



Food and Agriculture Organization of the United Nations

WORLD MANGROVES

FAO-NRCE/GTOS contribution to the 2nd edition of the World Atlas of Mangroves - Rome, November 2008

Mangrove forest and bird Mangrove forests are essential in the protection of coastal areas from catastrophic occurrences like cyclones, floods, and tsunamis. The Nargis cyclone (2008) clearly demonstrated the function of mangrove thick forest in the mitigation of the destructive effects of flooding. Therefore, distribution and change over time of this valuable resource is a crucial information to collect and update. The first mapping project of the world mangrove ecosystem was accomplished in 1997 with the publication of the World Mangrove Atlas. The project was directed by the International Society for Mangrove Ecosystem (ISME) in collaboration with the International Tropical Timber Organization (ITTO) and the World Conservation Monitoring Centre (WCMC). The World Atlas of Mangrove includes information about world and regional mangrove distribution, descriptions about tree species, maps and case studies. The Atlas had an important value and was considered a reference point for managers, conservation experts and scientists. The second edition of the Atlas, ten years after, arise together with the need to improve the digital map and get a more reliable and consistent database.



The Food and Agriculture Organization of the United Nations (FAO) Environmental Assessment and Management Unit (NRCE), with its long experience in remote sensing and GIS technologies, and with its consolidated mapping methodologies and tools (Africover, GLCN, etc.) together with the Global Terrestrial Observation System (GTOS) and particularly its coastal panel (C-GTOS) have been requested by ITTO, the main donor, to review 28 countries where the base lines were more unreliable, defective or completely absent.

More than 400 satellite images, dated 2000-2003, were processed, geo-referenced and interpreted to produce a new updated global database.

MAIN TASKS

Within the framework of this initiative, NRCE/GTOS have been tasked to:

- Build awareness, at country level, in promoting good practices for the protection of mangrove locations.
- Help and assist local governments in the development of methodologies and procedures based on remote sensing technologies designed to detect, recognize and monitor mangrove areas.
- Conduct the mangroves mapping over 28 countries.
- Standardize mangrove databases and other geo-spatial layers into a common global cartographic system.
- Build a cartographic layout and produce thematic maps with special focus on mangrove areas and natural protected areas.
- Generate a global database of geographical locations referred to areas covered by mangrove forests.

FAO-NRCE/GTOS ACTIVITIES

MAPPING THROUGH REMOTE SENSING

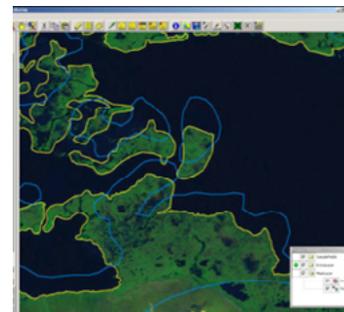
The methodology adopted for mapping land cover information through satellite imagery involves the following steps:

- **PRELIMINARY INTERPRETATION.** The mapping was carried out by visual on-screen interpretation using NRCE standard tools (i.e. GeoVis) and procedures. The previous mangroves database (1997) was used to identify the new images to interpret. For countries not covered in the previous atlas, the entire set of images covering their coastline was used.



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- FIELD VALIDATION.** It aims to minimize interpretation errors. In such wide project, a comprehensive fieldwork programme would have increased enormously the costs way beyond the allocated resources. At the same time, the exclusion of this phase would have implied an output with low reliability. NRCE, with its networking capability, has involved organizations, scientists, national and international experts into the validation process. Partners and field experts have been provided with images, interpretations, coastline data and other relevant information, all packed in Dynamic Atlas (FAO's GIS viewer), to support this phase. Considering that a full field validation has not been undertaken, the above process has allowed the minimization of mapping errors.
- DATABASE FINALISATION.** Using the information collected during the previous phase, any detected errors have been corrected to produce a final, validated database.



CARTOGRAPHIC OUTPUT

This activity is currently on going. The world mangroves layer, together with natural places (national parks, nature reserves, nature sanctuaries, etc.) relevant to mangrove locations, will be displayed in 61 maps (see figure). They are being compiled for the 2nd edition of the World Atlas of Mangroves. The map template has been designed in cooperation with WCMC.

CONCLUSIONS AND RECOMMENDATIONS

An updated database of mangroves is critical for important topics such as climate change, coastal environment and hydrosphere, human usage and exploitation, and for ongoing international initiatives on global environmental change such as the measurements of progress towards the 2010 Biodiversity Target of the Convention on Biological Diversity.

Discussions are underway between FAO and WCMC, concerning the creation of a global, seamless layer of mangrove areas by combining the mapping efforts conducted by the different organizations. The global database will provide the international community with valuable information on distribution, extent, and change of mangrove forests.

Mangrove ecosystems are unique, marginal and highly productive; thus, they are important from a social, economic and biological perspective. To build up a complete valuable and exhaustive analysis, multidisciplinary initiatives should be taken. For example, future activities could be framed within the implementation of the Memorandum of Cooperation between the Ramsar Convention and the Global Terrestrial Observing System (GTOS), and through the Type II Partnership on Wetlands Mapping and Inventory in support of the Ramsar Conventions and other Biodiversity-related Conventions (e.g. Convention on Biological Diversity; Convention on Migratory Species; World Heritage Convention), recently-developed by FAO (through the GTOS Coastal Panel) and the International Water Management Institute (IWMI).

