



# Meteorological data exchange on a global stage

How WMO must adapt to changing requirements

Jeremy Tandy    *WMO IPET-MDI*



# Introducing WMO

UN specialized agency:  
*long established,  
governmental org,  
treaty based*

Membership:  
*188 members,  
countries & territories*

6 regional assoc.:  
*Africa, Asia, S America,  
N America, Oceania,  
Europe+*



Technical  
commissions:

*CBS\*  
CHy  
CCI  
CAgm  
CAeM  
CIMO  
JCOMM*

**2- or 4-year change cycle**

**CBS major programme:  
World Weather Watch (WWW)**

- **Open Programme Access Groups**
- **Inter-Programme Coordination Teams**
- **Inter-Programme Expert Teams**



# Inter-Programme Expert Teams

**IPET-MDI** *coordinate* the development of meteorological information exchange standards on behalf of WMO

## **Metadata & Data Interoperability**

*Develop metadata & data representations, profiles, usage policies & guidance material*

*Develop guidance & procedures for the interoperability of data & metadata between WMO & external communities*

*Establish mechanisms for on-going governance & maintenance of data & metadata representations*

**IPET-DRC** *realize* WMO's technical regulations as endorsed by the international community

## **Data Representation & Codes**

*Maintain data representations: 'table-driven-code-forms' [TDCF] BUFR, CREX & GRIB*

*Adapt & update 'traditional alphanumeric codes' [TAC]*

*Coordinate & monitor migration of TAC-TDCF*

*Update & publish Manual on Codes (WMO No. 306) with associated reference & guidance material*



# WMO information exchange



**National Met Services +  
Global Telecommunication  
System (GTS/MTN)**

**'Resolution 40' data-products**

**'Resolution 28' data-products**

***Migrating from TAC to TDCF***

**operational exchange**



**time critical  
safety critical**

**'closed' community  
data-product centric**

**developed over 50+ years**

**global extranet – predates internet**

**suitable for low-bandwidth networks**



**Aviation Community**

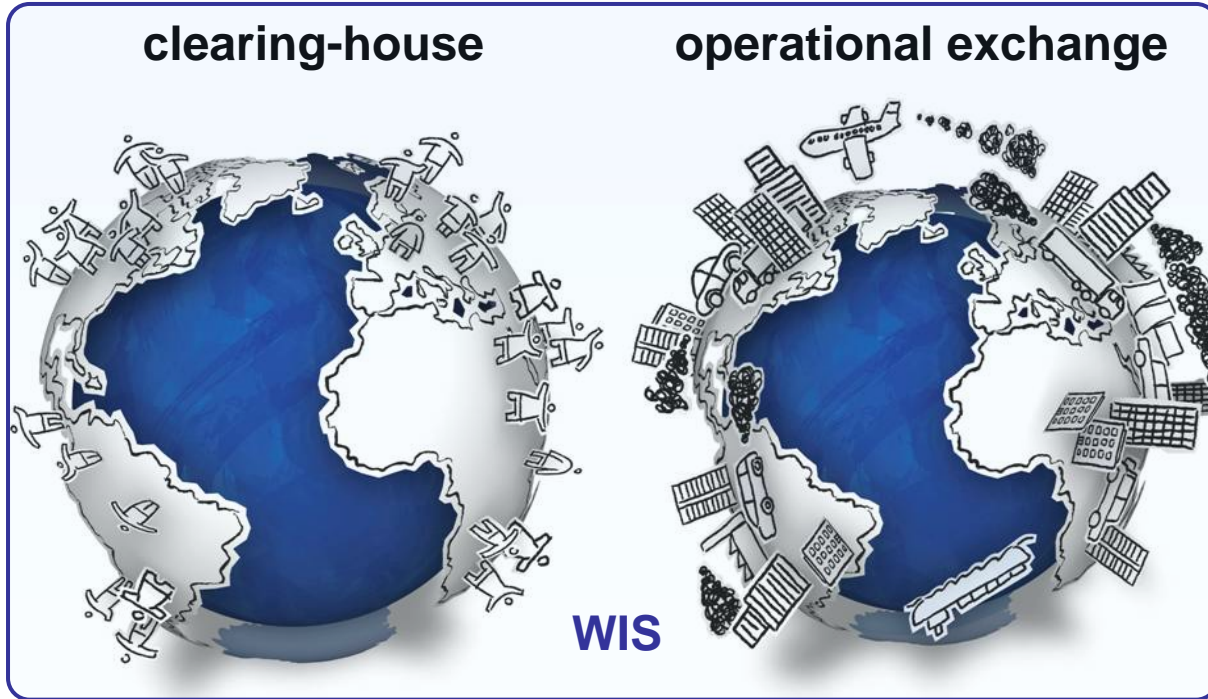
**Aeronautical Fixed  
Telecommunication  
Network (AFTN)**

