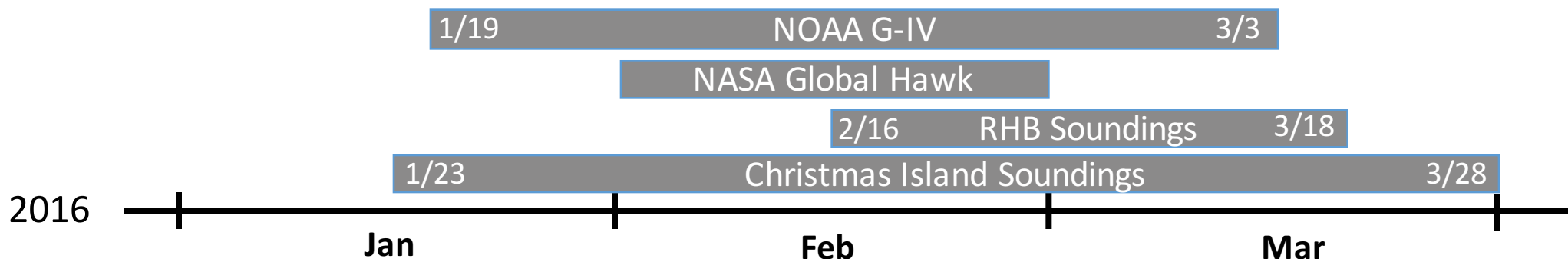

**NOAA El Nino Rapid Response
Field Campaign
Implementation Plan**

AMS 96th Annual Meeting

**Ryan Spackman
12 January 2016**

Implementation Plan

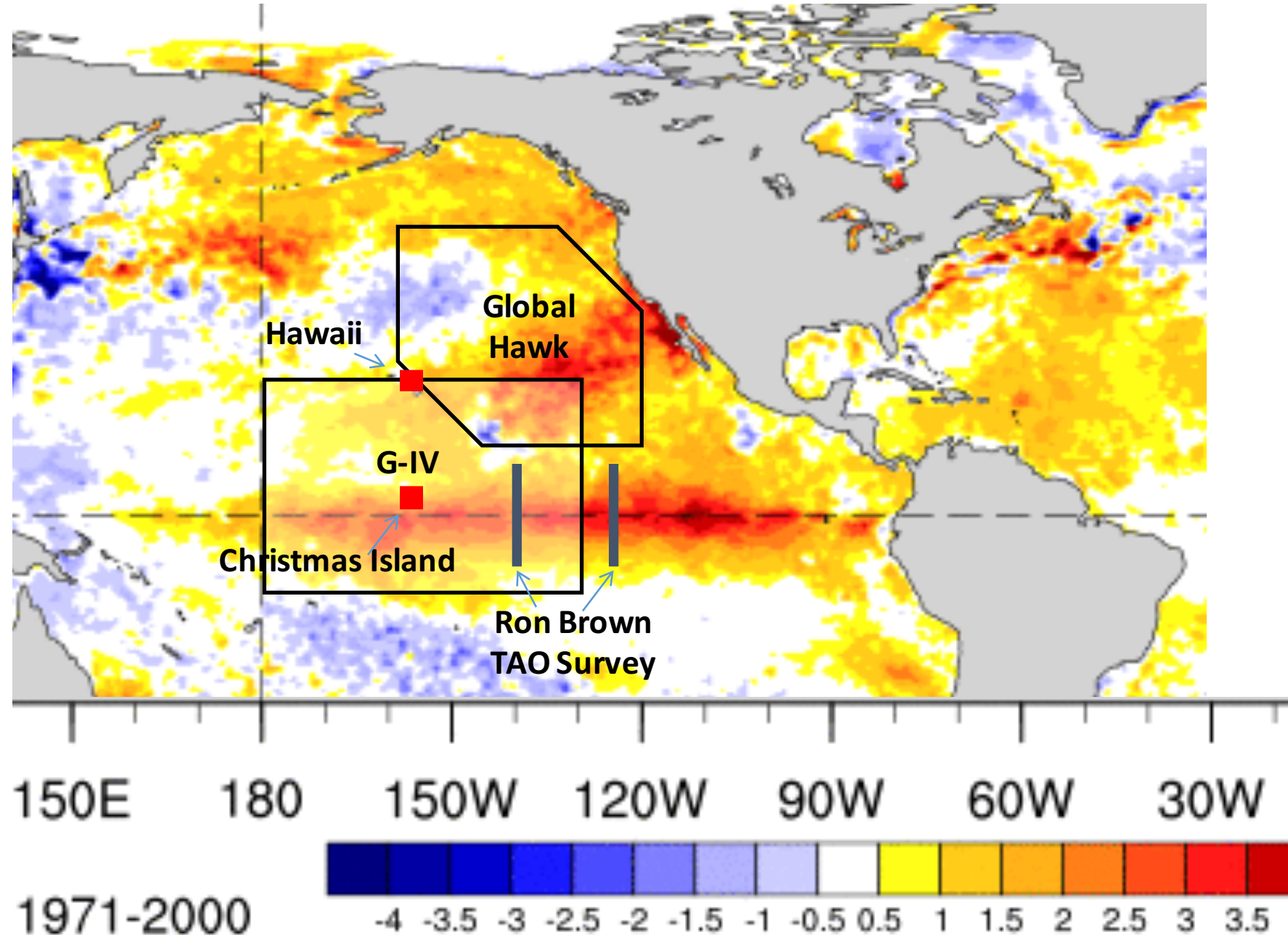
- NOAA G-IV is available for 45 days from 19 Jan to 3 Mar for 20 science flights operating from Hawaii with option to forward deploy if convection is south of equator – payload includes dropsondes and tail doppler radar
- NASA Global Hawk is available for 4-6 flights (24 hr duration) in 3 weeks in Feb as part of NOAA Unmanned Aircraft Systems SHOUT program operating from NASA Armstrong Flight Research Center at Edwards AFB
- Twice daily radiosonde launches on Christmas Island for 23 Jan – 28 Mar
- NOAA Ron Brown will be conducting a TAO survey 16 Feb – 18 Mar (Honolulu to San Diego) along 140°W and 125°W providing a cruise of opportunity for 6 to 8 times daily radiosonde launches



