APPENDIX II. ASCLME DATA AND INFORMATION MANAGEMENT PLAN

Working document

V3 (2) – 9 November 2011

1. Introduction

Substantial amounts of data collected by government and donor-funded marine scientists around the world are not routinely archived in data centres. Even if published, the original data are irretrievably lost to studies of long-term (environmental) change (SCOR/IODE 2008) over time. This data and information management plan has been developed by the Agulhas and Somali Current Large Marine Ecosystems (ASCLME) Project national Data and Information Coordinators together with the Project Coordination Unit. The purpose of the plan is to ensure that data collected during the duration of the ASCLME project, and thereafter, are not only tracked and monitored to the stage of publication, but that data sets are also archived in national data centres for the ongoing benefit of countries, and to build country ownership of the TDA/SAP process. International best practices and standards for data management will be followed in all cases (eg. JCOMM 2008). Together with capacity building interventions, this approach aims to support the goal of sustainable national data archives that countries can use in the support of ecosystem monitoring and management in the long term.

This is a working document which will continue to evolve with the project, while always following the principles for data management (detailed in Section 2, below) as agreed by participating countries.

2. Principles and guidelines for Data and Information Management on the ASCLME Project
14 November 2008

Participating countries in the ASCLME Project, and their designated representatives, have the mandate to develop this document on principles and guidelines for ASCLME data and information management so that it facilitates the effective collection, use and dissemination of information in support of TDA/SAP development in the short term and the ecosystem approach in the long term.

National D&I coordinators in particular, have a primary responsibility for sourcing, collating, interrogating and presenting information relevant to the TDA/SAP process, and developing mechanisms for reliable long-term storage and use of information collected under the ASCLME Project.

This section has been drawn up based on principles discussed and outlined in MOUs, data policies and meeting resolutions of the ASCLME Project, the South West Indian Ocean Fisheries Project (SWIOFP), UNEP's Addressing Land Based Sources of Pollution in the Western Indian Ocean (WIO-LaB), the Nairobi Convention, the African Coelacanth Ecosystem Programme (ACEP), the International Council for Science (ICSU), the Intergovernmental Oceanographic Commission of UNESCO (IOC), the Committee on Data for Science and Technology (CODATA) and the Intergovernmental Oceanographic data exchange (IODE). It is also informed by recommendations of the ASCLME Steering Committee meeting of January 2008 (Durban).

The section only addresses **principles**, **guidelines** and some fundamental requirements. It will **not address mechanisms or activities**. This document should be seen as the guiding policy on intellectual property underlying the proposal, design and implementation of all research and data-use activities.

The process of development has been:

1. Discuss and develop the content of the document at **National** meetings of the COGs, with Steering Committee and D&I representatives in particular (May to July 2008)
2. Adopt an interim guiding document on commencement of the first ASCLME cruise (1 August 2008)
3. Present the compiled document together with comments, recommendations and points of discussion at the **Regional** meeting of the COGs (29 September 2008).
4. COGs to get further input from countries and submit final comments to the Project Coordination Unit (PCU) before 3 November 2008.
5. The PCU to do a final review of changes to check consistency with FAO and UN Principles.
6. Finalisation of document (14 November 2008).

Principles of intellectual property and data management under the ASCLME Project (with reference to international recommendations on best-practice)

Data and information collected and compiled for the purposes of the development of the regional TDAs and SAPs may be divided into two main categories; A) New data collected under the ASCLME Project, and B) Existing or historical data residing in National or International institutions or databases.

A) New data and new mechanisms for data management

The intellectual property of data, associated metadata, information collection activities and resulting products funded by the ASCLME Project resides with the principal investigator (in the case of a scientific investigation), the Institution to which the scientist belongs, the participating country and the ASCLME Project.

Bearing in mind that access to new data, associated metadata, information collection **activities and resulting products funded by the ASCLME Project** shall be free and unrestricted to the Project and the participating countries;

Existing initiatives and collaboration

1. The ASCLME Project takes cognizance of the many projects, programmes, networks and institutions in the region that are actively collecting, managing, archiving and disseminating marine and coastal-related data. The Project will seek to avoid duplication of existing activities.
2. The Project has established, or will seek to establish, collaboration with the initiatives that have a complimentary mandate.
3. It is recognized that ASCLME countries have institutions with mandates for certain marine data-related activities (management or policy), and every effort will be made by the Steering Committee to include these institutions in ASCLME technical committees.
4. Internationally accepted standards and best-practices for data collection and management will be used wherever possible.
5. The ASCLME Project will support the coordination of effort across the region for the promotion of access to coastal and marine-related information in appropriate forms, to underpin informed ecosystem management decisions.

Custodians of data and policy

6. The primary custodians of data sets shall be member-countries of the ASCLME Project, and the primary contact points and archive locations for ASCLME-generated data shall be at National data centres. Where requested, the ASCLME Project shall provide appropriate support and training to the Data Centres (as determined by countries themselves) to enable them to fulfill this mandate.
7. The Working Group of National D&I coordinators (Regional Information Working Group) for the ASCLME Project will be made up of National representatives, and will have the responsibility for guiding all aspects of data collection, management and policy.
8. Participating countries shall collaborate in good faith to establish systems to best meet the needs of the Project, Programme and region as a whole, in support of the ecosystem approach.

Primary research data

9. Primary research data collected by scientists under the ASCLME Project shall be immediately available to the Regional Information Working Group (made up of National D&I Coordinators).

