United Nations
Office for the Coordination of Humanitarian Affairs

Policy Instruction

29 October 2007

Geographic Information Systems and Geospatial Data Management

Approved by: *John Holmes, USG*
Approval date: *29 October 2007*
Contact: *FIS Manager*
Review date: *30 September 2008*

POLICY INSTRUCTION ON
Geographic Information Systems and Geospatial Data Management

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ANNEXES

A. PURPOSE

1. The purpose of this instruction is to establish the overarching policy for the effective utilization and coordination of Geographic Information Systems (GIS) and geospatial data within OCHA. The main objective of this policy is to improve the accessibility of a wide variety of geospatial data, together with the associated information, at different scale and from multidisciplinary sources, organized and documented in a standard and consistent way within the organization.

B. SCOPE

2. Compliance with this policy is mandatory. The primary audiences for this policy are information management practitioners within OCHA with functional responsibilities for managing GIS and/or using geospatial data. The secondary audiences for this policy are the Chief of the Field Coordination Support Section, Chief Information Technology Section, Chief Advocacy and Information Management Branch, Managers of ReliefWeb and the Field Information Services Unit, as well as OCHA Heads of Office and HIC Managers.

C. RATIONALE

3. OCHA has the mandated responsibility within the UN system for developing and improving baseline data on regions and countries affected by humanitarian crisis. A core component of this is the use, exchange and management of information relating to the location of, and relationships between, geographical features using geospatial information technology tools such as Geographic Information Systems, satellite imagery and image processing software as well as Global Navigation Satellite Systems.

4. During the initial response to a humanitarian emergency, accessing accurate and timely geospatial information on the affected region or country is critical; without the availability of common baseline geospatial data, resources which otherwise could be allocated for processing information on the affected population and needs, is spent identifying, collecting and processing geospatial data essential for the conduct of relief operations. In chronic emergencies, conflict or poor governance often means that data is unreliable, or if it is

available, it is invariably out of date as populations move, infrastructure is destroyed and new settlements are established. Without establishing a policy to systematically use, reuse, exchange and manage this data, the effective delivery of assistance can be significantly undermined.

5. Therefore, the rationale for the policy is threefold. Firstly, given OCHA is mandated to coordinate the humanitarian response in natural disasters and complex emergencies, through the Emergency Relief Coordinator and the Under-Secretary-General for Humanitarian Affairs, it is imperative that OCHA's geospatial data is effectively managed to support effective coordination.

6. Secondly, in the nine years since the Secretary-General's programme of reform in 1998, when DHA was reorganized into OCHA, the organization has adopted a decentralized approach to managing Geographic information Systems (GIS) and geospatial data with each unit or field office adopting systems appropriate to their specific needs. There are a number of OCHA entities, most notably ReliefWeb, Field Information Services Unit, Field Coordination and Support Section, OCHA Field Offices and HICs who take advantage of geospatial technologies without an over-arching policy to support standardization of data management practices across the Department and to encourage re-use of data. This approach is inconsistent with Secretary-General's bulletin *ST/SGB/2004/15 Use of information and communication technology resources and data,* which requires all staff to ensure the accuracy of any data for which they are responsible, and to preserve and protect data which may be needed by the UN for any purpose. Whilst OCHA has made considerable advances in the management of GIS and geospatial data, the implementation of this policy will bring OCHA geospatial data management practices closer to what was envisioned by the Secretary-General's 2004 bulletin, as well as industry best practice in the use of Geographic Information Systems. In addition, the *Symposium on Best Practices in Humanitarian Information Exchange*, February 2002, identified that in order to be useful, spatial data must be relevant, accurate and timely. Ensuring this quality requires the development of, and adherence to, standards for information collection, exchange, security, attribution and use.

7. Thirdly, in order to fulfill two of OCHA's core functions in *A/RES/46/182, Strengthening of the coordination of humanitarian emergency assistance of the United Nations*, the maintenance of '*an overview of all emergencies through…the systematic pooling and analysis of early-warning information'*, and the provision of '*consolidated information, including early warning on emergencies, to all interested Governments and concerned authorities, particularly affected and disaster-prone countries*,' it is necessary for OCHA to promulgate standards for geospatial information use, exchange and management.