Planned Implementation Strategy

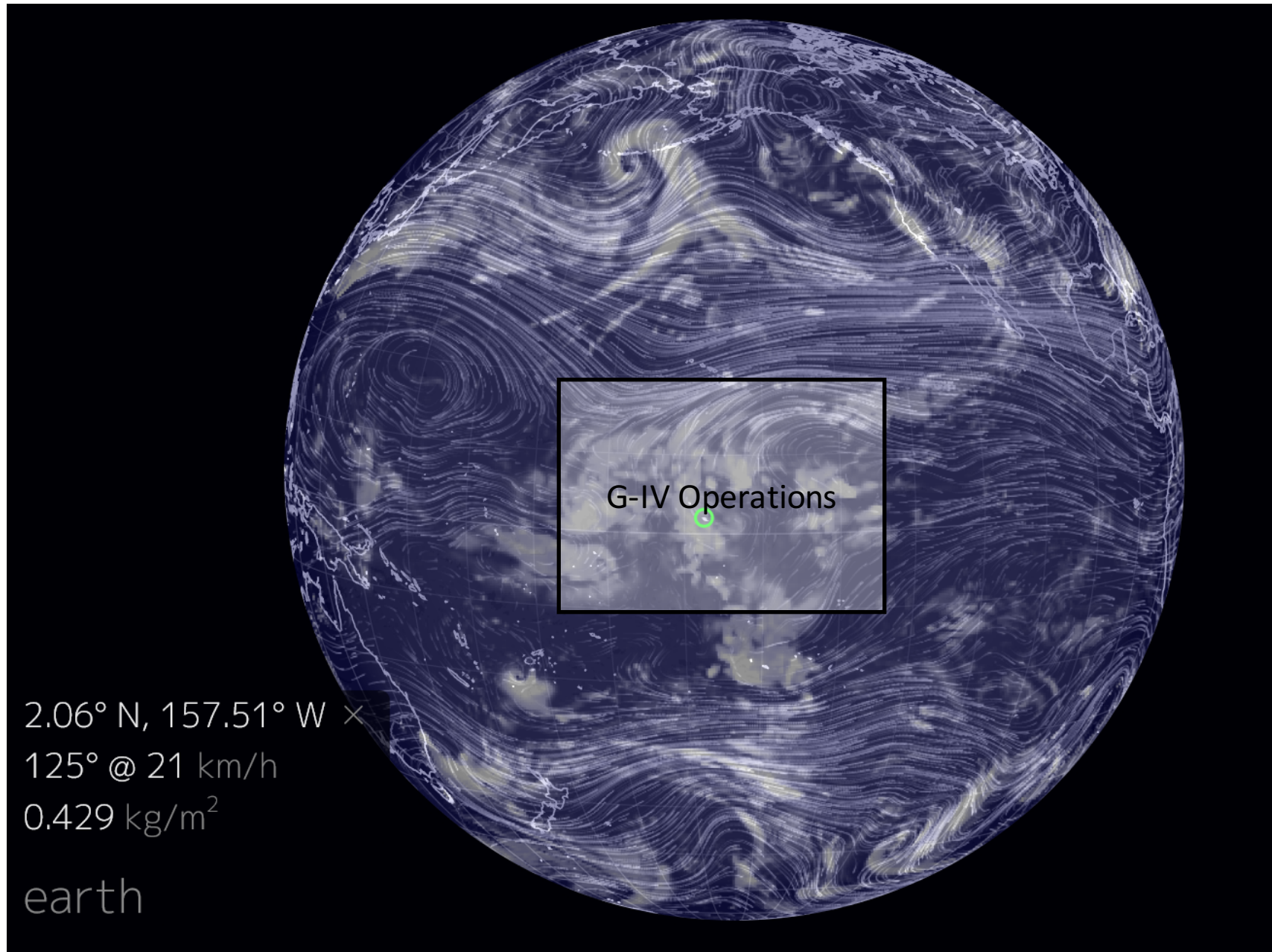
- G-IV: Divergent outflow and jet extension processes in central and eastern tropical Pacific
- Global Hawk: Coupling to midlatitude weather with surveys in eastern Pacific midlatitudes to evaluate impacts on U.S. West Coast
- Ron Brown: Survey of atmosphere and ocean conditions in eastern tropical Pacific

