Task-Team on Climate Data Models (TT-CDM)

WEATHER CLIMATE WATER
TEMPS CLIMAT EAU

How NMHSs have answered so far to WMO specifications with their Climate Data Models ?

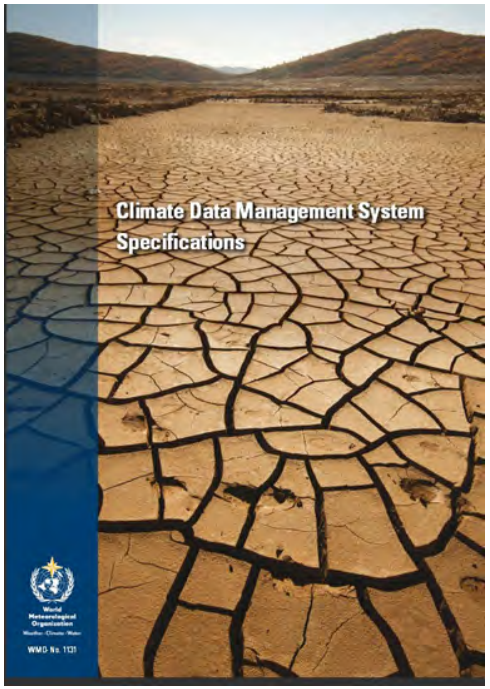
WMO OMM

World Meteorological Organization
Organisation météorologique mondiale

Expert-Team on Data Requirements for Climate Services
ET-DRC- 16 March 2022 - Denis Suber

NMHSs compliant with WMO-No. 1131 ?

Quite difficult to answer to this question as the Climate Data Management Specifications , WMO-No.1131, is dated from 2014, and no real feedback (survey) has been organized since.



WMO-No.1131

Nevertheless, two calls for tender mentioned the specifications of WMO-No. 1131 : Singapore (2018) and Bangladesh (2021), available on https://github.com/ET-DRC/WMO-No.1131/wiki.

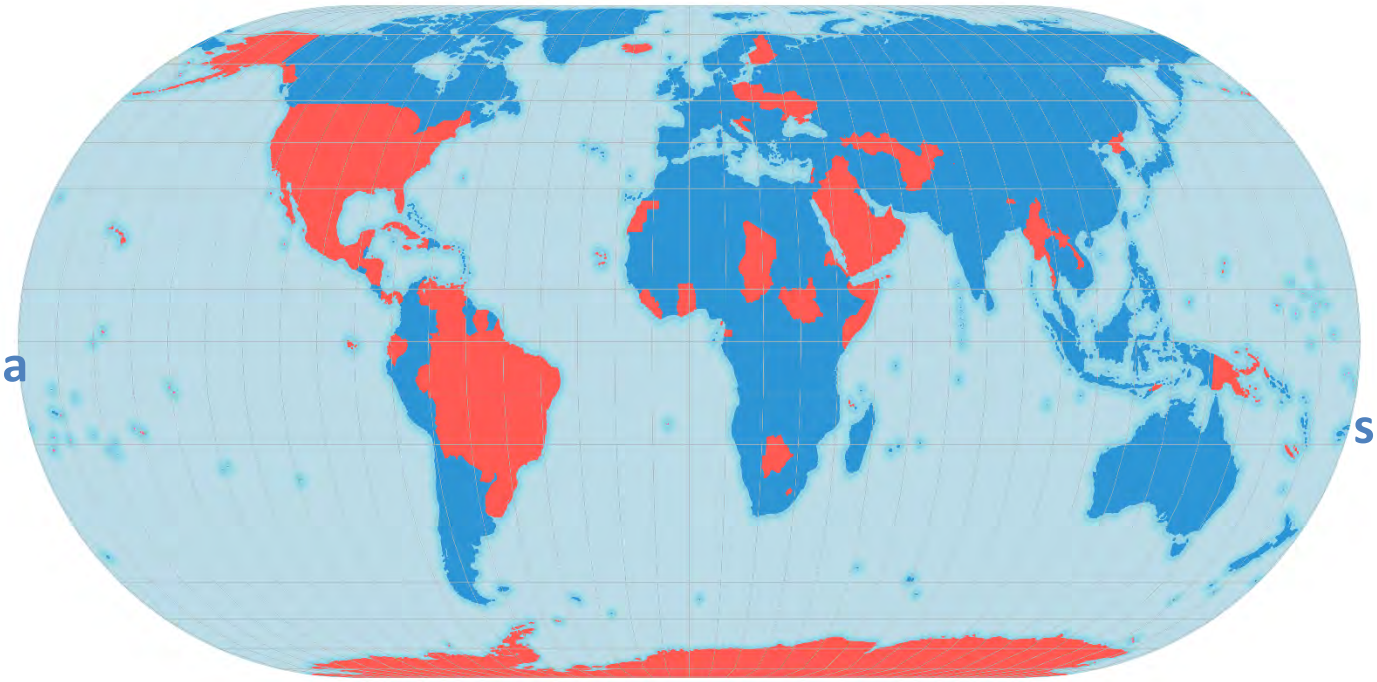
CCI survey with 72% of response rate :