8. In addition to the above, there is a necessity for OCHA to put in place procedures and protocols for the effective utilization and coordination of Geographic Information Systems in order to better contribute to the United Nations Spatial Data Infrastructure (UNSDI) effort. In 2006, the United Nations Geographic Information Working Group (UNGIWG), a 32-member UN-wide coordination body, initiated the UNSDI effort.[1] SDI is defined as a framework of technology, policies, standards, skills, data, hardware and software necessary to acquire, process, store and exchange geospatial data. It is envisioned that UNSDI will be realised over time, as thematic spatial data infrastructures (SDI) are developed under the umbrella UNSDI reference architecture adopted by UNGIWG.

D. POLICY

9. The Under-Secretary General for Humanitarian Affairs, pursuant to OCHA's policy, entitled "*OCHA Guidance Materials*", and for the purpose of delineating the roles and

[1] United Nations Spatial Data Infrastructure Vision, Implementation Strategy and Reference Architecture – Draft Discussion Paper, October 2006 (www.**ungiwg**.org/docs/unsdi/UNSDI%20**Draft**%20**Discussion**%20**Paper**%2025-10-'06.pdf -)

responsibilities of staff in the management and use of GIS resources and geospatial data within OCHA, promulgates the following:

10. **Accountabilities for the management of GIS resources and geospatial data.**

    a) The Chief of the OCHA Advocacy and Information Management Branch (AIMB) is accountable for managing all of OCHA's GIS resources and geospatial data.

    b) Within AIMB, the Chief of the Information and Analysis Section is responsible for the implementation and supervision of this policy on behalf of the Chief, AIMB.

    c) Within the Emergency Services Branch (ESB), the Chief of the Field Coordination and Support Section is responsible for the implementation and supervision of this policy on behalf of the Chief, AIMB.

    d) At the field level, the Head of Office and HIC Manager is accountable for the implementation of this policy, under the guidance of the Manager of the Field Information Services Unit. Within the Field Office or HIC, the Information Management Officer (or Data Coordinator if deployed) is responsible for the implementation and supervision of this policy on behalf of the Head of Office or HIC Manager.

11. **GIS Standard Data Models, metadata and Interoperable Software Architectures.** In the procurement and implementation of GIS resources and geospatial data within OCHA, attention will be paid to the following interoperability concerns :

    a) To reach the goal of interoperability within a service oriented environment requires formalization and acceptance of shared governance rules, which include standard definitions of the content of the messages and for message protocols when data is exchanged. For core and non-core data, OCHA shall follow the standards identified by the United Nations Geographic Information Working Group (UNGIWG – www.ungiwg.org) Core Geo-database and the Interoperability Task Groups with extensions provided by OCHA Field Information Services Unit where needed. In the absence of standard definitions of the content, OCHA will require that geospatial data supplier provide comprehensive metadata and data dictionary in compliance with existing and emerging ISO standards for data and metadata (ISO 19100 series -19110, 19115 etc).

    b) OCHA shall only procure software and services from vendors which comply with standards established by the UN Secretariat (ITSD). Although the UN Secretariat is not a member of the Open Geospatial Consortium (OGC - http://www.opengeospatial.org/standards), in recognition of the OGC's unique role as a global forum for the advancement of international standards for geospatial interoperability, OCHA shall endeavour to ensure that all software and services procured by the Department is OGC compliant. In the event of an inconsistency between OGC and UN Secretariat standards, the UN Secretariat standards shall take precedence.

12. **Use of Geographic Information Systems software.** In recognition of the recommendations of the report titled *Policies of the United Nations System Organizations Towards the Use of Open Source Software (OSS) in the Secretariat* (JIU/REP/2005/3 - Joint Inspection Unit, Geneva 2005), OCHA shall seek to utilize opportunities to mitigate software costs through increased usage of appropriate open source geo-spatial software. This is especially significant in light of the fact that geospatial resources and data assets compiled in the field prior to or during an emergency by OCHA, are either transferred to host government entities or UNDP, which do not typically have the necessary financial resources to maintain these systems, partially due to high software licensing and maintenance costs.

13. In the longer-term OCHA plans to shift from the use of proprietary GIS software for geospatial data building to an OSS solution. This will take place if the OSS solution is feasible to implement and is fully supported globally and adopted as a standard within the UN Secretariat. In moving towards an OSS solution, OCHA will also take into account the cost benefit implications of such an approach, given the vast majority of GIS practitioners are trained only in the ESRI suite of GIS software.

