



# Dropsonde Data Quality Control:

## *PREDICT*

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# Overview

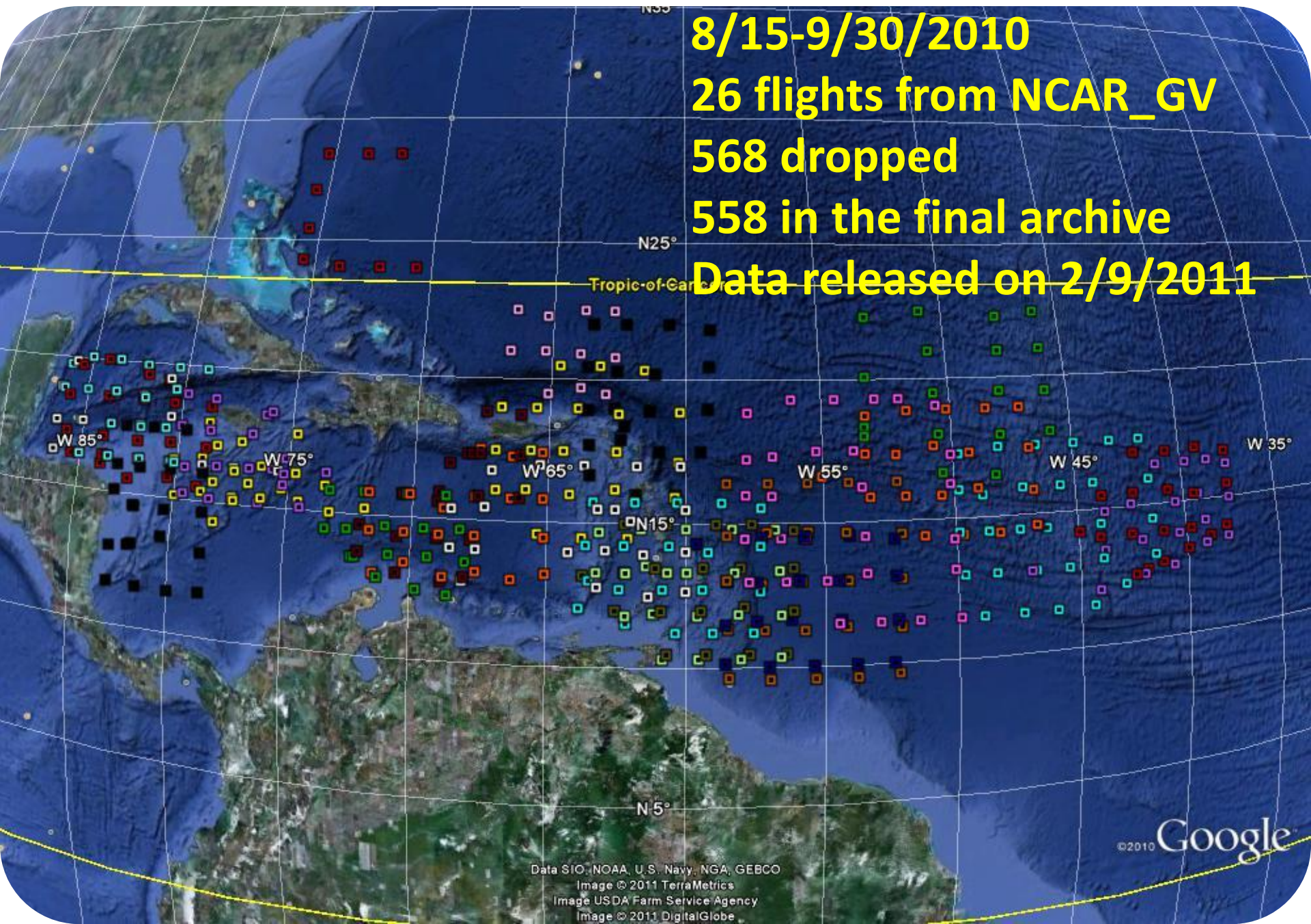
8/15-9/30/2010

26 flights from NCAR\_GV

568 dropped

558 in the final archive

Data released on 2/9/2011

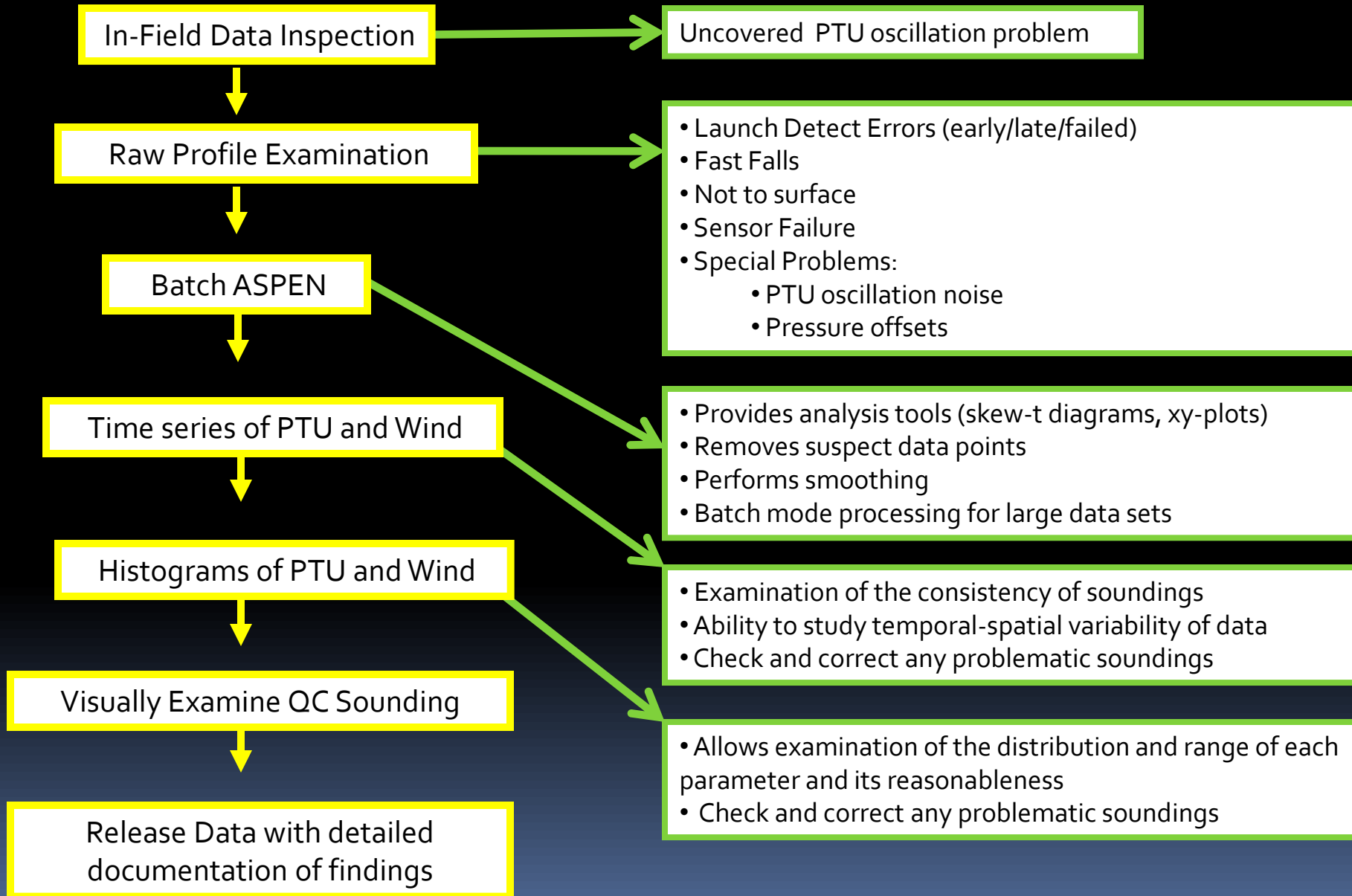




1. **Communication** was established using the tri-agency email. Using that alias, it was easy to identify who could help in resolving issues that arose.
2. **Student operators** in the operations center to evaluate data quality, submit messages to the GTS, and to communicate errors or problems to senior staff.
3. Collective effort to thoroughly test and identify problems with **ASPEN V3** software on multiple platforms. We were able to have a robust version available before the project began (no further re-releases during the project were required).
4. **Near real-time evaluation** of the dropsonde data quality during the project was conducted and proved essential in identifying problems with the dropsonde PTU sensors.

