WMO Information System and WIS Discovery Metadata

TOYODA Eizi
Japan Meteorological Agency
Co-Chair, WMO/CBS/IPET-MDRD

About Myself

- Lead on WIS Metadata Development
  - Lead, TT-MDI (Task Team on Metadata Implementation)
  - Lead, TT-ApMD (Application of Metadata)
  - Co-Chair, IPET-MDRD (Inter-Programme TT on Metadata and Data Representation Development)
- Working for GISC/DCPC Tokyo
  - Numerical Predicition Division, Japan Meteorological Agency

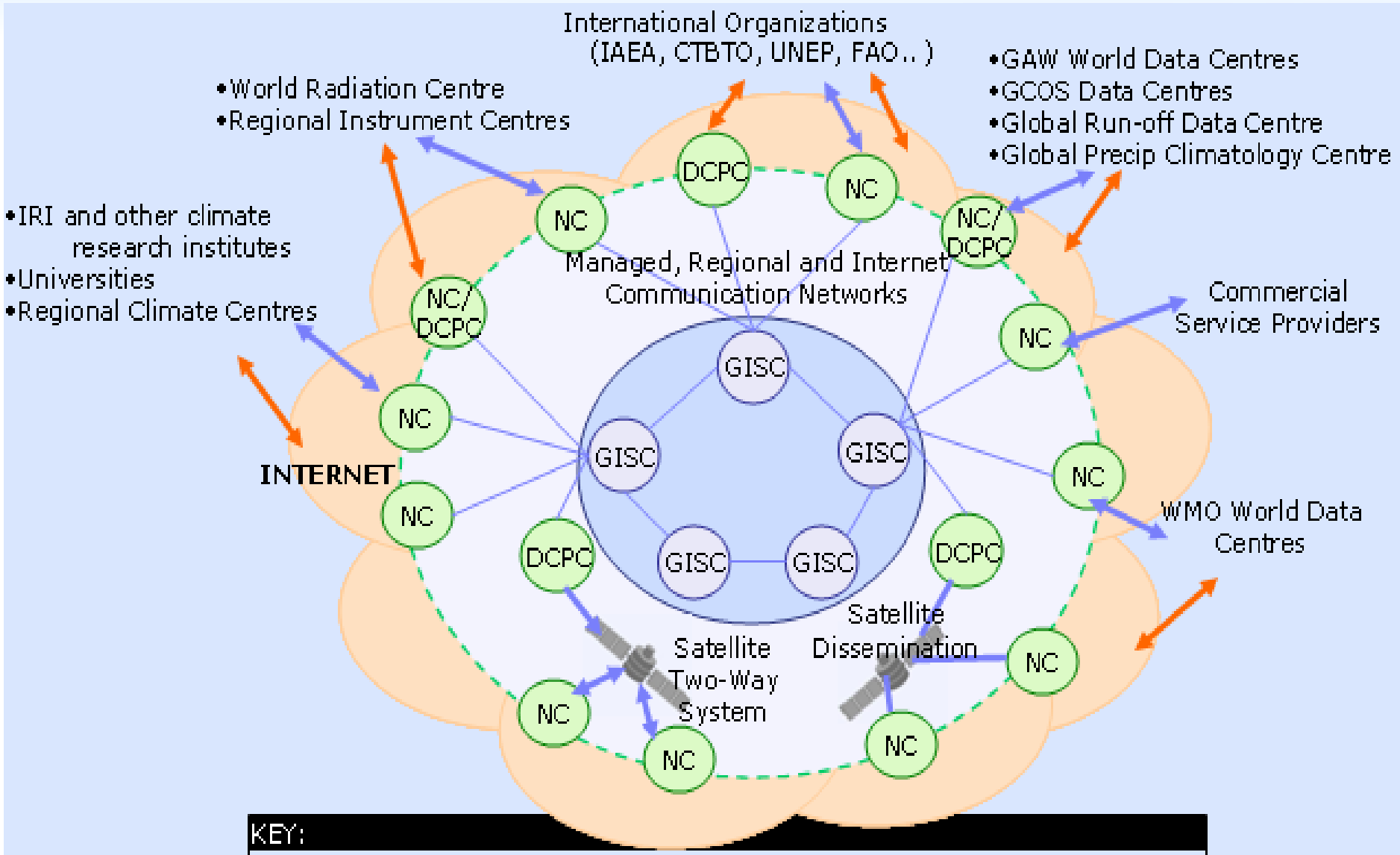
This talk

- What is WMO Information System
- JMA's designated WIS centres including GISC Tokyo
- WMO Core Metadata Profile

What's WIS?

