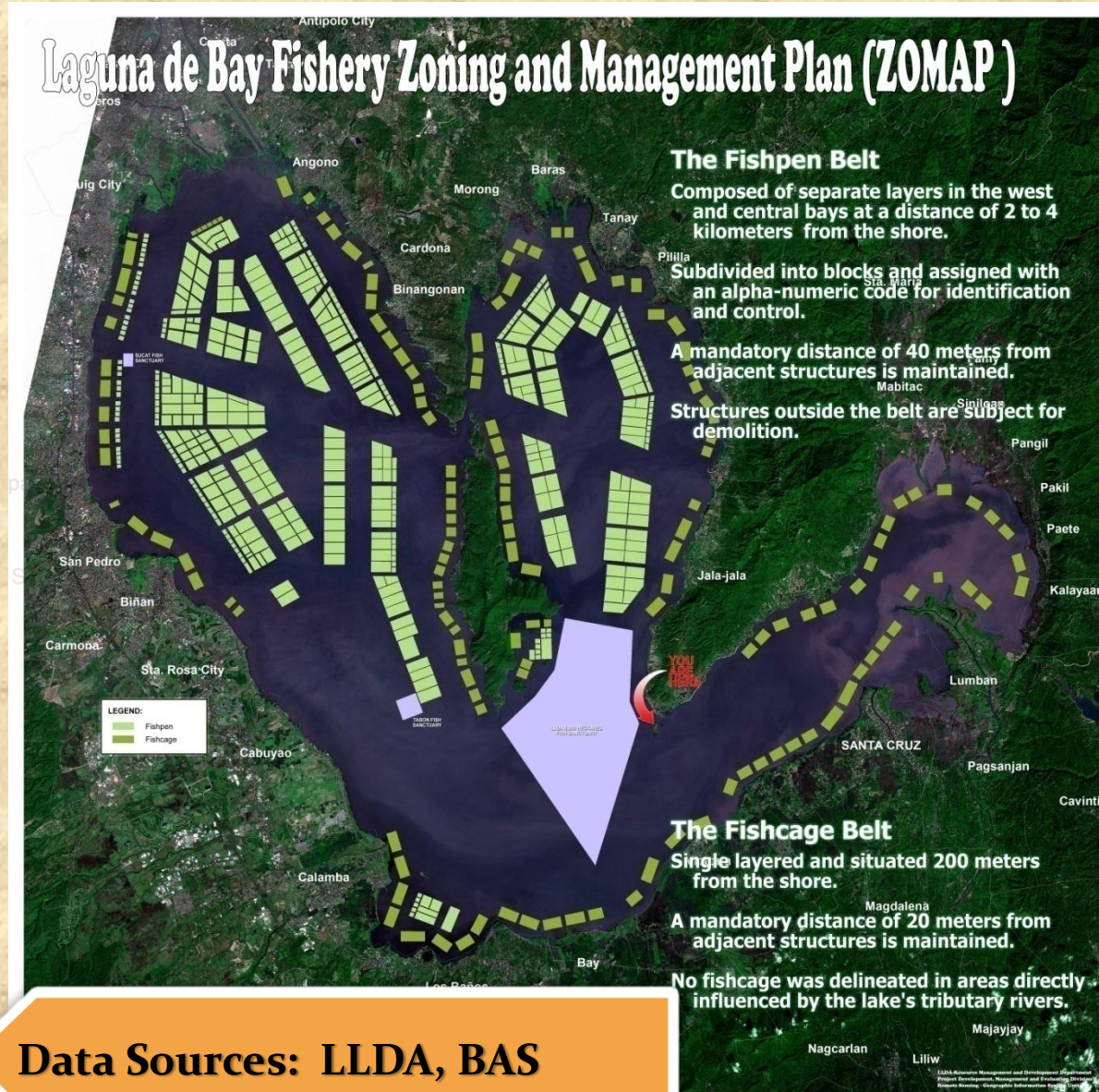
- Estimated BOD, Nitrogen and Phosphorous loading in four years 2008, 2010, 2015 and 2020

