World Meteorological Organization

Working together in weather, climate and water

WMO

Fourth International PMO Workshop & support to global ocean observations using ship logistics

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WMO Publication No. 47

International List of Selected, Supplementary and Auxiliary Ships

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Need for metadata

- Understanding data
  - Uncertainty estimates (weighting)
  - Bias correction
  - Black listing
  - Validation of products
  - Quality monitoring & feedback
  - Validation of models and satellite products
- Programme management
  - Programme monitoring
  - Platform operator diagnostic & follow up
  - Identification of vessels recruited by other countries
- Applications
  - Operational users (e.g. NWP, ocean modelling, weather forecasters, disaster response)
  - Satellite applications (e.g. GHRSST, virtual constellations & mixed products)
  - Climate applications (incl. Seasonal to inter-annual climate variability)

WMO Integrated Global Observing System (WIGOS)

- Promoted by WMO XV Congress (2007)
- WIGOS call for and integrated, comprehensive and coordinated observing system to satisfy in a cost-effective and sustained manner the evolving observing requirements of WMO Members, and will enhance coordination of WMO observing systems with those partner organizations, such as the Intergovernmental Oceanographic Commission (IOC) of UNESCO

WMO Integrated Global Observing System (WIGOS)

- Integration
  - Standardization
  - Interoperability
- Three levels of integration
  - Instrument and methods of observation
    - » Traceability to standards, availability of instrument metadata
  - Data Exchange
    - » Provision of data through the WMO Information System (WIS)
  - Quality Management

Purpose of the International List of Selected, Supplementary and Auxiliary Ships (Pub47)

- An international mechanism for collecting VOS metadata
- Addressing the requirements for metadata of WMO applications
  - Understanding VOS data (uncertainty estimates, bias correction ...)
  - VOS Monitoring
  - VOS Recruitment
  - VOS diagnostic, feedback & follow up

Pub47
a Mandatory Publication of WMO

- Regulated by the WMO Manual on the Global Observing System (WMO No. 544)
- Details in
  - WMO Guide to the GOS (WMO No. 488)
  - WMO Guide to Meteorological Instruments and Methods of Observation (WMO No. 8)
  - WMO Guide to Marine Meteorological Services (WMO No. 471)
  - WMO & VOS web sites

Manual on the GOS (WMO 544)

Purpose and scope

1. The Manual is designed: (a) To facilitate cooperation in observations between Members; (b) ***To specify obligations of Members*** *in the implementation of the World Weather Watch (WWW) Global Observing System (GOS); (c) To ensure adequate uniformity and standardization in the practices and procedures employed in achieving (a) and (b) above.*

While some regulatory material concerning instruments and methods of observation is contained in a special short section of the Manual, a ***full description*** *of how and with what observations are made is contained in the Guide to Meteorological Instruments and Methods of Observation (****WMO-No. 8****).*

*Further guidance on observations for special applications is given in WMO publications such as … Guide to Marine Meteorological Services (****WMO-No. 471****) …*

Manual on the GOS (WMO 544)

- *2.3.3.3 Members concerned shall provide the Secretariat, not later than 1 March each year, with a list of their selected and supplementary ship stations in operation at the beginning of the year or with amendments to the previous list giving the name, call sign and route or route designator of each ship.*
- *2.3.3.4 Members shall include in the lists of selected and supplementary ship stations information on the method of obtaining sea surface temperature, type of barometer, psychrometer, barograph, radio equipment and other instruments aboard the ship and radiowatch hours.*

Guide to the GOS (WMO 488)

3.2.1.3.3.1 Selected, supplementary and auxiliary ships

...

Relevant standards and recommended practices and procedures are contained in the Guide to Marine Meteorological Services (WMO-No. 471).

Guide to the GOS (WMO 488)

3.2.1.3.3.3 Information relating to ships participating in the WMO Voluntary Observing Ships Scheme

...