10. On request by the Principal Investigator (PI), a restriction may be placed on the release of primary research data outside of the Project for a period of no more than 24 months (International Council for Science (ICSU) guidelines). Scientists will, however, be encouraged to publish their data as soon as possible, and shall be given appropriate support and skills training to allow the analysis and interpretation of their data.

11. If restricted (10, above), even within this 24 month period, data may still be used by the ASCLME Regional Data & Information Working Group, TDA and SAP Working Groups, for purposes that are fully disclosed to the PI and that, by mutual agreement, do not compromise any pending publications.

Commercial gain

12. Information and data, as well as products developed from these data under the ASCLME Project shall under no circumstances be sold, either during or after the ASCLME Project duration.

13. This restriction does not apply to value added services.

Mechanisms for data exchange, sharing and access

14. Internationally recommended standards for data description shall be used in all cases (metadata standards and ontologies by MMI, JCOMM, IODE, ICAN).

15. Metadata formats used by the Project shall comply with Open Geospatial Consortium (OGC) and ISO standards.

16. All reasonable efforts to ensure interoperability with existing African and International marine and coastal information networks shall be taken.

17. Information systems instituted by the ASCLME must have a purpose and design for the benefit of the region, must have a mechanism to ensure updating at an appropriate frequency, and must have measures to ensure their protection and the sustainability of content information *in some form, in the future* beyond the duration of the ASCLME Project.

18. Public domain data should be contributed to appropriate international databases and international information networks including SADCO, the World Ocean Database, the Ocean Biogeographic Information System, the African Marine Atlas, the Nairobi Convention Clearinghouse Mechanism, the Global Ocean Observing System.

19. Mechanisms of data exchange shall be determined by the D&I working group.

Disclosure of relevant project, data and research activities

20. Countries shall, in good faith, make known to the ASCLME National & Regional Committees any project, programme, research or data activity that is relevant to the ASCLME.

21. Metadata of all data collected for ASCLME purposes, as well as research data shall have no restriction and shall be placed in the public domain as soon as reasonably possible.

22. Data and metadata from the ASCLME Project shall be made available in one or more formats to ensure accessibility by the widest range of potential users.

23. Public-domain information shall be made available to the ASCLME communications team to facilitate awareness of ASCLME results and activities.

24. No research or data collection activity (including specimen collection and the deployment of instrumentation) will take place in territorial waters without the guidance and permission of the relevant country, and the possession of required permits.

25. Where morphological specimens are collected, every effort will be made to collect duplicates and to lodge primary specimens in National Collections, and to provide appropriate training where this is requested.

26. Copies of all electronic data collected by the ASCLME Project will be given to the National Oceanographic Data Centre, or other Nationally designated institution for archiving (flagged if necessary), regardless of the publication status.

27. Data collected or disseminated remotely, from satellites or drifters, is often immediately in the public domain (data from Argo floats, for example), and links to these repositories will be provided.

Sensitive data

28. Since the establishment of data policies and data management mechanisms will be established by National D&I representatives, countries will be able to decide actions on data of particular sensitivity. Clauses may be added for sensitive data types (themes) or sensitive areas (geographically delimited).

Disclosure

29. Data collected by the ASCLME Project, whether from historical or field (new data) sources, shall be described (metadata shall be written if the data sets are new) and the metadata shall be made available in the public domain as soon as practically possible, with reference to the location and appropriate national-level contacts for obtaining the actual data sets.

30. Project descriptive information which will always be public domain and fully open access will include:
    - Cruise tracks (planned and executed)
    - The location of deployed instrumentation
    - The location and nature of field activities, including ship-based Station logs.

B) Existing and historical data

31. Data obtained from other projects or sources must be attributed with comprehensive metadata, and copyright, and use restrictions. Citation requirements made by other data providers must be respected and followed without exception.

32. Data provided by National Institutions are deemed to be National contributions to the ASCLME Project and would remain the intellectual property of those institutions while being used by countries in the development of their own National and Regional TDAs and SAPs.

33. The ASCLME Project will actively pursue and support the repatriation of data sets to their source countries, for example from past research cruises in Western Indian Ocean waters, for both ASCLME Project and Country use.

Quality control

34. Data sets and derived information used in the ASCLME MEDAs, TDAs and SAPs, from any source, must be subject to quality control or peer review to confirm their reliability and usefulness.

3. Data and Information Coordinators

A working group of Data and Information (D&I) Coordinators, one from each of the ASCLME countries, is responsible for all aspects of D&I management on the ASCLME Project. Representation nominated by each country is specified in Table 1. This working group has developed documents on principles and guidelines for overall data management as presented in Appendix I. Guidelines for 2008 cruise data are presented in Appendix II (ASCLME 2008a). During the first year of the ASCLME project, there have been substantial discussions with relevant projects active in the WIO region, including regional agencies, commissions and conventions to ensure that ASCLME builds on these already established systems developed by other UN agencies (ASCLME 2008b). This is critical for the effective implementation of a long term ecosystem approach to the management of marine resources in the in the Western Indian Ocean that is supported by governments in the long term.