- WIS: WMO Information System
  - WMO: World Meteorological Organisation
- Continues & enhances GTS
  - Realtime network for operational meteorology
- Infrastructure for all WMO programs
  - Now efforts concentrates on data catalogue

Organisational structure

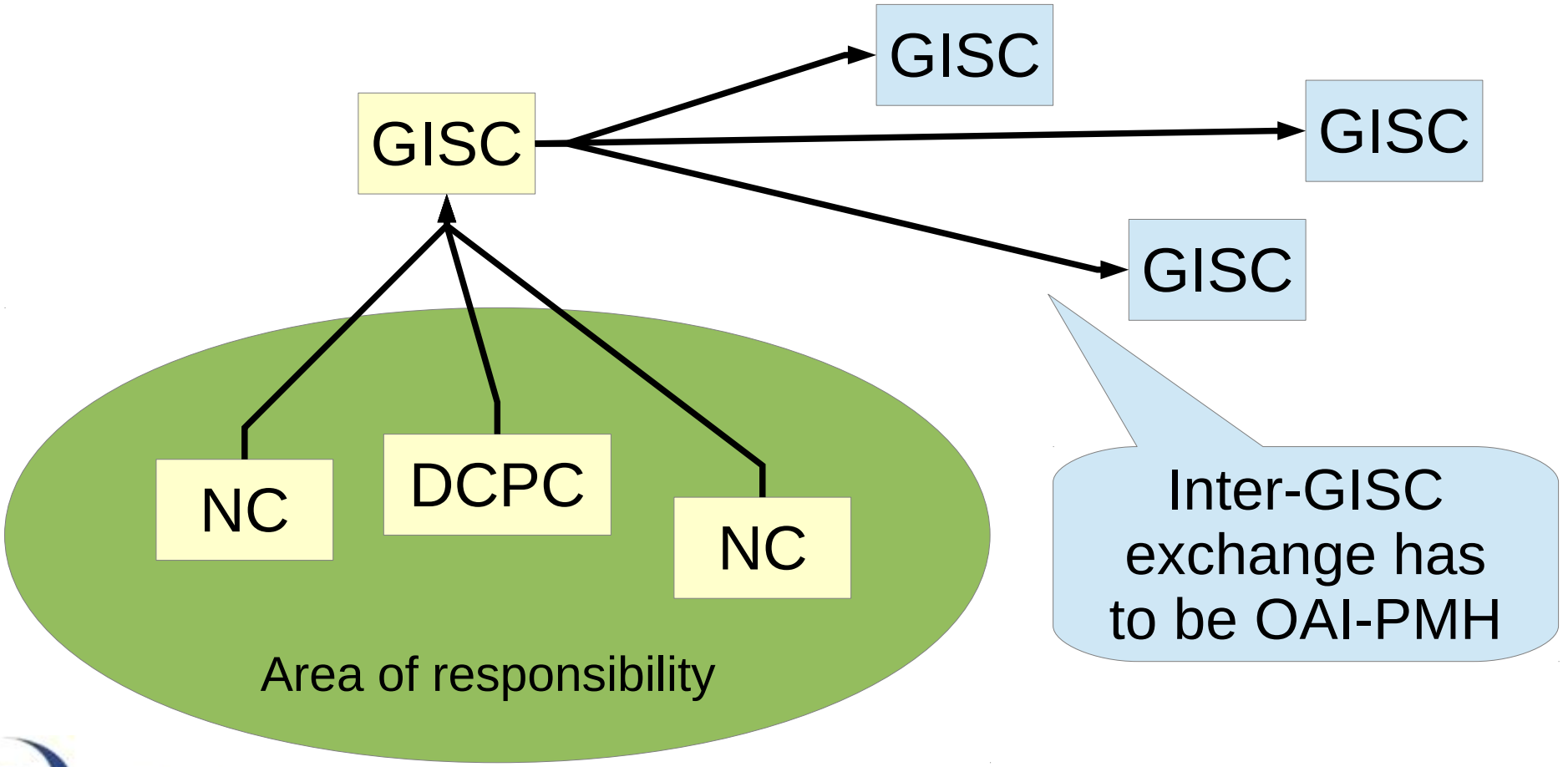


Organisational structure

- GISC: global information system centre
  - information catalogue of entire WIS
  - global distribution information on web
- DCPC: data collection & product centre
  - regional or programme-wide activities
- NC: national centre
  - national activities

GISC collects metadata records

Then exchanges among GISCs



Designation of GISC or DCPC

- Service offer by potential centre
- TC or RA: Endorsement
- CBS: Recommendation
  - Demonstration of capability
- Congress or EC: approval
  - Listed in Appendix B, Manual on WIS

JMA's designated WIS Centres

- GISC (Global Information System Centre)
- DCPC
  - 3 RSMCs (regional specialized met centres)
    - Typhoon, RSMC-Geographical, ATM
  - Satellite Centre
  - Global Producing Centre for Long-range Forecast
  - RCC Tokyo (Tokyo Climate Center)
  - **GAW-WDCGG**
- All designated Cg-XVI, operational Aug 2011