SST Daily Anomalies (°C), 25 Oct 2015

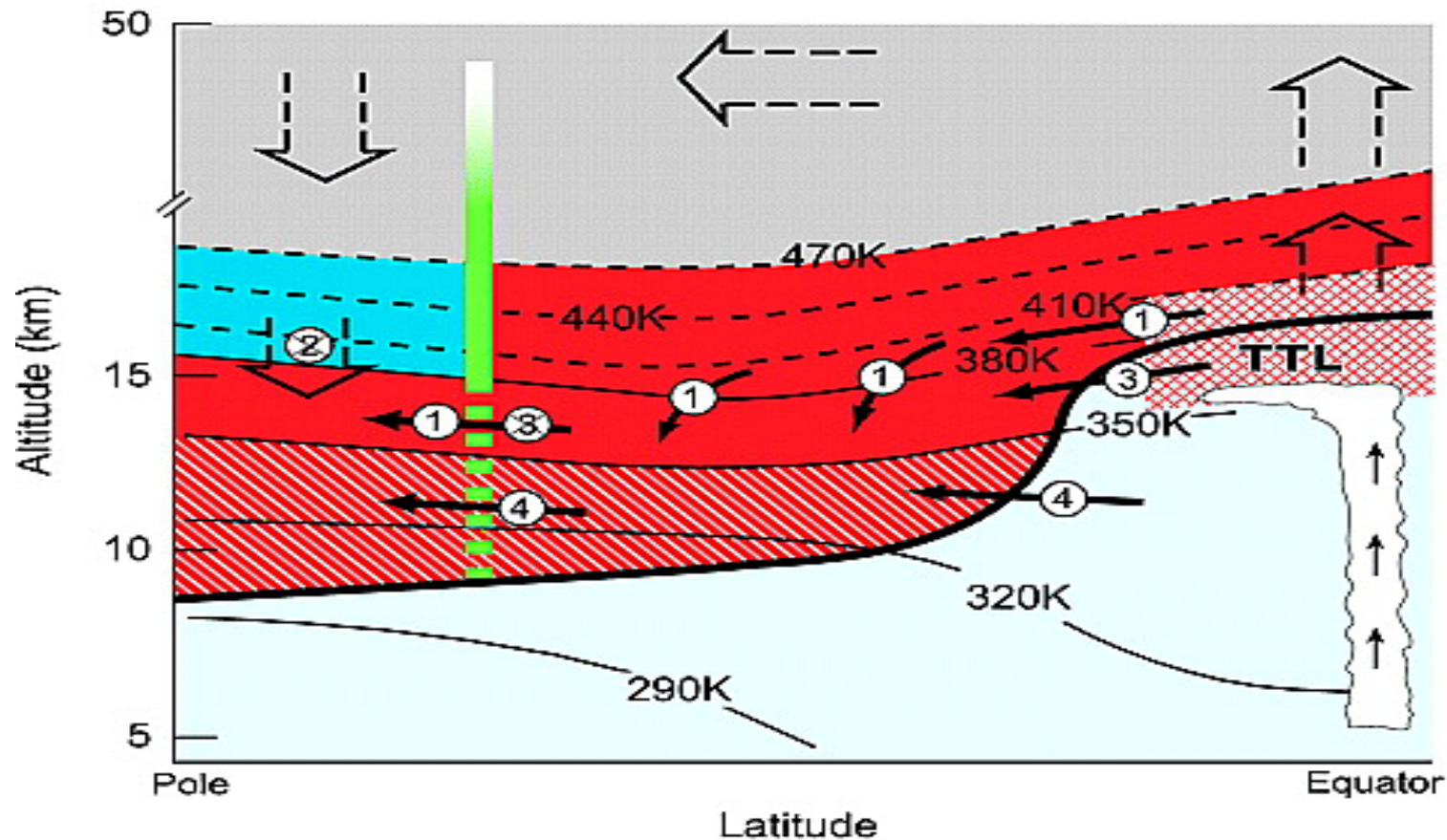


