WORLD CLIMATE RESEARCH PROGRAMME

Feedback from JSC41b, Model-data-home

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WMO UNESCO INTERNATIONAL COUNCIL FOR SCIENCE WCRP World Climate Research Programme

Towards a new WCRP Structure

Joint Scientific Committee

WCRP Secretariat

Lighthouse Activities
Major experiments, high visibility projects, infrastructure building blocks
Ambitious and exciting

International Offices

WCRP Communities
Enduring Capabilities, Homes for Expertise

- *Climate and Cryosphere*
- *Climate and Ocean Variability, Predictability and Change*
- *Global Energy and Water Exchanges*
- *Stratosphere-troposphere Processes And their Role in Climate*
- *Earth System Modelling and Observational Capabilities (new)*
- *Regional Climate Information for Societies (new)*

Ongoing and additional activities and fora

- Fixed-term Projects
- Conferences and Workshops
- Reference Datasets, Evaluations and Benchmarking
- Diversity- and Capacity-building: ECRs, Regions
- Rapid Updates, Syntheses Assessments, Gap Analyses
- Communications and Outreach

Proposed Lighthouse Activities

Explaining and Predicting Earth System Change

My Climate Risk

Safe Landing Climates

WCRP Academy

Digital Earths

These draw on WCRP's fundamental science, critical infrastructure and strategic partnerships

Provisional Names

Research Programme

Soft Transition Timeline

JSC-41

- Consultation on proposed WCRP structure and elements
- Assessment of all existing WCRP activities

JSC-42

- New "homes" decided and in place
- Lighthouse Activities initiated
- Old elements fade out

JSC-43

- New WCRP structure in place
- Implementation plan written and continuously updated

2020

WCRP Extraordinary Session Late 2020

2021

2022

Sunsetting WCRP Grand Challenges and activities

JSC-*n* = WCRP Joint Scientific Committee Sessions (meetings)

Model-data-home

Purpose: Address overall coordination mechanism across all model, data and observations activities within the programme.

Initial charge: Task Teams on “Modelling and Computing Infrastructure” and “Seamless Data and Data Management”, jointly charged to work on possible scenarios for the establishment of a Model-Data Home and make recommendations at JSC41b; M. Kimoto and M. Visbeck were the JSC liaisons.

Challenges: Buy-in from the community, efficient links to other homes, efficient links to LHAs

See also: Document with details on the JSC41b web site

Model-data-home: vision

Vision: **To serve as an overall coordination mechanism across necessary model, data and observations activities within the programme** with the following aims:

1. To foster a seamless and value-chain model-data-observation approach across Earth system components (Goals 1-4 of the WCRP Strategic Plan)
2. To bring about integrated modelling and data infrastructures, data policy, protocols and standards to serve the broader interest of the programme (Critical Infrastructures of the WCRP Strategic Plan)

3. To share best practices, data, knowledge, challenges and opportunities, and ensure engagement, equal access and inclusion of the 'global south' (Engagement and Partners of the WCRP Strategic Plan)
4. To identify critical stakeholders, scientific ambition and resourcing needs along this model-data-observation value chain, and to remove fragmentation, duplications and suboptimal aspects in the programme on those matters

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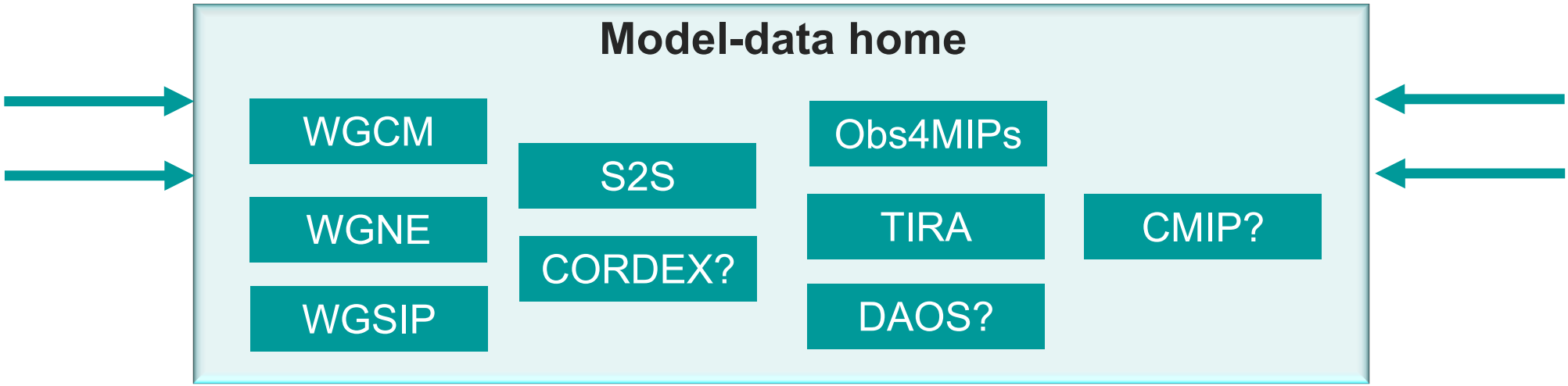
Model-data-home: scope

