

Updates on the WAVES for the Laguna de Bay Basin

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Tagaytay City



LLDA Accounts

- Water Accounts
- Land Accounts
- Fishery Accounts



Land Accounts

Account Number	Overlay layers	Status
1 Land Cover Account by Sub-basin	1. Land Cover 2003 2. Land Cover 2010 3. Sub-basin	Done. Map ready Opening and Closing year
2 Land Cover Account by Municipality	1. Land Cover 2003 2. Land Cover 2010 3. Municipality	Done. Map ready Opening and Closing year
3 Land Cover Change by Municipality and Sub- basin	1. Land Cover Change (2003, 2010) 2. Municipality 3. Sub-basin	Data integration and map processing/analysis Land cover matrix and physical account for the whole Laguna de Bay Region available



Account Numbers	1. Overlay Layers	Status/Remarks
4 Sediment Load and Soil Erosion Map	1. Sediment Load (SedNet) 2. Soil Erosion (SedNet)	For data integration Sediment data to be computed once available factors are available (e.g. soil characteristics) Data on soil erosion available for inclusion in the thematic layers
5 Nutrient Map	Nutrient Mapping (Nitrates, Phosphorus)	Nutrient data to be gathered



Account Numbers	1. Overlay Layers	Status/REmarks
6 Soil Type Map	Soil Type	For map processing and data analysis
7 Land Classification Map	1. Land Classification	Data to be gathered
8 Land by Ownership Map	1. Tenure 2. Easements 3. Protected Areas 4. Reservations (Forest, Military)	Information and thematic layers of land cover, easement (at 12.50 m elevation), protected areas are available. Data on tenure and land classification to be gathered



Account Numbers	1. Overlay Layers	Status/Remarks
9 Infra structures Map	1. Infrastructures 2. Roads	Infrastructures and road data to be gathered
10 Geohazard Map	1. Geohazard 2. Land subsidence	Thematic layers of landcover and Geohazards are available. Land subsidence data to be gathered



Account Numbers	1. Overlay Layers	Status/Remarks
11 Quarry Map	1. Mountain Quarry 2. River Quarry	For data and map processing. LLDA has data on quarrying
12 Government Projects Map	1. Government Big Ticket Projects	Data about government projects to be gathered.



Water Accounts

Account Number	Overlay Layers	Status/Remarks
1 Industry Map	1. Wet and Dry Industries (Location) 2. Rivers/Creeks	Data on concentration, discharge flowrate and BOD loading available
2 Population Density Map	Population Density	With data (in excel), for mapping
3 Water Quality Map	Water Quality (BOD, Dissolved Oxygen)	Water Quality data (in excel and in graphs), for mapping



Account Numbers	Overlay Layers	Status Remarks
<p>4</p> <p>Groundwater Map</p>	<p>1. Ground Water Abstraction (class, Volume)</p> <p>2. Precipitation</p>	<p>- w/ data from NWRB</p> <p>- rainfall data (in excel): for encoding</p>
<p>5</p> <p>Water level Map</p>	<p>1. Water Level</p>	<p>For data integration and map processing and analysis</p>



Account Numbers	Overlay Layers	Status/Remarks
6 Flooding Map	Extreme Weather Events	- with data, for mapping
7 Streamflow Map	Streamflow	- with data, for mapping



Account Numbers	Overlay layers	Status /Remarks
8 Water Demand Data	1. Water Demand (HH, Industries, Agricultural Sector, Energy) 2. Evaporation 3. Outflow	- with data from Maynilad and Manila Waters (2013 only) – total per category (industrial, commercial, households..etc.) - data from local water districts: for collection - with data from CBK - c/o PAG-ASA, with payment - Water Balance study
9 Water Supply Data	1. Water Supply (Precipitation, Streamflow) 2. Groundwater level	- Water Balance Study - not available
10	1. DEM, Bathymetry	- ok, c/o GIS



Fishery Accounts

Account Number	Overlay layers	Status
1 Fish Harvest/ Production Data	1. Fish Harvest/Production 2. Water Quality (Chloride) 3. Aquaculture Stocking Density) 4. Primary Production	-2002 to 2013 data obtained from BAS website -2003 to 2013 data in LLDA-ELRD obtained. -Information obtained from LLDA-Clearances and Permits Division (CPD) - 2003 to 2013 data