The [Pub47] *should be updated regularly, owing to the frequent changes in the international merchant shipping fleet and in the recruitment of auxiliary ships, in particular.* ***As a rule, Members are required to provide on a quarterly basis, namely by 15 January, 15 April, 15 July and 15 October each year, to the WMO Secretariat*** *a complete list of their selected, supplementary and auxiliary ships that were in operation at the end of the quarter in question. This information can also be given in the form of amendments to the list for the preceding year.*

WMO Guide to Meteorological Instruments and Methods of Observation (WMO 8)

4.2.15 Operations of the voluntary observing fleet

An essential initial step in recruiting Voluntary Observing Ships is to obtain the permission of the owners and master of the vessel. When permission has been granted and the ship has been identified, Port Meteorological Officers should do the following:

(a) Install calibrated instruments ensuring best exposure;
(b) Issue stationery or install electronic logbook software;
(c) Train observers on instrument care and operation;
(d) Train observers in all aspects of observing practices;
(e) Demonstrate use of electronic logbook software and compilation of the observation;
(f) Record the required ship Metadata (in the current WMO No. 47 format);
(g) Demonstrate methods of observation transmission;
(h) Explain NMS marine forecast products.

WMO Guide to Marine Meteorological Services (WMO 471)

6.2.10 International list of selected, VOSClim, supplementary and auxiliary ships

The [Pub47] *needs to be regularly updated (see the Manual on the Global Observing System, Volume I, Part III, paragraph2.3.3.3) because of frequent changes in the international merchant fleet and changes in the recruitment of observing ships.* ***Members are asked to provide to the WMO Secretariat at least every quarter, but preferably every month****, updates of their list of Selected, VOSClim, Supplementary and Auxiliary ships, as an email attachment in approved format. This is the most efficient means of keeping the master list updated, as no retyping is required.* ***The Secretariat makes available the master list through its web page (http://www.wmo.int/pages/prog/www/ois/pub47/pub47-home.htm).***

Pub47 collection mechanism

- VOS National Focal Points
  - Point of contact nationally on all VOS matters, including Pub47
  - Nominated by Permanent Representatives of their country with WMO
  - Information provided yearly through SOT annual report
- Quarterly submissions by NFP, preferably monthly
  - To WMO Secretariat (pub47@wmo.int)
  - Using recommended format (currently v 3.4)
- Details on WMO web site

  http://www.wmo.int/pages/prog/www/ois/pub47/pub47-home.htm

Format of Pub47

- Concerned ships
  - Mobile platforms, including ships either temporarily or semi-permanently at anchor
- Fixed platforms reported under ODASMS
- Ships sorted alphabetically by name
- Ship's digital images and drawings shall be retained by the NMS
- Only one country can recruit a ship
  - Search facility available at http://www.meteo.shom.fr/vos-monitoring/multi-recruit.html
- Can be submitted as CSV or XML files
- Format described in Pub47 Metadata Format v3

  http://www.bom.gov.au/jcomm/vos/documents/pub47_documentation_version3.pdf

WMO-No. 47

International list of Voluntary Observing Ships

Metadata fields & descriptions, exchange formats and code tables

Metadata Format Version 03

(Document Revision 3.4)

Prepared for the World Meteorological Organization by the
JCOMM Ship Observations Team

(Effective 1 July 2007)

Format of Pub47

- Semi-colon delimited file (CSV)
  - One line per ship with 119 metadata elements
  - Sequence according to Annex 1 of Pub47 metadata format v3
  - Each metadata element includes a semi-colon (;)
- XML file
  - Structure of XML file given in Annex 3of Pub47 metadata format v3
  - File Start & closing tags
    <?xml version="1.0"?> … </pub47dataset>
  - Dataset begins with <pub47dataset country="" version="03" namespace>
  - Namespace consists of two parts separated by a space
    - xmlns:xsi=”http://www.w3.org/2001/XMLSchema-instance”
    - xsi:noNamespaceSchemaLocation="http://www.bom.gov.au/jcomm/vos/pub47/pub47.xsd"
  - Ship record start & closing tags
    <pub47record nmsID=””> … </pub47record>
  - XML Schemas
    - http://www.bom.gov.au/jcomm/vos/information.html#info08

