

Re-Establishing Typhoon Reconnaissance Capability in the Western-North Pacific: Summary of the 2025 Pilot Study and Plans for 2026

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A WC-130J Super Hercules aircraft from the 53rd Weather Reconnaissance Squadron sits on the flightline prior to an atmospheric river mission at Travis Air Force Base, Calif.

Re-establish Typhoon Reconnaissance Capability in the West-North Pacific

The vision:

multinational cooperation on operational typhoon reconnaissance capability in the Western Pacific.

Active partners:

US (NOAA: OMAO, AOC, NWS- Guam, NCAR, DoW/JTWC), **Korea** (KMA/NIMS, Ewha Womans Univ, KNU), **Japan** (Nagoya Univ, JMA/MRI), **Taiwan** (NTU, CWA), and soon Philippines (PAGASA).

Re-establish Typhoon Reconnaissance Capability in the West-North Pacific

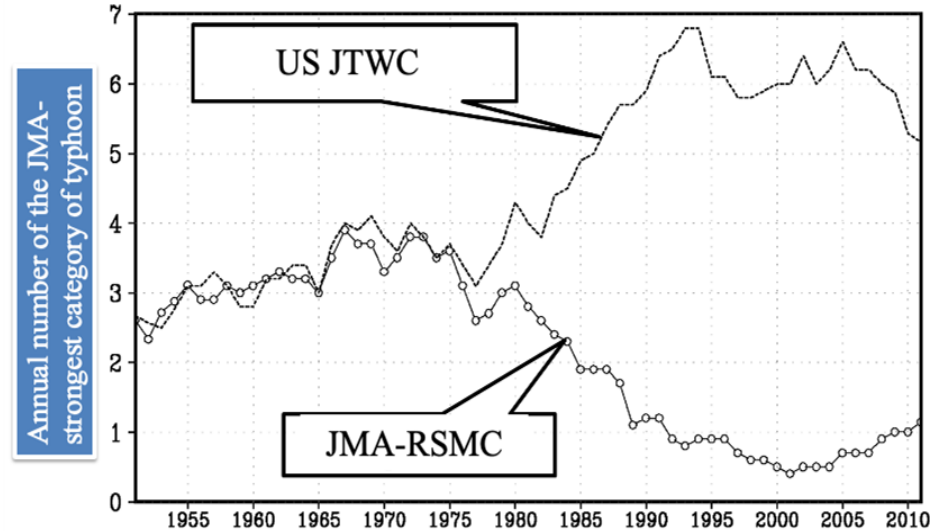
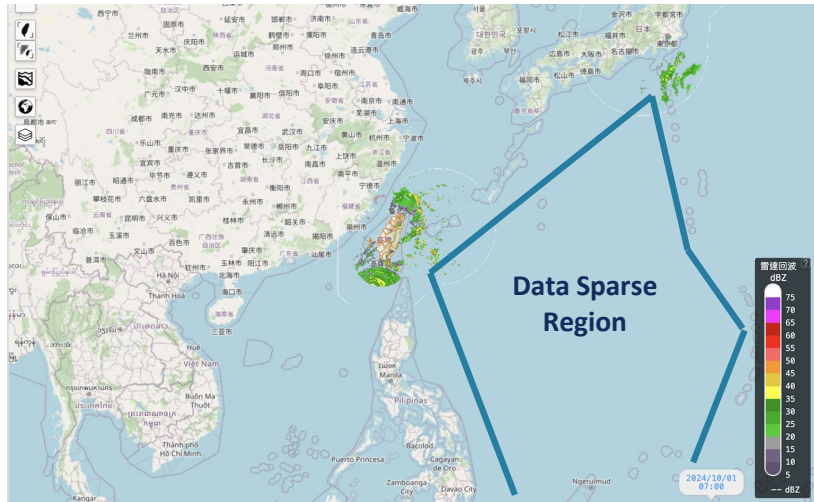
Goals of the effort:

1. Reestablish and strengthen the typhoon reconnaissance capability in the WNP region with state-of-the-art observing facilities to improve observations and operational prediction of typhoons to reduce risks from typhoons in the region.
2. Facilitate multinational collaboration leading to increased data sharing, accessibility, and use for both research and operation communities.
3. Strengthen geo-political partnerships around strategies to enhance the resilience of the region against the impacts of increasingly extreme weather events, in particular to enhance regional security and partnership to build and expand reconnaissance capabilities across the region.

