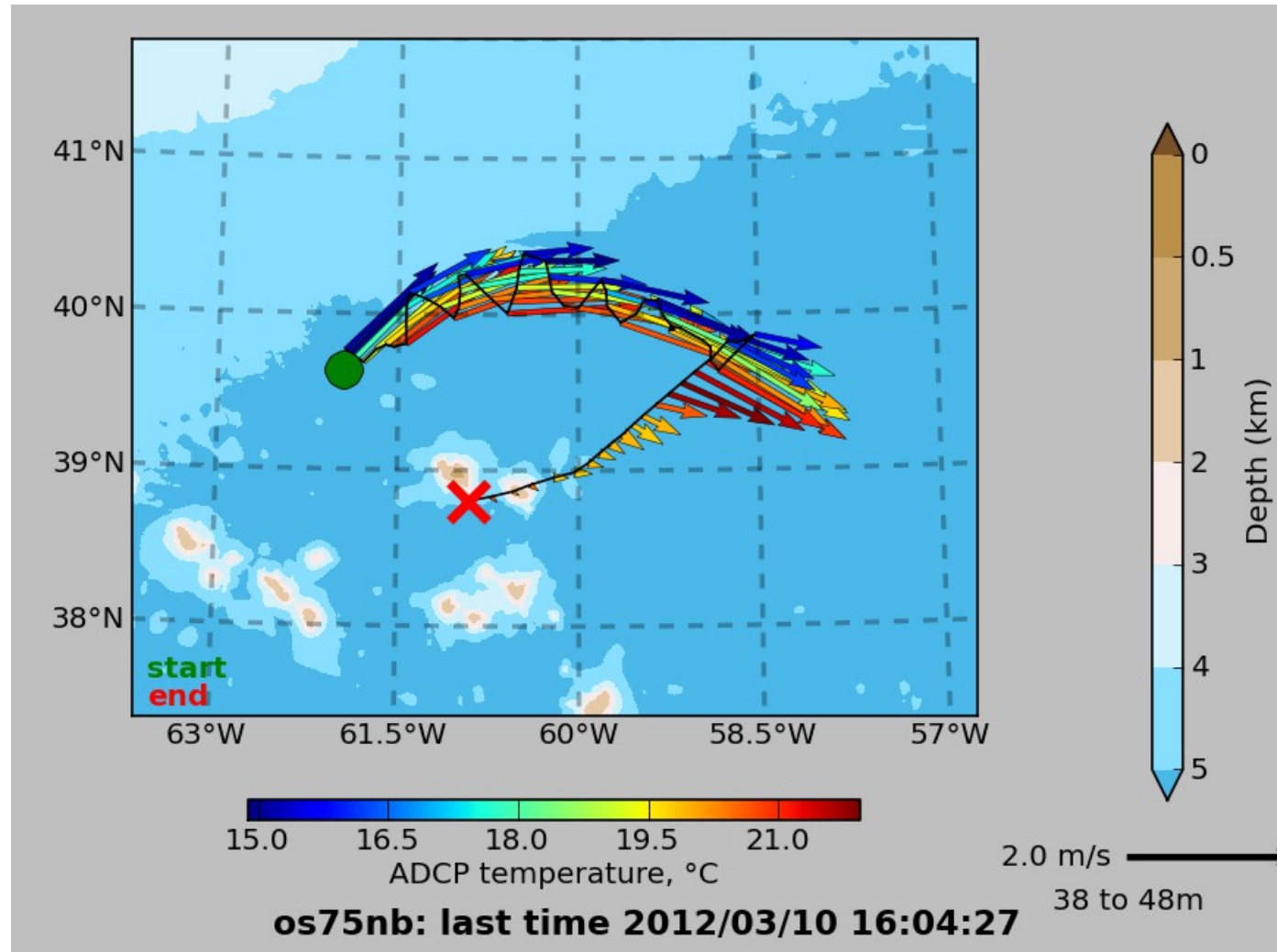
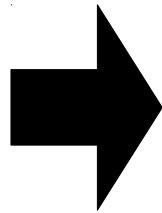


RVTEC Nov 2017 – UHDAS/ADCP

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
- **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

50% of typical
open ocean
velocity signal

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)

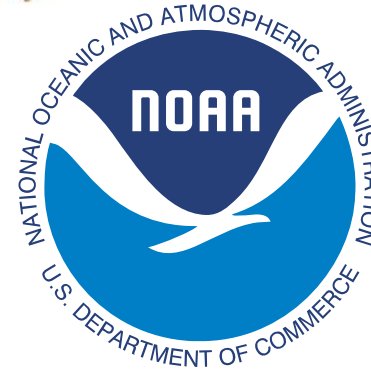
UHDAS Systems (2017)