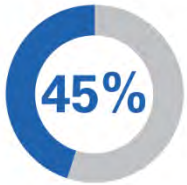
Have operational issues

Are not operational

Do not use a database

Use a spreadsheet





Have developed their own CDMS

Would like to change their CDMS

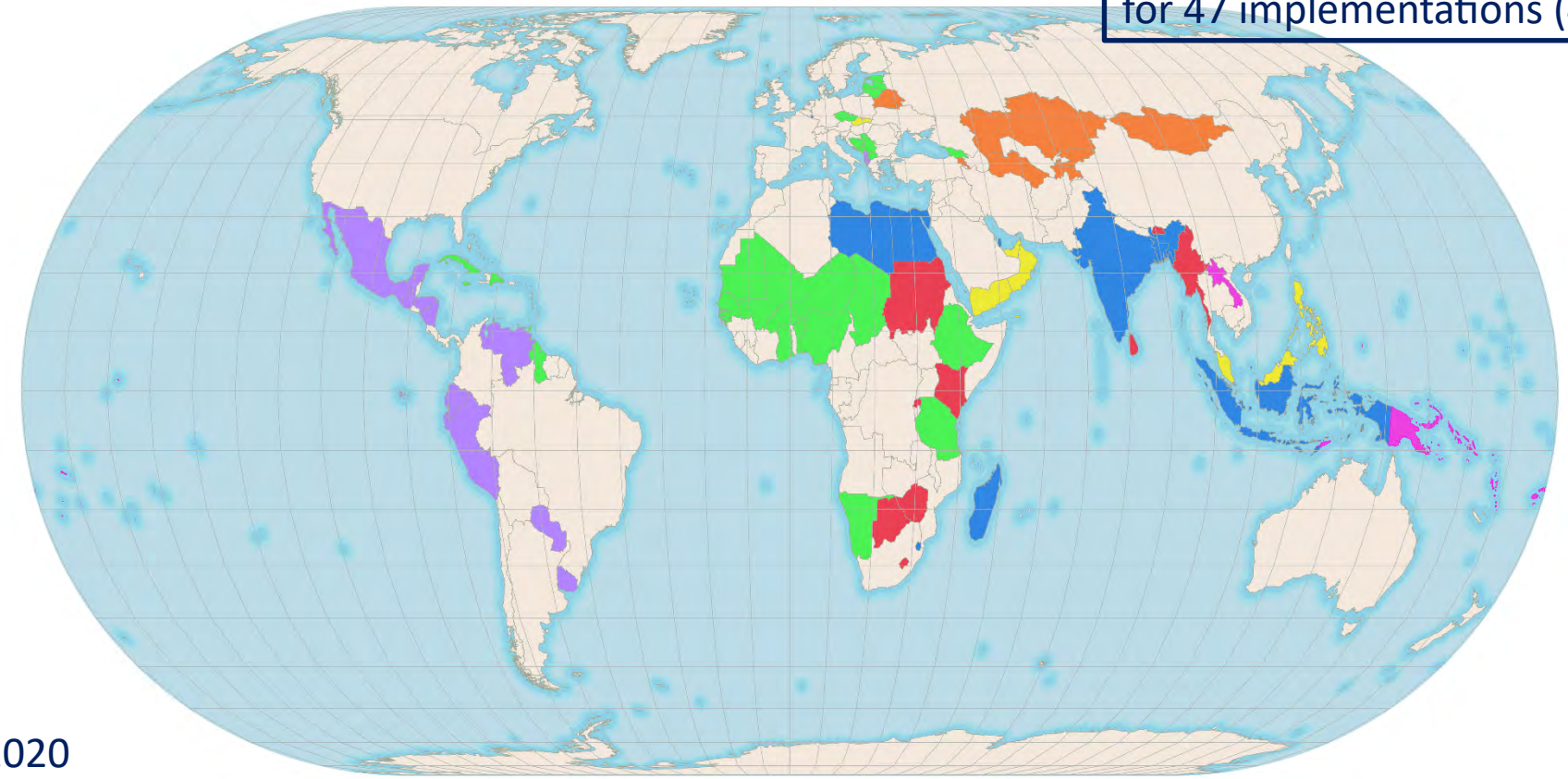
Estimated in 2017 : 89 CDMS developed for national purposes