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Metadata Format Version 03

Semi-colon delimited exchange format – fields and descriptions

Order	Code Name	Explanation	Table	Format	Footnote	Example
1	rcnty;	Recruiting country.	1801		No	
2	ver;	Metadata format version			No	03
3	prepared;	Date of report preparation.		ddmmyyyy	No	
4	name;	Ship's name.			No	
5	reg;	Country of registration.	1801		No	
6	call;	Call sign or WMO Number. Some sea stations are identified by a WMO Number instead of a call sign.			No	
7	IMOn;	IMO Number. Unique identifying number assigned by Lloyd's Register to the hull of the ship.			No	
8	vssl;	Vessel type.	2201		Yes	
9	vsslP;	Vessel digital image.	2203		No	
10	lenvssID;	Length overall of the ship, ignoring bulbous bow.		0.0 m	No	
11	brdvssID;	Moulded breadth. The greatest breadth amidships.		0.0 m	No	
12	frbvssID;	Freeboard. The average height of the upper deck above the maximum Summer load line.		0.0 m	No	
13	drfvssID;	Draught. The average depth of the keel below the maximum Summer load line.		0.0 m	No	
14	chtvssID;	Cargo height. Maximum height above the maximum Summer load line.		0.0 m	No	
15	brdg;	Distance of the bridge from the bow.		0.0 m	No	
16	rte;	Route No.1.	1802		Yes	
17	rte;	Route No.2.	1802		Yes	
18	rte;	Route No.3.	1802		Yes	
19	rte;	Route No.4.	1802		Yes	
20	rte;	Route No.5.	1802		Yes	
21	rte;	Route No.6.	1802		Yes	
22	rte;	Route No.7	1802		Yes	
23	rte;	Route No.8.	1802		Yes	

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Metadata Format Version 03

XML exchange format – fields and descriptions

Order	Code Name	Header Code Name Explanation	Table	Format	Footnote*	Example
1	country	Recruiting country.	1801		No	
2	version	Metadata format version			No	03
3	prepared	Date of report preparation.		yyyymmdd	No	

Order	Code Name	Record Code Name Explanation	Table	Format	Footnote*	Example
1	nmsID	NMS reference number. Unique reference or identifier assigned by the NMS to the ship (if applicable).			No	
2	name	Ship's name.			No	
3	reg	Country of registration.	1801		No	
4	call	Call sign or WMO Number. Some sea stations are identified by a WMO Number instead of a call sign.			No	
5	IMOn	IMO Number. Unique identifying number assigned by Lloyd's Register to the hull of the ship.			No	
6	vssl	Vessel type.	2201		Yes	
7	vsslP	Vessel digital image.	2203		No	
8	lenvssID	Length overall of the ship, ignoring bulbous bow.		0.0 m	No	
9	brdvssID	Moulded breadth. The greatest breadth amidships.		0.0 m	No	
10	frbvssID	Freeboard. The average height of the upper deck above the maximum Summer load line.		0.0 m	No	
11	drfvssID	Draught. The average depth of the keel below the maximum Summer load line.		0.0 m	No	
12	chtvssID	Cargo height. Maximum height above the maximum Summer load line.		0.0 m	No	
13	brdg	Distance of the bridge from the bow.		0.0 m	No	
14	rte	Route No.1.	1802		Yes	
15	rte	Route No.2.	1802		Yes	
16	rte	Route No.3.	1802		Yes	
17	rte	Route No.4.	1802		Yes	
18	rte	Route No.5.	1802		Yes	

XML File Structure (Annex 3)

```
<?xml version="1.0"?>
<pub47dataset country="" version="03" prepared="" namespace>
    <pub47record nmsID="">
        <name/>
        <reg/>
        <call/>
        <IMOn/>
        <vssl footnote=""/>
        <digital_image>
            <vsslP/>
        </digital_image>
...
        <instrumentation>
...
        </instrumentation>
        <chgd/>
    </pub47record>
</pub47dataset>
```

