Developing an Earth Observation Operational Application for Coastal Ecosystems Mapping, Monitoring and Assessment of the Northern African Coastal Zone – NAfCoast

National Authority for Remote Sensing and Space Sciences (The Leader of the Consortium)

Omar Elbadawy
Center for Environment and Development for the Arab Region and Europe (CEDARE)
elbadawy@cedare.int
<table>
<thead>
<tr>
<th>Consortia</th>
<th>Institute</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead Institute</td>
<td>NARSS</td>
<td>Egypt</td>
</tr>
<tr>
<td>Partner</td>
<td>CEDARE</td>
<td>Regional</td>
</tr>
<tr>
<td>Partner</td>
<td>CERT</td>
<td>Tunisia</td>
</tr>
<tr>
<td>Partner</td>
<td>UCD</td>
<td>Morocco</td>
</tr>
<tr>
<td>Partner</td>
<td>IMROP</td>
<td>Mauritania</td>
</tr>
</tbody>
</table>
Background

1. Coastline of the Southern Mediterranean Sea

- This coastal zone is wealthy with natural resources
- more than 140 cities distributed on this coastline that accommodate more than 170 Million inhabitants.
- The coastal line of the Mediterranean Sea is rich with diverse ecosystems and flora species, which is estimated at over 25,000 species.
<table>
<thead>
<tr>
<th>Name of the Country</th>
<th>Length of the Coastline</th>
<th>Number of Coastal Cities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Egypt</td>
<td>1036 Km</td>
<td>20</td>
</tr>
<tr>
<td>Libya</td>
<td>1900 Km</td>
<td>33</td>
</tr>
<tr>
<td>Tunisia</td>
<td>1300 Km</td>
<td>32</td>
</tr>
<tr>
<td>Algeria</td>
<td>1200 Km</td>
<td>39</td>
</tr>
<tr>
<td>Morocco</td>
<td>512 Km</td>
<td>16</td>
</tr>
</tbody>
</table>

Mediterranean Sea
Regional Challenges

• Urbanization
• Socio-economic
• Pollution
• Food security – fish farms and fish stock
• Climate changes – sea level rise
• Natural Hazards
## Service Delivery Matrix

<table>
<thead>
<tr>
<th>Product Classification</th>
<th>Service packs</th>
<th>Targeted users</th>
<th>Means of Service Delivery</th>
<th>Dissemination Channels and platforms</th>
<th>Periodicity</th>
</tr>
</thead>
</table>
| Physical oceanographic conditions and features | Sea Surface temperature, wave heights, coastal water suspended sediment, Shoreline erosion, Shoreline coastal protection works | Meteorology, Oceanography, Fisheries institutions, coastal safeguards, local authorities, urban planners, environment agency, researchers and universities | Interactive web-based (maps, photos, charts, reports, etc.)                                   | • Online interactive system
• Website / viewer / web map / information platform
• HDs, CDs, DVDs,
• Workshops and seminars                                                      | Monthly / seasonally |
| Biological oceanographic conditions and features | Chla spatial distribution, HBAs anomaly, Water quality variables (TDS, Salinity, TP, TN) | Fisheries institutions, Local authorities Environment agency, researchers and universities | Interactive web-based (maps, photos, charts, reports, etc.)                                   | • Online interactive system
• Website / viewer / web map / information platform
• HDs, CDs, DVDs,
• Workshops and seminars                                                      | Monthly / seasonally |
<table>
<thead>
<tr>
<th>Product Classification</th>
<th>Service packs</th>
<th>Targeted users</th>
<th>Means of Service Delivery</th>
<th>Dissemination Channels and platforms</th>
<th>Periodicity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terrestrial coastal features</td>
<td>Lakes, Coastal fish farms and aquaculture</td>
<td>Fisheries institutions, Local authorities, Environment agency, researchers and universities</td>
<td>Interactive web-based (maps, photos, charts, reports, etc.)</td>
<td>• Online interactive system&lt;br&gt;• Website / viewer / web map /&lt;br&gt;• information platform&lt;br&gt;• HDs, CDs, DVDs, Workshops and seminars</td>
<td>Seasonal / annual</td>
</tr>
<tr>
<td></td>
<td>Macrophytes, Hydrophytes, seaweeds &amp; Mangroves,</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hazardous and vulnerability</td>
<td>Impact of climate changes, environmental hazards on coastal features and conditions (e.g. sea level rise)</td>
<td>Meteorology, Oceanography, Fisheries institutions, coastal safeguards, local authorities, urban planners, environment agency, researchers and universities</td>
<td>Interactive web-based (maps, photos, charts, reports, etc.)</td>
<td>• Online interactive system&lt;br&gt;• Website / viewer / web map /&lt;br&gt;• information platform&lt;br&gt;• HDs, CDs, DVDs, Workshops and seminars</td>
<td>Yearly</td>
</tr>
</tbody>
</table>