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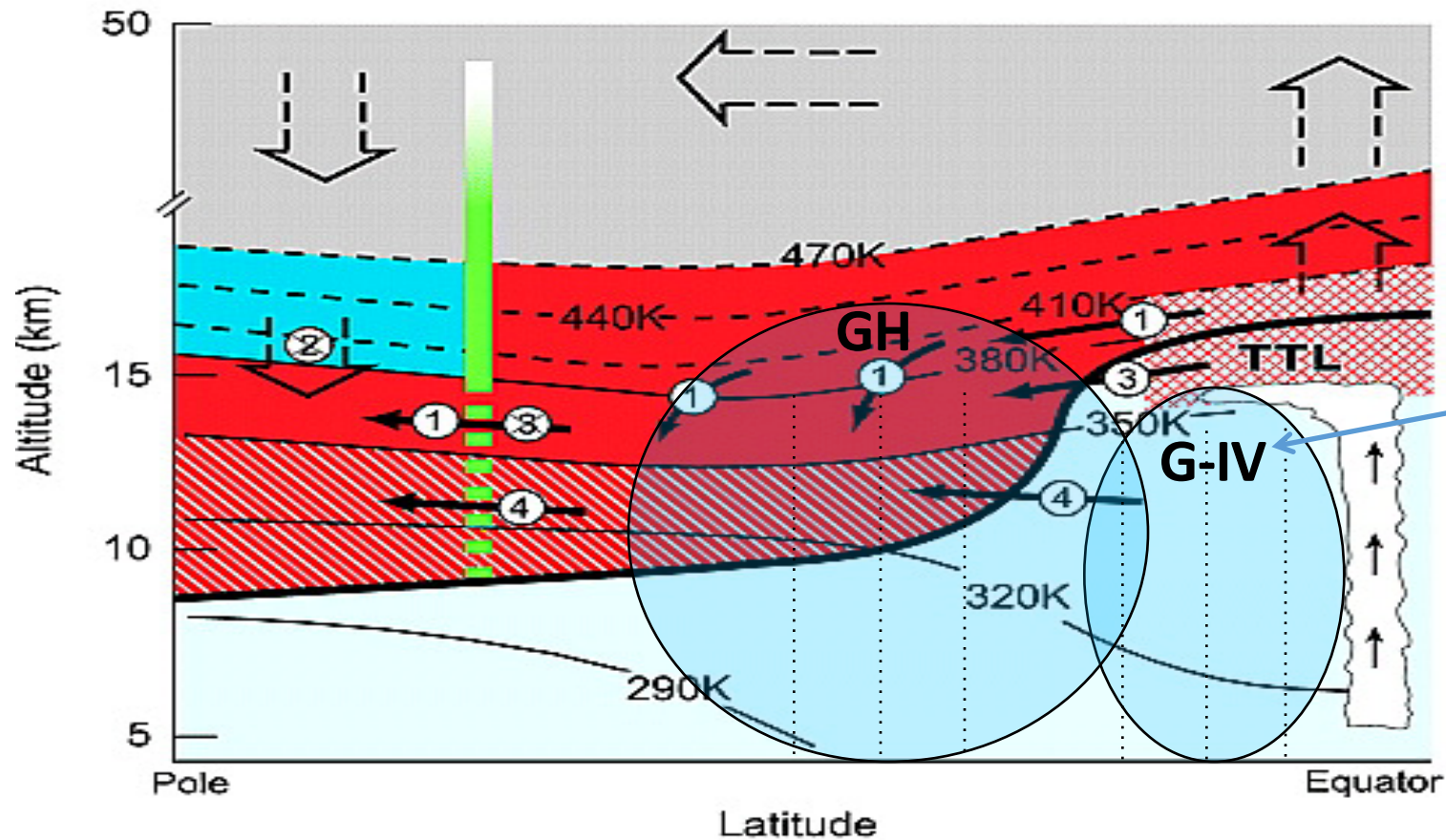