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Metadata Format Version 03

Code Tables

Table	Code	Description
0101	anmL	Location of the anemometer.
0102	anmT	Anemometer type.
0103	anmU	General wind observing practice.
0104	anSC	Side indicator of the (fixed) anemometer from the centre line, if appropriate.
0105	atm	General observing practice.
0201	barg	Barograph type, or method of determining pressure tendency.
0202	barm	Barometer type.
0203	blc	Baseline check of the automatic weather station.
0204	brmL	Location of the barometer.
0601	fieldabbrev	Code name of the field to which the footnote applies (in order of reporting in pub47).
0602	freq	Routine observing frequency.
0801	hgrE	Exposure of the hygrometer.
	thmE	Exposure of the dry bulb thermometer.
0802	hygr	Hygrometer type.
1501	othI	Other meteorological/oceanographic instrument.
1801	rcnty	Recruiting country.
	reg	Country of registration.
1802	rte	Route
1901	sstM	Method of obtaining the sea surface temperature.
2001	thmL	Location of the dry bulb thermometer and hygrometer
2002	thrm	Dry bulb thermometer type.

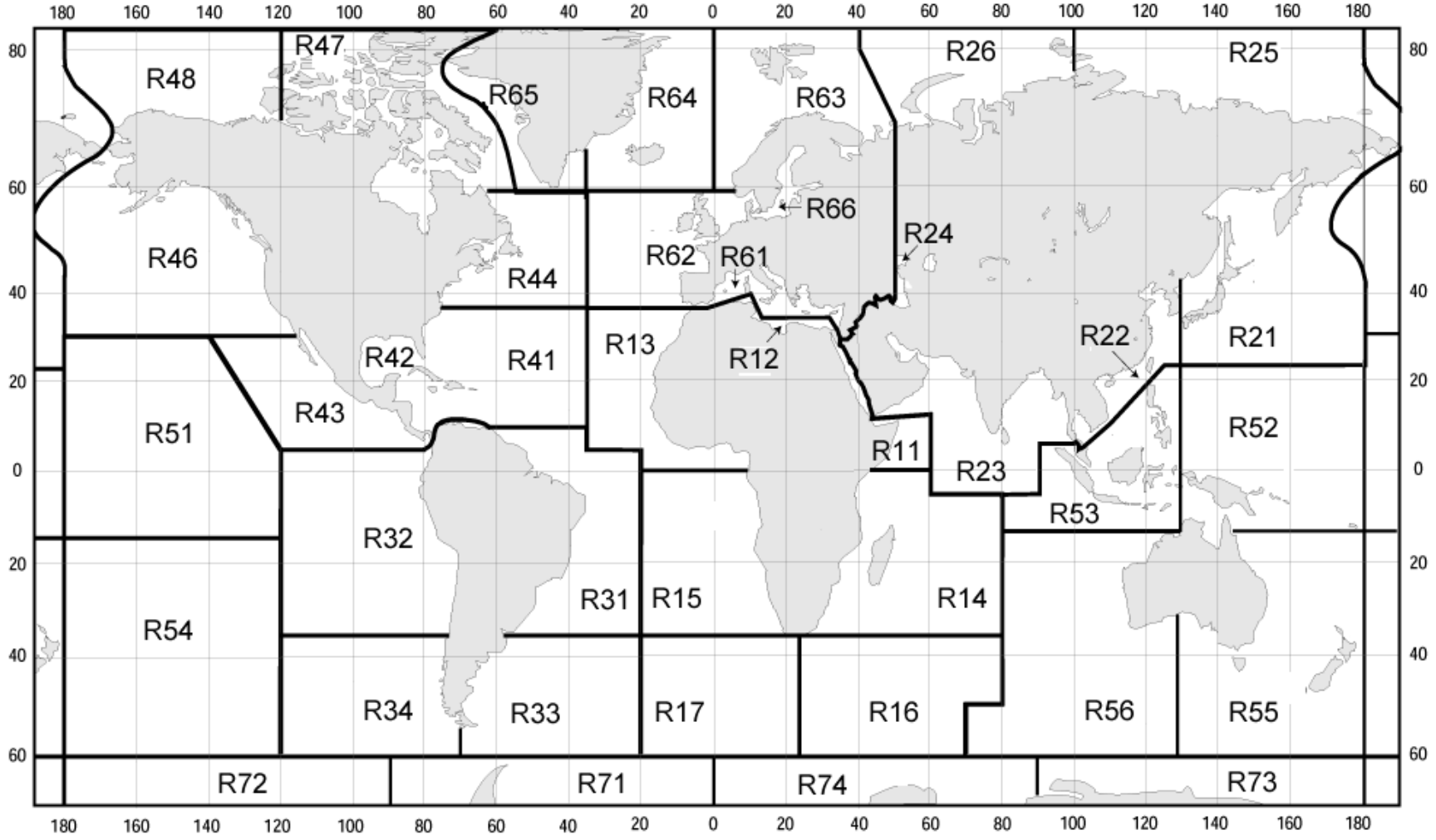
Code Table example *(Anemometer type)*

0102