- 17 UNOLS ships



- 3 polar ships

- 11 (+/-) NOAA ships



- 5 "other" ships



INSTITUTE OF MARINE RESEARCH

- 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

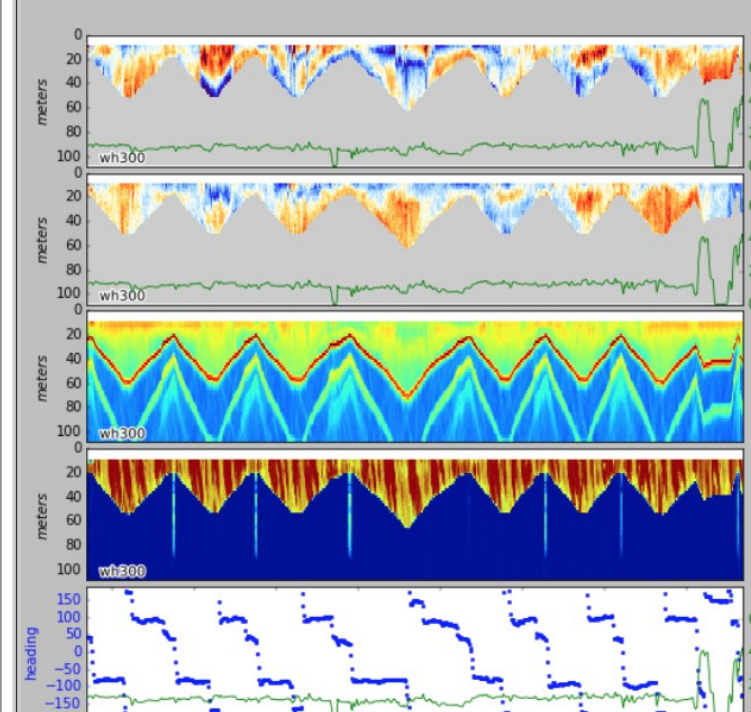
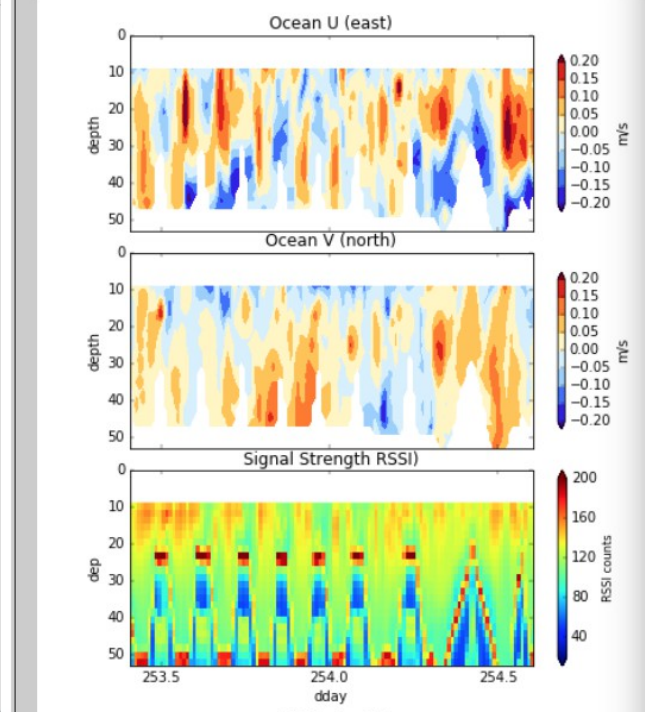