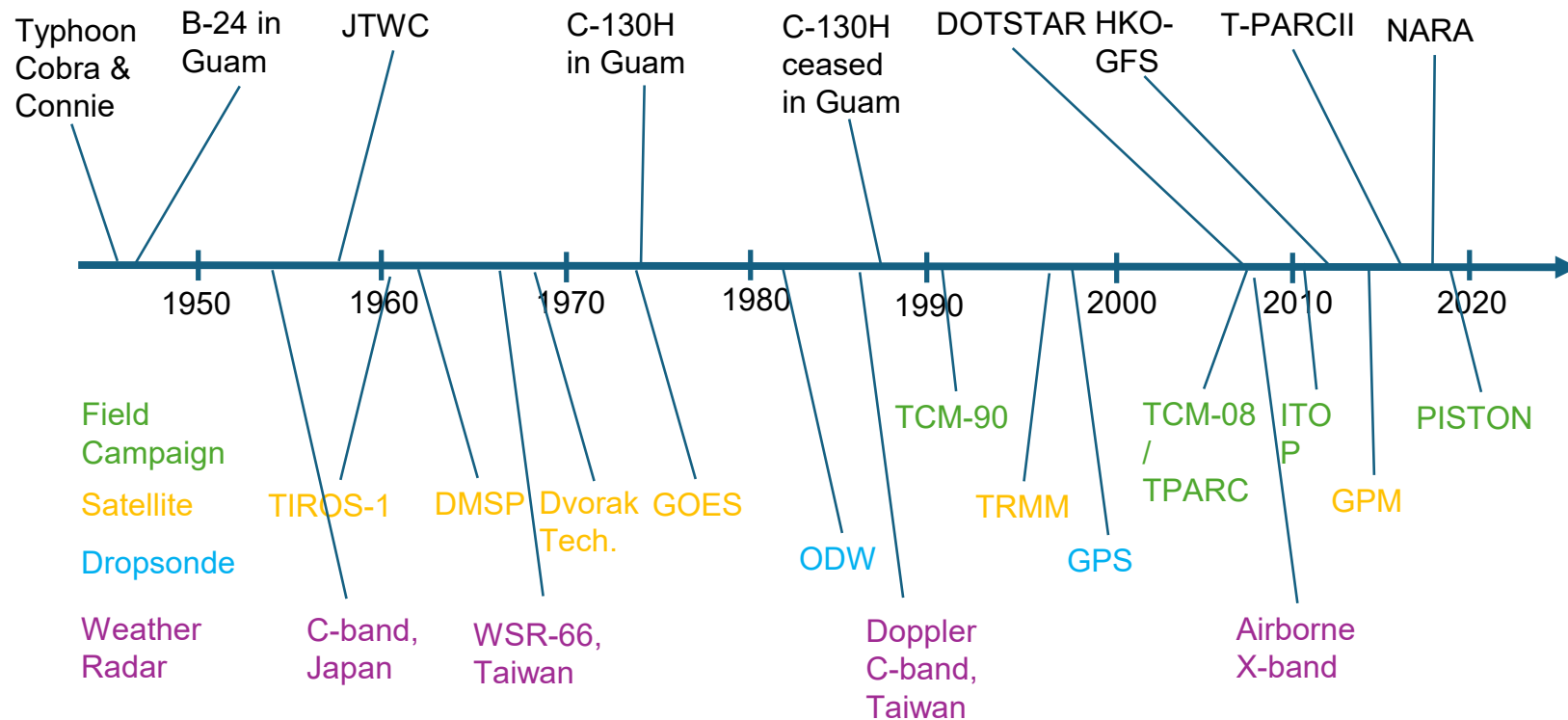
Motivating Need for WPAC Reconnaissance

Asian-Pacific Typhoon Forecast Challenges

No inner core penetration by TC reconnaissance aircraft since 1987 has made the assessment of typhoon intensity difficult in the Asian-Pacific Region



History of West Pacific Typhoon Reconnaissance/Observation



Potential Impacts of Sustained Aerial Reconnaissance Program in West Pac

- Improved measurements of storm intensity, structure, and environment lead to better predictions
- True typhoon intensity known in advance to aid emergency management decisions
- Protecting society and US military interests in WPAC region
- Strengthening partnerships in the region to advance other development (Tech Transfer, model development, etc)
- Potential to create demand for NCAR aircraft for research missions

Background & Vision

Re-establish Typhoon Reconnaissance in West-North Pacific

Highlights from partner meetings

- Broad interest in re-establishing typhoon reconnaissance capability in West Pac
- Proposal-based Recon using civilian aircraft does not meet the needs for research and operation (continuity, frequency, density, etc.)
- Adapt Atlantic-basin model to West Pac → Expand partnerships with sectors (e.g. civilian, operational, academic, and non-civilian) & countries
 - Multinational cooperation means no single country carries the load.

Aspirational Vision - *Revolutionize TC reconnaissance and prediction*

2025

West Pac Typhoon Pilot Study

2030

US aircraft + Int'l partner aircraft

204X

Multi-nation fleet of C-130 and high-altitude aircraft equipped with state-of-the-art observing facilities (e.g., polarimetric Doppler radar, lidars, dropsonde, etc.) enabling nearly continuous sampling of TC from genesis to landfall

