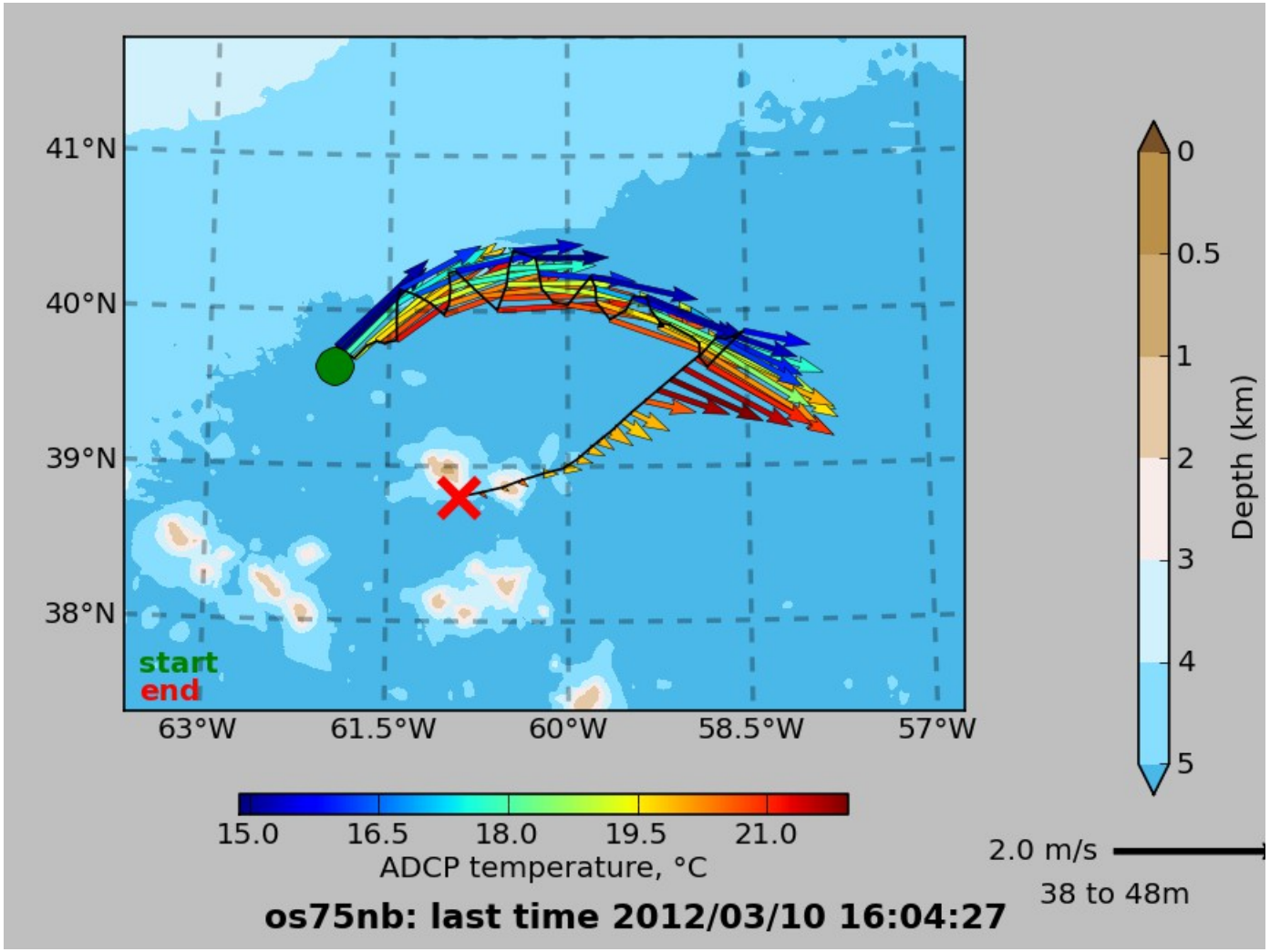
# RVTEC Nov 2017 – UHDAS/ADCP

Time,
ADCP
Position
Attitude




primitive data

ocean velocities

# UHDAS/ADCP

## Review UHDAS Concept:

- **Acquisition**: reliable, robust, duplicate feeds
  - reliable heading, accurate heading (**goal = 0.1deg**)
  - 1deg heading error at 10kts ➡ 10cm/s cross-track error