WIS Portal


WIS Portal - GISC Tokyo
Welcome to Tokyo Global Information System Centre!
Home
About WIS
Warning
KML
WMO format
Metadata
Help Desk
News
Home
RSS
Welcome to the Tokyo Global Information System Centre!
This portal web-site is operated by the Japan Meteorological Agency(JMA) in its capacity as a GISC (Global Information System Centre) for the WMO Information System (WIS).
Please proceed to:
Overview of WIS
List of JMA's WIS services relating to its capacity as a GISC and a DCPC
List of JMA's single sign-on services
User Guides including Tutorial Slides of DAR service
Data in text (warnings), raw WMO Codes and KML
Recent Posts
Cloud database maintenance
—Posted on 4/23/2013
JMA will change its wind profiler data on March 6th.
—Posted on 2/6/2013
JMA Workshop on WMO Information System Implementation
—Posted on 12/28/2012
JMA will change its wind profiler data
—Posted on 12/27/2012
WIS Application Pilot Project (PP-App) website open!
—Posted on 12/5/2012
www.wis-jma.go.jp/cms/

WIS Portal - Services

- Data
  - Incoming from GTS
  - Some JMA's DCPC's
    - Not WDCGG (sorry)
- Metadata (= Catalogue)
  - Entire WIS, of course wolrdwid

GSM data service

気象庁 Japan Meteorological Agency

JMA High-Resolution GSM Data Service

Home | Tutorial | Product Information | Model Information | Download | Help Desk

JMA High-Resolution GSM Data Service

With a resolution of 0.1875 degrees (approximately 20 km), the Japan Meteorological Agency's Global Spectral Model (GSM) has one of the highest horizontal resolutions of any operational global model in the world.

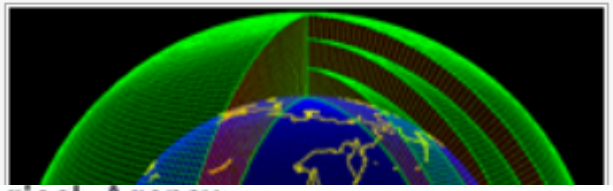
This website provides data from JMA's GSM at a resolution of 0.5 degrees (0.25 degrees for surface layers) on an operational basis.

Users can access and retrieve the following forecast outputs:

- Up to 84 hours four times a day (with initial times of 0000, 0600, 1200 and 1800 UTC) within 4 hours of the initial time
- Up to 216 hours once a day (with an initial time of 1200 UTC) within 7 hours of the initial time

For further information,see:

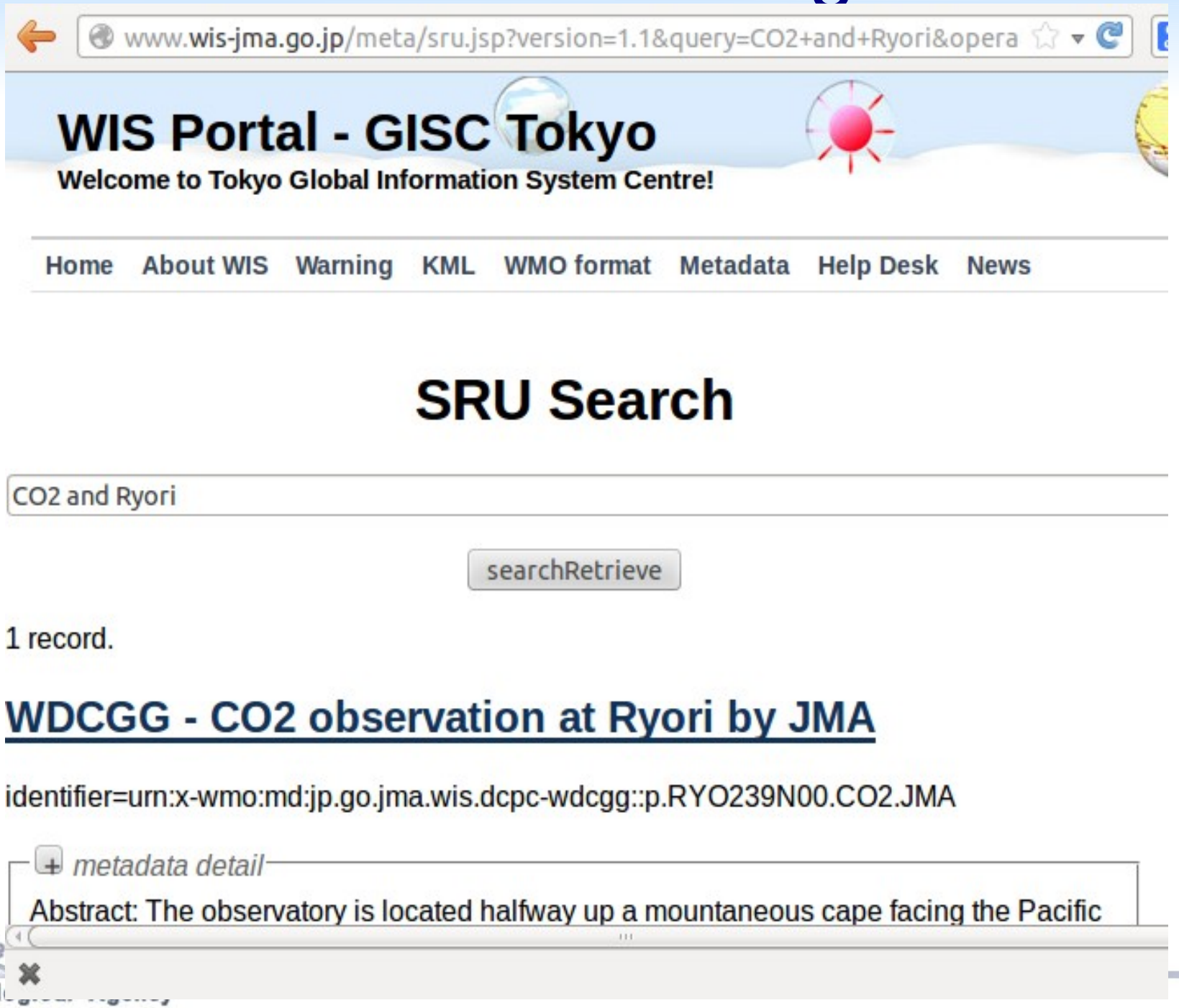
- **Tutorial** for instructions on downloading data
- **Product Information** for details of products
- **Model Information** for a model profile
- **Download** for access to GSM products in GRIB2 format
- **GISC Tokyo's website** for access to GSM products in KML format