AdGIF UNREGISTERED - www.gif-animator.com



Data Source: LLDA

ZOMAP and Fisheries Data

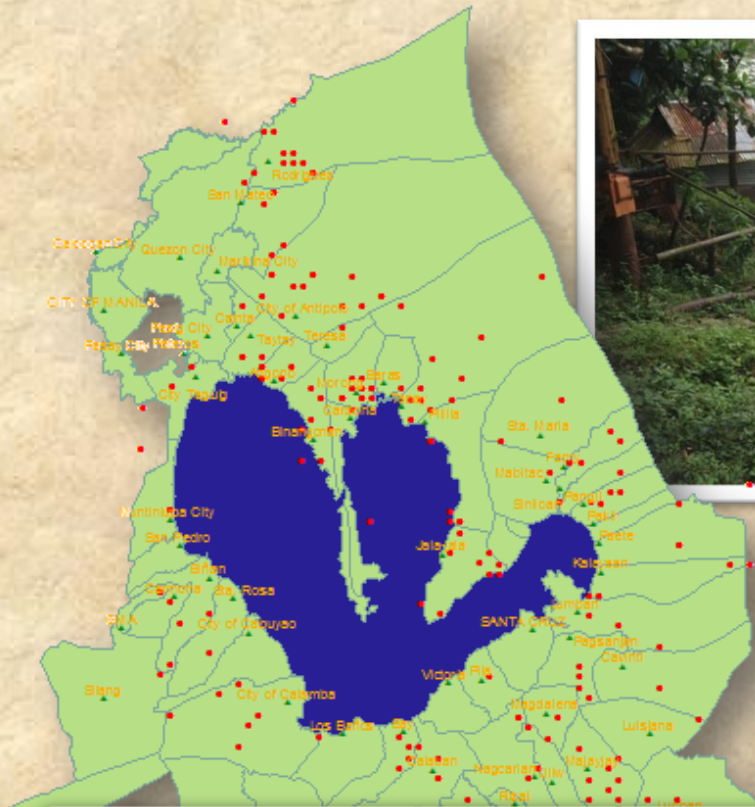


- **Fisheries Production:** 140,426 metric tons (17% of National Production and 58% of Region IV Aquaculture and municipal fisheries production)
- **Aquaculture:** 57,805 metric tons (10% National & 37% Region IV)
- **Municipal Fisheries:** 82,621 metric tons (44% National & 95% of Region IV for inland water municipal fisheries (BFAR 2010))