**50% of typical open ocean velocity signal**

- **Monitoring** and remote troubleshooting
  - data access and figures in at-sea web site
- **Processing**
  - Balance real-time output and post-cruise recovery
  - Minimal effort to “touch up” (if all goes well)
  - Investigate subtle problems and reprocess if necessary
  - Portable code and documentation
- **Stewardship** (improve QA, accessibility, visibility, understanding)
  - Central location for community knowledge (http://uhdas.org)
  - Happy Scientists, Happy Techs

# UHDAS Systems (2017)

- **17 UNOLS ships**: Atlantic Explorer, Neil Armstrong, Atlantis, Blue Heron, Endeavor, Hugh Sharp, Kilo Moana, Langseth, Oceanus, Pelican, R.Revelle, Sally Ride, Savannah, Sikuliaq, R.G.Sproul, T.G.Thompson, F.G.Walton Smith
- **3 polar ships**: Healy, L.M.Gould, N.B.Palmer
- **11** (+/-) **NOAA ships**: Okeanos Explorer, Hassler, G.Gunter, H.Bigelow, Hi`ialakai, N.Foster, Pisces, R.Brown, R.Lasker, Sette, B.Shimada
- **5 "other" ships**: Ka`imikai O Kanaloa, Falkor, Pt Sur, Investigator, Kristine Bonnevie
- **2** (+) **Volunteer Observing Ship**: Oleander, Norrona, (in progress: RCCL Adventure of the Seas)

# UHDAS Systems (2017)

- **17 UNOLS ships**
- **3 polar ships**
- **11 (+/-) NOAA ships**
- **5 “other” ships**
- **2 (+) VOS (Volunteer Observing Ship)**










# UHDAS: recap of 2017

- new ships:

  UNOLS: Savannah

  NOAA: Hassler, Lasker, Gunter, Pisces

  other: Investigator, K.Bonnevie, Norrona

- refreshed: (Trusty 14.04) (Xenial 16.04)
  - Sally Ride, Ron Brown,Okeanos Explorer, Sikuliaq, KOK
  - Armstrong, Atlantis, Endeavor, Healy, Kilo Moana, Falkor, Langseth, Point Sur, Pelican, Blue Heron

- New People: python, processing, monitoring

**Thomas** Roc**, Uggo** Ferreira dePinho

- Old People ;) [**Jules, Toby, Eric** ]

**UHDAS Team**

# UHDAS: recap of 2017

- meetings:
  - Environmental Data Management (Wa. DC) - Toby
  - RVTEC Duluth

- workshops:
  - Univ. Southern Mississippi
  - Texas A&M

(3 days each:
ADCPs, UHDAS,
CODAS Processing)