anmT **Anemometer type.**

Code	Description
AN	Anemograph.
CCV	Cup anemometer and wind vane (combined unit).
SCV	Cup anemometer and wind vane (separate instruments).
HA	Handheld anemometer.
PV	Propeller vane.
SON	Sonic anemometer.
OT	Other (specify in footnote).

Ship routes



R90	More than 10 separate marine areas (see Note 2).
R91	Inland sea or river (see Note 3).
R92	Variable or no fixed route (see Note 2).

Example of CSV input

NZ;03;01102008;ARAHURA;NZ;ZMBS;8201454;RF;NA;148.4;20.5;;;;;R55;;;;;;;;;;08041986;;;;40;5;IRR;;;19;3;3;;;;AN;FUESS;;19;;;;;;10042008;;MER;;;;W;;;;;;;;;P;;W;;C;;;;OS7;;;;;;1;;;;;;;;;30;;;;;;;;;;;;;;rte;;;;;;;;;;COOK STRAIT;;;;;;;;;

NZ;03;01102008;ARATERE;NZ;C6QE2;9174828;RF;NA;150;20.5;;;;;R55;;;;;;;;;;27041999;;;;40;5;IRR;;;18;3;3;;;;AN;FUESS;;18;;;;;;10042008;;MER;;;;S;;;;;;;P;;S;;C;;;;OS7;;;;;;1;;;;;;;;;28;;;;;;;;;;;;;;rte;;;;;;;;;;COOK STRAIT;;;;;;;;;

NZ;03;01102008;BORAL GAS;VU;YJYY2;8915419;GT;NA;84.3;13.6;;;;;R55;R54;;;;;;;;;17012001;;;;10;5;FPD;INMARSAT-C (SAC41);TURBOWIN 2.12;15;3;3;;;;DA;N+Z;;15;;;;;;07102005;;MER;MER;DOBROS;DOBROS;S;S;3;3;;;1;1;P;P;S;S;BU;;;;OS7;;;;;;1;;;;;;;;;;;;;;

Example of XML input (includes 1 record here only)