Data Sources: LLDA, BAS

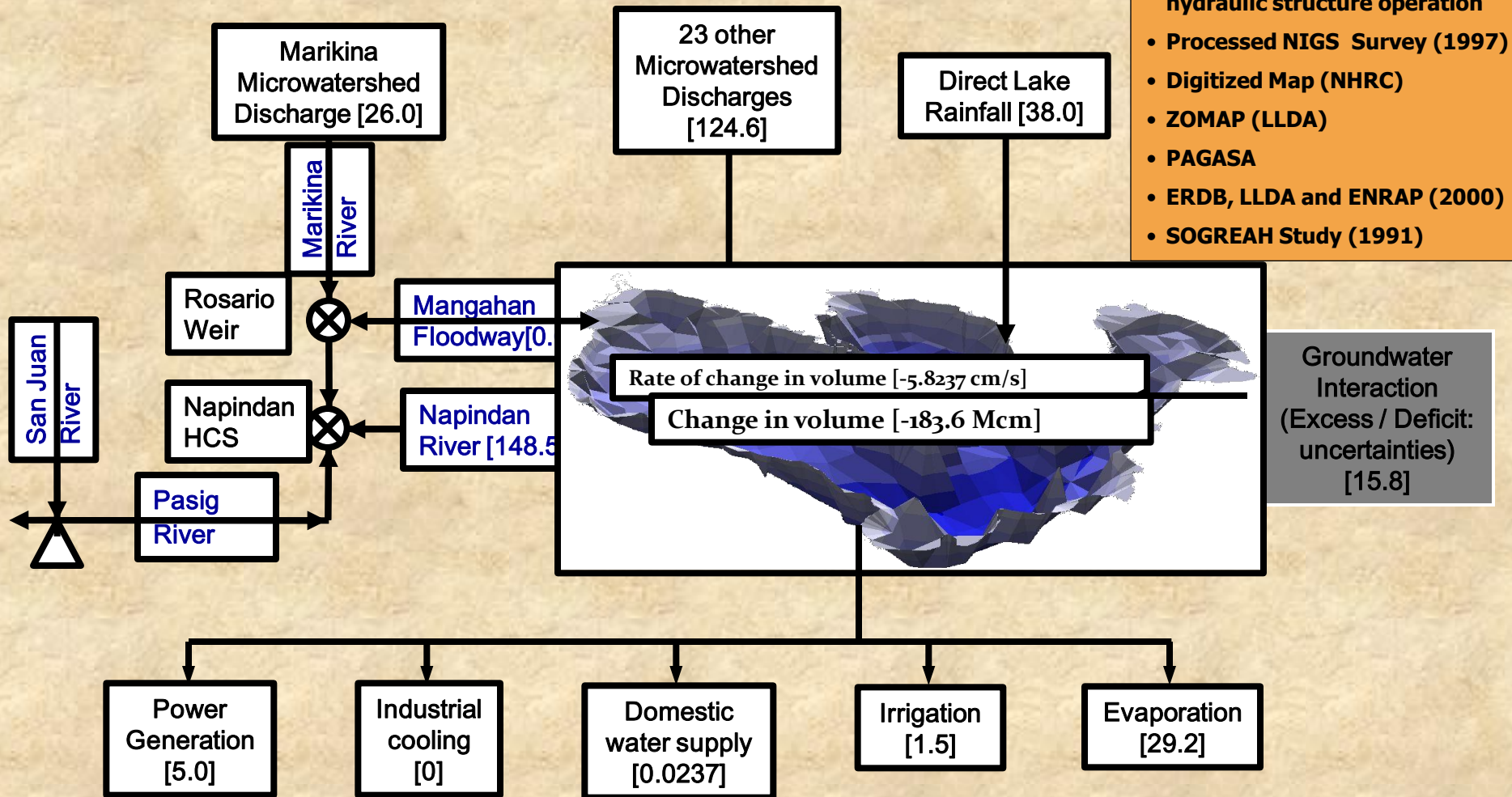
WATER PERMITTING SYSTEM

- Monitored existing Water Permittees
- Surveyed registered and unregistered Water Permittees



Data Sources: LLDA, NWRB,

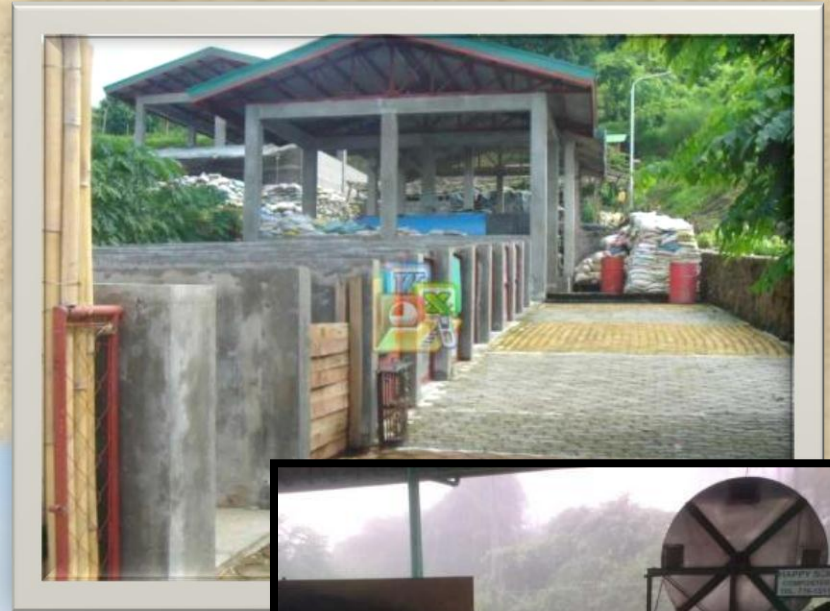
Schematized Laguna Lake Water Balance [2004 results]



Other Data

Community Carbon Finance Project

- Afforestation/Reforestation Project (carbon sequestration)
- Composting Project, biogas (methane captured and methane avoidance projects)