7 CDMSs for 96 implementations in NMHSs

Distribution of Named CDMS

as at June 2017

3 Open Source (CLIDE, MCH, CLIMSOFT) over the 7 CDMSs for 47 implementations (49%)



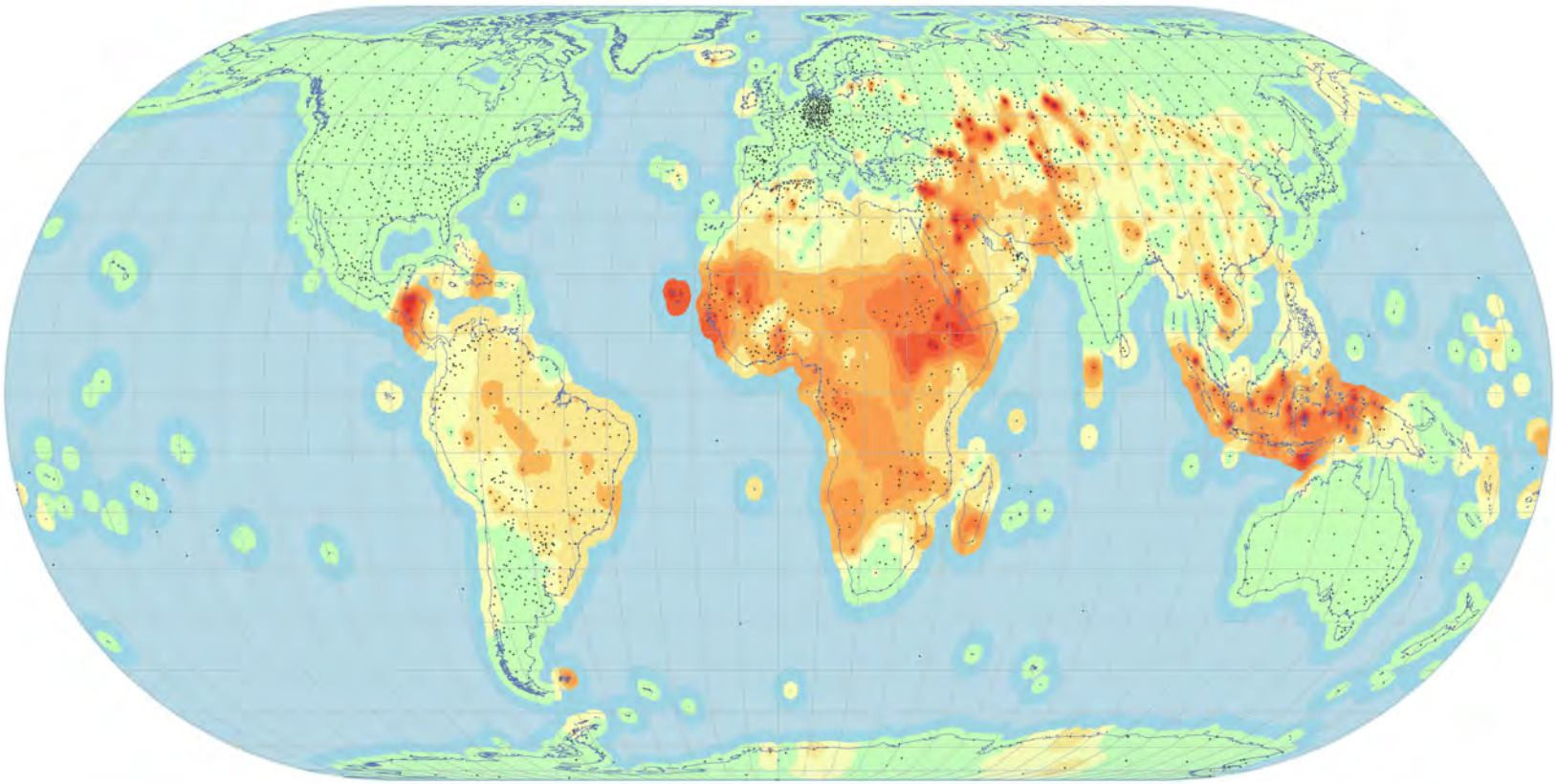
2020

NMHSs: **CLIDATA 31**, **CLIDE 15**, **CLIMSOFT 15**, **CLISYS 13**, **CLIWARE 8**, **IMS 14**, **MCH 17**

Non-NMHS: **CLIDATA 5**, **CLIDE 5**, **CLIMSOFT 2**, **CLISYS 1**, **CLIWARE 0**, **IMS 4**, **MCH 3**

% correct global CLIMAT messages received

10 year average 2007 - 2016



Legend

% Correct CLIMAT			
0 - 10	20 - 30	50 - 60	80 - 90
10 - 20	30 - 40	60 - 70	90 - 100
	40 - 50	70 - 80	

Estimate of the trend of historical CLIMAT messaging using spatial autocorrelation.