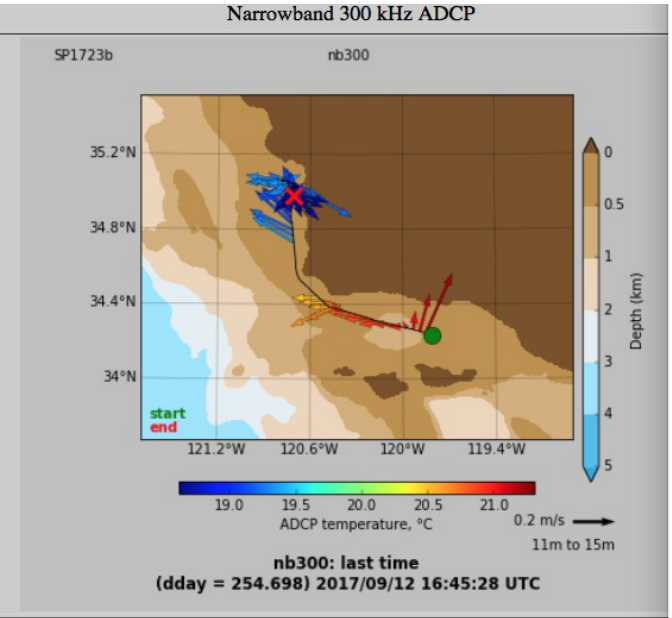
# UHDAS: recap of 2017

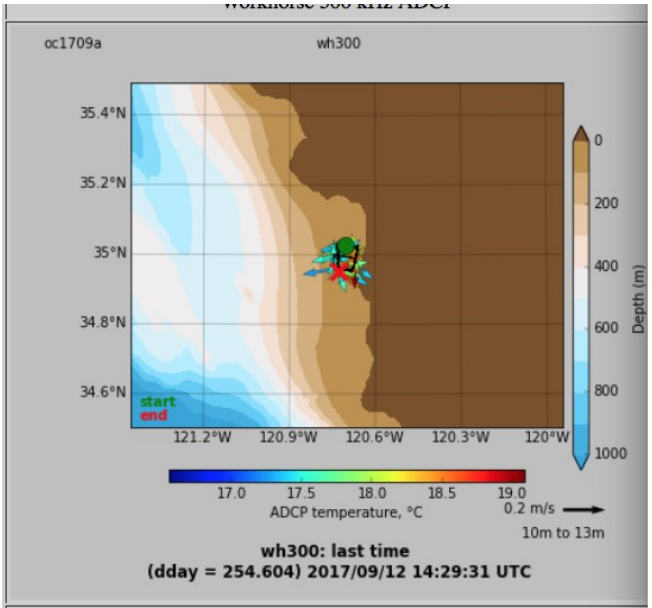
New developments:

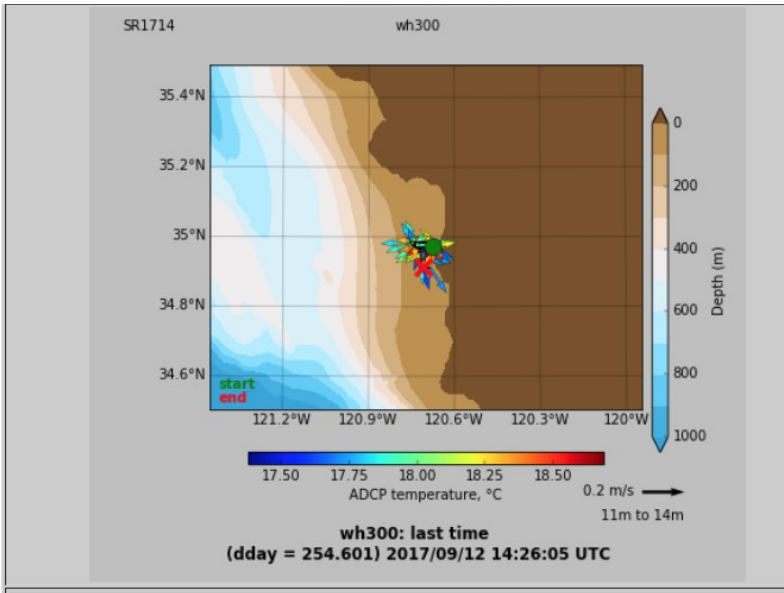
- improvements to email reporting
- improving external web page; updating documentation
- adding internal ticketing system (monitoring UHDAS status)
- at-sea web site:
  - link to web-based speedlog display
  - backscatter (now on panel plots at sea)
  - new plots:
    - high-resolution panel plot (with more fields)
    - “last few” vectors

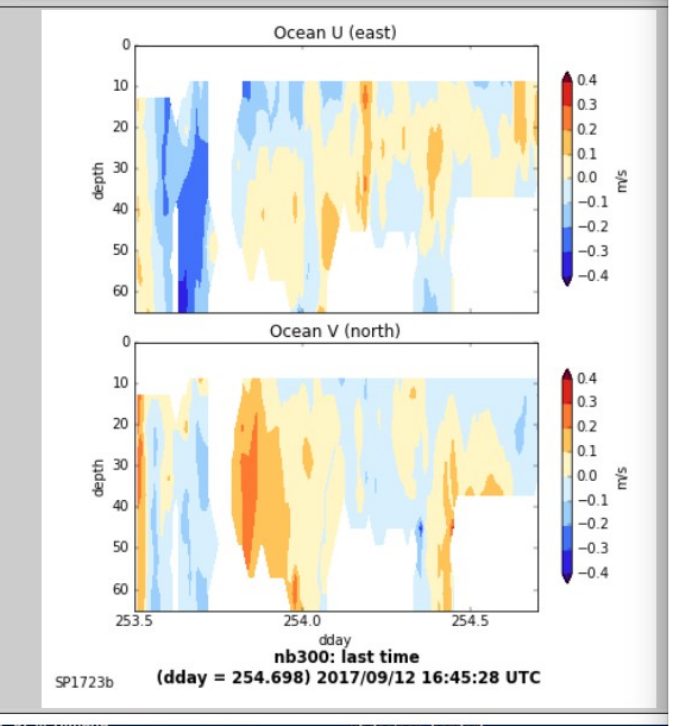
# Improvements to UHDAS email diagnostics figures