Table 1. Data and Information Coordinators for the ASCLME Project

Country	Institution	Official representative	Alternate	Contact details
Comoros	Ministry of Agriculture, Fisheries and the Environment (MAPE)	**Mr Farid Anasse**	Yahaya Ibrahim	Email: farid_anasse@yahoo.fr; yahayaim@yahoo.fr>;
Kenya	Kenya Marine and Fisheries Research Institute (KMFRI)	**Mr Harrison Onganda**		Email: honganda@kmfri.co.ke
Madagascar	Office National pour l'Environnement *(*ONE)	**Mr Jean-Roger Rakotoarijaona**		Email: jroger@pnae.mg; jr.rakotoarijaona@gmail.com
Mauritius	Mauritius Meteorological Services (MMS)	**Mr Mohamudally Beebeejaun**	Renganaden Virasami	Email: m.bbjohn@odinafrica.net; vganessen@yahoo.com
Mozambique	Instituto Nacional de Hidrografia e Navegação (INAHINA)	**Ms Clousa Maueua**	Obadias Cossa	Email: clousam@yahoo.com.br
Seychelles	Policy Planning and Services Division, Ministry of Environment, Natural Resources and Transport	**Ms Michelle Etienne**	Mr Justin Prosper	Email: cheekymich@gmail.com; m.etienne@scmrt-mpa.sc
South Africa	South African Earth Observation Network (SAEON)	**Dr Juliet Hermes**		Email: juliet@saeon.ac.za
Somalia	Ministry of Fisheries	**Mr Ali Sabriye**		Email: sabriye.alisalad@gmail.com or sabriye.alisalad@hotmail.com
Tanzania	Institute of Marine Sciences	**Dr Desiderius Masalu**	Dr.Kyewalyanga	Email: masalu@ims.udsm.ac.tz
France (observer)	IRD - EME	**Dr Jean-François Ternon**		Email: Jean.Francois.Ternon@ifremer.fr
PCU	ASCLME Project Office	**Lucy Scott**		Email: Lucy.scott@asclme.org
PCU	Cruise coordination (and publications)	**Dr Tommy Bornman**		Email: tommy.bornman@asclme.org
PCU	Capacity Building and Training	**Prof. Warwick Sauer**		Email: w.sauer@ru.ac.za

4. ASCLME Project

The overall objective of the ASCLME Project will be to deliver a Marine Ecosystem Diagnostic Analysis (MEDA) for each participating country, a regional Transboundary Diagnostic Analysis (TDA), and Strategic

Action Programme (SAP) for the Agulhas Current LME (South Africa, Mozambique, Comoros, Seychelles, Madagascar and Mauritius), and the Somali Current LME (Somalia, Kenya and Tanzania), which can be expanded when governance within the northern portion of the Somali LME becomes more stable. The parallel UNEP and World Bank Projects (WIO-LaB and SWIOFP) will also feed pertinent information into the TDA/SAP formulation process, and assist in the identification of policy, legal and institutional reforms and needed investments to address transboundary issues. Collectively, the projects build foundational capacities at regional scale for management of the LMEs. Provision is made through the UNDP ASCLME Project for overall ASCLME Programme coordination.

5. Definitions[1]

Data

DATUM   Pl: data ('deɪtə).
   2. *pl.* Facts, esp. numerical facts, collected together for reference or information.

Metadata
metadata *n.* a set of data that describes and gives information about other data.

Information
   3. a. Knowledge communicated concerning some particular fact, subject, or event; that of which one is apprised or told; intelligence, news. *spec.* contrasted with *data*. …….**1970**

Portal
5. A web site or service that provides access to a number of sources of information and facilities, such as a directory of links to other web sites, search engines, email, online shopping, etc.

6. The ASCLME MEDA, TDA, and SAP

Each participating country will develop a Marine Ecosystem Diagnostic Analysis (MEDA) which will synthesise information at National level, and be the national input into the TDA and SAP. Appendix III presents the template for the MEDA.

Figure 1 describes the process of data and information synthesis for MEDA, TDA and SAP development.

Data and Information Coordinators for each country will take primary responsibility for product delivery, with specialists giving input in key areas. Coordinators are responsible for determining the level and nature of support (funding, advice and/or meetings) provided by the ASCLME Project to enable the delivery of products on time.