**ICAO Annex 3 OPMET data-  
products (Chicago  
Convention)**

***SESAR / NextGen***



# WMO Information System (WIS)



**WMO Information system ensures the...**  
*"extension of WMO's policy on the free and unrestricted international exchange of meteorological and related data and products to the entire domain of such data and products used globally."*

**WMO Bulletin Vol. 55(4) - Oct 2006**

data discovery, access and retrieval services for all weather, climate, water and related data





# Global meteorological data exchange requirements

clearing-house

operational exchange

emergency management



continuum of requirements







# Profiling existing standards

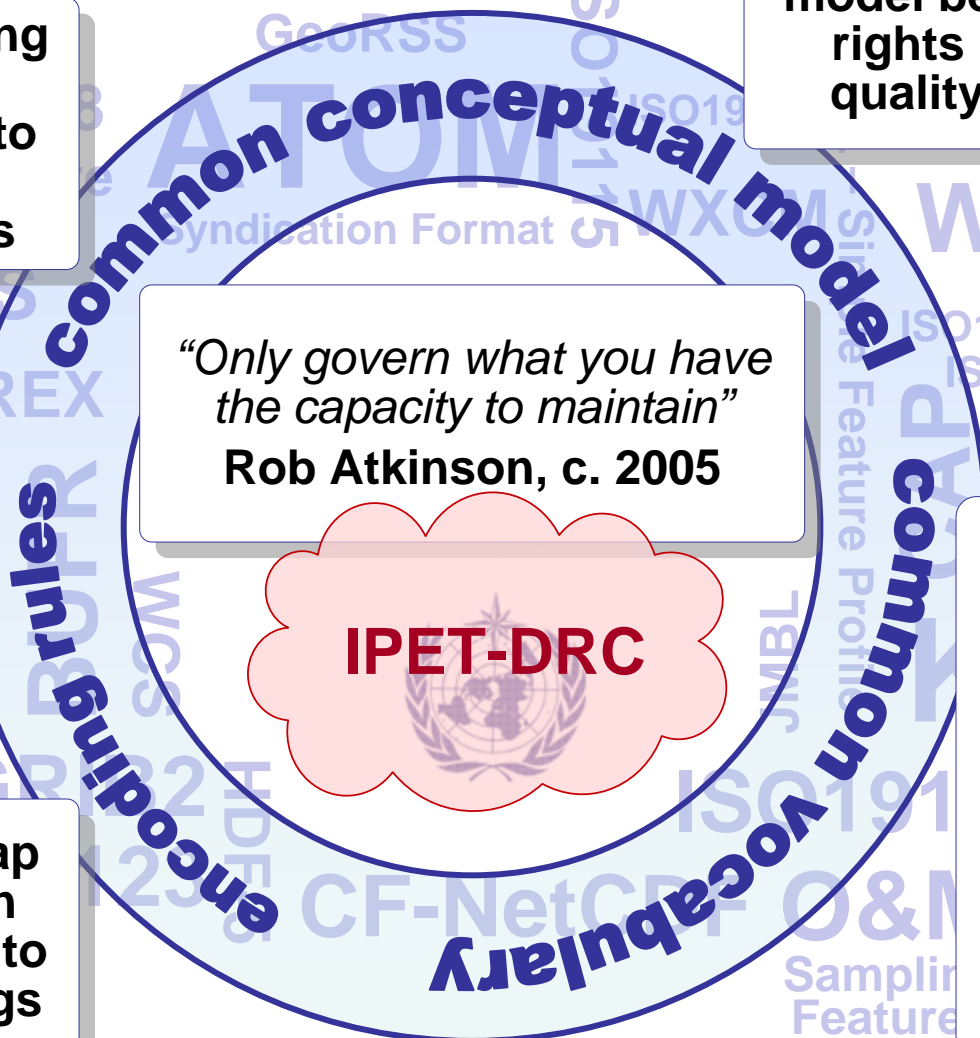
Supplement existing standards *only* where necessary to express domain specific concepts

Can a common conceptual model be identified – incl. rights management & quality management?