Hierarchy by taxonomy (like Tony's)

- http://www.wis-jma.go.jp/d/o/ Open Access
  - CWAO, KWBC, LSSW, ...
  - RJTD
    - BUFR, CREX, GRIB
    - Alphanumeric
      - Analysis, Climate, Forecast, Oceanographic_data, Upper_air
      - Surface
        - BUOY, SHIP, SYNOP, Seismic_data
- http://www.wis-jma.go.jp/d/c/ For Registrated
- Feed http://www.wis-jma.go.jp/data/syn?Access=Open&Type=Alphanumeric&Subcategory=SYNOP&ContentType=Atom

Metadata Catalogue



What is Metadata?

Metadata = data about data

- Depends on Context (sorry!)
- WIS
  - Catalogue of distributed data
- WIGOS
  - Catalogue of stations, satellites, instruments, …
- Computer files
  - Size, owner, permission, ...

WIS Discovery Metadata

Data catalogue
= collection of metadata

describes →

Real data:
SYNOP, TEMP,
GRIB, Imagery, ...

- Analogy to library

Book catalogue
= collection of metadata

describes →

Real books

Images from Wikimedia Commons

Typical book card

- **Title**: An Introduction to Dynamic Meteorology, 3rd Edition
- **Author**: James R. Holton
- **Subject**: Atmospheric Dynamics
- **Published**: April 12, 1992
- **Identifier**: ISBN 978-0123543554
- **Language**: English
- **Shelf**: 1st floor, 551.51-H838i-3

What more for data catalogue?