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[1] All definitions and numbering follow the Oxford English Dictionary.
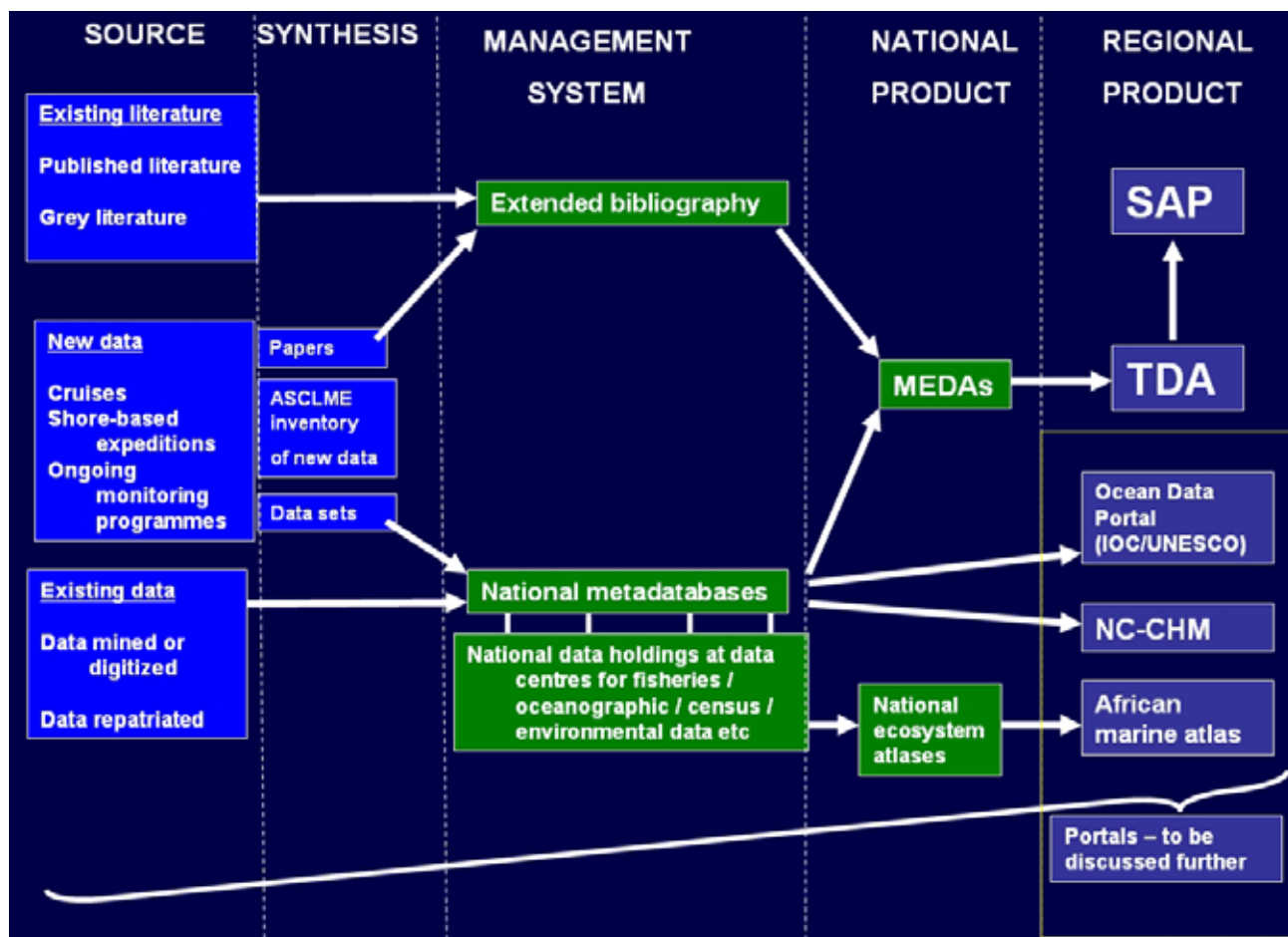
Figure 1. Process of information synthesis for MEDA, TDA and SAP development. Green blocks refer to national systems and products.

The content of the extended bibliography and the national metadatabase is determined by the table of contents (TOC) of the MEDA (Appendix III).

7. National reviews: Sources of information

The national Marine Ecosystem Diagnostic Analyses (MEDAs) will be the synthesis of current knowledge of the coast and ocean, related to ecosystem management. As described in Figure 1, information and data for the national MEDAs will be sourced from published literature, collected in the field, and/or mined from unpublished data and document repositories. The MEDA will also identify knowledge gaps and make recommendations for targeted activities to add to our knowledge of regionally important issues or ecosystem processes. These proposed activities should be rated on a scale of importance so that the Project Coordination Unit (PCU) can consider assistance towards addressing priority issues through early action, or incorporate recommendations into the SAP for implementation after the first phase of the ASCLME Project.

New data will be collected from both ship and shore-based expeditions, processed, and then written-up for peer-review and publication. The document Principles and guidelines for ASCLME data and information management (Appendix I), as agreed by ASCLME participating countries, guides this management plan, including the handling of new data collected with ASCLME Project funding.

7.1 Notes on repatriation of data to Western Indian Ocean countries

As outlined in the project document, this will be a specific request, facilitated by the ASCLME, for data repatriation to participating countries. Experiences and successes of the Global Ocean Data Rescue and Archaeology (GODAR) project of the IOC/UNESCO will be taken into account.

Data sets required for repatriation will be identified during the course of development of the MEDAs. In addition to the identification of data sets recommended for repatriation, a proposal with budget attached, must be submitted to the ASCLME PCU for the processing/interpretation of data for the purposes of informing the ASCLME MEDA.

Once received, data should be described and lodged at national data centres, and metadata must be made available online.

8. Data and information management systems

As illustrated in Figure 1, information and data in support of the MEDA will be drawn from many sources. A management framework is needed to make sure that there is a system for tracking and managing source information for the MEDAs and the TDA, so that the information resources for the ASCLME project documents remain available and useful for the ongoing benefit of participating countries engaged in the LME process.

Archiving and long term management of information systems and data sets sourced at national level should remain in national institutions. Information/data should not be removed from their original source, and management systems should not be duplicated. For this reason, the focus of the ASCLME Project will be on synthesising and describing information (increasing awareness of information resources), promoting access to information, and supporting the good management and curation of existing data and information (through capacity building and training). The main *users* of scientific information in the LME process will be managers and scientists from national management and governance agencies, who will need to draw on sources of information to inform management/governance strategy and develop policy briefs.

In order for information to be accessed, managed and disseminated in support of the LME process, a suite of management tools will be implemented. The four core tools that will be used by ASCLME Project participants will be:

- A literature management system (for access to information)
- A metadatabase (for access to data)
- The ASCLME inventory of new data (to monitor and track new data collected with ASCLME funding), and
- A Projects database (to manage information about other projects in the WIO region).

Information in these and other systems will be used to generate a series of information products in support of the ecosystem approach. The four core tools must be considered to be useful products in themselves, but further value addition and design is needed to produce specific information products that are required for the countries of the ASCLME Project.

Other projects and funders have generated important data resources for the countries of the Western Indian Ocean. At regional level, there is agreement or discussion with several partners to exchange data and/or resources with the ASCLME Project to better serve the interests of the region. This data exchange is described in Appendix IV (Data exchange and collaboration with other projects in the WIO region). Since this only addresses exchange at regional level, a similar table is included in each of the National D&I plans to describe collaboration in each country.