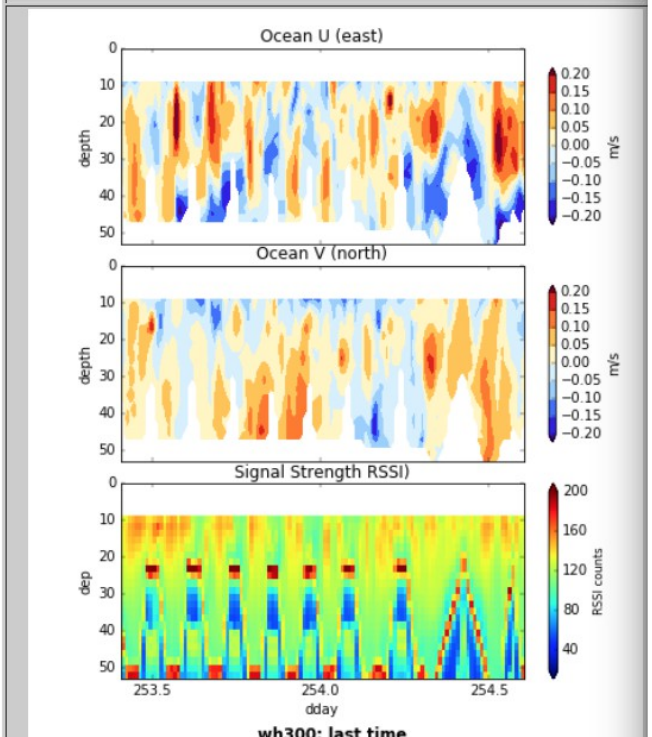
daily email payload (~50K) (~120K) (~500K)