Meridional Perspective on Flight Strategies



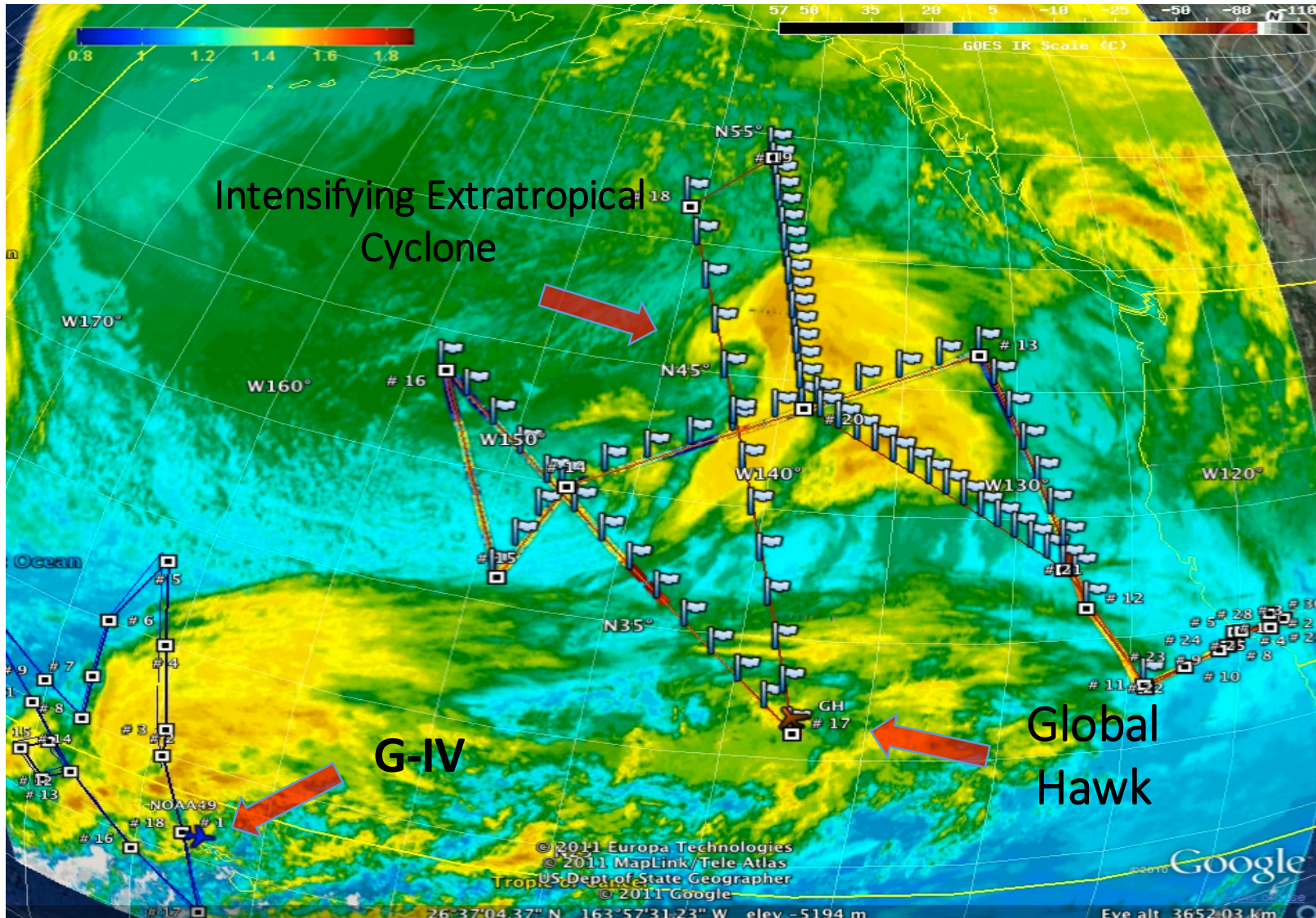
- G-IV: Divergent flow aloft in central/eastern tropical Pacific should mostly be reachable by G-IV at altitude of 12-14 km and captured by dropsonde measurements
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Perspective from Winter Storms and Pacific Atmospheric Rivers (WISPAR) Mission



- GOES West IR image showing winter storm in North Pacific and system near Hawaii
- GH: 70 dropsondes



- G-IV: 43 dropsondes



NOAA G-IV Aircraft Operations

- G-IV is available for 20 science flights in 45 field days
- G-IV will base flight operations from an established FBO at Honolulu International Airport (21.3°N, 157.9°W) to facilitate logistics for science team and crew access
- AOC is planning for possible forward deployments to Tahiti (17.7°S, 149.4°W), American Samoa (14.3°S, 170.7°W), and Kiritimati (1.9°S, 157.4°W) to ensure we can reach convective outflow throughout the central and eastern tropical Pacific
- **Payload:** Dropsondes, tail doppler radar, stepped-frequency microwave radiometer, flight-level met measurements
- Science team will have at least one onboard scientist on each flight in satellite communication with the mission science team on the ground