8.1 Literature Management System

During the course of development of the MEDAs, numerous articles and papers, both published and unpublished, will be reviewed and used as sources of information. It will be useful to participating countries to have access to a database or extended bibliography of literature on LME-related subjects.

Bibliographies should be maintained by a national institution (with offline and online access), but should be ultimately accessible via a regional, internet-based portal.

Input has been solicited from the IOC/UNESCO, UNEP, ReCoMaP, WIOMSA and SAEON regarding the adoption of an existing system OR the development of a database specifically for ASCLME purposes. The use of WEBLIS by SWIOFP and the resources in IOC portals and WIOfish are also acknowledged.

The choice of a system was an item on the agenda of the 2nd Working meeting of D&I Coordinators (Feb 09), after which an implementation plan commenced. **Endnote** was chosen as the software for Project information management, and SWIOFP subsequently selected the same software.

A partnership with IOC/UNESCO will see the final, regional Endnote database incorporated into Oceandocs (www.oceandocs.net) for sustainability of access into the future.

8.2 Metadatabases

A metadatabase is required for each country to track data sets that are used by the ASCLME Project in support of the MEDA, as well as in the development of national data products. Most participating countries have one or more marine-related metadata portals already up and running. Regional discussion about the overlap and synergies between portals developed by UN agencies in the Western Indian Ocean is already underway, particularly with the Nairobi Convention Clearinghouse Mechanism and ODINAFRICA (IOC/UNESCO).

Instead of developing a new, system for the ASCLME Project, the countries recommended that one of the existing discovery metadatabase systems already in place, be adopted by each country for the ASCLME Project. The proposed national metadatabase, and requirements for support (if any) from the ASCLME Project should be drawn up in each National D&I plan (see section 9 below). While it is acknowledged that SWIOFP proposed to use MEDI (IODE/UNESCO) (SWIOFP 2003), SWIOFP is now using Geonetwork.

If an existing metadatabase is used, a flagging system must be implemented to indicate data sets which are a) of relevance to the ASCLME Project, and b) have been entered into the system on behalf of the ASCLME Project. This is necessary so that data inventories relevant to the ASCLME can be generated quickly and also so that work progress (the describing of additional data sets) can be monitored.

In countries where no functional metadatabase currently exists to serve the needs of the marine/coastal community, or where funding is required to make such a system fully functional, this should be specified in the national D&I Plan (see section 9 below).

The ASCLME PCU will continue to work closely with ODINAFRICA (IOC/UNESCO), the Nairobi Convention Clearinghouse Mechanism and SWIOFP, to ensure that any targeted interventions that are necessary to increase access to coastal and marine-related metadata are done in the best interests of the region. Interoperability of metadata portals, funding, and participation in the International Coastal Atlas Network (ICAN) will also be addressed at D&I meetings of regional projects.

8.3 ASCLME new data inventory

New data will be generated mainly from three sources:
1.   Ship-based expeditions
2.   Shore-based expeditions
3.   Ongoing data collection for monitoring purposes

The ASCLME PCU will maintain an online inventory of these data sets for the reference of all Project participants.

In addition to the data inventory, the actual digital data will be maintained online on an FTP site for access by all participating countries and participating scientists. The FTP site contains (for example) the contents of each of the DVDs delivered by the Nansen Chief Scientist after each of the cruises. Access to the FTP site will be provided by the D&I Coordinators or by the PCU to scientists working on cruise data.

Scientists from the region, whether they were able to participate in field work or not, have been encouraged to form collaborations to analyse and publish ASCLME-related data. A list of publications is maintained by the Project.

Processed data should be uploaded back on to the FTP site (details of which should be discussed with the PCU).

Once the final Project cruise is completed, the inventory of new data will be updated and uploaded on to the Nairobi Convention Clearinghouse Mechanism website (South African or Nairobi portals), and confirmation will be made that each of the NODCs has downloaded a complete set of data from the FTP site. Complete sets of ASCLME data will be archived at the Southern African Data Centre for Oceanography (flagged, if required) and the World Data Centre for Oceanography (two years post data collection).

8.4 WIO Projects database

A spreadsheet has been compiled of projects active (in more than one country) in the WIO that have some relevance to the ASCLME Project. This has been compiled by the ASCLME PCU, currently standing at >120 projects. Each country should contribute a list of projects at national or local level to complement the regional list. This will form part of the National D&I Plan (see below).

A more detailed document entitled **Summary of WIO regional projects** has been compiled, also by the ASCLME PCU, to describe in detail the activities of key projects and areas of potential collaboration along thematic lines. Further contributions to this document are welcome, and regular updates will be made available online.

A joint collaboration with ODINAFRICA and the IODE (IOC/UNESCO) will see a searchable repository of this information being made available online (2012).

9. Information products

A series of products will be developed for the dissemination of ASCLME ecosystem-related data and information, in addition to the information management systems described above.

National ecosystem atlases in support of disseminating information and monitoring change will be developed by each country, as a joint activitiey with ODINAFRICA. Since some countries have already developed national marine atlases, coastal atlases, or sensitivity atlases/maps, the requirements for spatial products will differ by country. Content should be related to priority issues in MEDAs. A regional Ecosystem Atlas is proposed which would be the basis for a long term monitoring programme, again in collaboration with ODINAFRICA and other partners.

All data generated by the ASCLME Project may be accessed via the URL: http://www.asclme.org/en/data-and-information/data-and-information/access-data-and-information-for-the-asclme-region.html

This portal also contains useful links to partner websites and external repositories of data for the region.

