The African Marine Atlas

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The African Marine Atlas

A project of the:
Ocean Data and Information Network For Africa (ODINAFRICA),
funded by the:
Government of Flanders and the:
Intergovernmental Oceanographic Commission (IOC of UNESCO)’s IODE
Over 40 institutions in 25 countries
National Oceanographic Data Centres (NODCs)

Ocean Data and Information Network for Africa (ODINAFRICA)
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1. Algeria
2. Angola
3. Benin
4. Cameroon
5. Comoros
6. Congo
7. Côte d’Ivoire
8. Egypt
9. Gabon
10. Ghana
11. Guinea
12. Kenya
13. Madagascar
14. Mauritania
15. Mauritius
16. Morocco
17. Mozambique
18. Namibia
19. Nigeria
20. Senegal
21. Seychelles
22. South Africa
23. Tanzania
24. Togo
25. Tunisia

African Marine Atlas - participating NODCs
Primary international partners: UNEP, ACEP
A digital GIS atlas, and atlas products, containing a broad spectrum of informative marine geo-information about the African coasts and oceans.

The Project
A project that aims to source, collect and format marine geospatial datasets and make them available to marine scientists and managers while building capacity for marine data management.

The Products
A digital GIS atlas, and atlas products, containing a broad spectrum of informative marine geo-information about the African coasts and oceans.

1. Improve access to data
   (online Atlas product)

2. Increase capacity to use data
   (training courses, work programmes)
Further objectives

⇒ improve data flows into the national oceanographic data and information centres in the participating countries,

⇒ develop data and information products required for integrated management of the coastal areas of Africa, and

⇒ increase the delivery of services to end users.
The African Marine Atlas

Technical Scope:

Five Themes: Geosphere, Hydrosphere, Atmosphere, Biosphere, Human environment

The atlas incorporates data sets that are relevant in any way to coastal / marine sciences or management (initial list of over 200 data categories)

Existing geo-referenced datasets available in the public domain (but tailored to meet specific user requirements).

Continental Africa and island states:

Transboundary data sets
The African Marine Atlas

The Team:

ODINAFRICA National Data Centre Managers from 12 countries and two regional partners, the African Coelacanth Ecosystem Programme (ACEP) and the United Nations Environment Programme (UNEP).
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BASE MAP

Chief Editor  Dr. Murray BROWN; IOC/IODE Consultant, USA
Methods

(1) **Data mining** to gather global, continental and national data according to an agreed-upon scope of topics, geographic limits and temporal considerations;

(2) **Conversion** of the collected datasets into GIS-compatible forms and products; compilation of climatologies and seasonal surfaces (adding value to raw data);

(3) **Documentation and compilation** of the data sets into map and data elements for the atlas.
Products and end users

1. Static website (spatial data clearinghouse)
2. Dynamic Web Mapserver sites (interactive maps)

- Beginning with most important data sets
- Meaningful data products at continental and transboundary scale

Policy-makers
Managers
Scientists
Product 1: Static website (spatial data clearinghouse)
Product 1: Static website (spatial data clearinghouse)

>800 unique data sets, each one:

- described briefly
- JPG image provided of the data
- Link to source, citation
- Downloadable zip file:
  (actual data, data image and metadata in original form)

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Themes & data sets
1. Geosphere Theme

Soils
- Basic types

Sediments
- Thickness
- Texture
- Chemical composition (including pollutants)

Minerals
- Resource potential
- Active sites

Geohazards
- Faults & plate boundaries
- Historic events
- Historic impacts
- Geotechnical problem areas (slumping etc.)