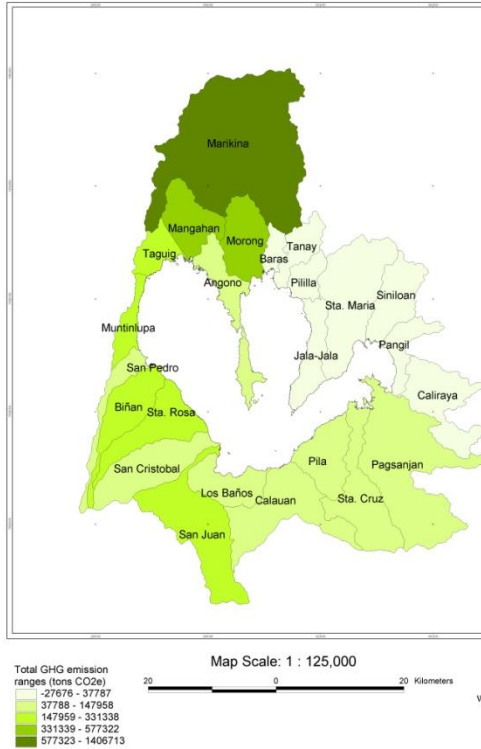
Data Sources: EMB-DENR, LLDA, LGU data

Reforestation sites in Siniloan and Caliraya, Laguna

Composting areas

Carbon Finance Projects

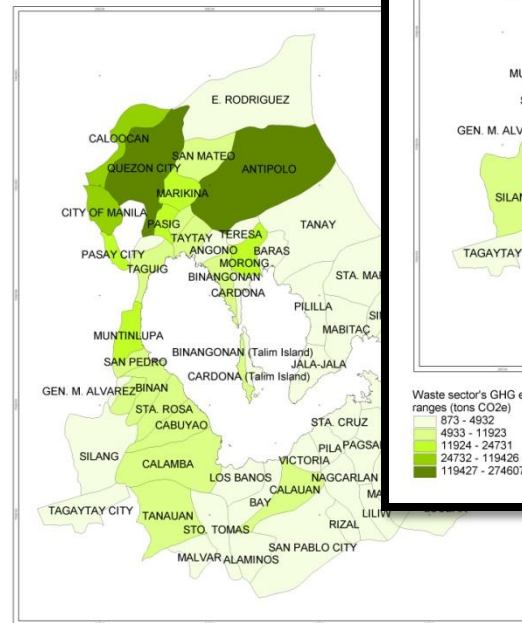
Total GHG Emission in 24 Subwatershed



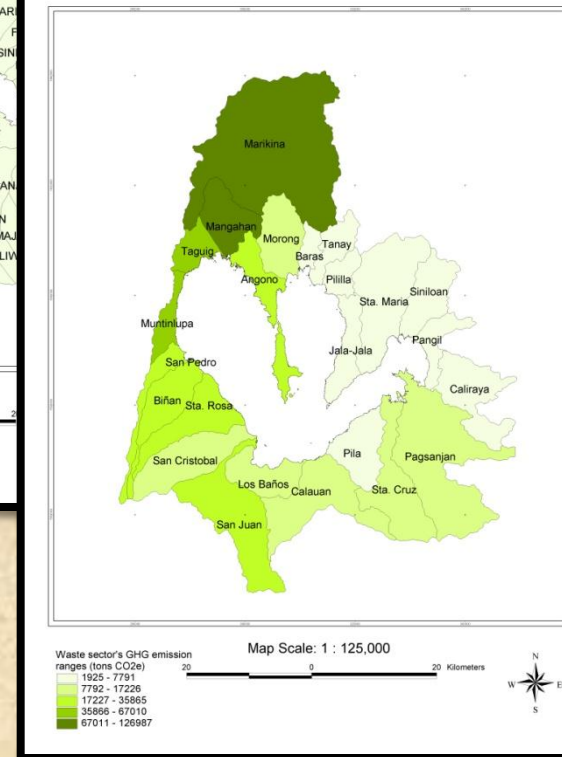
Waste Sector's GHG Emission in LDBR Jurisdiction