10. National data and information management plans

Each country has written their own national D&I plan to describe national mechanisms for data management and the archiving of new ASCLME data in national data centres. Networks and systems implemented by other projects, particularly ODINAFRICA (IOC/UNESCO), SWIOFP and WIO-LaB (through the Nairobi Convention) are incorporated into the plan to be used as necessary (eg UNEP/GEF WIO-LaB Project 2006).

National data and information plans are based on the regional D&I framework, taking into account country-specific information.

Table of Contents for National data and information management plans

1. National D&I Coordinators
Institutional and coordinator contact details

2. Specialists for the MEDA
Lists of suggested (initial list) specialists for MEDA themes within each country

3. Institutional sources of information for national MEDAs
Name and thematic area of responsibility of national institutions

4. List of national state of the environment reports (or similar) that have been produced over the past 50 years.

5. List of marine of coastal projects currently underway that may be related in some way to the ASCLME project, through direct collaboration, data exchange, or as interested parties in the TDA/SAP process. These are specifically national or local projects; regional projects are reviewed elsewhere.

6. Archiving and long-term data management of new ASCLME data in national data centres
National plan for the archiving of sectors of new data coming from the ASCLME project within each country. These allocations should be based on national mandates and international agreements. For example IOC member states must use data centres linked to IODE's NODC and WDC network as long term repositories for oceanographic data (IOC Oceanographic Data Exchange Policy - RESOLUTION IOC-XXII-6)

Examples of data categories are:

6.1 Specimens from ASCLME expeditions
➢ Fish specimens will be curated at xxxx
➢ Invertebrate specimens to be curated at xxxx

6.2 Oceanographic data from ASCLME expeditions will be archived at xxxx

6.3 Fisheries data from ASCLME expeditions will be submitted to xxxx

7. National metadatabase
7.1 General description (software, location, funder)
7.2 Field names and access controls
7.3 Flagging system for ASCLME-specific metadata
7.4 Requirements for modification for ASCLME purposes

8. Meeting and reporting schedule
For implementation of national activities in support of the MEDAs.

9. Financial arrangements

(with specific reference to co-funding and other funders)

10. Time lines and reporting

Time lines and deliverables for reporting are outlined in the Terms of Reference for Data and Information Coordinators. An annual report is required from every ASCLME D&I coordinator on the status of implementation of the national data and information plan.

11. References

ASCLME 2008a. Proceedings of the ASCLME Regional meeting of Technical Coordination Groups (29 September – 1 October 2008), La Plantation, Mauritius, 25 pp. Unpublished report.

ASCLME 2008b. Proceedings of the ASCLME Regional Project Coordination Forum (2-4 October 2008), La Plantation, Mauritius, 23 pp. Unpublished report.

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JCOMM. 2008. JCOMM Data Management Plan. WMO/TD-No.1426. JCOMM Technical Report No. 40. Final Draft before finalization. 28 pp.

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SWIOFP 2003. Development of a data management plan framework based on the information and data management workshop held at reef hotel, Mombasa, Kenya. 8-9 October 2003. Unpublished report.

Makanga, P. and Smit, J. 2008. A review of the status of spatial data infrastructure implementation in Africa. Unpublished report.

UNEP/GEF WIO-LaB Project. 2006. Regional Workshop on the Development of a Clearinghouse Mechanism and Information Sharing System on Eastern African Coastal and Marine Environment Resources. Report of the meeting 9-11 May 2006, Nairobi, Kenya.

12. Acknowledgements

Appendix I. Annex to the Dr Fridjof Nansen 2008 sailing orders: Data agreement

The intention of this Data Management Agreement is to clarify and protect the interests of all scientists and countries participating in the ASCLME Project. This Agreement is appended to the ToRs for all scientists that are working on the Dr Fridjof Nansen as part of the 2008 ASCLME Cruise.

General Introduction

Participating countries in the ASCLME Project, and their designated representatives, have the mandate to develop a comprehensive document on principles and guidelines for ASCLME data and information management so that it facilitates the effective collection, use and dissemination of information in support of TDA/SAP development in the short term and the ecosystem approach in the long term. National Data and Information coordinators in particular, have a responsibility for developing mechanisms for reliable long-term storage and use of information collected under the ASCLME Project.

This Agreement is intended to govern the collection, storage and access to data on the ASCLME 2008 Cruises as an interim measure prior to agreement of a more detailed MoU on data access and management which is currently under development as part of the overall ASCLME Programme (particularly as a joint MoU between the ASCLME and SWIOFP projects and their respective countries). In this context, data collected will be shared between the ASCLME and the SWIOFP Project with due note being taken of SWIOFP's own MoU with each of its countries regarding Transboundary Marine Scientific Research in Support of the South West Indian Ocean Fisheries Project (SWIOFP). Nothing in this current agreement should jeopardise the ability of SWIOFP scientists on joint research cruises from abiding by their terms of agreement as specified in the SWIOFP MoU.

Bearing in mind that access to new data, associated metadata, information collection **activities and resulting products funded by the ASCLME Project** shall be free and unrestricted;

Data collected on ASCLME cruises, associated metadata, publications and other data products are the joint responsibility of the principal investigator (in the case of a scientific investigation), their institution, participating countries, the ASCLME Project and the EAF-Nansen Project. The primary custodians of data sets shall be the Institute of Marine Research, Bergen (on behalf of the FAO EAF-Nansen project,) the UNDP/GEF ASCLME Project and the member-countries of the ASCLME Project. The primary contact points and archive locations for the survey data shall be at nationally appointed data centres as designated by the ASCLME Data and Information Working Group.