Analysis of historical CLIMAT messages:
Christiana Lefebvre, Deutscher Wetterdienst (DWD)

Spatial Analysis and Cartography:
Bruce Bannerman, GeoInnovations Pty Ltd

September 2017

CDMSs status world wide

To simplify let's say that we have :

- ✓ 100 WMO Members who are using one (or several !) CDMS of the 7 distributed CDMSs from Private Companies or from Open Source software project which are facing resource issue; Those Members are mainly from developing countries.

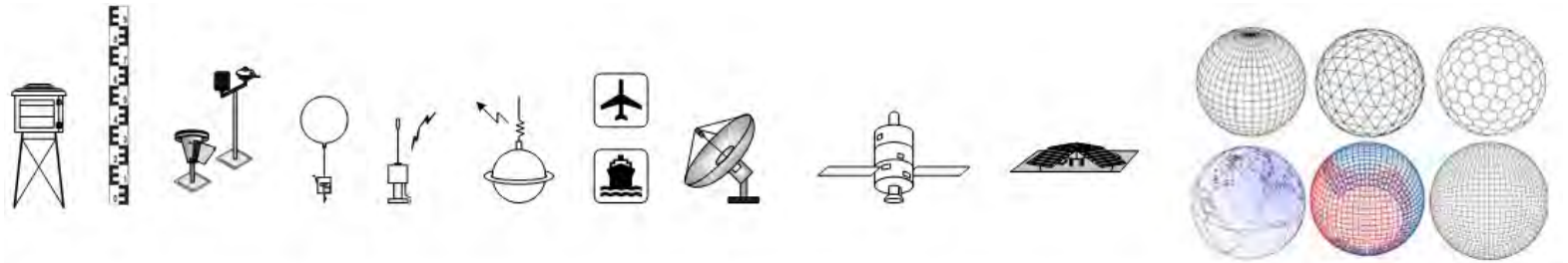
- ✓ 100 WMO Members who are using a CDMS developed by themselves. Most of developed countries have developed their own CDMS. Those Members are also facing resource issues to always be up to date with the latest technology.

For example, Europe proposes an open tool for climate services (Copernicus - Climate Data Store). But, no one offer so far an open tool to manage a climate database on a daily basis over the Cloud.

A so called **"niche" market**. A CDMS, a very important system due to its "Earth" objective foundation, with a limited number of primary users, the NMHSs. Even if other actors could also need this kind of system (Research, University, Scientific Organization/Companies, etc.).

Those who have developed their own CDMS

They started in the 80's with Relational Databases. Most of them were using data tables with a structure so called "observation value" which often has difficulties in adapting to changes.
They often have different databases according the data type they manage.