Total GHG Emission in LDBR Jurisdiction

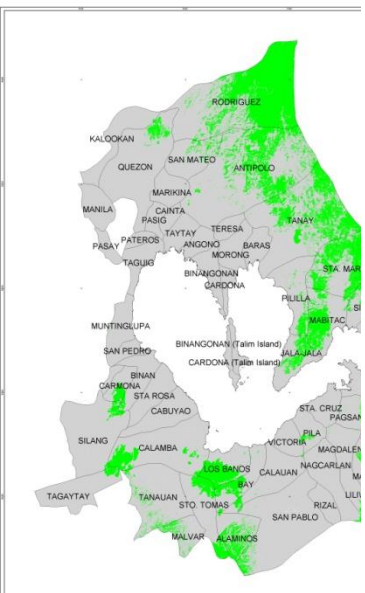


Waste Sector's GHG Emission in 24 Subwatershed

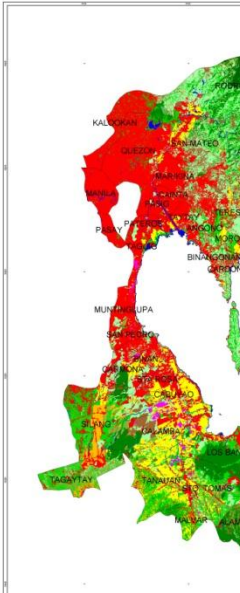


Data Sources: EMB-DENR, LLDA, DOE, LGU data

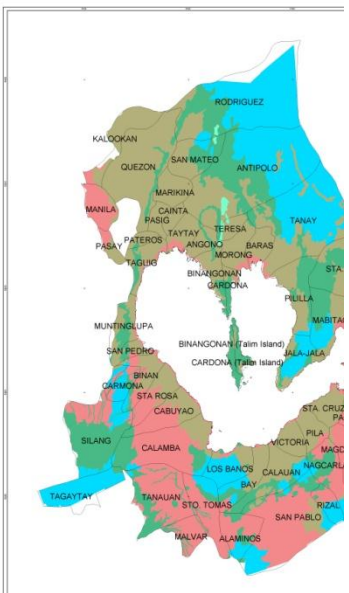
2002-2003 Forest to Non-forest in LDE



2002-2003 LCM