These guidelines for intellectual property assume that adequate opportunity has been given to scientists via their national ASCLME focal points to plan collaboration on research projects (data collection, processing and paper-writing), *particularly* from countries in whose territorial waters the research cruises have taken place.

Interim data management guidelines with specific reference to the 2008 ASCLME/EAF-Nansen cruises

The IMR Cruise Leader and the ASCLME Chief Scientist will be jointly responsible for ensuring the accurate documentation of activities, preservation of samples and backup of electronic data.

Detailed documentation will be made of all measurements and samples collected during each cruise. Documentation will include the cruise track, timing, geo-referenced and time-referenced records of every sampling site and station. All specimens and samples collected will be described and documented electronically during each cruise. Wherever possible, duplicate or triplicate voucher specimens of macrofauna will be preserved.

Timing of cruise data reports and products

A provisional cruise report and completed data report (containing documentation of all measurements and samples collected during each cruise, including the cruise track, timing, geo-referenced and time-referenced records of every sampling site and station) will be provided to the ASCLME PCU *within 45 days of the end of the cruise (6 February 2009)*. It is accepted that biological samples may not be identified and sorted before the end of the cruises, but those data that are captured must be included in the report. Together with this, an electronic version (in Excel) of all activity/site/station records, and video & photographic inventories will be given to the PCU. These will be checked and sent on to each of the ASCLME participating countries.

Specimens and samples

Specimens and samples will stay on board the Dr Fridjof Nansen until the close of the 2008 cruises, at which time they will be offloaded in Cape Town and checked against the inventories of the Chief Scientists from each leg.

Once samples and inventories have been checked, they will be sent to laboratories, or back to ASCLME countries for processing, further study, or curation, as appropriate.

Morphological specimens which are preserved as voucher specimens will be fixed in formalin during the cruises. These will be transferred to ethanol after fixing, also during the cruises. At least one voucher will be lodged at each of:
1) the South African Institute of Aquatic Biodiversity in South Africa (SAIAB). This is an African collection where specimens will be preserved for the use and study by scientists throughout the region.
2) The National collection or National focal point institution for the ASCLME Project of the country (and its EEZ) from which the collection was made. This will ensure that countries also keep voucher collections. Where feasible, appropriate support will be provided by the ASCLME Project to the countries that do not currently have good capacity for specimen curation.

Voucher specimens will be lodged at institutions *within three months of the conclusion of the 2008 cruises (23 March 2009).*

Processed data from the cruises

Data that have been processed from the 2008 ASCLME/FAO cruises will be made available to the PCU *within three months of the conclusion of the cruise (23 March 2009).* Examples of these data will include CTD, ADCP, multibeam data sets, as well as inventories of identified specimens. It is recognized that some data sets may not be processed by this time. In that case, any raw electronic data must be provided to the PCU together with a report on the steps (and timing) that will be taken to process the data.

Data sets that are required for publications will be safely retained offline (ie flagged and not made available to other scientists) until either
a) Chief scientists agree to the dissemination of data sets OR
b) Publications are submitted OR
c) Eighteen months has passed since the conclusion of the cruise, whichever is the soonest.

As soon as data sets are checked, they will be lodged at nationally appointed data centres as designated by ASCLME national Data and Information Coordinators.

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Raw OR processed data collected by scientists under the ASCLME Project shall be immediately available to the Regional Information Working Group (made up of national Data and Information Coordinators) for the sole purpose of (*internally*, not for distribution) informing the TDA/SAP, should it be necessary.

Publications

Plans for publications (including tasks and time lines) will be finalised between principal investigators and participating researchers at an ASCLME meeting back-to-back with the 6th WIOMSA Scientific Symposium (August 2009). Publications from the 2008 cruise are expected to be submitted for publication within one calendar year of the close of the cruise schedule, by 23 December 2009. Any extensions to this date will be discussed and considered at the August meeting.

Acknowledgement

The use of any expedition-derived data in data products or publications must be associated with proper acknowledgement of the ASCLME Project and EAF Nansen Project.

Summary time line for delivery of data and products from the 2008 ASCLME cruises

During each cruise	All sampling activities are carefully documented, geo-and time-referenced.
	Voucher specimens are fixed and samples are properly preserved.
Final day of the 2008 cruise schedule. 23 December 2008.	Specimens and samples are offloaded from the Fridjof Nansen in Cape Town, South Africa, checked and the process starts of sending them on to laboratories, or back to ASCLME countries for processing, further study, or curation, as appropriate.
45 Days after the completion of the cruise (6 February 2009).	Provisional cruise reports, and final data report (containing a full record of sampling activities) is delivered to the PCU. Electronic data inventories are provided to the PCU, checked, and sent on to ASCLME countries.
Three months from the conclusion of the 2008 cruise schedule. 23 March 2009	Voucher specimens are lodged at National Collections.
	Deadline for all processed data (or raw data sets with a report if not yet processed) to be provided to the PCU, checked and sent on to ASCLME countries.
August 2009	6th WIOMSA Scientific Symposium – plans for publications are finalised.
12 months from the conclusion of the 2008 cruise schedule. 23 December 2009	All manuscripts written from the research associated with 2008 ASCLME cruises should be submitted for publication.
Eighteen months from the conclusion of the 2008 cruise schedule. 23 June 2010.	The last of the processed data sets are made available to the ASCLME PCU, checked and sent on to ASCLME countries.