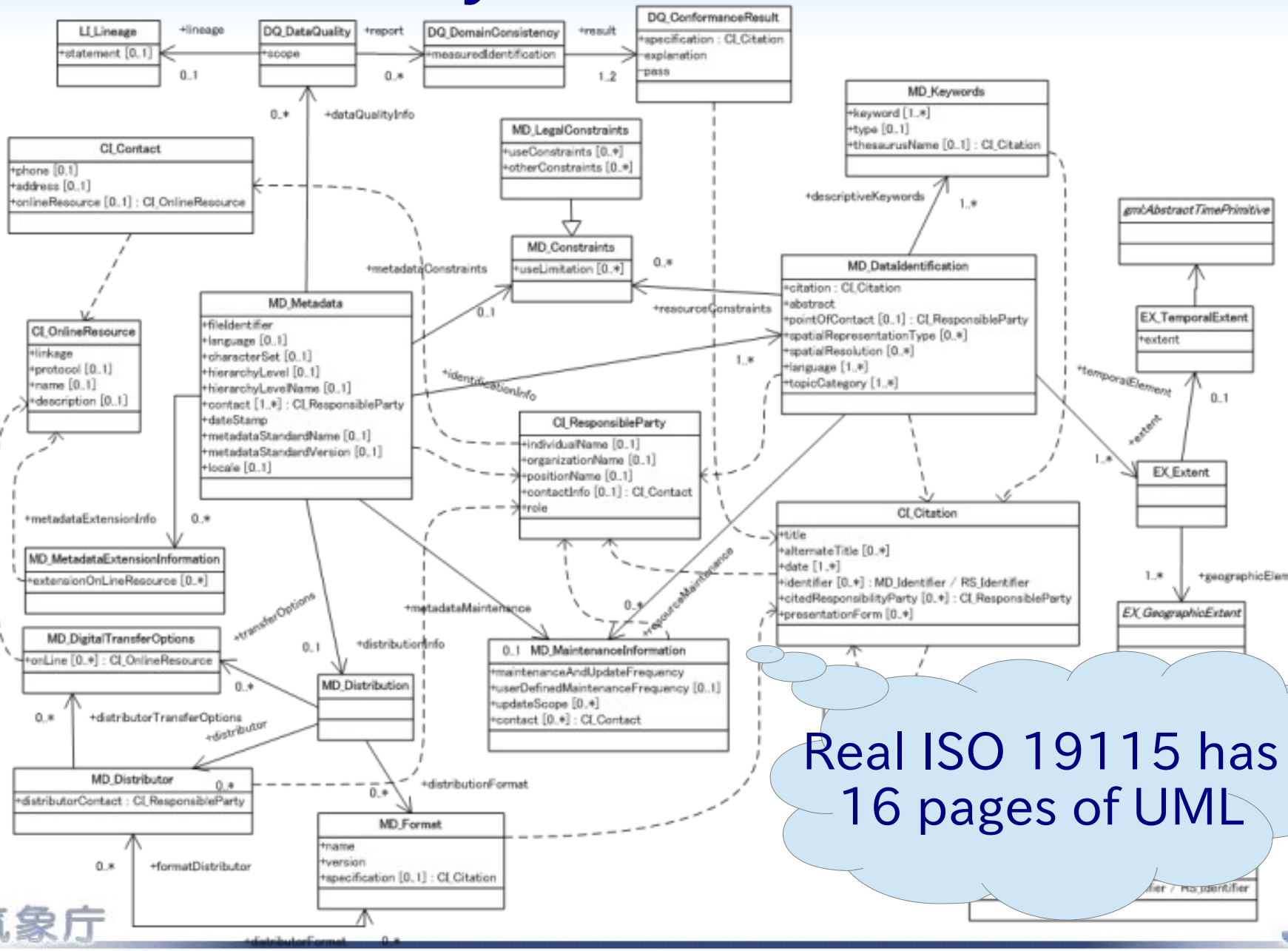
- Location: station or lat-long ←*geographical*
- Vertical: height or pressure
- Time (maybe range and forecast origin)
- Data format
- Contact details
- Link to data
- Free-text description
- ...

ISO Standards of Geographical Metadata

ISO-WMO Geographical Metadata

- ISO 19115:2003
  - Abstract schema (= UML)
- ISO/TS 19139:2007
  - Implementation in XML Schema
- WMO Core Metadata Profile
  - Subset of ISO structure for WMO use