Account Number	1. Overlay Layers	Status/Remarks
2	1. Extreme Event 2. Sedimentation 3. Nutrient Mapping 4. Primary Productivity 5. Chlorophyll A 6. Fish kill 7. TSS 8. Turbidity	-Data on affected families for Ondoy and Habagat taken from NDRMMC -To be obtained from BSWM - To be obtained from BSWM -2003 to 2013 data - 2003 to 2013 data - 2003 to 2013 fishkill occurrence to be completed - 2003 to 2013 data - 2003 to 2013 data



Account Number	1. Overlay Layers	Status/Remarks
3	<p data-bbox="452 318 923 361">1. Fishpens/Fish cages</p> <p data-bbox="452 582 765 625">2. Zoning Map</p> <p data-bbox="452 715 919 758">3. Demolition Reports</p>	<p data-bbox="1008 318 1769 529">-Data on the numbers and areas of registered and unregistered fishcages and fishpens obtained from LLDA-Clearances and Permits Division (CPD)</p> <p data-bbox="1008 615 1630 658">-To be digitized in Google Earth</p> <p data-bbox="1008 743 1657 915">-With existing data from LLDA-Enforcement Division (ED); to be obtained</p>



Account Number	1. Overlay Layers	Status/Remarks
4	<p data-bbox="430 318 830 361">1. Policy Issuances</p> <p data-bbox="430 715 850 758">2. Violation records</p> <p data-bbox="430 912 788 955">3. Price Changes</p>	<p data-bbox="1006 318 1750 639">-Issued LLDA Board Resolutions and Memoranda available in the LLDA Publication entitled "Milestone Compilation of LLDA Laws, Rules and Regulations" and from the Office of the LLDA Board of Directors</p> <p data-bbox="1006 715 1661 865">-With existing data from LLDA-Enforcement Division (ED); to be obtained</p> <p data-bbox="1006 886 1750 1036">-2004 to 2013 annual market price of fish for the provinces of Laguna and Rizal obtained from BAS.</p>