**GMES & Africa Support Programme 1st Technical Committee Meeting, Tunis-Tunisia**

**Septembre 24-28, 2018**
Summary list of the services delivery

1. Sea surface temperature
2. Sea heights
3. Shoreline erosion,
4. Shoreline coastal protection works;
5. Coastal water suspended sediment
6. Chla spatial distribution & HBAs anomaly
7. Macrophytes, hydrophytes, seaweeds & Mangroves
8. Water quality variables (TDS, Salinity, TP, TN)
9. Coastal fish farms and aquaculture
10. Vulnerable hotspots of coastal ecosystems to:
   11.a) climate changes & sea level rise
   12.B) natural hazards
   13.C) pollution and environmental hazards
14. Socio-economic implications
Target Community

• Ministries and government agencies
• Local authorities
• Environmental authorities
• Local community
• Fishermen’s
• Educational institutions
• Business owners
• NGO’s
Data in-use in the project

- Sentinel 3 OLCI FR & RR L1 & L2,
- Sentinel 3 SLSTR L2,
- MODIS Aqua L2 OC & SST,
- Sentinel 2 MSI
- Landsat

Example of Sentinel 3 coverage
Sentinel 1 for land subsidence – interferometric data analysis

Example of interferogram for the north eastern part of the Nile delta
Other Data sources:
NARSS has prepared base map for the area of study

- Geological and geomorphological maps
- Land use and cover maps
- Hazards maps
## Communication and Marketing Matrix

<table>
<thead>
<tr>
<th>Service</th>
<th>Strategies of marketing the service</th>
<th>Users feedbacks mechanism</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical oceanographic conditions and features</td>
<td>Geoportal, website, workshops, media (Radio and TV), Mail (newsletter and SMS), materials (posters, flyers, brochures, etc.), media interventions, Press releases, awareness campaigns,</td>
<td>Committee meetings, workshops, Phone calls and emails, Surveys, Interviews</td>
</tr>
<tr>
<td>Biological oceanographic conditions and features</td>
<td>Geoportal, website, workshops, media (Radio and TV), Mail (newsletter and SMS), materials (posters, flyers, brochures, etc.), media interventions, Press releases, awareness campaigns,</td>
<td>Committee meetings, workshops,</td>
</tr>
<tr>
<td>Terrestrial coastal features</td>
<td>Geoportal, website, workshops, media (Radio and TV), Mail (newsletter and SMS), materials (posters, flyers, brochures, etc.), media interventions, Press releases, awareness campaigns,</td>
<td>Phone calls and emails, Surveys, Interviews</td>
</tr>
<tr>
<td>Hazardous and vulnerability</td>
<td>Geoportal, website, workshops, media (Radio and TV), Mail (newsletter and SMS), materials (posters, flyers, brochures, etc.), media interventions, Press releases, awareness campaigns,</td>
<td>Committee meetings, workshops,</td>
</tr>
</tbody>
</table>
Outcomes

• Regular dissemination media (e.g. newsletters,
• Updated maps and quantification of the physical and biological coastal ecosystems
• Maps of the socio-economic value of the coastal ecosystems
• Maps of the vulnerability status of these ecosystems to climate changes
• Definition of the most important transboundary issues among the northern African countries
• Geoportal of the northern African countries data for coastal and marine environment.
• APIs and tools to generate services to the stakeholder, beneficiaries and end users.
GMES and AFRICA Programme
The Support Programme Management Unit
AFRICAN UNION COMMISSION
Department of Human Resources, Sciences and Technology
PoBox 3243 | Roosevelt Avenue (Old Airport Area)
Addis Ababa, Ethiopia
Tel.: (251) 115517700
Website GMES and Africa: www.gmes4africa.blogspot.com
African Union Website www.au.int
Email GMES@AFRICA-UNION.ORG

Leader of the Consortium Address:
National Authority for Remote Sensing and Space Sciences - NARSS
Prof. Dr. Islam Abou El-Magd
Cairo, Egypt
+202 26251286 (D)
+2010 66343915 (Cell)
www.narss.sci.eg
imagd@narss.sci.eg /
islam.magd@gmail.com