*“Only govern what you have the capacity to maintain”*  
Rob Atkinson, c. 2005

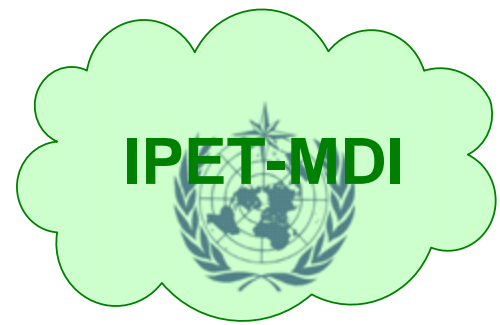
Identify how to map from the common conceptual model to standard encodings

Analyse usage patterns of existing standards to create ontology as first step to resolving challenges of ‘semantic heterogeneity’





# IPET-MDI must operate within a community of stakeholders



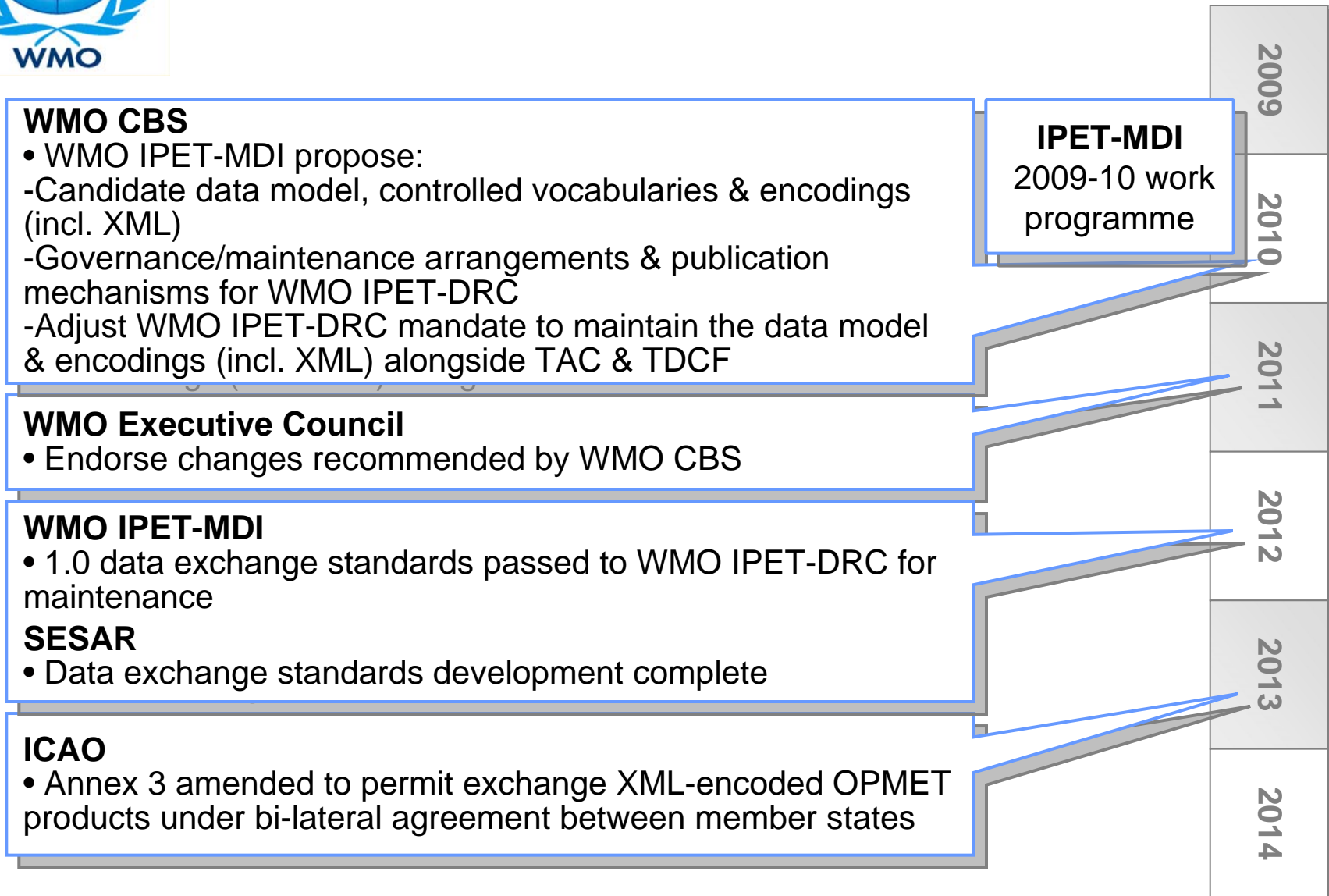


## Candidate WMO IPET-MDI work programme 2009-10

- Assess current data-standards landscape;
- Develop candidate common data-models & controlled vocabularies, and consider how it can be mapped with the TDCF models (tables and regulations), to support:
  - Operational meteorology and hydrology (ICAO Annex 3 OPMET data, WMO Resolution 40 'essential' data)
  - Data clearing-house (WMO WIS/GISC, GEOSS, **INSPIRE**)
  - Emergency response (Common Alerting Protocol)
- Develop candidate data-encodings – including XML
- Demonstrate effectiveness of candidate encoding(s) within test-bed – aviation OPMET as a minimum
- Develop governance / maintenance arrangements for proposed data-standards – new terms of reference for WMO IPET-DRC & provision for changes to WMO technical regulations