2003 Land Cover Map

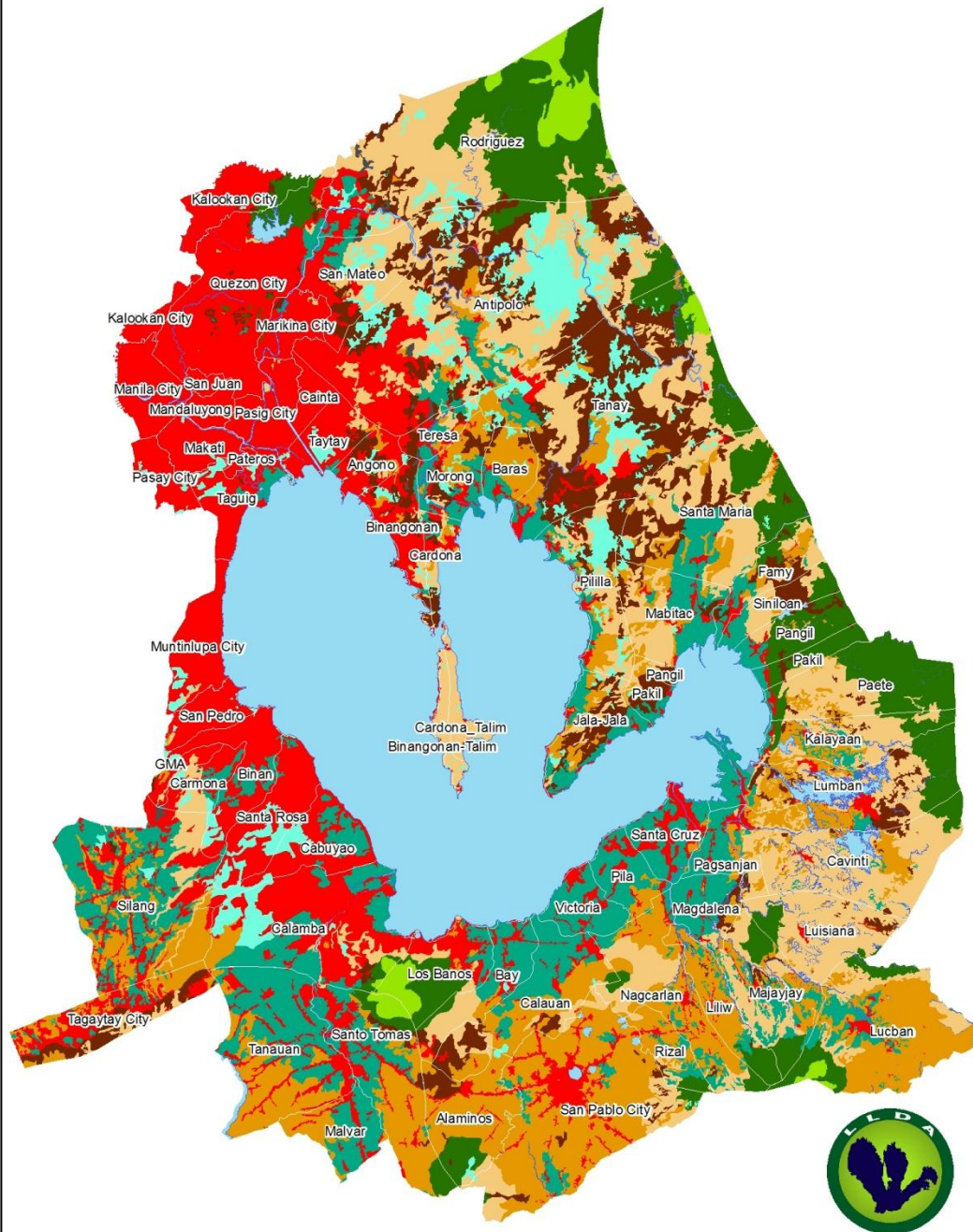


Legend:

-  Closed forest, broadleaved
-  Open forest, broadleaved
-  Forest plantation, broadleaved
-  Mangrove forest
-  Other land, built-up area
-  Other land, cultivated, annual crop
-  Other land, cultivated, perennial crop
-  Other land, natural, barren land
-  Other land, natural, grassland
-  Other land, natural, marshland
-  Other wooded land, shrubs
-  Other wooded land, wooded grassland
-  Other land, fishpond
-  Inland water



2010 Land Cover Map



Legend:

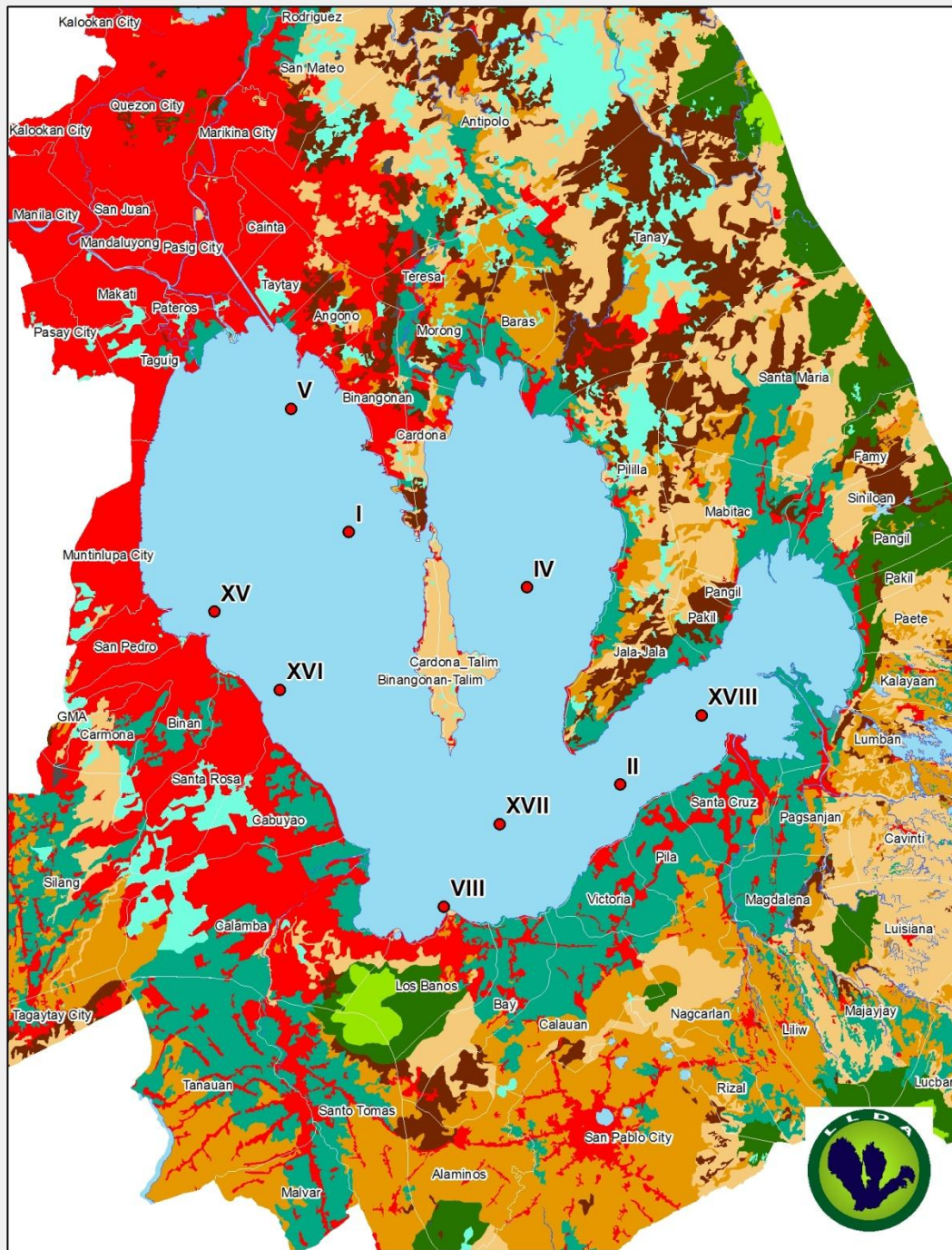
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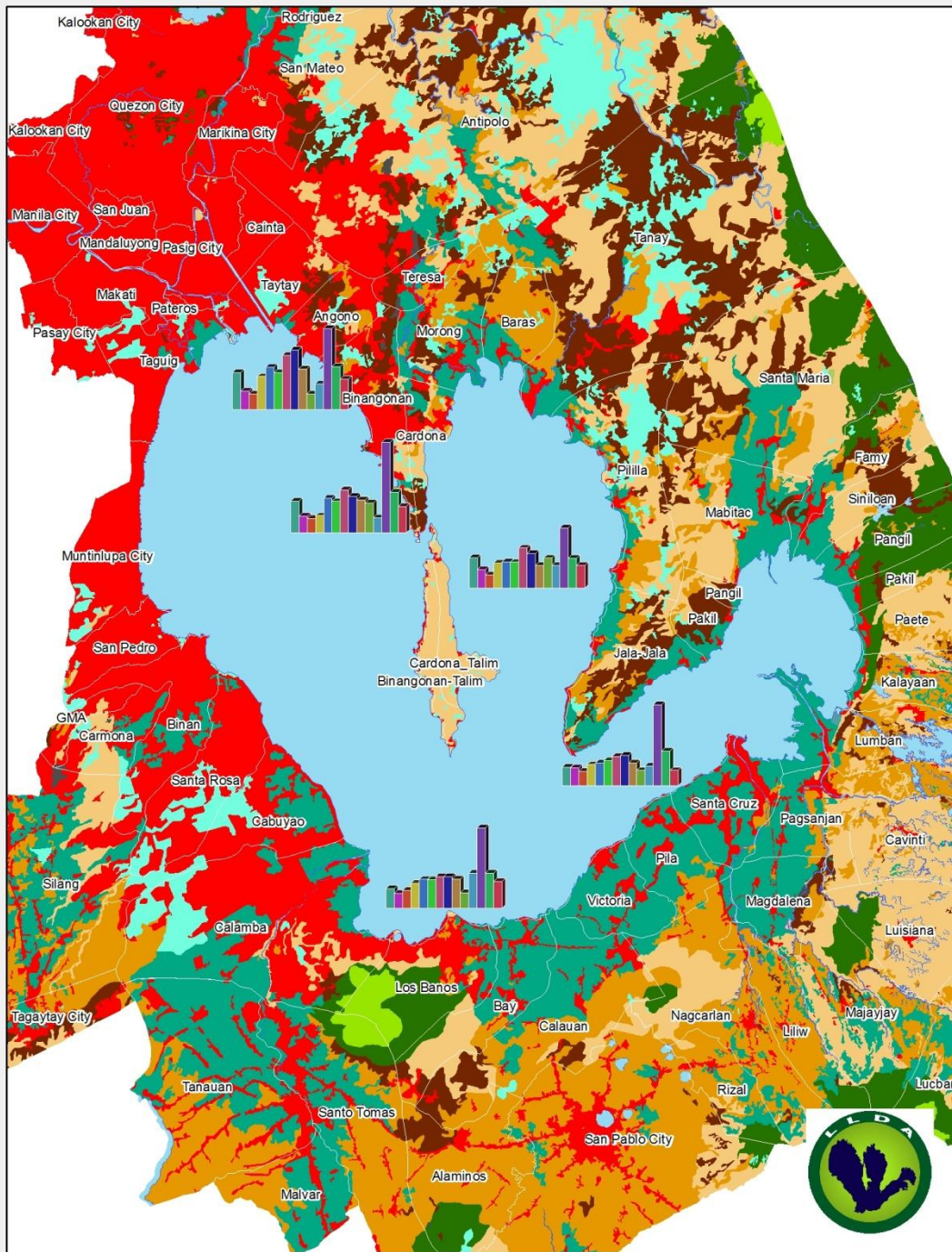
Industry Map