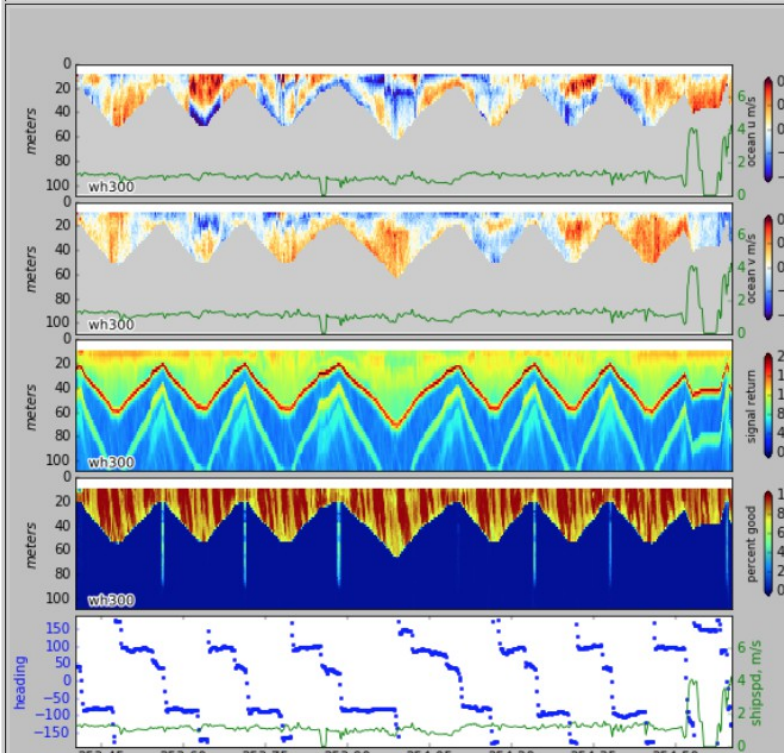


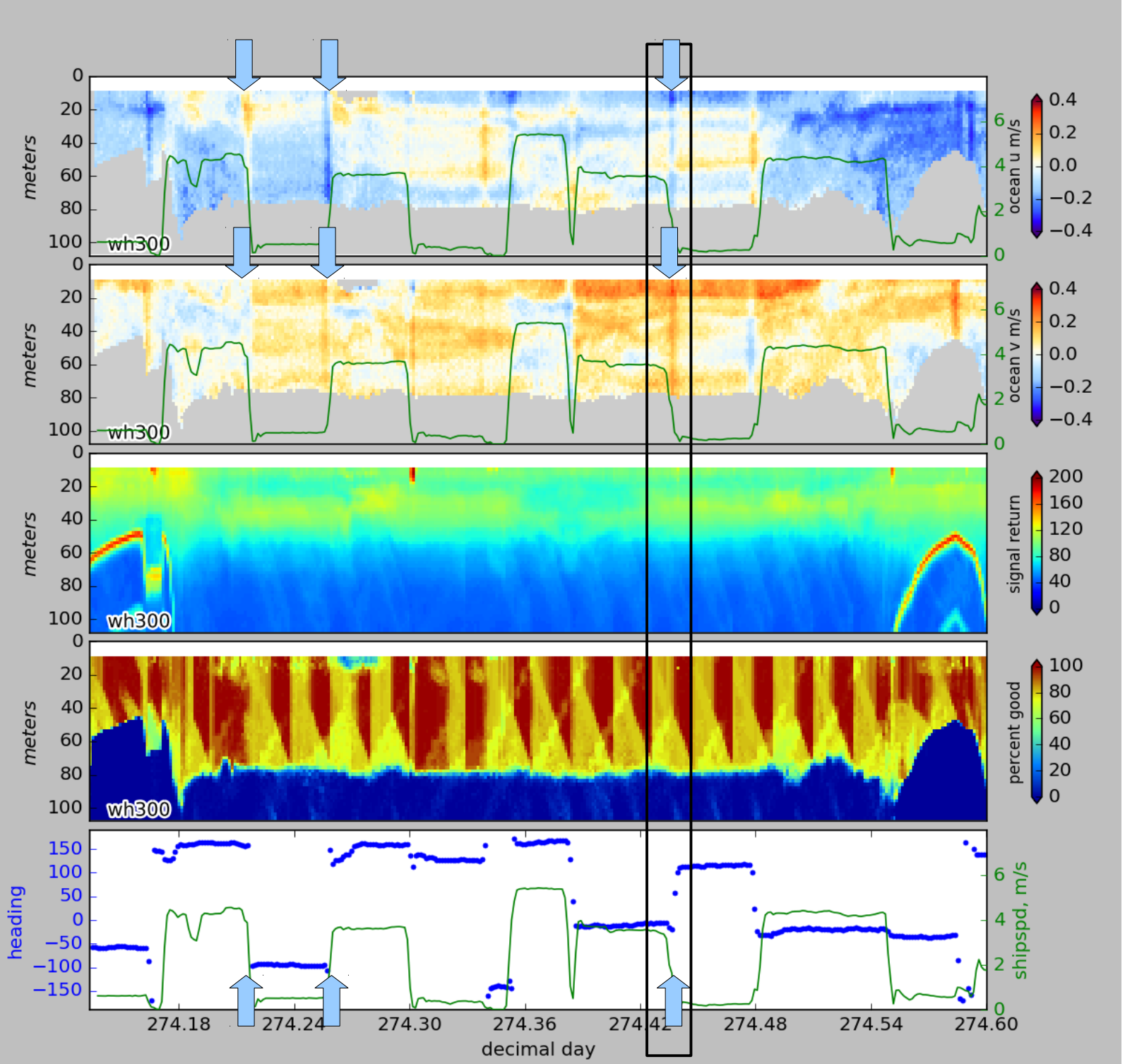






Artifact in ocean east/west velocity and north/south velocity

occurs when ship **direction** changes (i.e. it turns)

error is worse when **ship speed** is fast

# Problems: ADCP instruments

| ship | instrument | repair |
|---|---|---|
| • Falkor | : WH300, OS75 | June 2017 (*1) |
| • Langseth | : OS75 | July 2017 |
| • Sikuliaq | : OS75 | Dec 2017 |
| • Sette | : OS75 | Dec 2017 |
| • Bigelow | : OS150 | ?? (*2) |
| • Investigator | : OS150 | ?? |
| • Okeanos Expl | : OS38 | ?? (*3) |

(*1) bad wire: “choose between losing Temperature or 1 of 4 beams”

(*2) failed beam

(*3) temperature read 92.64C (leaking endcap?)