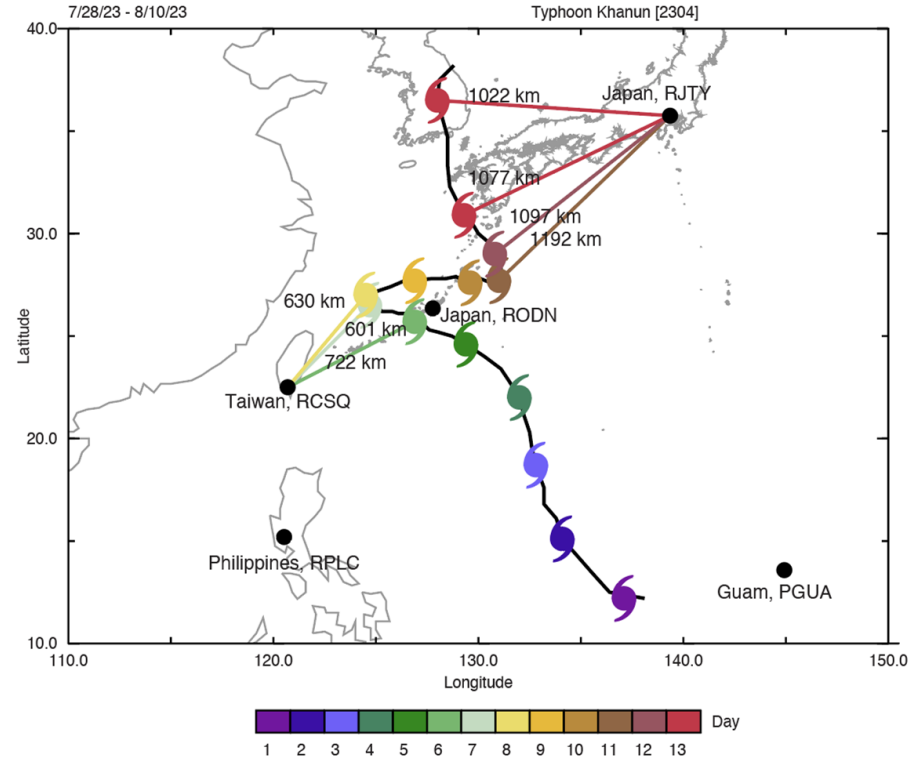
2025 Summer Pilot Study

Goals:

- Understand needs for data use and dissemination to/from partners
- Convene regular flight coordination meetings
- Explore possibility of one multi-national coordinated mission



Typhoon Khanun (2304)



2025 Pilot Study Concept of Operations

Summer 2025 Pilot Study

First step towards the vision with current partners: Japan, Korea, Taiwan, US

Activities:

- **Form data working group**
 - Inventory data related requirements and solutions to ensure all partners can receive and use data from partner flights
- **Convene regular meetings during typhoon season**
 - Establish mechanism for regular communication
 - Facilitate forecast briefings and discussions on protocols for a coordinated mission
 - Sharing of flight/mission plans before deployment
- **Explore possibility of coordinated campaign** (Japan, Korea, and Taiwan)
 - Leverage committed flight hours to coordinate a mission, pending an ideal storm
- **End of season review meeting - November 30 in Japan**

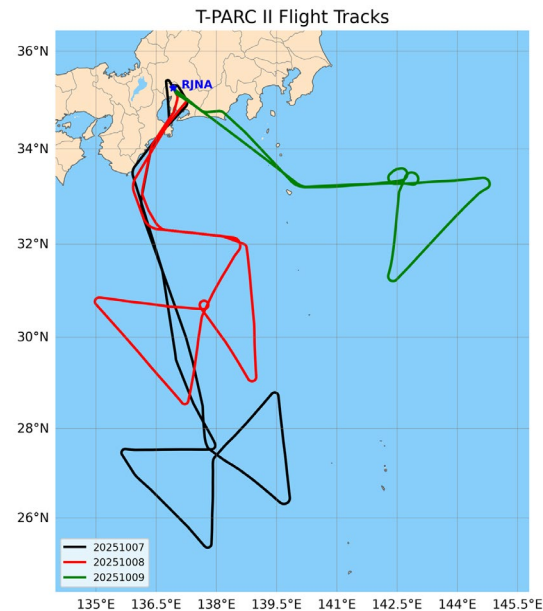
Outcomes & Recommendations

Outcomes:

- 13 forecast and flight planning meetings between 11 September and 11 November 2025 (between 5 and 10 participants for each)
- 6 flights into 3 storms (Ragasa, Halong, Fung Wong) by Japan and Taiwan with valuable data collected
- Data disseminated to data working group members
- Relationship building among multi-national research and operational partners (JTWC and NWS Guam)
- Foundation for communication channels and forecast briefings
- Shared understanding of flight planning, budgeting, and decision making processes

Recommendations:

- Begin planning process and coordination early
- Continue data working group
- Improve communication of aircraft plans to increase situational awareness among partners
- Get data distributed more quickly, to partners and others interested
- Add Philippines as a new partner as their capacity allows



Plans for 2026

Formalizing the Effort & Partners

- Letter of Intent for Collaboration
 - ◆ Mechanism to establish the collaborative effort
- Formalize partnerships with Philippines
- Planning for future year resources and activities
- Involvement beyond academic & operational partners

Questions?