## PREDICT Successes

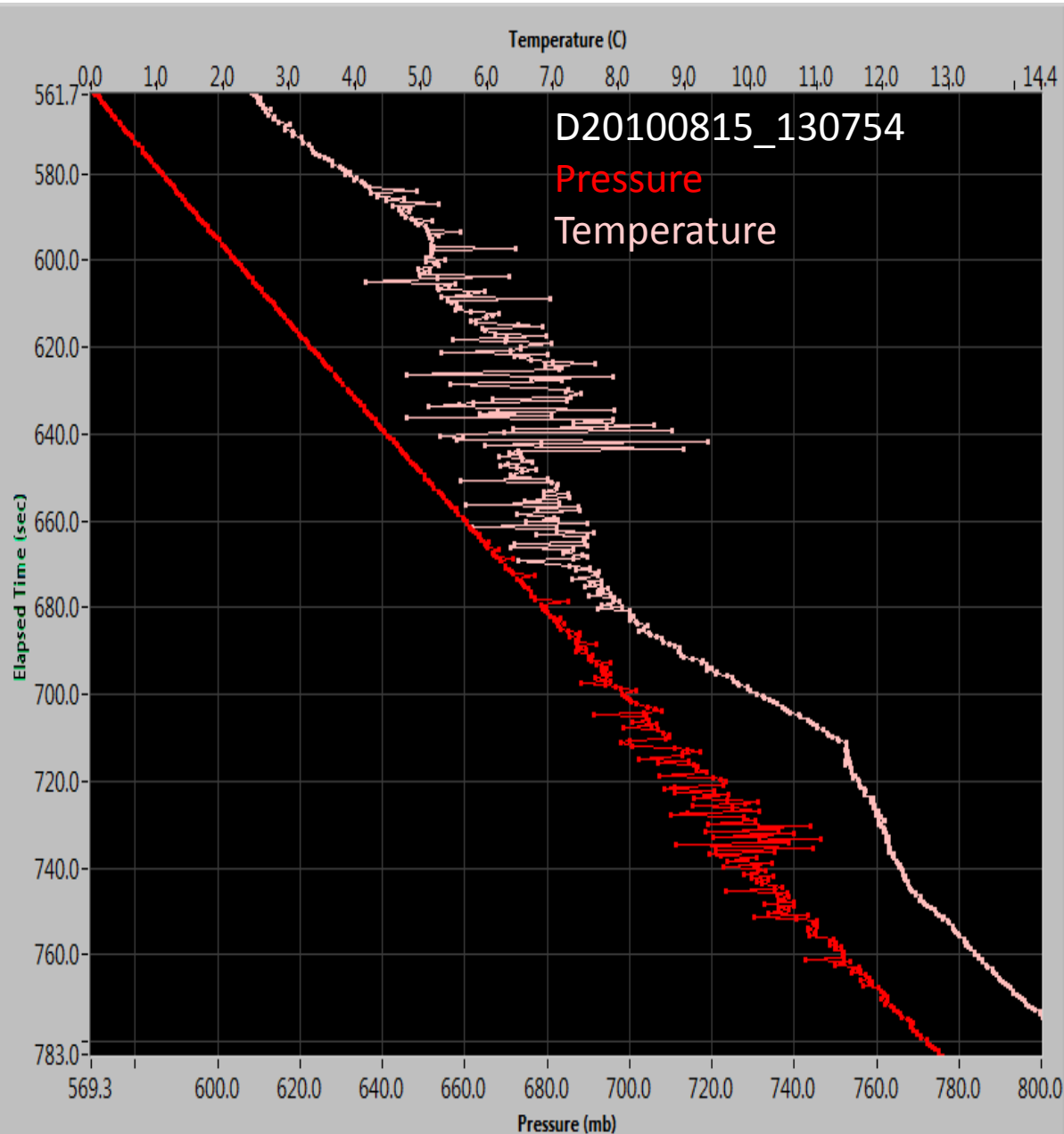
# Quality Control of Dropsonde data



# Results and Statistics

- 568 dropsondes were used, 558 are included in the final data archive.
- 11 soundings were affected by the PTU oscillation error and contain sparse data
- One sounding experienced interference from another sonde started on the same frequency . Some data was lost during this time.
- 9 soundings experienced large, temporary offsets in the pressure, temperature and humidity
- 8 soundings failed to transmit to the surface (Geopotential altitude calculated downward).
- 21 soundings were “fast fall” soundings, and 20 were “partial fast-fall”
- 7 soundings experienced failure of one or more sensors, resulting in data loss.
- Launch detect (LD) errors (7 early, 2 failed, 29 late)

# PTU Oscillations



## Issue

11 soundings had varying degrees of noise or oscillations in the pressure, temperature and/or RH data.