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        <vos_service><vosR>19860408</vosR><vosD/><vclmR/><vclmD/></vos_service>
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footnote="">IRR</freq><prST/><logE/><wwH>19.0</wwH><anmU footnote="">3</anmU><blc footnote="">3</blc></met_prgm>
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footnote=""/><brmU/><brmC>20080410</brmC></barometer>
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footnote=""/><thmH/><tscale footnote=""/></dry_bulb>
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footnote=""/></dry_bulb>
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        <hygrometer Id="2"><hygr footnote=""/><hgrE footnote=""/></hygrometer>
        <sea_temp Id="1"><sstM footnote="">C</sstM><sstD/></sea_temp>
        <sea_temp Id="2"><sstM footnote=""/><sstD/></sea_temp>
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        <barograph Id="2"><barg footnote=""/></barograph>
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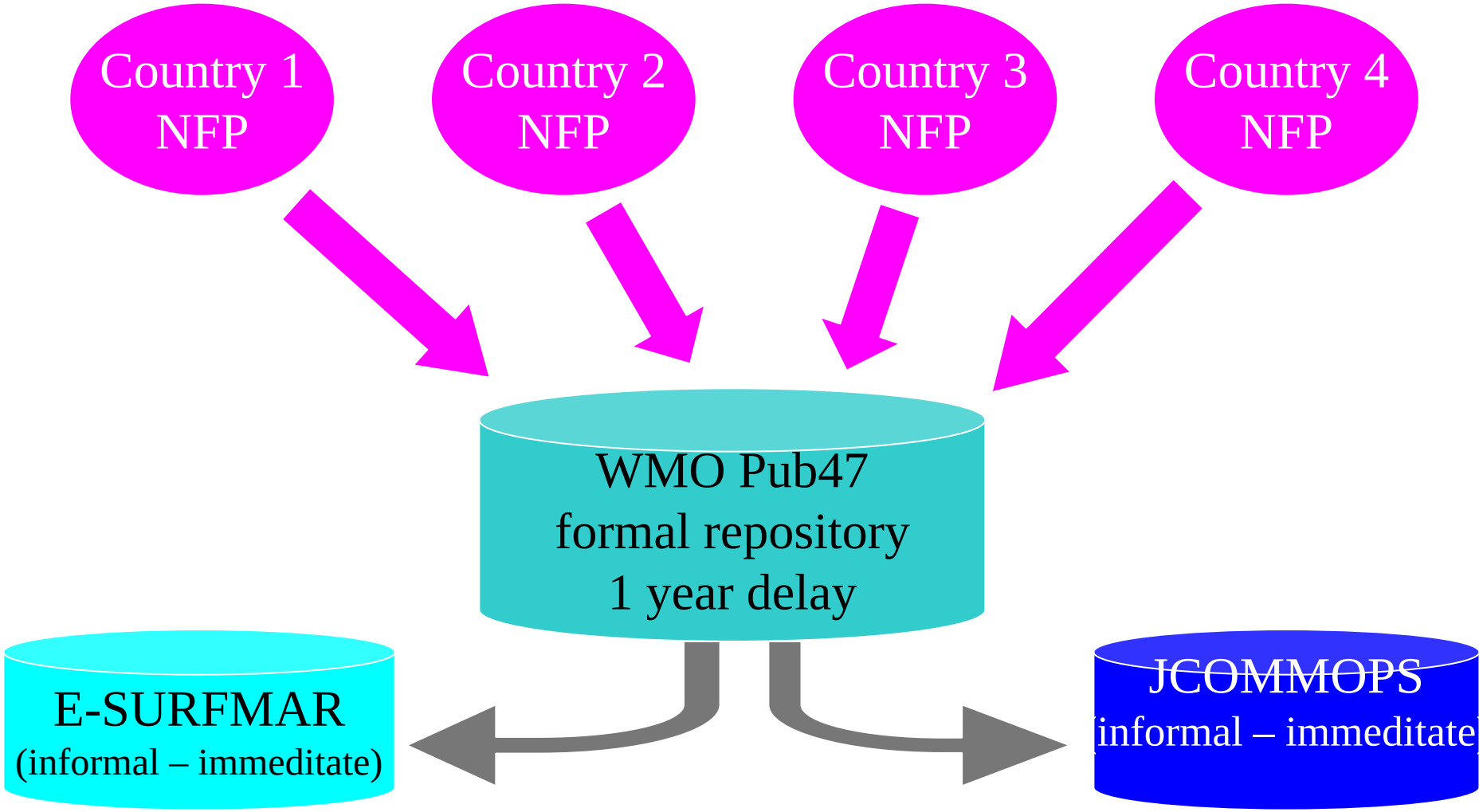
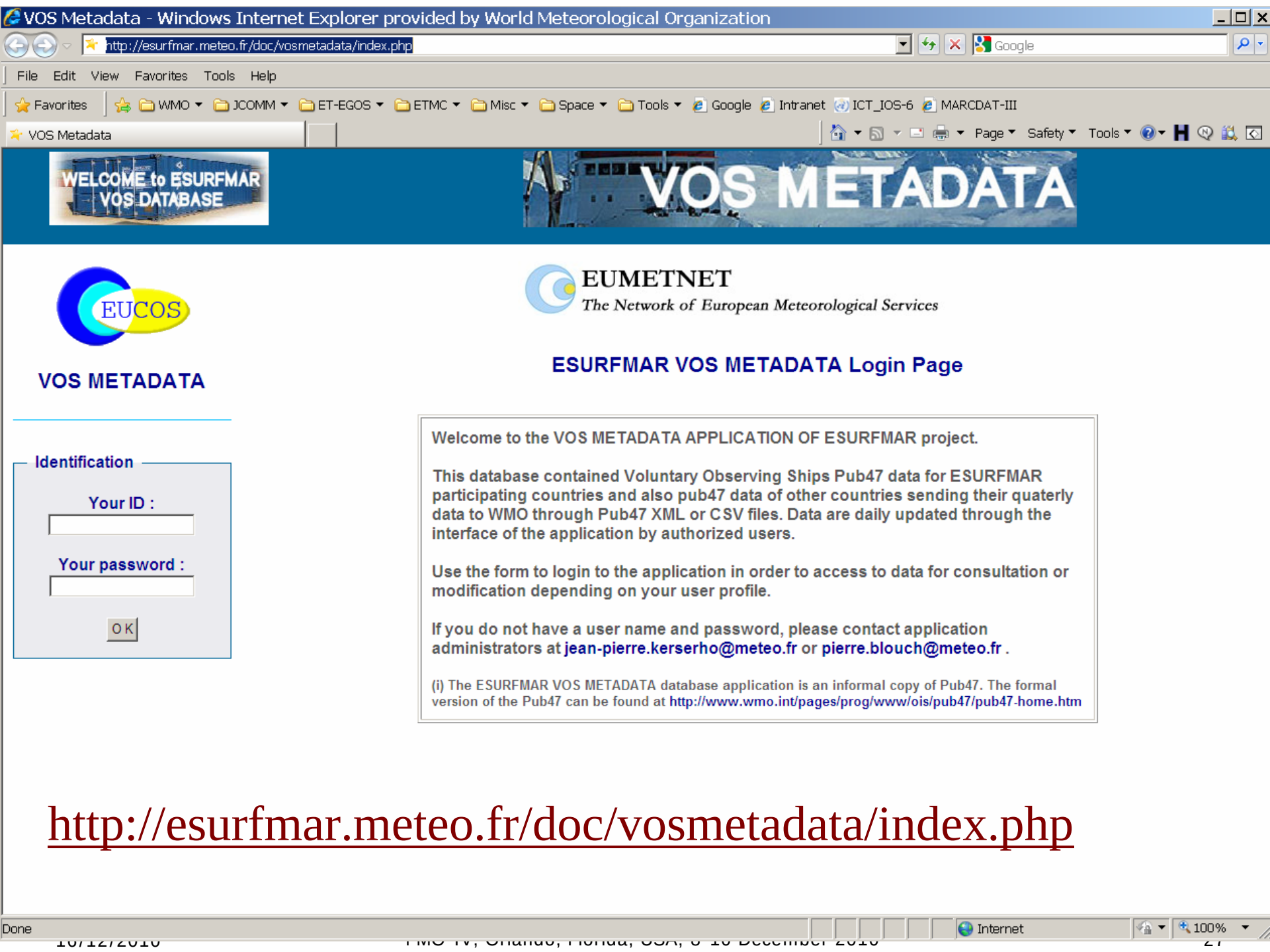
        <anemometer Id="2"><anmT footnote=""/><anmM/><anmL
footnote=""/><anDB/><anDC/><anSC/><anHL/><anHD/><anmC/></anemometer>
        <other><othI Id="1" footnote=""/><othI Id="2" footnote=""/><othI Id="3" footnote=""/><othI Id="4"
footnote=""/><othI Id="5" footnote=""/><othI Id="6" footnote=""/></other>
</instrumentation>
<chgd>20101101</chgd>
</pub47record>
</pub47dataset>
```

Informal copies of Pub47