Beaches & Dunes
- Distribution
- Erosion
2. Hydrosphere Theme

Historical surveys
• Cruises & stations
• Moorings
• Existing atlases and products

Physical oceanography
Salinity, temperature, density distributions
– In-situ observations & analyses (V)
– Satellite observations & analyses

Currents
– Traditional
  » Ship based
  » Moorings
– Operational
  » Drifters & floats
  » Satellites

Sea level
- Tide gauges – tides and mesoscale
- Satellites - mesoscale

Waves
- Satellite
- Buoys
Chemical oceanography
- Major nutrients & oxygen
  - Station maps
  - Climatological analyses
- Micronutrients
- “Water quality”
  - Low O2
  - H2S events
  - Major oil spills

Optical oceanography
- Compilation of statistics for standard measurements
- Particulates, detritus, scattering

Limnology
- Drainage basins
- Major rivers & estuaries
  - Locations
  - Hydrographs (/w extreme)
  - Impacted ocean shelf areas
- Coastal wetlands & lagoons
  - Locations
  - Seasonal levels & extremes
3. Biosphere Theme

Biological oceanography
- Phytoplankton
- Chlorophyll
- Zooplankton

Marine/coastal plants
- Algae and kelp
- Mangroves and seagrasses

Terrestrial and coastal vegetation

Fisheries data (FAO – to country level)
- Species distributions
- Critical habitats
- Fishing areas and landing sites
- Catch statistics
3. Biosphere Theme

**Biological oceanography**
- Phytoplankton
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**Fisheries data (FAO – to country level)**
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**Species distributions**
- Corals
- Fishes
- Invertebrates
- Mammals
- Birds

**Protected areas**
4. Atmosphere Theme

Weather
- Synoptic weather patterns
- Extreme event paths, frequencies and impacts
- Maximum storm conditions

Climate
- Temperature
- Precipitation
- Winds
5. Human Environment Theme

Land
- Countries
- States/internal divisions

Marine
-EEZ boundaries
- Treaty lines
-Military activity zones
-Offshore dumping areas
-Major shipping routes
-IMO regular activity zones (distance limits)
-IMO special activity zones
-Navigational fairways & anchorages
-Pipelines
-Cables
-Minerals leases & platforms
Population
- Municipal population & densities
- Rural population & densities

Infrastructure
- Roads
- Ports & coastal engineering structures
- Railroads
- Bridges
- Airports
- Energy transmission
- Information transmission

Industry & commerce
- Factories and production facilities
- Discharges
  - Industrial
  - Sewerage
  - General non-point sources
- Coastal agriculture
- Coastal forestry
- Mariculture
- Coastal mining
Tourism

- Tourist targets
  - Local/national cultural & historical
  - UNESCO cultural & historical
  - Ecological resources of note (see also Protected Areas)
- Hotels & resorts
- Diving, sportfishing & surfing locations/areas

Socio-economic data

- Employment/unemployment levels
- Income levels
- Employment sectors

- **Demonstration site** developed
- Selection of themes
- Training and working meetings (2)
- Training exercise and a prototype
- Current display: [www.africanmarineatlas.net](http://www.africanmarineatlas.net)
Challenges

- Expectations of an online data atlas were very varied
- Metadata management
- Standards: choosing data formats and standard legends
- Selecting appropriate data of interest and meaning at continental scale
- Logistics of working together from several countries
- Remote access to servers
- Access to the Internet from countries
- Biological data: specific permission had to be requested and recorded, data citations were complex
Considerations: standards and interoperability

- We have implemented a WMS, need to describe and serve searchable metadata.

Should use global standards to allow virtual integration with other data providers. Adoption of OGC and ISO standards will facilitate data exchange with other data portals.

We aim to adopt recommendations and best practices of ICAN.
Considerations: scales and applications

The AMA should develop functionality at more scales

Different management & research challenges need data at appropriate scale, including National and case-study scale.

Managers and decision-makers need information products that address a particular issue.

The development of National, sub-regional and local products will facilitate this - additional languages, thematic focus areas, regional and local institutional partners.
Considerations: thematic focal areas

• Requirements of end-users must drive new AMA developments

• Integrated coastal data products (current and future projects of regional institutions) can be incorporated

• Some proposals for the future from the ODINAFRICA WP4 meeting:

1. Rates of shoreline erosion
2. Coastal flooding prediction guides
3. Storm surge prediction models
4. Climate prediction models
5. Critical/sensitive habitats (mangroves, coral reefs etc.)
6. Productivity of coastal oceans
7. Biodiversity Status (Assessment) of coastal and offshore waters
8. Tide data (near real-time and locally sensitive)
9. Bathymetric Charts of inshore waters
http://www.africanmarineatlas.net

http://omap.africanmarineatlas.net

Acknowledgements
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