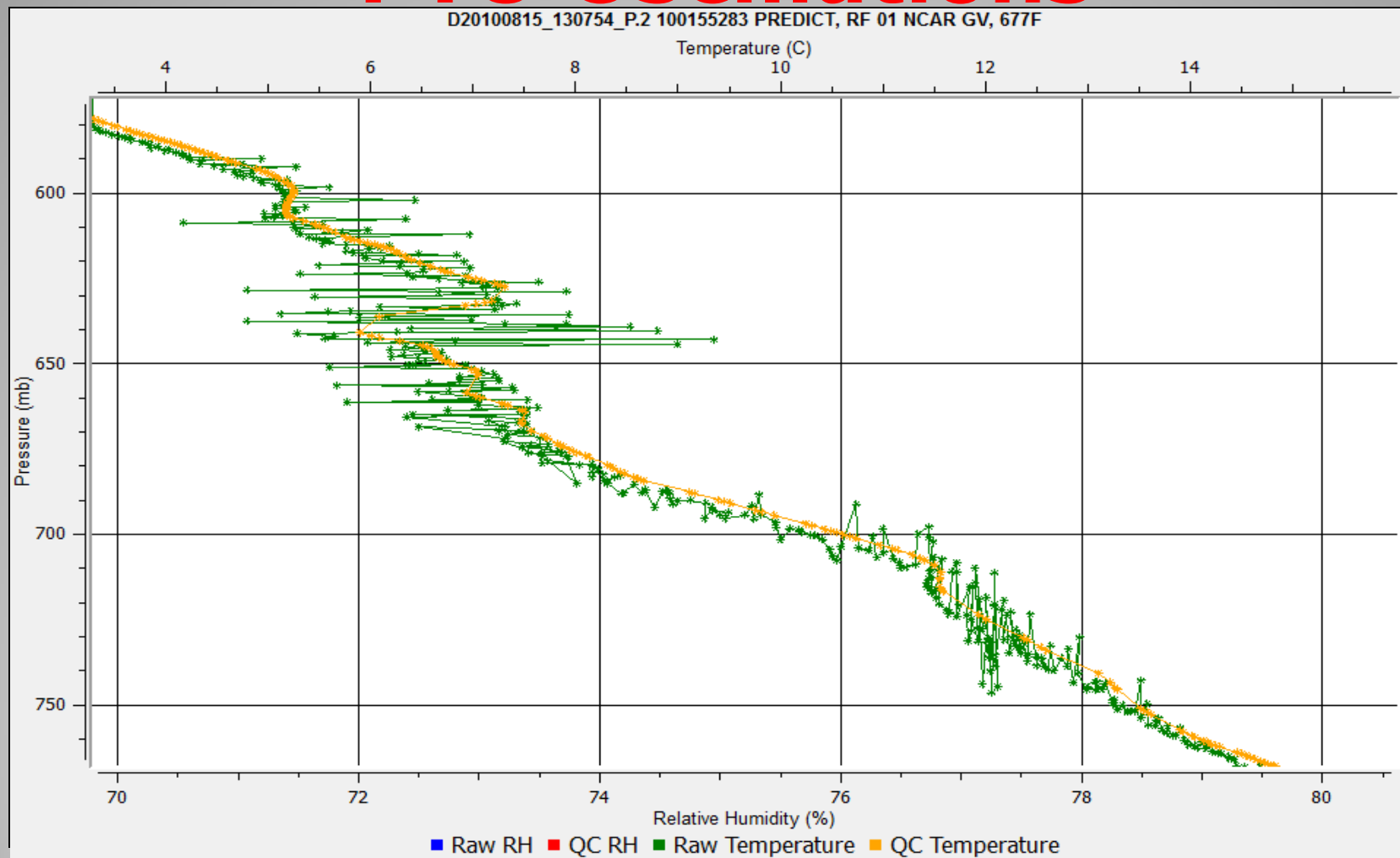
## Cause

RF energy from the dropsonde transmitter antenna inducing noise in the PTU module which was caused by a manufacturing change in the PTU module and tolerance of electronic components in the dropsonde.