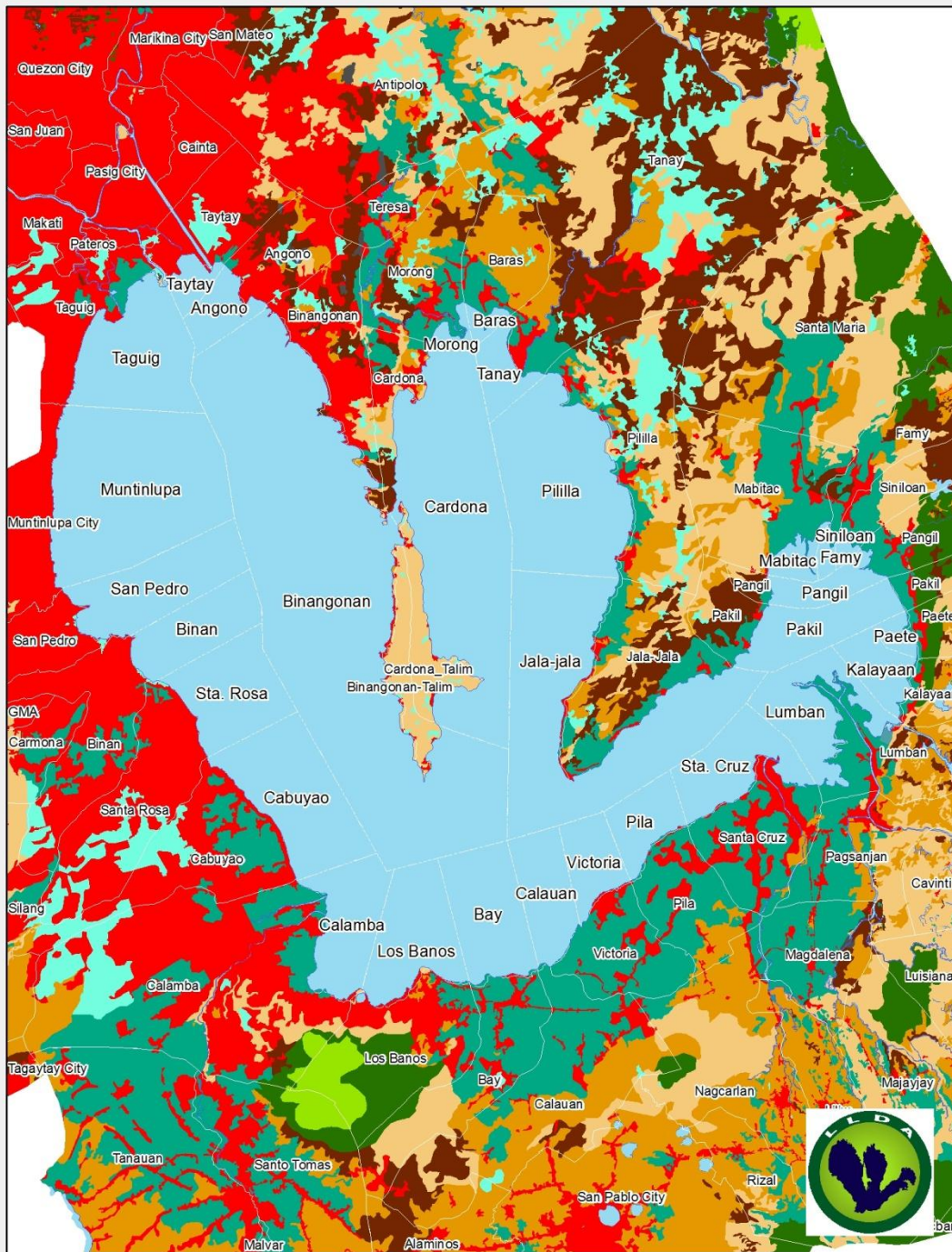
Map of the Water Quality Monitoring Stations





