

# Accelerating WIS 2.0 Implementation in Asia

## Technical Foundations and Regional Support

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# Objectives of This Keynote

- Provide historical and technical context for WIS2.0
- Explain why migration is necessary and what challenges exist
- Show Japan's role in supporting participating countries
- Prepare for following lectures and hands-on session by clarifying metadata importance

# Historical Evolution

- 19th century: Telegraph-based weather reporting → IMO/WMO formation
- 1960s: JFK's UN proposal → World Weather Watch → GTS established
- 2000s: WIS1.0 introduced (Internet catalog + GTS backbone)
- 2020s: WIS2.0 replaces GTS with open standards

# GTS Architecture and Limitations

- Push-based TCP transmission → manual routing
- High cost, specialized software, static routing
- Operational complexity and sustainability issues

# Why WIS2.0?

- MQTT Pub/Sub model solves push inefficiency
- HTTP(S) for flexible data access
- Enables large-volume data exchange (satellite, NWP)
- Open-source tools ensure sustainability

# WIS2.0 Architecture Overview

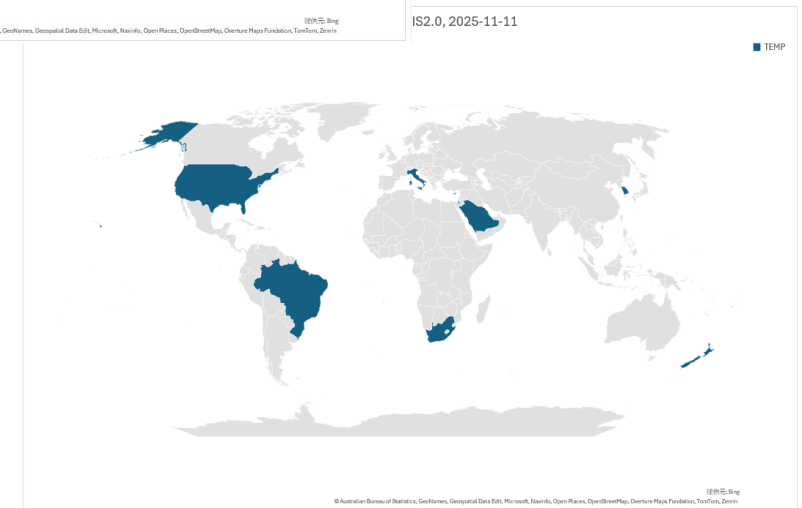
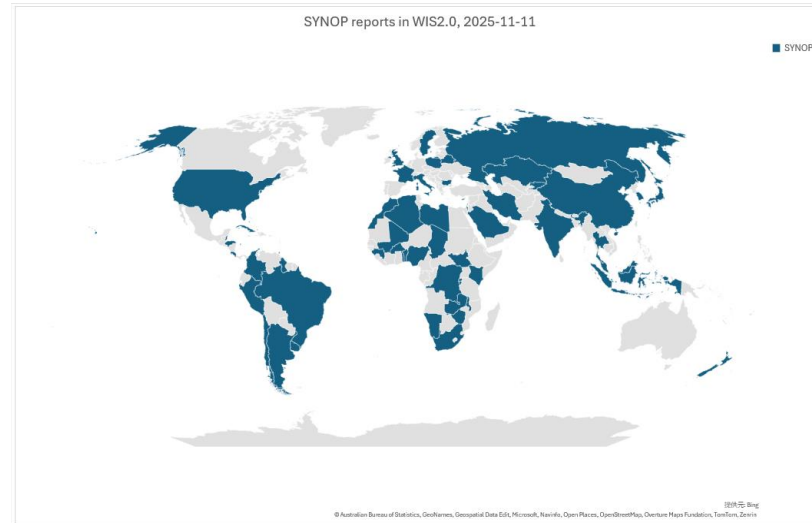
- WIS2 Node: HTTP endpoint + MQTT broker
  - MQTT notifies when new data comes in
  - Data can be downloaded via HTTP
- Global Services: Broker, Cache, Discovery Catalogue, Monitor
  - Broker relays MQTT
  - Cache holds data to download by HTTP
- Metadata: WCMP v2 standard
  - Publishing metadata makes your data visible globally

# Migration Timeline

- 2025: Operational start
- 2030: 90% migration target
- 2033: GTS retirement
- Gateway support during transition

# Migration Nov 2025

- WIS2.0 messages
  - SYNOP: 74 centres
  - TEMP: 17 centres
- GTS-to-WIS gateway
  - SYNOP/SHIP: 168 countries
  - TEMP: 102 counties



# Connectivity Transition – Challenges and Context

- From leased lines (GTS) to Internet (WIS2.0)
  - Expected to reduce costs
- Regional Challenge
  - Internet connectivity remains unstable in some parts of the region
- Japan will not rush you
  - GTS will remain operational as long as any participant depends on it
  - Japan operates the GTS-to-WIS2 gateway to ensure continuity
  - We will keep the WIS community informed to ensure no one is left behind

# Solution Choices – WIS2Box and Beyond

- WIS2Box: WMO's open-source reference implementation, widely adopted
- Some countries choose WIS2Box for rapid deployment; others develop their own solutions for control and sustainability
- *Solution depends on your national strategy: Japan supports both approaches*

# JMA's Role and Support Roadmap

- Global Cache on AWS (to be operational very soon)
- GTS-to-WIS2 Gateway ensures continuity for Members still using GTS
- Onsite technical meetings
- Training workshops
- *Whatever solution you choose, Japan will assist with configuration, metadata compliance, and interoperability.*

# WIS Manual Volume II and WCMP v2

- 2023: First adoption of Volume II
  - Previous JMA Workshop in 2023
- 2024: Major revision → detailed implementation rules
- WCMP v2 central to global data discovery

# Hands-on Preparation

- Today's focus: metadata creation and data publishing
- Why this matters: without metadata, data is invisible
- Practical tips for accurate WCMP v2 records
- *In the hands-on session, you will practice metadata creation using both wis2box and an Excel-based workflow.*

# Closing Message

- WIS2.0 is the backbone for future meteorological data exchange
- Migration takes time, and Japan will support you throughout
- *Let's build a sustainable, inclusive, and interoperable system together.*