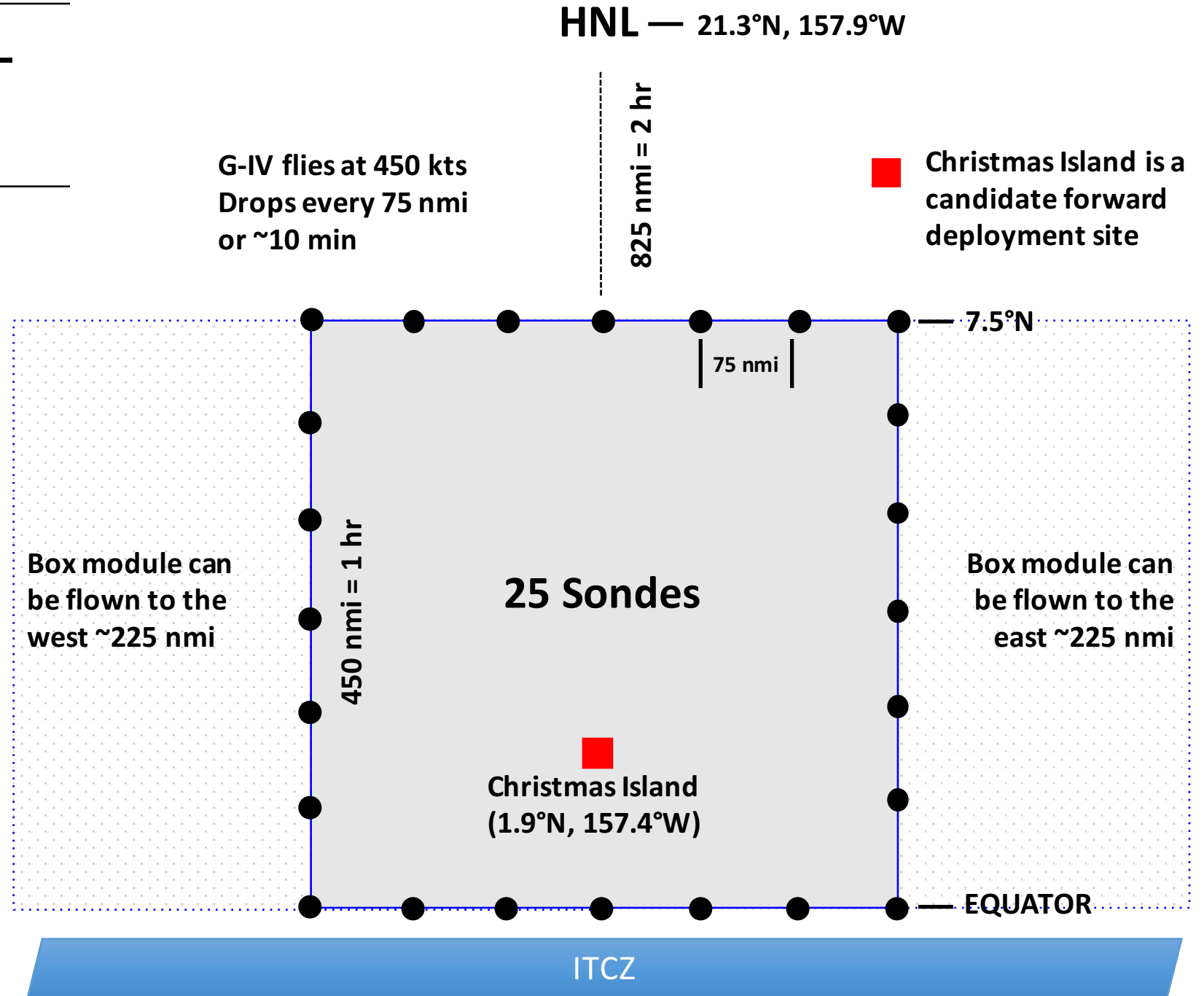
NASA Global Hawk Aircraft Operations

- Global Hawk is available for 4 flights in 3 weeks in February based from NASA Armstrong Flight Research Center at Edwards AFB in SoCal
- Full science flights are 24 hr in duration
- GH flight sampling will respond, in part, to SHOUT science objectives with the opportunity for focused El Nino Rapid Response flight modules
- Operations allow for up to 2 full science flights in a 3-day period with 24 hours between flights
- **Payload:** AVAPS (Dropsondes, 75 sondes/flight), HIWRAP (Ku-/Ka-band radar), HAMSr (microwave radiometer), and **CSD Ozone instrument**
- Mission scientists staff the Global Hawk Operations Center at NASA AFRC during flights and real-time processing of dropsondes is conducted on the ground and then uploaded to the GTS



G-IV Flight Module – Deep Tropics


- Sample thermodynamics and wind field north of the ITCZ
- Box module is 450 nmi square with 75 nmi dropsonde spacing
- G-IV performs box module in 4 hr at cruise altitude (41-45 kft)
- Expected total flight duration for pattern shown is 8 hr (~3500 nmi)

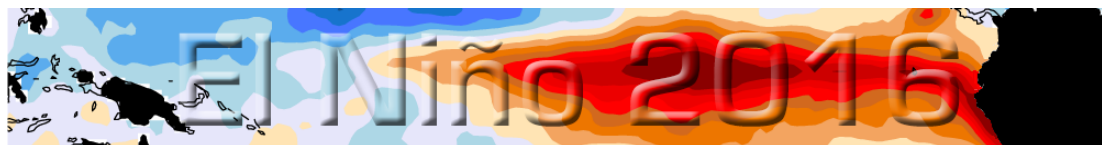