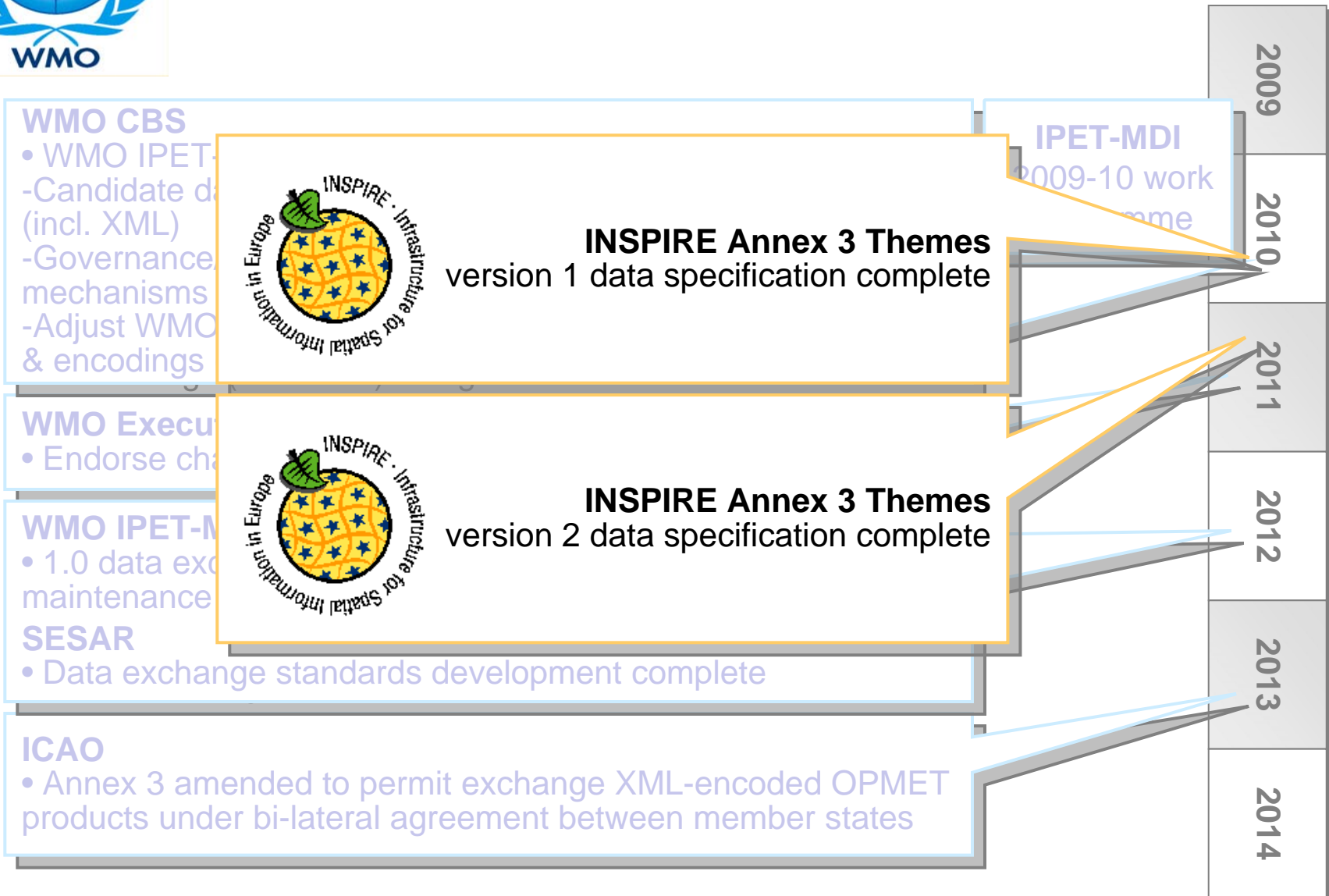


# Timeline for Aviation OPMET standards





# Timeline for INSPIRE standards





# Summary

- **WMO** recognized as the organization responsible for standardizing data exchange within meteorology & hydrology domains
- **IPET-DRC** mandated to maintain these standards within WMO technical regulation framework
- **IPET-MDI** focal point for developing standards maintained by WMO
- Focus on **profiling** existing standards – supplemented only where necessary for domain-specific concepts
- **Coordinate** standards development with stakeholder community
- **2010** is critical year for harmonizing meteorological data exchange standards to meet timelines for ICAO & INSPIRE



Thankyou