Summary of ISO structure

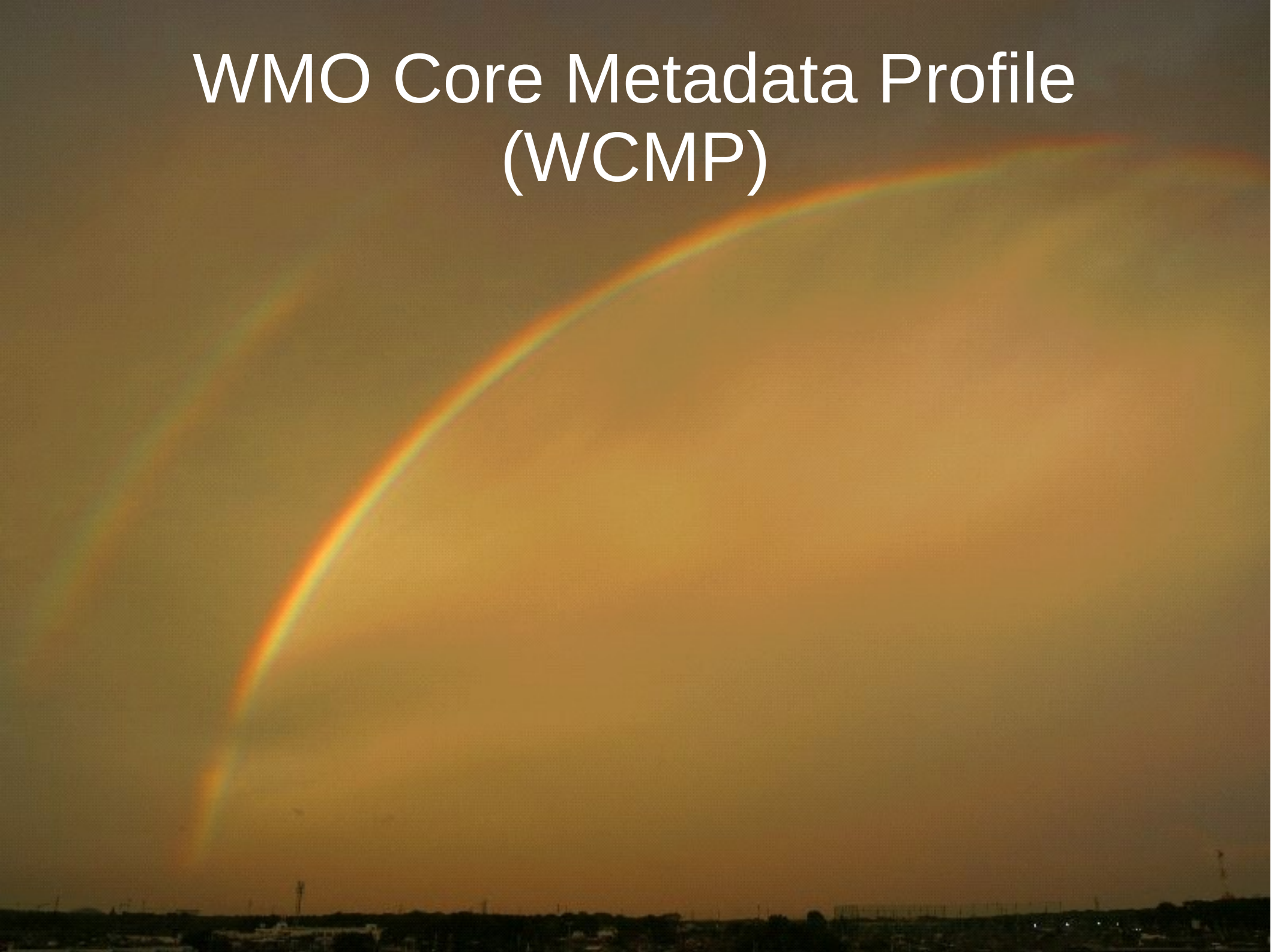


Looks too complicated?

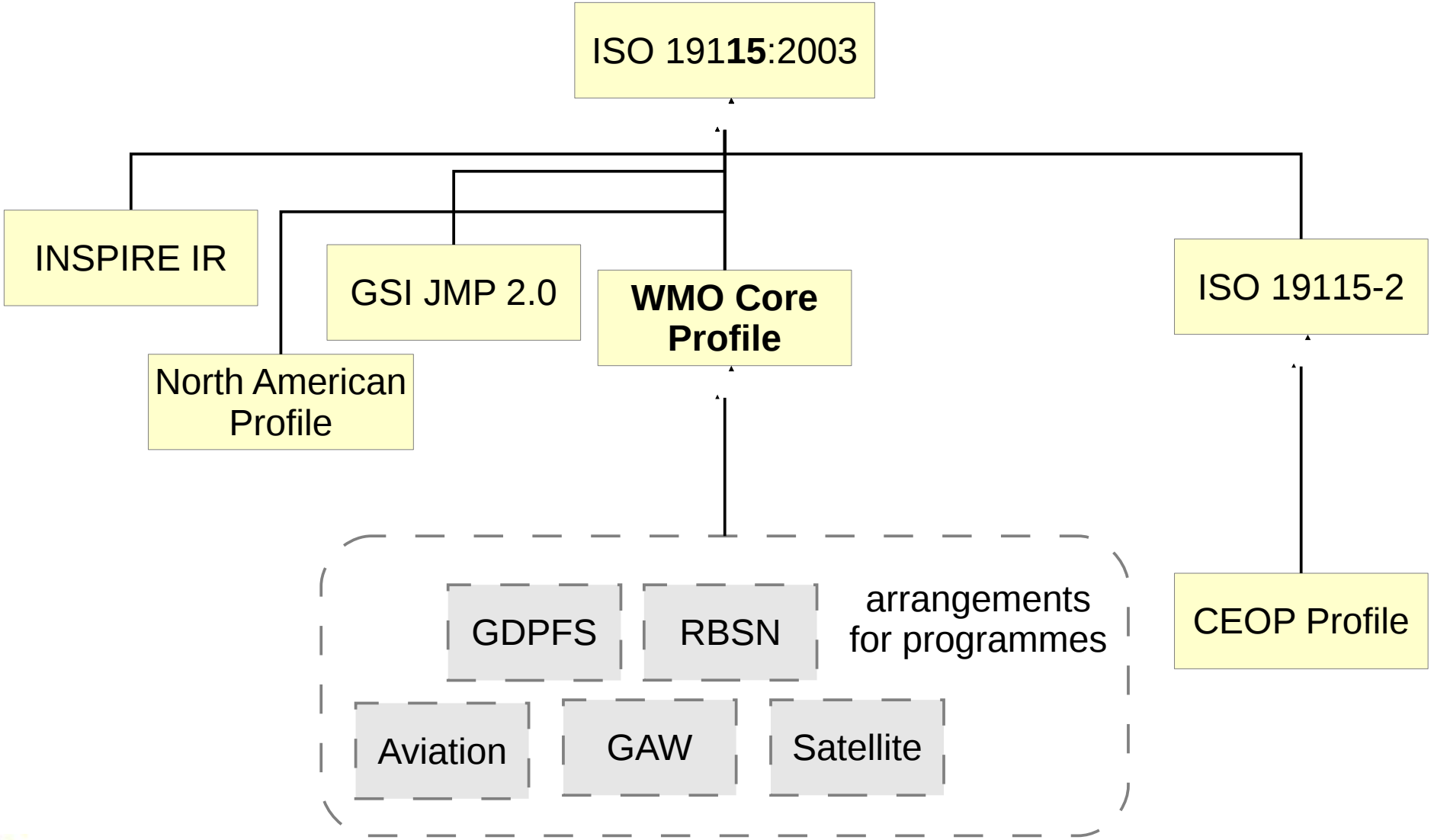
- ISO 19139 contains
  - 620 elements
  - 255 are complex-typed (contain other elements)
  - 26 attributes