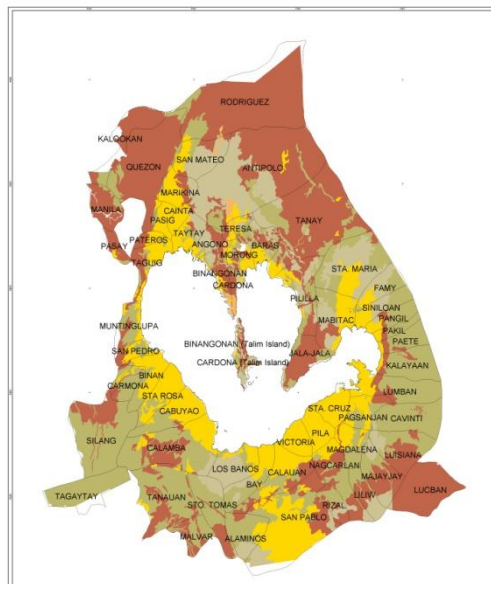
Geomorphological Map of LDBR



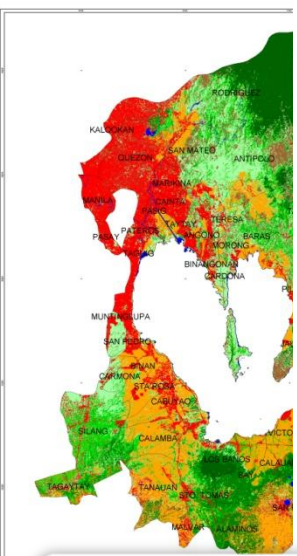
Slides in LDBR Jurisd



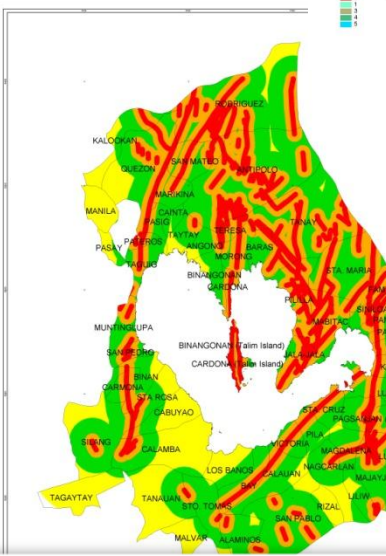
Soil Map of LDBR Jurisdiction



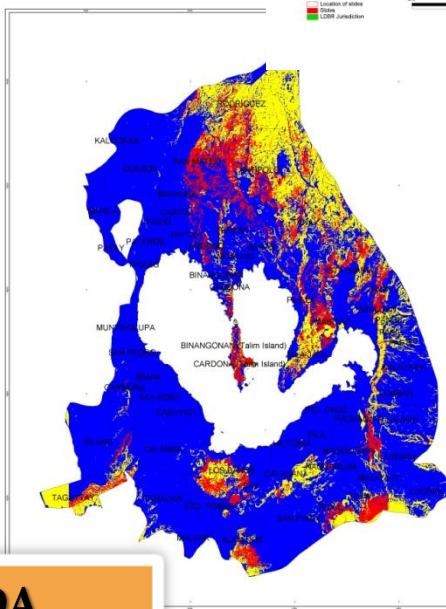
1987-1993 LCM of LDE



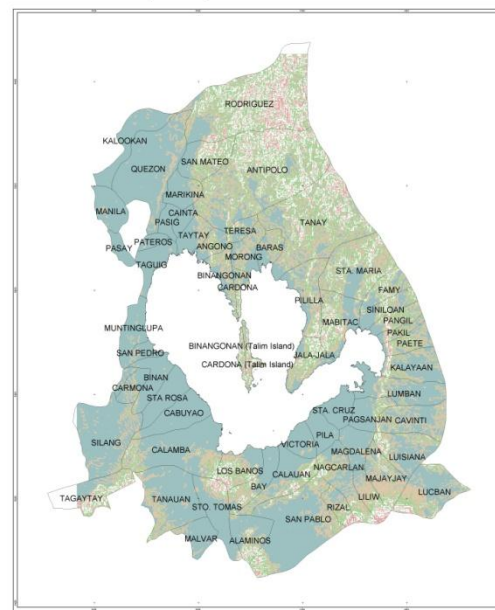