# Accurate Heading (known/vetted devices)

- **POSMV**: (quality plots)
  - **excellent**: Falkor, Hi`ialakai, Kilo Moana, Nancy Foster, Okeanos Explorer, Thompson, Gordon Gunter, Ron Brown, Hi`ialakai, Armstrong, Shimada
  - **poor/glitchy**: Lasker, Hugh Sharp, Langseth
  - **temporarily broken:** (Gunter and Walton Smith) – bad antenna
- **Seapath**:
  - **excellent**: L.M.Gould, N.B.Palmer (2), Sikuliaq, Revelle, Ride, Falkor, Healy, Langseth
- **Phins:** Atlantis, Revelle, Ride
- **Ashtech**:
  - **ADU2/ADU5**: Endeavor, Healy, Oceanus, Sproul, Revelle
  - **ADU800**: Atl. Explorer, Pelican, Pt Sur, Oleander, Norrona, (RCCL Adventure of the Seas)
- **Mahrs:** KOK

# Heading devices to Evaluate (*)

| device to evaluate | ship | devices for comparison | other comparisons |
|---|---|---|---|
| Vector<br>VS330 | Savannah | (gyro) | WH300<br>bottomtrack |
| SpatialDual | Endeavor | ADU2,ADU5 | WH300<br>bottomtrack |
| glitchy<br>POSMV | Healy<br>Langseth | Seapath<br>Seapath | |
| Hemisphere | Sally Ride | Seapath, Phins | |
| Sperry Navigat | Pelican | ADU800 | |
| Trimble (model?) | Sally Ride | Phins | |
| Trimble SP350 | Pt Sur | ADU800 (?) | |
| Furuno ?? | Sproul | ADU5 | |
| | | | |
| other Furuno? | | | |
| other Hemisphere? | | | |
| other Trimble? | | | |
| | | | |

(*) Please help me fill in this table so I can get more comparisons

# 2018 improvements/projects

- new installations:
  - NOAA ships (for those with transducers)
- renewals
  - Xubuntu 18.04 (Artful Aardvark)
    - Python 3.x
- directions for improvement:
  - add optional/temporary instrument by request
  - work with R2R to improve QA tools
  - better tracking of serial metadata and history
- further software improvements – graphical editor (Qt)
- start to leverage http://uhdas.org

# Continuing Request: Keep us in the loop regarding (**give us lots of warning**)

- New ADCP (requires configuration, calibration)
- Replaced/Reinstalled ADCP
- Changes in serial feeds
- Moving a GPS antenna we use, especially for processing
- New attitude devices (we like to evaluate them)
- Changes in networking
  - route to ship
  - infrastructure on ship
- Science Special Needs (triggering, temporary instrument)

**give us lots of warning**

# Protocol

- Always run “End Cruise” before archiving
  - UHDAS adds final metadata to directory
  - UHDAS builds a “reports” directory to help with QA
- Cruise distribution and backup:
  - **ALWAYS** use complete cruise name, eg. cruise distro:

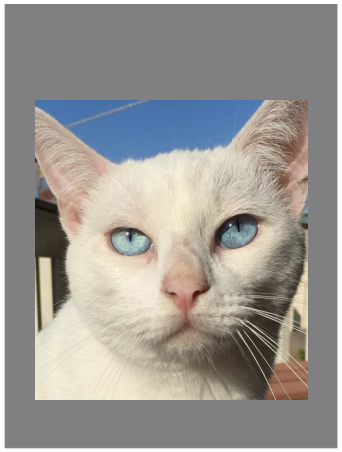
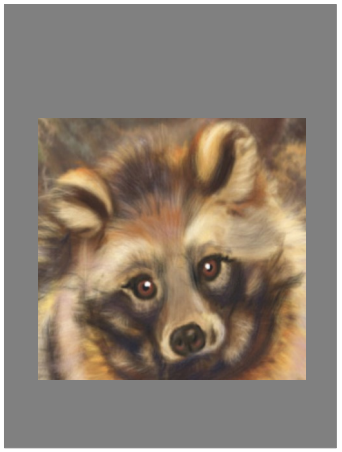
web site: http://uhdas.org
email uhdas@hawaii.edu

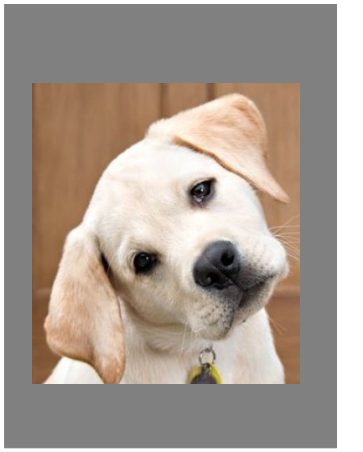
**KM1701/adcp/KM1701a**
**KM1701/adcp/KM1701b**
**KM1701/adcp/KM1701c**

# Final request

… as always:

**Send your needy scientists to ~~Jules~~**



**The UHDAS Team!**