- Only a few are mandatory
  - The rest are optional
  - Profile: limited subset by user community

WMO Core Metadata Profile (WCMP)



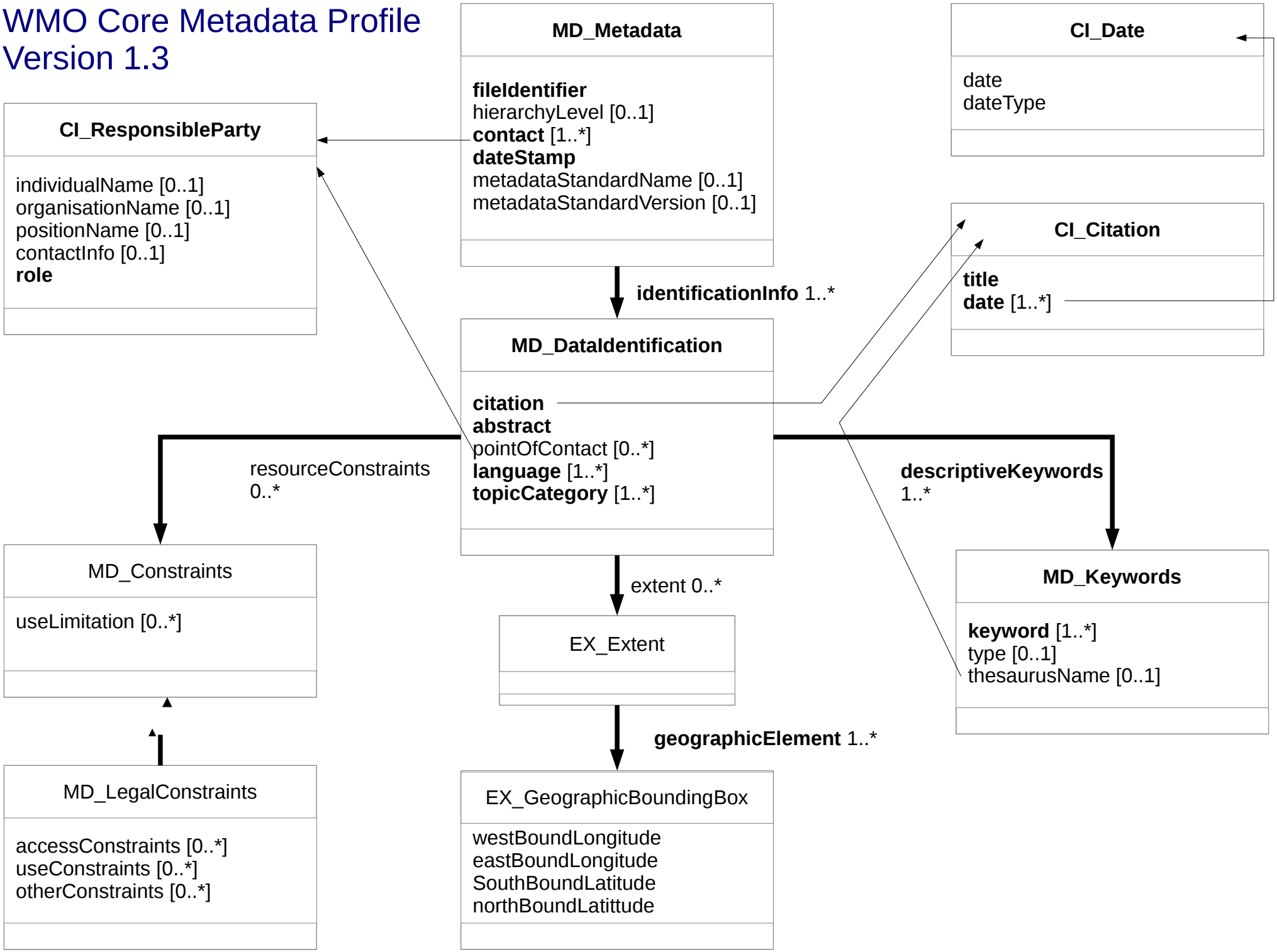
Why named *core* profile?