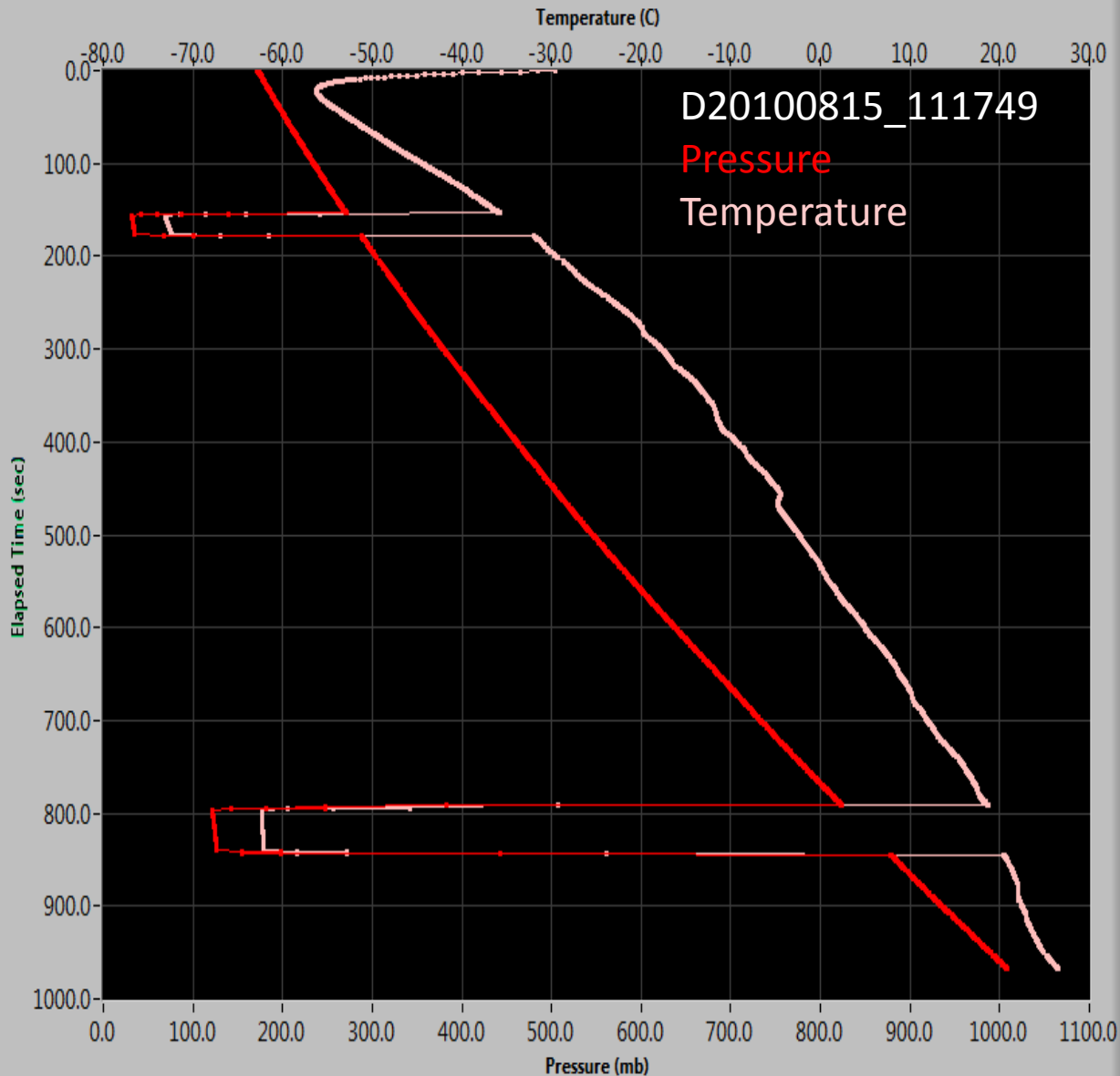
## Corrections

- The problem was resolved in the manufacturing for new sondes.
- These files were processed through ASPEN with more restrictive QC parameters than are typically used. This removed virtually all evidence of the oscillations. As a result, these soundings can be data sparse.