- E-SURFMAR
  - http://esurfmar.meteo.fr/doc/vosmetadata/index.php
- JCOMMOPS
  - http://wo.jcommops.org/cgi-bin/WebObjects/JCOMMOPS.woa/wa/ship

Versions of Pub47




VOS Metadata - Windows Internet Explorer provided by World Meteorological Organization
http://esurfmar.meteo.fr/doc/vosmetadata/index.php
File Edit View Favorites Tools Help
WELCOME to ESURFMAR VOS DATABASE
VOS METADATA
EUCOS
EUMETNET
The Network of European Meteorological Services
VOS METADATA
ESURFMAR VOS METADATA Login Page
Identification
Your ID :
Your password :
OK
Welcome to the VOS METADATA APPLICATION OF ESURFMAR project.
This database contained Voluntary Observing Ships Pub47 data for ESURFMAR participating countries and also pub47 data of other countries sending their quaterly data to WMO through Pub47 XML or CSV files. Data are daily updated through the interface of the application by authorized users.
Use the form to login to the application in order to access to data for consultation or modification depending on your user profile.
If you do not have a user name and password, please contact application administrators at jean-pierre.kerserho@meteo.fr or pierre.blouch@meteo.fr .
(i) The ESURFMAR VOS METADATA database application is an informal copy of Pub47. The formal version of the Pub47 can be found at http://www.wmo.int/pages/prog/www/ois/pub47/pub47-home.htm
http://esurfmar.meteo.fr/doc/vosmetadata/index.php

Welcome to JCOMMOPS: Implementation_Home - Windows Internet Explorer provided by World Meteorological Organization