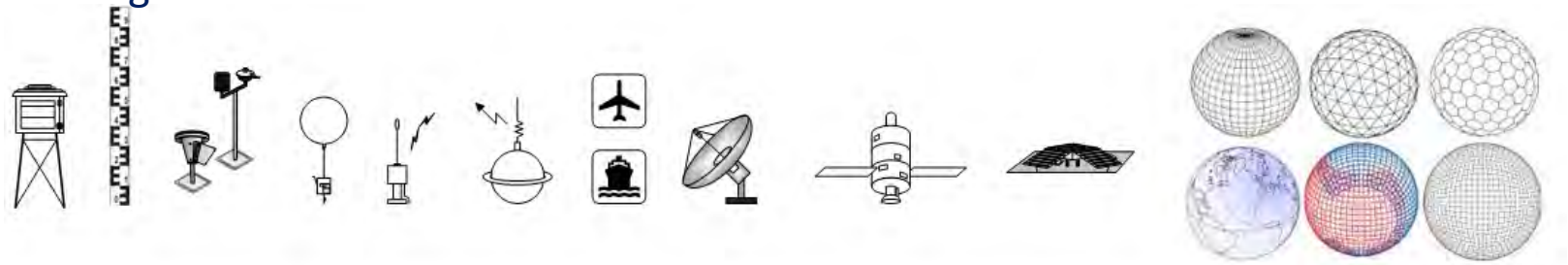
Data Collection and Processes Platforms

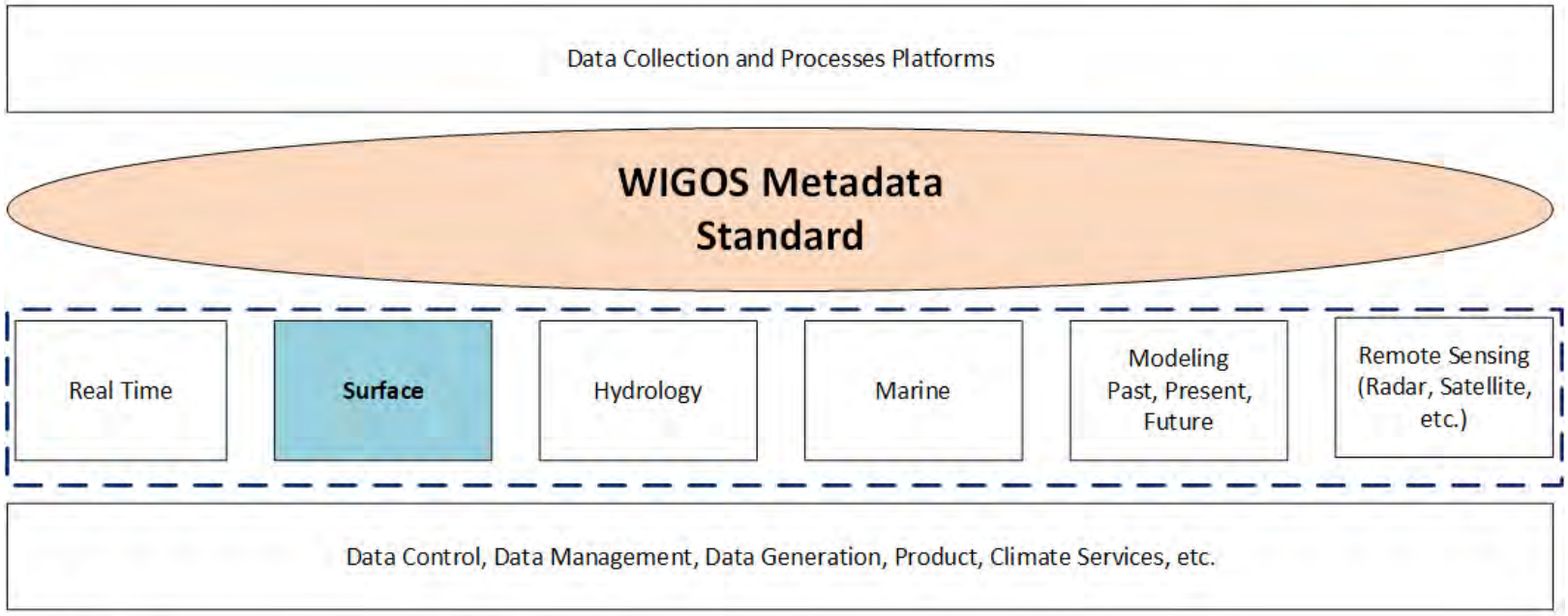
Metadata	Metadata	Metadata	Metadata	Metadata	Metadata
Real Time	**Surface**	Hydrology	Marine Database	Modeling Past, Present, Future	Remote Sensing (Radar, Satellite, etc.)

Data Control, Data Management, Data Generation, Product, Climate Services, etc.

A possible way forward…

- ✓ To propose a CDMS data model easily adaptable to each NMHSs
- ✓ To propose a data model smart enough to accept the different climatological practices
- ✓ To move towards interoperable exchange formats
- ✓ To invite NMHSs to be compliant to the future CDM “standard” and promote its advantages





ET-DRC work in progress

- ✓ ET-DRC has already defined the Metadata part that should be included into the WMO DAYCLI message (CLIMAT message) that includes: **Siting Classification**, **Measurement Quality Classification**, **Quality Code**, the **generation method** in use and the national **climate day definition** for each variable

- ✓ ET-DRC maintains the list of the structure of the Hourly Data Tables used by NMHSs in their CDMSs (14 CDMSs so far)

- ✓ ET-DRC maintains the list of the quality flagging system in use by NMHSs in their CDMSs (21 CDMSs so far) and is working on an International quality flagging system

- ✓ OpenCDMS makes available the data models used by Australia (ADAM and CLIDE CDMSs), by Météo-France (BDCLIM), by CLIMSOFT, by UK Met Office (MIDAS), by WMO (MCH and CLICOM) : https://github.com/opencdms/opencdms-test-data/tree/main/schemas

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Thank you
Merci

Denis Stuber – SERCOM ET-DRC

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