Faultlines of LDBR J



Geohazard Map of L



Slope Map of LDBR Jurisdiction

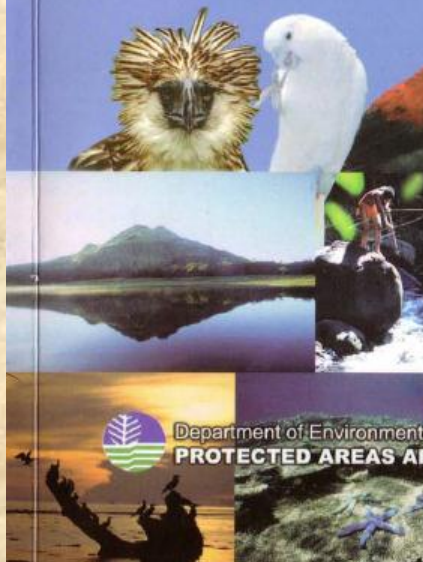


Data Sources: EMB-DENR, LLDA, NAMRIA

Map Scale: 1 : 125,000

Map Scale: 1 : 125,000

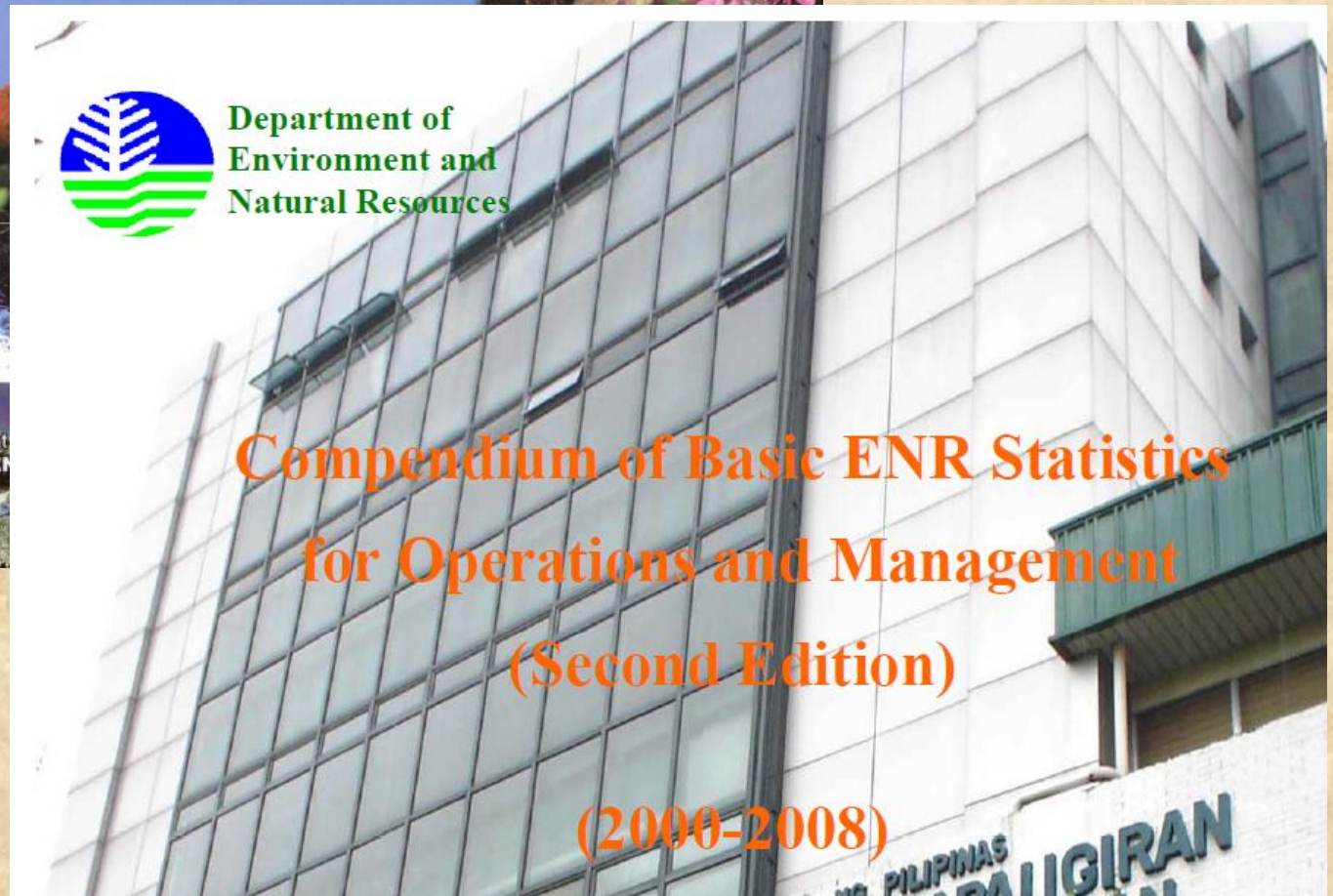
2004 Statistics on Philippine Protected Areas and Wildlife Resources



