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OCEAN DATA  
STANDARDS



## Recommendation to Adopt ISO 3166-1 and 3166-3 Country Codes as the Standard for Identifying Countries in Oceanographic Data Exchange

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## 1. BACKGROUND

The value of standards for the management and exchange of data has always been acknowledged. In the oceanography and marine meteorology domain, there have been many efforts to develop common standards and data frameworks for processing data and information but these have never been widely adopted by the community.

IODE (International Oceanographic Data and Information Exchange) and JCOMM (Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology) recognized that, although there were mechanisms to facilitate coordinated ocean data exchange, these had not resulted in the degree of agreement on a wide range of matters that were needed in order to allow the easy exchange and interoperability of collected data. In 2008, the joint IODE/JCOMM Forum on Oceanographic Data Management and Exchange Standards established the Ocean Data Standards Pilot Project (ODS).

One of the objectives of this Project is to initiate discussions on a limited set of topics for which it is felt that broad agreement is possible and to achieve broad agreement and commitment to adopt key standards related to ocean data management and exchange to facilitate exchange between data centres and contributing programmes. A second objective is to establish an internationally recognized process for submitting proposed standards and their acceptance by the ocean community.

The recommended standards that are produced by this process are intended primarily for the use of the oceanographic and marine meteorological community. After recommendation, their use will be widely encouraged within IOC and WMO.

This recommendation to adopt ISO 3166-1 and 3166-3 Country Codes as the Standard for Identifying Countries in Oceanographic Data Exchange has been evaluated and approved in accordance with the IODE/JCOMM Standards Process.

## 2. USE OF COUNTRY CODES FOR DATA EXCHANGE

The use of a country code in the exchange of data has long been recognized as an important element for the management and exchange of oceanographic data. The seventh session of the Intergovernmental Oceanographic Commission Working Group on International Oceanographic Data Exchange (1973) recommended the adoption of country codes for the purpose international data exchange.

The IOC Country Codes have been maintained, since 1983, by the International Council for the Exploration of the Sea (ICES) as part of its responsibility as RNODC Formats. Although the system of RNODCs was abolished in 2005, ICES continued to maintain the codes.

### 3. INTERNATIONAL STANDARD ISO 3166

ISO 3166 is the International Standard for country codes. Its purpose is to establish codes for the representation of names of countries (current and formerly used names), territories and areas of geographical interest, and their subdivisions. ISO 3166 do not express any opinion whatsoever concerning the legal status of any country, dependency, or concerning its frontiers or boundaries. It is based on the list in the “Standard Country or Area Codes for Statistical Use” established by the United Nations Statistics Division.

ISO 3166 lists over 220 countries and has become one of the world’s most popular and widely used standard for the representation of names of countries ISO 3166 is used in many of today's computerized systems to store and process information related to countries and country names. The ISO 3166 standard is maintained by the ISO 3166 Maintenance Agency (ISO 3166/MA).

The International Standard was published in 1974, 1981, 1988 and 1993 as ISO 3166. In 1997, it was split into three parts:

- **ISO 3166-1:2006 *Codes for the representation of names of countries and their subdivisions - Part 1: Country codes.*** This defines codes for the names of countries, dependent territories, and special areas of geographical interest. It was first published in 1974, it is has since then become one of the world's most popular and most widely used standard solution for coding country names. It defines three sets of country codes: (i) ISO 3166-1 alpha-2 contains a two-letter code which is recommended as the general purpose code, (ii) ISO 3166-1 alpha-3 contains a three-letter code which has better mnemonic properties and (iii) ISO 3166-1 numeric which is a numeric-3 code which can be useful if script independence of the codes is important.
- **ISO 3166-2:2007 *Codes for the representation of names of countries and their subdivisions - Part 2: Country subdivision code.*** This gives codes for the names of the principal subdivisions (e.g. provinces or states) of all countries coded in ISO 3166-1. This code is based on the two-letter code element from ISO 3166-1 followed by a separator and a further string of up to three alphanumeric characters.
- **ISO 3166-3:1999 *Codes for the representation of names of countries and their subdivisions - Part 3: Code for formerly used names of countries.*** This contains a four-letter code for those country names which have been deleted from ISO 3166-1 since its first publication in 1974. The code elements for formerly used country names have a length of four alphabetical characters (alpha-4 code elements).

In ISO 3166-1 each country or territory has three codes: (i) a two letter (alpha-2) code, (ii) a three letter (alpha-3) code, and (iii) a three digit (numeric-3) code.

The alpha-2 and the alpha-3 byte codes are used to represent country names. However, it is recognized that countries that do not use the Latin alphabet may find the numeric-3 code (e.g., 056 for Belgium) preferable since it has a stronger script independence than the alpha-2 and alpha-3 byte representation. A simple lookup table showing the ISO country names and codes is available and most importantly, the names and codes are standardized and maintained by the ISO/Maintenance Agency. A list of country names (official short names in English) and the corresponding ISO 3166-1-alpha-2 code elements is described in [Annex I](#).

ISO 3166-3 has a four character code notation for withdrawn codes. The first two characters are the withdrawn code while the last two are the code that replaced it, the code of the country that absorbed the country whose code is withdrawn, or a special code to indicate that there is no single successor code. A list of the current ISO 3166-3 codes is described in [Annex II](#).

This Recommendation will consider only ISO 3166-1 and ISO 3166-3.

#### **4. SCOPE OF THIS RECOMMENDATION**

This recommendation seeks to standardize country code usage for the exchange of oceanographic and marine meteorological data and metadata. The use of the ISO 3166 can facilitate standardization of the exchange of data and information and was recommended by the IODE/JCOMM Forum on Oceanographic Data Management and Exchange Standards. Integrating the ISO 3166 standard into oceanographic data and associated items of metadata will facilitate interoperability and comparability among data systems and domains such as atmosphere for climate science. It is intended for all local, national, and international bodies, programs and projects that exchange oceanographic and marine meteorological data. It applies to all instances where a country needs to be identified within oceanographic and meteorological data or accompanying metadata. There is no statutory requirement for the adoption of ISO 3166 standards.