14. For the storage, discovery and distribution of geospatial data, OCHA shall utilize OSS solutions that comply with OpenGIS Specifications. Notwithstanding OCHA's commitment to OSS, for the foreseeable future OCHA will utilize proprietary GIS software for geospatial data building both at the HQ units and the field offices. (See Appendix B for a list of standard GIS software in use at OCHA).

15. OCHA is to ensure that ReliefWeb, FIS, Regional Offices, Field Offices and HICs are allocated sufficient resources in their cost plans for the procurement and ongoing license fees for relevant proprietary GIS and info-graphic software. The use of non-licensed software is strictly prohibited.

16. **Storage and management of geospatial data**. In OCHA New York geospatial data shall be stored on an approved server (ArcSDE)[2] hosted by the Information Technology Section (ITS). In OCHA Geneva, and at the field level, appropriate physical storage and backup solutions should be adopted in order to guarantee data security. All geospatial data shall be catalogued based on OCHA-defined profiles built on the ISO 19115 standard implemented by the OCHA standard geospatial metadata catalogue. Both at headquarters and the field, geospatial data is to be backed up in accordance with the ITS approved Data Recovery Plan.

17. **Metadata and GIS Management.** Given the fuel of GIS is spatial data, it is important to know when the data is stored it will meet user needs. To facilitate this, data users need metadata to retrieve appropriate data sets. Metadata not only helps find data, but once data has been found, it also tells how to interpret and use data. Therefore it is essential within OCHA that geospatial metadata records are accurately and systematically maintained in accordance with international standards. For the purposes of this policy, OCHA has endorsed ISO 19115:2003 *Geographic Information – Metadata* as OCHA's metadata standard. The ISO defines:

    a) mandatory and conditional metadata sections, metadata entities, and metadata elements;

    b) the minimum set of metadata required to serve the full range of metadata applications (data discovery, determining data fitness for use, data access, data transfer, and use of digital data);

    c) optional metadata elements - to allow for a more extensive standard description of geographic data, if required; and

    d) a method for extending metadata to fit specialized needs.

18. **Minimum Operational Datasets.** To harmonize geospatial data preparedness between field and regional offices, as well as between the field, regional and OCHA HQs, a minimum set of operational geospatial datasets are to be compiled and maintained by field and regional offices. Regional Offices also have the responsibility to compile data sets

[2] ArcSDE is an advanced data server, providing a gateway for storing, managing, and accessing spatial data in any of several leading RDBMSs from any ArcGIS application. It is a key component in managing a shared, multiuser geodatabase in a RDBMS (see http://www.esri.com/software/arcgis/arcsde/index.html)

within their region for countries that do not have an OCHA or GIS capacity. They are also to hold an archived copy, should the link to GeoNetwork not be accessible from the region in times of emergency.

19. In recognition of the cost of data: OCHA is to ensure that ReliefWeb, FCSS, FIS, Regional Offices, Field Offices and HICs are allocated sufficient resources in their cost plans for the procurement of data and/or services to keep the information current. The list of core datasets identified as minimum required is provided in Annex A. The major themes for minimum core datasets are:

    a) Settlements/demographics,

    b) Government administrative infrastructure (boundaries & administrative centres); and

    c) Accessibility (road network, ports, railroads, etc.).

20. **Adherence to Standards adopted by Coordination Bodies and Authorized Entities.** To facilitate data sharing and ease of data integration, OCHA will adhere to field data collection, data encoding and data exchange standards as well as standard data models adopted by the United Nations Geographic Information Working Group (UNGIWG) and the Geographic Information Support Team (GIST). GIS Specialists will pay special attention to utilize International borders, administrative boundaries and place name lists sanctioned by authorized UN entities.

21. **Official use and exchange of GIS Resources and Geospatial Data.** OCHA staff shall ensure that their use of GIS resources and geospatial data is consistent with their obligations as staff members or such other obligations as may apply to them, as the case may be. Authorized users shall use their best efforts:

    a) To ensure the accuracy of any geospatial data for which they are responsible;

    b) To accurately store geospatial data only on approved storage approved media; and

    c) To observe all policies, guidelines, or standard operating procedures applicable to the collection of, access to, use of, possession of, or distribution of all geospatial data.

22. **Prohibited activities.** Users of GIS resources and geospatial data shall not engage in any of the following actions:

    a) Knowingly and without justification or authorization, or through gross negligence, damaging, deleting, deteriorating, altering, extending, concealing, misspending or suppressing GIS resources or geospatial data; and

    b) Knowingly, or through gross negligence, using GIS resources or geospatial data in violation of United Nations contracts or other licensing agreements for use of such GIS resources or geospatial data or in violation of international copyright law.