Daily Operations

- Daily 1 hour forecast briefings will be hosted from Boulder
 - 0730 HT / 0930 PT / 1030 MT
 - Tropical Forecast
 - Short-term extratropical (1-3 days)
 - Medium-range outlook (4-10 days)
- Mission science discussion and decisions
- Coordinate G-IV flight plans with Global Hawk UAS Team
- File GH flight plans by 1100 PT
- File G-IV flight plans filed by 1100 HT
- Monitor flights using NASA Ames-developed Mission Tool Suite

U.S. Department of Commerce | National Oceanic & Atmospheric Administration | NOAA Research

 **Earth System Research Laboratory**
Physical Sciences Division



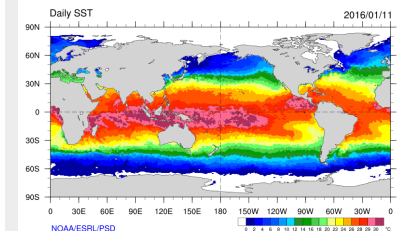
NOAA El Niño Rapid Response Field Campaign - Forecasting Resources

[Current Conditions](#) | [Tropical Forecast Resources](#) | [Short-Term Forecast Resources](#) | [Medium Range Forecast Resources](#)

Current Conditions

Sea Surface Temperature (SST) (NOAA/ESRL/PSD)

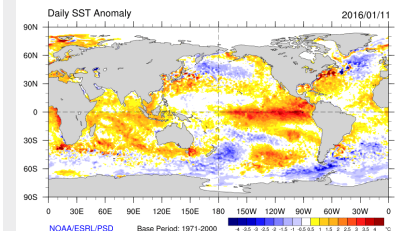
Today's SSTs



NOAA/ESRL/PSD

Weekly Animation

Today's SST Anomalies



NOAA/ESRL/PSD

Base Period: 1971-2000

Weekly Animation

[More SST Maps \(PSD Map Room\): Weekly, Monthly, and Seasonal Averages](#)