# PTU Oscillations



# PTU Offsets



**Issue:**

**Nine soundings had large, temporary offsets in pressure, temperature and humidity.**

**Cause:**

**Vaisala PTU firmware problems.**

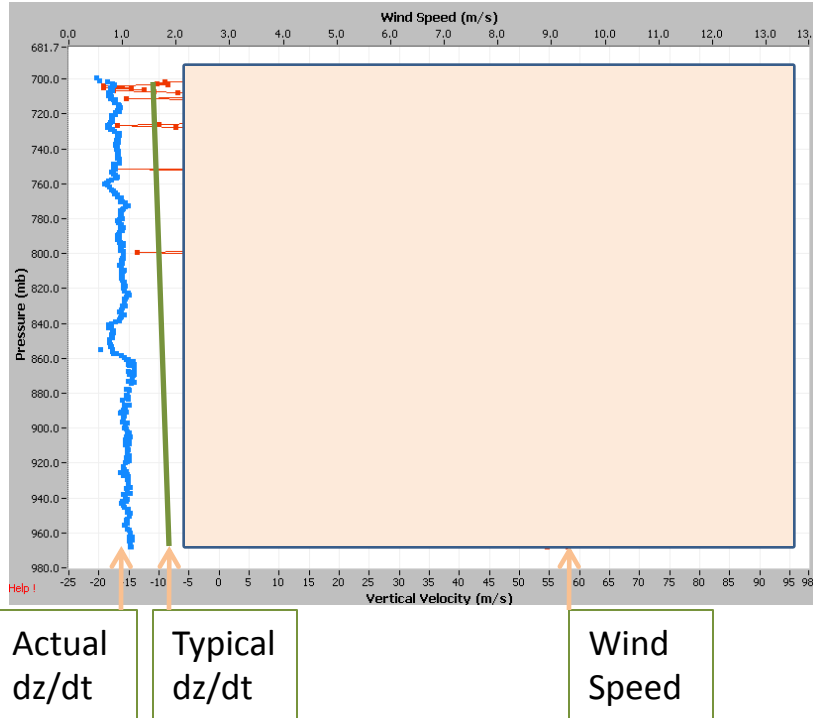
**Corrections**

**Vaisala fixed it in 4/2010. The PTU data during these periods was set to missing.**

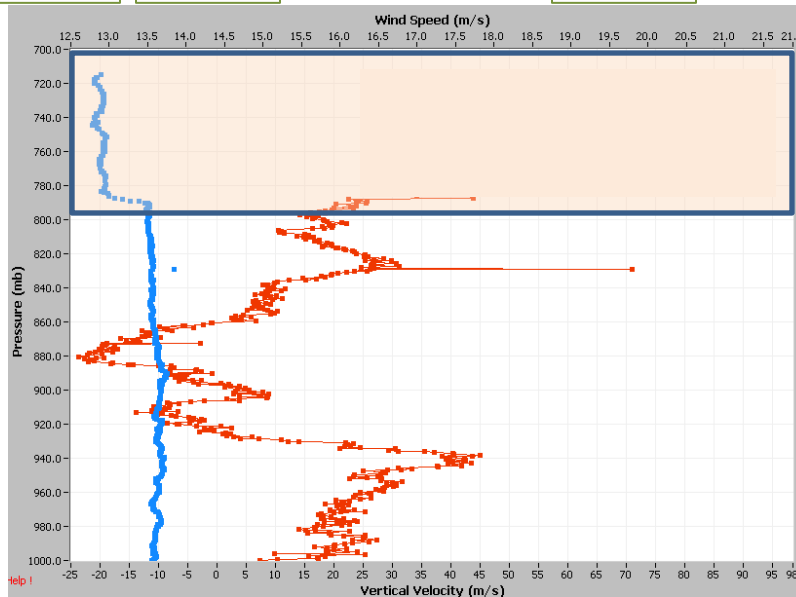


# Fast Falls and Partial Fast Falls

Fast Fall



Partial Fast Fall



## Issue/Cause

“Fast falls” are drops where the parachute failed to deploy or deployed late (a “partial fast fall”). During PREDICT there were 21 fast fall drops and 20 partial fast fall drops.

Results in the dropsondes falling at a faster rate (and sometimes tumbling) causing the wind speed and direction to be unreliable.

## Corrections

For these soundings the wind speed, wind direction and vertical wind parameters were set to missing during the period of fast fall.