Appendix II. Data exchange and/or collaboration with other regional projects in the Western Indian Ocean (with particular respect to MEDAs and the TDA)

Project name:	Thematic area:	Nature of collaboration (numbering refers to ASCLME Activities and Outputs in the Project Document):
WIO-LaB	**Land-based threats to the LMEs**	1.1 Data and information review 2.3 National and regional data handling, storage and synthesis focal centres are established The WIO-LaB TDA and draft SAP have direct input into the ASCLME TDA and SAP. As a sister project, the ASCLME will facilitate some activities recommended in the WIO-LaB SAP.
SWIOFP	**Fisheries and cruises**	1.1 Data and information review 2.3 National and regional data handling, storage and synthesis focal centres are established 1.3 Active offshore and coastal oceanographic data collection to fill gaps in ecosystem assessment and status as necessary for development of TDAs and SAPs. Planning of fisheries components of ASCLME and SWIOFP, with SWIOFP addressing offshore commercial stocks, and the ASCLME handling artisanal and subsistence fisheries as well as critical habitats. SWIOFP processed information to go into MEDA and TDA. Sharing of ship time and harmonisation of information in support of the Programme-level TDA.
FAO/EAF Nansen Programme	**Cruises**	Co-funding of the Dr Fridtjof Nansen, joint investigations
Ocean Data and Information Network for Africa (ODINAFRICA)	**Data and information management**	1.1 Data and information review 2.3 National and regional data handling, storage and synthesis focal centres are established Collaboration on the African Marine Atlas, ASCLME section. Joint participation in ICAN (below), potentially joint reviews of data management capacity in ASCLME countries, joint support of national data centres.
ReCoMaP	**Coastal livelihoods**	1.1 Data and information review 1.2B Key knowledge gaps in near-shore (artisanal/subsistence) fisheries updated Potential collaboration in Coastal livelihood project, artisanal fisheries data
BIO-WIO	**Habitat mapping, spatial analysis**	Potential for data exchange, and particularly for the ASCLME to make a contribution of habitat and biodiversity data. The products of BIOWIO (recommendations for protected areas) could be used by the ASCLME SAP.
WIOMSA	**Information dissemination and exchange**	Potentially, the publication of ASCLME-related literature through WIOMSA, the use of WIOMSA networks for the peer-review of ASCLME products, as well as for the recruitment of specialists and trainees.

FARI	**Document review**	Potentially, for the peer-review of ASCLME outputs (MEDAs, TDA and SAP)
ACEP	**Information exchange and joint cruises**	1.1 Data and information review 1.2B Biological habitat mapped or otherwise identified using existing information 2.4 Use of GIS and predictive models expanded to increase systems knowledge Joint cruise coordination. South Africa provides co-funding to the ASCLME Project via ACEP. ACEP biodiversity projects form part of ASCLME Activity 1.2B Habitats Assessment. Ship-time on board the FRS Algoa may be shared.
Nairobi Convention Clearinghouse Mechanism		1.1 Data and information review 2.3 National and regional data handling, storage and synthesis focal centres are established Data and information management, the development of policy briefs and the dissemination of ecosystem-level information
IRD		1.1 Data and information review 1.2B Biological habitat mapped or otherwise identified using existing information 2.4 Use of GIS and predictive models expanded to increase systems knowledge 3.4 Institutional, programme and human capacity building requirements are identified and addressed through training initiatives 2.2 (*provides information for*) A region wide socio-economic valuation of near-shore marine goods and services is undertaken to gain greater understanding of the social and economic importance of these areas A joint project will be implemented in 2009: A regionally consistent assessment of the location, extent and diversity of coral reefs, seagrass beds, estuaries and mangroves for the Western Indian Ocean countries.
ESPA (proposal)		1.1 Data and information review 2.4 Use of GIS and predictive models expanded to increase systems knowledge 3.4 Institutional, programme and human capacity building requirements are identified and addressed through training initiatives A proposal has been submitted *(National Oceanography Centre, Southampton (NOCS); Centre of Ecology and Hydrology (CEH) UK; Intergovernmental Oceanographic Commission of UNESCO (IOC/UNESCO); Department of Fisheries And Aquatic Sciences (DFAS), MOI University, Kenya; Department of Water Resources Engineering, University of Dar-es-Salaam, Tanzania (DWRE).* To develop networks and management tools to assist in the implementation of the ecosystem approach, and mitigate the negative effects of environmental change on coastal ecosystems in the WIO region.

AMESD		2.3 National and regional data handling, storage and synthesis focal centres are established 2.4 Use of GIS and predictive models expanded to increase systems knowledge 3.4 Institutional, programme and human capacity building requirements are identified and addressed through training initiatives Potential for the joint support of projects implementing remote sensing data to the monitoring of the environment.
International Coastal Atlas Network (ICAN)		The adoption by the ASCLME project of the standards and best practices published by ICAN. Contributions to the ICAN Coastal Web Atlases Handbook, specifically a chapter on the African Marine Atlas.
RAMA		ASCLME / EAF Nansen Programme has committed to providing the platform for the deployment and maintainance of the RAMA moored array (Atlas moorings)
Agulhas Current Tranport		Contact has been made with Lisa Beale, she will get back to the ASCLME Project once her work plan is more certain.
Argo Programme		ASCLME has facilitated the deployment of Argo floats in the WIO region.
Coral Triangle Project		Shared ships' time, exchange of coral biodiversity data for the ASCLME.
NOAA		
US NAVY		
COI- Network of MPAs		1.1 Data and information review 2.4 Use of GIS and predictive models expanded to increase systems knowledge 3.2 SAPs are negotiated and approved by technical stakeholders Data exchange and incorporation of COI outputs into the ASCLME SAP. Joint policy briefs.