http://wo.jcommops.org/cgi-bin/WebObjects/JCOMMOPS.woa/1/wo/c6z65Kvd1ZwTu3jrnPBzxg/0.0.5.0
File Edit View Favorites Tools Help
Favorites WMO JCOMM ET-EGOS ETMC Misc Space Tools Google Intranet ICT_IOS-6 MARCDAT-III
Welcome to JCOMMOPS: Implementation_H...
Page Safety Tools
jcommops
jcomm IN-SITU OBSERVING PLATFORM SUPPORT CENTRE
IMPLEMENTATION MONITORING MAP ROOM INSTRUMENTATION DATA
Requirements Manuf. Sat-comm. Platforms GTS Deployments Maps
OK
username
OK
Implementation
Welcome to the observational programmes implementation section.
Please select a link above for information on:
- User requirements
- Manufacturers (platforms, transmitters, instruments)
- Satellite data telecommunication (e.g. Argos, sat-comm.review)
- Platform specific implementation information (Argo, DBCP, SOT)
- Global Telecommunication System (GTS)
- Deployment opportunities (ship, air)
- Maps
JCOMMOPS, Copyright 2001 - 2008
NEWS
PLATFORMS
CONTACTS
DOCUMENTS
MEETINGS
GALLERY
LINKS
HELP
http://wo.jcommops.org/cgi-bin/WebObjects/JCOMMOPS.woa/wa/ship
Internet
100%

Conclusion and recommendations

- Collection of VOS metadata in essential
  - Operational uses
  - Climate applications
  - Network/fleet management & monitoring
  - Contributes to WIGOS integration
- Must be submitted quarterly to WMO Secretariat, preferably monthly
  - CSV or XML format v3.4
- Formal version available via WMO web site
- Informal more timely version available from E-SURFMAR and JCOMMOPS