23. **Protection of technical integrity and performance of GIS resources.** OCHA shall retain all rights in GIS resources and geospatial data and in any work product of an authorized user using GIS resources or geospatial data.

E. TERMS AND DEFINITIONS

24. The following definitions shall apply for the purposes of the present policy:

    a) *Authorized user*: any staff member who is authorized to use GIS resources.

b) *Geographic Information Systems:* a GIS is a system of hardware, software and procedures to facilitate the management, manipulation, analysis, modelling, representation and display of geo-referenced data to solve complex problems regarding planning and management of resources (NCGIA, 1990).

c) *GIS resource*: any tangible or intangible asset capable of generating, storing, processing, or representing geospatial data, where the asset is owned, licensed, operated, managed, or made available by, or otherwise used by, the United Nations.

d) *Geospatial data*: any data or information pertaining to a geographical location, regardless of its form or medium, which is or has been electronically generated by, transmitted via, received by, processed by, or represented in a GIS resource.

e) *GeoNetwork*: is a standardized and decentralized spatial information management environment, designed to enable access to geo-referenced databases, cartographic products and related metadata from a variety of sources, enhancing the spatial information exchange and sharing between organizations and their audience, using the capacities of the internet. This approach of geographic information management aims at facilitating a wide community of spatial information users to have easy and timely access to available spatial data and to existing thematic maps that might support informed decision making.[3]

f) *Metadata:* Metadata is a summary document providing content, quality, type, creation, and spatial information about a data set.

F. REFERENCES

25. ST/SGB/2004/15 *Use of information and communication technology resources and data*
26. JIU/REP/2005/3 *Policies of the United Nations System Organizations Towards the Use of Open Source Software (OSS) in the Secretariat.*
27. ISO 19115:2003 *Geographic Information - Metadata*

G. MONITORING AND COMPLIANCE

28. All use of GIS resources and geospatial data shall be subject to monitoring by the Chief, Advocacy Information Management Branch (AIMB), or their designee. Officials authorized to monitor the use of GIS resources shall have access to all ICT resources hosting the GIS resource and geospatial data, including data files, LAN records, Intranet/Internet access records, computer hardware and software, any other relevant data accessible to or generated by users.

29. Technical monitoring of the use of GIS resources is routinely performed by those authorized by the Chief of AIMB, for troubleshooting, diagnostics, statistical analysis and performance tuning. This may include the compiling of aggregated data for a general monitoring of usage.

H. DATES

30. The policy shall be effective on 29 October 2007 and be reviewed no later than 30 September 2008.

[3] http://geonetwork.unocha.org/mapsondemand/srv/en/about

I. CONTACT

31. The contact for this policy is the Manager, Field Information Services Unit.

J. HISTORY

32. This policy was approved on 29 October 2007 and has not been amended.

SIGNED:

Under Secretary General, OCHA
29 October 2007

Annex A to
Geographic Information Systems and Geospatial Data Management
Dated 29 October 2007

Minimum Operational Datasets to be maintained by OCHA Offices and HICs

Category	Data layer	Recommended scale of source material
Political/ Administrative boundaries	Country boundaries Admin level 1 Admin level 2 Admin level 3 Admin level 4	1:250K
Populated places (with attributes including: latitude/longitude, alternative names, population figures, classification)	Settlements	1:100K – 1:250K
Transportation network	Roads Railways	1:250K
Transportation infrastructure	Airports/Helipads Seaports	1:250K
Hydrology	Rivers Lakes	1:250K
City maps	Scanned city maps	1:10K

Optional Datasets to be maintained by OCHA Offices and HICs

Category	Data layer	Recommended scale of source material
Marine	Coast lines	1:250K
Terrain	Elevation	1:250K
National map series	Scanned toposheets	1:50K - 1:250K
Satellite imagery	Landsat, ASTER, Ikonos, Quickbird imagery	Various

Annex B to
Geographic Information Systems and Geospatial Data Management
Dated 29 October 2007

List of Standard Geospatial Software in Use by OCHA

1. *GeoNetwork Opensource* geospatial metadata catalogue and online interactive mapping software by FAO.[4]
2. *ArcGIS* Geographic Information System software suite by ESRI.[5]

[4] http://geonetwork.unocha.org/mapsondemand/srv/en/about
[5] http://www.esri.com