The main benefit for the oceanographic and marine meteorology communities in using ISO 3166 country codes is to standardize across the IOC and WMO communities by implementing a widely used and internationally accepted standard to describe a geopolitical entity regardless of language. Another advantage is that the ISO Maintenance Agency (ISO 3166/MA) has full responsibility for maintaining and providing new codes when a new country is established, when an existing country is split, or countries are merged. If a name is not published by the United Nations, it will not appear in the list of country names and codes.

This recommendation should be applied to oceanographic and marine meteorological data exchange, although it is acknowledged that it may take time to implement across all National Oceanographic Data Centres and within existing oceanographic data collection and management projects. However, failure to

adopt the ISO country codes as an exchange standard will have significant negative consequences for a data centre. If a data centre, or data submitter diverge from the codes being used by other communities, both nationally and internationally, this divergence will require routine expenditure of resources to enable translations and maintain independent country code tables.

Data collection projects are also encouraged to adopt this standard. If an ongoing project has difficulties to implement the standard, depending on the stage of project development, the National Oceanographic Data Centres with responsibility for long-term management of the data may be able to provide assistance.

Many NODCs have implemented the ISO country codes to describe their data while other NODCs have agreed to adopt and integrate the standard in their databases and products. In addition, several international oceanographic communities have already implemented ISO 3166-1 into their data management practices. These organizations include: (i) SeaDataNet, the Pan-European and European Union Infrastructure for Ocean and Marine Data Management, has included the ISO country codes in their master database and metadata as vocabulary options, (ii) WMO has included the ISO country codes into their metadata format and published the code in the International List of Selected, Supplementary and Auxiliary Ships, (WMO Pub47), (iii) NOAA Observing System Monitoring Center project, (iv) the International Hydrographic Organization (IHO) has agreed to use the alpha-2 codes (Technical Resolution A 1.19), and (v) World Data Centre for Oceanography (WDC) Obninsk, Russia.

## **5. RECOMMENDATION**

IODE and JCOMM recommend the use of the International Standard ISO 3166-1 (*Codes for the representation of names of countries and their subdivisions - Part 1: Country codes*) and ISO 3166-2 (*Codes for the representation of names of countries and their subdivisions - Part 3: Code for formerly used names of countries*) for the representation of names of countries to be used to annotate oceanographic and marine meteorological data and metadata. The ISO country codes will replace the IOC country codes currently used by data centres.

## **6. REFERENCES**

International Oceanographic Data and Information Exchange (IODE), 2009. *Ocean Data Standards Pilot Project (ODS)*. <http://www.oceandatastandards.org/> (accessed 28 September 2009).

International Organization for Standardization. 2009. *What is ISO 3166?* Available from



[http://www.iso.org/iso/country\\_codes/background\\_on\\_iso\\_3166/what\\_is\\_iso\\_3166.htm](http://www.iso.org/iso/country_codes/background_on_iso_3166/what_is_iso_3166.htm) (accessed 28 September 2009).

International Organization for Standardization. 2009. *ISO 3166 code lists*. Available from <http://www.iso.org/iso/en/prods-services/iso3166ma/02iso-3166-code-lists/index.html> (accessed 28 September 2009).

Wikipedia. 2009. *ISO 3166-3*. Available from [http://en.wikipedia.org/wiki/ISO\\_3166](http://en.wikipedia.org/wiki/ISO_3166) (accessed 28 September 2009).



## **ANNEX I**

### **ISO 3166-1. Codes for the representation of names of countries and their subdivisions – Part 1: Country codes**

The official publication ISO 3166-1 is available for purchase from the ISO web site at [www.iso.org](http://www.iso.org).

The list of country names and codes are officially published by ISO and are updated whenever a change of country name and/or code element is made in ISO 3166-1. The list of country names for ISO 3166-1 are made available by ISO at no charge for internal use and non-commercial purposes. Reference: <http://www.iso.org/iso/en/prods-services/iso3166ma/02iso-3166-code-lists/index.html>

## **ANNEX II**

### **ISO 3166-3. Codes for the representation of names of countries and their subdivisions – Part 3: Code for formerly used names of countries**

The official publication ISO 3166-3 is available for purchase from the ISO web site at [www.iso.org](http://www.iso.org).

The ISO 3166 Maintenance Agency (ISO 3166/MA) updates the code lists for all parts of ISO 3166 and is the ISO focal point for country codes (see [http://www.iso.org/iso/country\\_codes.htm](http://www.iso.org/iso/country_codes.htm)).

A complete list of the current ISO 3166-3 codes is also available from Wikipedia at [http://en.wikipedia.org/wiki/ISO\\_3166-3](http://en.wikipedia.org/wiki/ISO_3166-3)

**ANNEX III****List of Acronyms**

ICES	International Council for the Exploration of the Sea
IHO	International Hydrographic Organization
IOC	Intergovernmental Oceanographic Commission (of UNESCO)
IODE	International Oceanographic Data and Information Exchange (IOC)
ISO	International Organization for Standardization
JCOMM	Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology
MA	Maintenance Agency (ISO)
NODC	National Oceanographic Data Centre (IODE)
ODS	Ocean Data Standards Pilot Project (IODE/JCOMM)
OSMC	Observing System Monitoring Center Project
RNODC	IODE Responsible National Oceanographic Data Centre (now abolished)
WDC	World Data Centre (ICSU)
WMO	World Meteorological Organization

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