History of WIS metadata standard

- 2002: ET-IDM
  - IDM = Integrated Data Management
  - UML-based customization
- 2005: ET-MI
  - MI = Metadata Implementation
  - ISO-19139 adopted
  - Conclusion: no good to extend 19139
- 2010: IPET-MDI
  - Refinement of really necessary elements
  - 2013.2 WMO Core Profile version 1.3

WMO Core Metadata Profile Version 1.3



Elements of WCMP
(if we have time...)

MD Elements by types

- Date – metadata & dataset
- IDs – metadata & dataset
- Contact info – metadata, dataset, distribution
- Numeric – 4 bounding coordinates
- Long text – title & abstract
- Controlled vocabulary
  - The rest mostly comes here
  - More lists welcomed!

Metadata identifier

- //gmd:fileIdentifier
- URN to identify the metadata record
  - **urn:x-wmo:md:***reverse.domain***::***variable.part*
  - urn:x-wmo:md:int.wmo.wis::SMJP01RJTD
  - urn:x-wmo:md:jp.go.jma.wis.dcpc-wdcgg::p.RYO239N00.CO2.JMA
- Not to be confused with filename
  - GISCs don't use filename in exchange
  - It's up to local sites
  - An idea: variable part plus ".xml"
    - SMJP01RJTD**.xml,** p.RYO239N00.CO2.JMA**.xml**

Granularity of metadata

GTS “SMJP01 RJTD”

- Surface (S) synoptic reports of main hours (M) in Japan (JP), first group (01) sent from Tokyo (RJTD)
- Includes correction and delayed message
- Collective set of bulletins from long past to now

WDCGG “p.RYO239N00.CO2.JMA”

- CO2 reported from Ryori (RYO239N00) observed by JMA
- Also represents always-updated set of time history
- Some may wish finer citation

Bounding box

- Mandatory for all dataset
- Preferred to georeference by name
- Just four numbers
  - <gmd:westBoundLongitude>
  - <gmd:eastBoundLongitude>
  - <gmd:northBoundLatitude>
  - <gmd:southBoundLatitude>

Contact information

- Locations
  - **Metadata contact**
  - **Dataset contact**
  - **Distribution contact**
  - Name and city for citation
  - Traditional citation to thesaurus document
- Inside the structure
  - **At least one name**
    - Individual/Org/Position
  - Telephone / Facsimile
  - Street Address
  - **Email Address**

Draft IPET-MDRD recommendation available at wmo.int/.../wiswiki/tiki-index.php

The rest is all controlled vocabulary:

Location (gmd:keyword or special tag)
is not an essential thing, I believe

ISO Topic Category

- //gmd:topicCategory
- Very coarse classification (19 total)
  - **climatologyMeteorologyAtmosphere**
  - **environment**
  - geoscientificInformation
  - health
  - intelligenceMilitary
  - farming ...

  Full list at schemacentral.com

WMO Category

- //gmd:keyword with special thesaurusName
- Finer classification (19 total)
  - synopticMeteorology
  - hydrology
  - aerology
  - **pollution**
  - **satelliteObservation**
  - **atmosphericComposition** [NEW!]

Full description:
http://wis.wmo.int/2012/codelists/WMOCodeLists.xml

Data policy (re-export restriction)

- //gmd:resourceConstraints
- You can choose one of keywords (optional)
  - “WMOEssential”
  - “WMOAdditional”
    - Res40 (Cg-XII) and Cg-XIII Res 25
  - “WMOOther”
    - Data NOT covered by WMO policy

Full description:
http://wis.wmo.int/2012/codelists/WMOCodeLists.xml

Intended realtime dissemination

- //gmd:keyword with special thesaurusName
- This is ***not*** a limitation nor confidentiality
  - Area the data should be deliverd to
- You can choose one of keywords (optional)
  - “GlobalExchange”
  - “RegionalExchange”
  - “OriginatingCentre”

Full description:
http://wis.wmo.int/2012/codelists/WMOCodeLists.xml

Now IPET-MDRD is working

- “Automate” the standard
  - Past WMO Core Profiles were a Word doc
  - Ver1.3: You can check online
- Care for each WMO programme
  - Guideline with examples
  - The GAW profile is of course an example
- Prepare for new ISO 19115-1:2012

Summary

- Meaning of *metadata* depends on context
- *WIS Discovery Metadata* is catalogue of data
- Uses ISO geographical metadata standard
- WMO has its own customization:
  - WMO Core Metadata Profile
  - Waiting for your input