Scope (this is a small selection from the reference document):

- Data science
  - Foster a stronger Earth system approach for reanalyses/assimilation, which currently are largely uncoupled
  - Coordinate observations, reanalyses, data science and data management research issues across the programme and across WMO
- Modelling
  - Promote the understanding and reduction of the many systematic errors found in Earth system models
  - Explore the comprehensive use of data science and machine learning
- Computing and data infrastructures
  - Adopt a seamless climate data management
  - Promote the adaptation of codes for exascale computing architectures, data infrastructures and the necessary efficient output management

Model-data-home: structure & resources



- Scientific steering group (or similar) reporting to JSC
- Ex-officio from other homes, LHAs, WWRP, GAW, GCOS and others
- Could also be framed as horizontal dimension across other homes
- Jump started from the reps of the Councils and groups brought in, then in the rotation move to an independent group after 2-3 years
- Advantage could be taken of the excitement around AI/ML by setting up a new specific group in this arena
- Need for Secretariat support, both from Geneva and a project office (either associated with the CMIP-IPO or not)
- Need for community buy-in for such ambitious plan

Model-data-home: relationships

- **Internal**
  - Linkages to WCRP constituencies, homes and LHAs
- **External**
  - WWRP, GAW, GCOS, space agencies (via CEOS/CGMS WG Climate) and Future Earth (e.g., AIMES, PAGES), SOLAS
  - Engagement with data standardization initiatives like NetCDF/CF and the World Data System (WDS-ISC)
  - Broader stakeholders like UNFCCC, IPCC (IPCC TG-Data and the IPCC Data Distribution Centre), GFCS (and initiatives like C3S), IOC-UNESCO, ISC, WMO entities like WMO Lead Centres and Global Producing Centres, NMHSs, Regional Climate Centres, etc.
- What role for broader engagement opportunities with NGOs, industry and regional activities? How to handle the deficit in the global south?

Stakeholders are those who might use the research outputs

Model-data-home: proposed timeline

This plan should be elaborated further after the JSC41b session. A team of 6-8 volunteers is proposed to design the implementation as follows:

1. **Year 1**: Set the home's governance, initial SSG, high-level contributions to both LHA and core activities and define secretariat support arrangements for JSC approval in 2021 and organise a kick-off event to also close the WCRP Data Advisory and Modelling Advisory Councils)
2. **Year 2**: Update/revise governance and set specific research priorities with the home's constituencies and establish the external partnership arrangements for JSC's approval in 2022
3. **Years 3-5**: Implementation of research priorities, resource mobilization, communication and outreach
4. **Years 6-10**: Implementation of a revised plan following a mid-term review taking place in year 5

Model-data-home: implementation options

Four main options proposed and developed during this consultation and summarized as follows:

1. **Option 1**: model-data home including CMIP governance; separate offices for resp. model-data home and CMIP coordination (23%)
2. **Option 2**: equivalent to option 1 but using CMIP branding, slightly revised CMIP framework, office(s) carry the CMIP brand (60%)
3. **Option 3**: model-data home NOT including CMIP governance; separate offices for resp. model-data home and CMIP coordination (4%)
4. **Option 4**: merger of current Councils without dedicated office support (13%)

NB Poll results on preference (%), 30 responses received, representation of the WCRP family

JSC41b: JSC is favouring Option 1 or 3 probably