Water Quality Map (BOD)

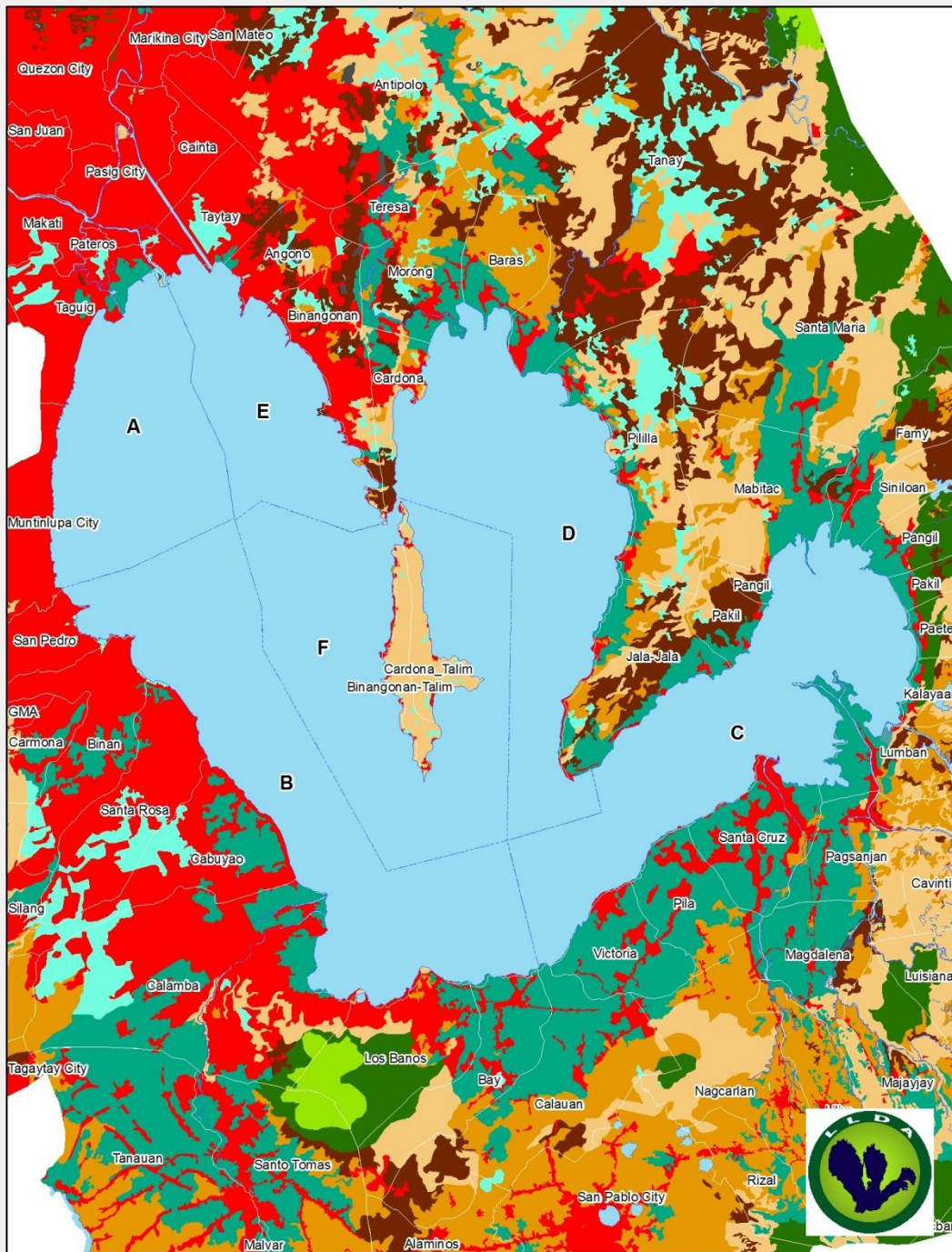




Lake Municipal Boundaries Map



Lake Zones



Issues/Concerns

- Need additional GIS Experts for the water and fishery account groups
- Pag-asa data – with payment
- Data are not dis-aggregated
- Additional workload for the TWG members
- Internal problems due to office transfer



Training Needs

- Data processing and management
- GIS processing , mapping and analysis
- Biophysical modelling (SedNet)
- Valuation/Ecosystem Accounting



Thank You!