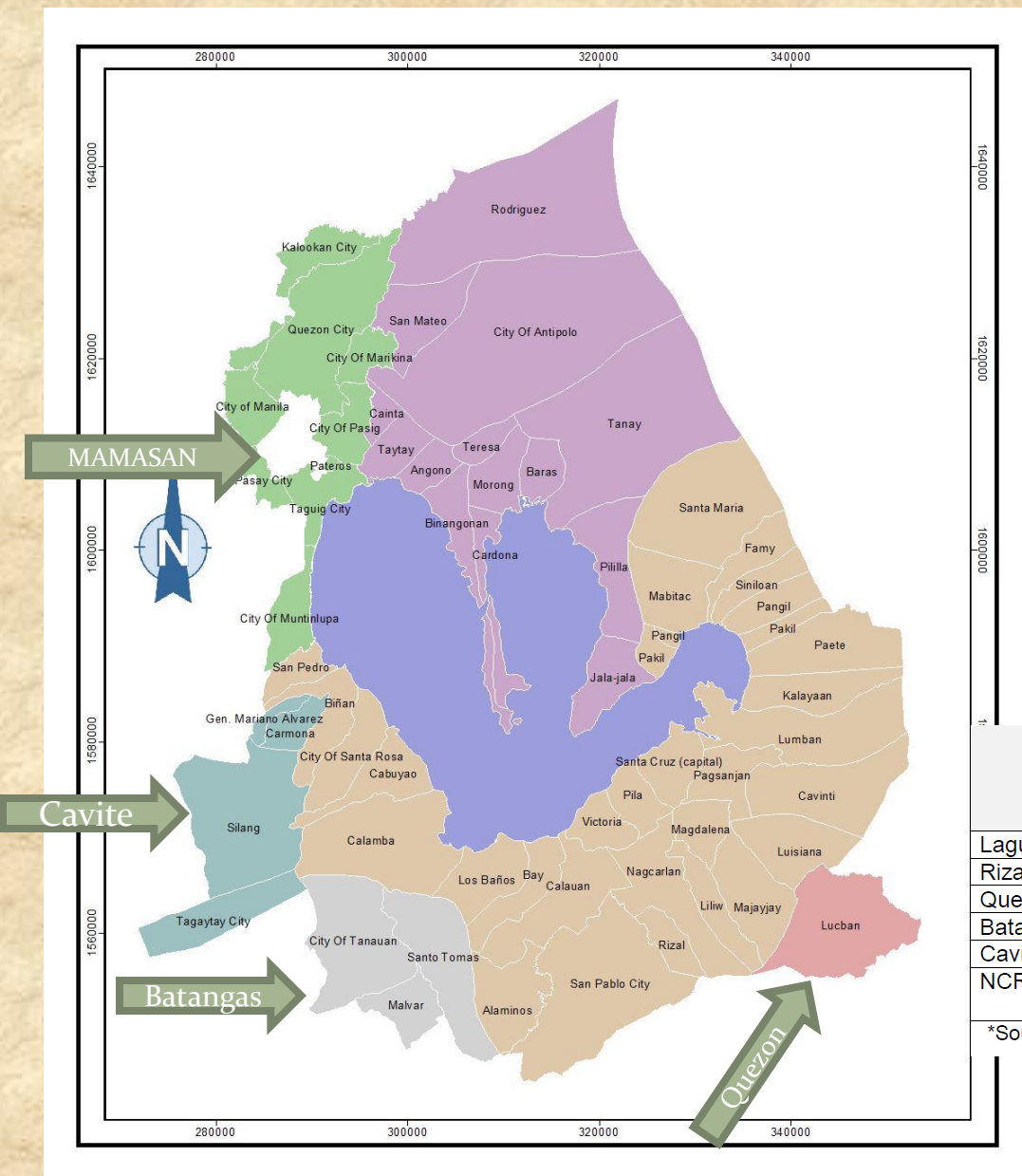
Department of
Environment and
Natural Resources

Compendium of Basic ENR Statistics for Operations and Management (Second Edition)

(2000-2008)



Data Availability and Quality Issues



- disaggregation of data at the Laguna Lake Basin (Region) level

	<i>Population, NSO 2007</i>	<i>Real Per Capita Income 2006 (adjusted to 2000 prices)*</i>	<i>Poverty Incidence of Population 2004*</i>	<i>Human Development Index 2000*</i>
Laguna	2,490,403	30,838	8.0	0.709
Rizal	2,301,064	30,525	9.5	0.733
Quezon	45,616 (1 town)	17,773	32.5	0.635
Batangas	557,940 (4 towns)	19,750	18.8	0.683
Cavite	432,521 (4 towns)	30,539	6.4	0.735
NCR	8,578,948 (10 LGUs)	44,357	5.8	0.900

*Source: National Statistical Coordination Board





LAGUNA LAKE DEVELOPMENT AUTHORITY

"Ibalik ang Diwa ng Lawa"

Thank you!!!

Visit our website: www.lda.gov.ph