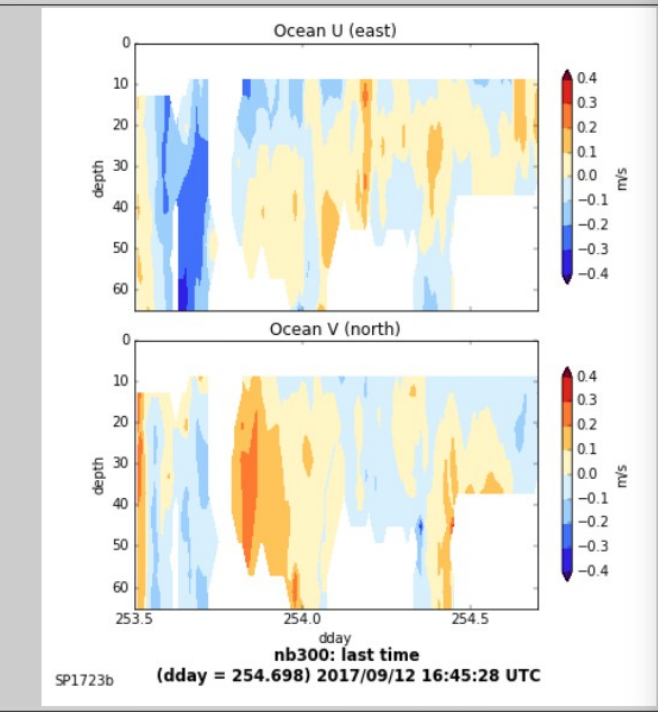
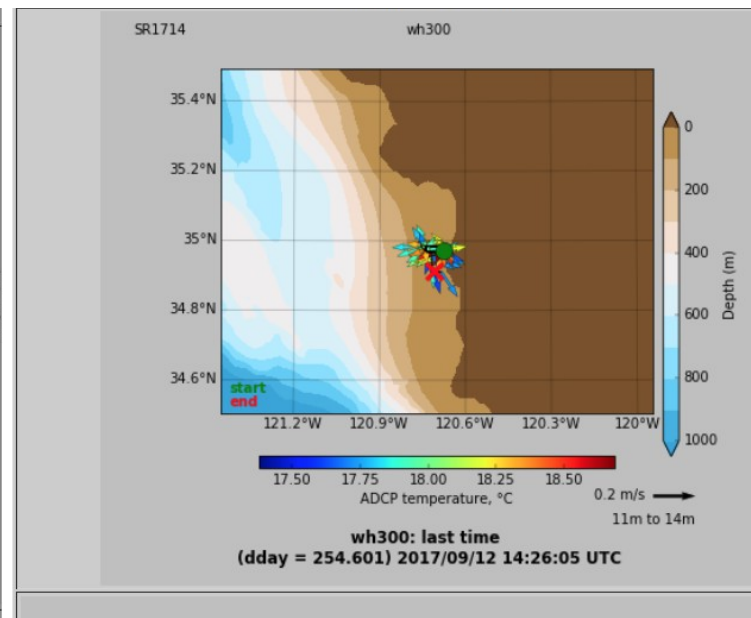
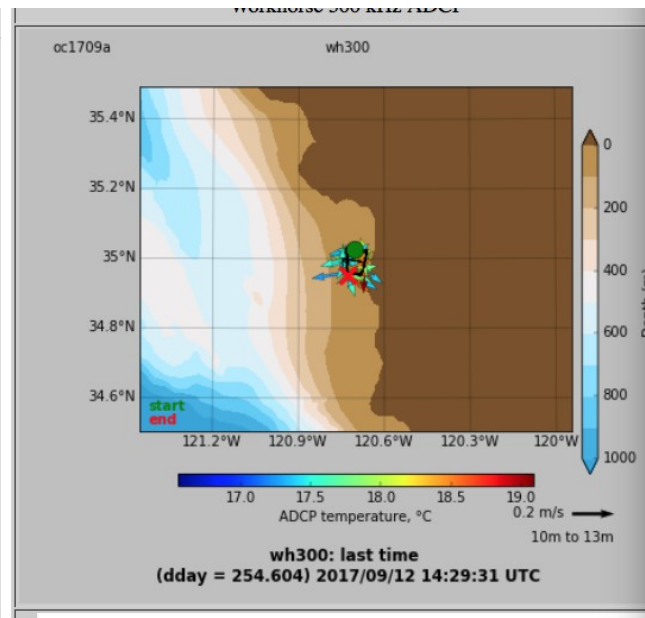
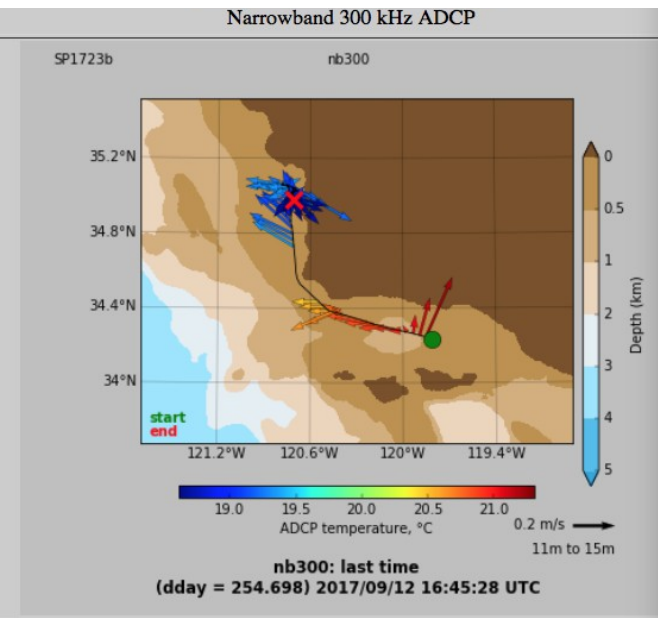
Improvements to UHDAS email diagnostics figures

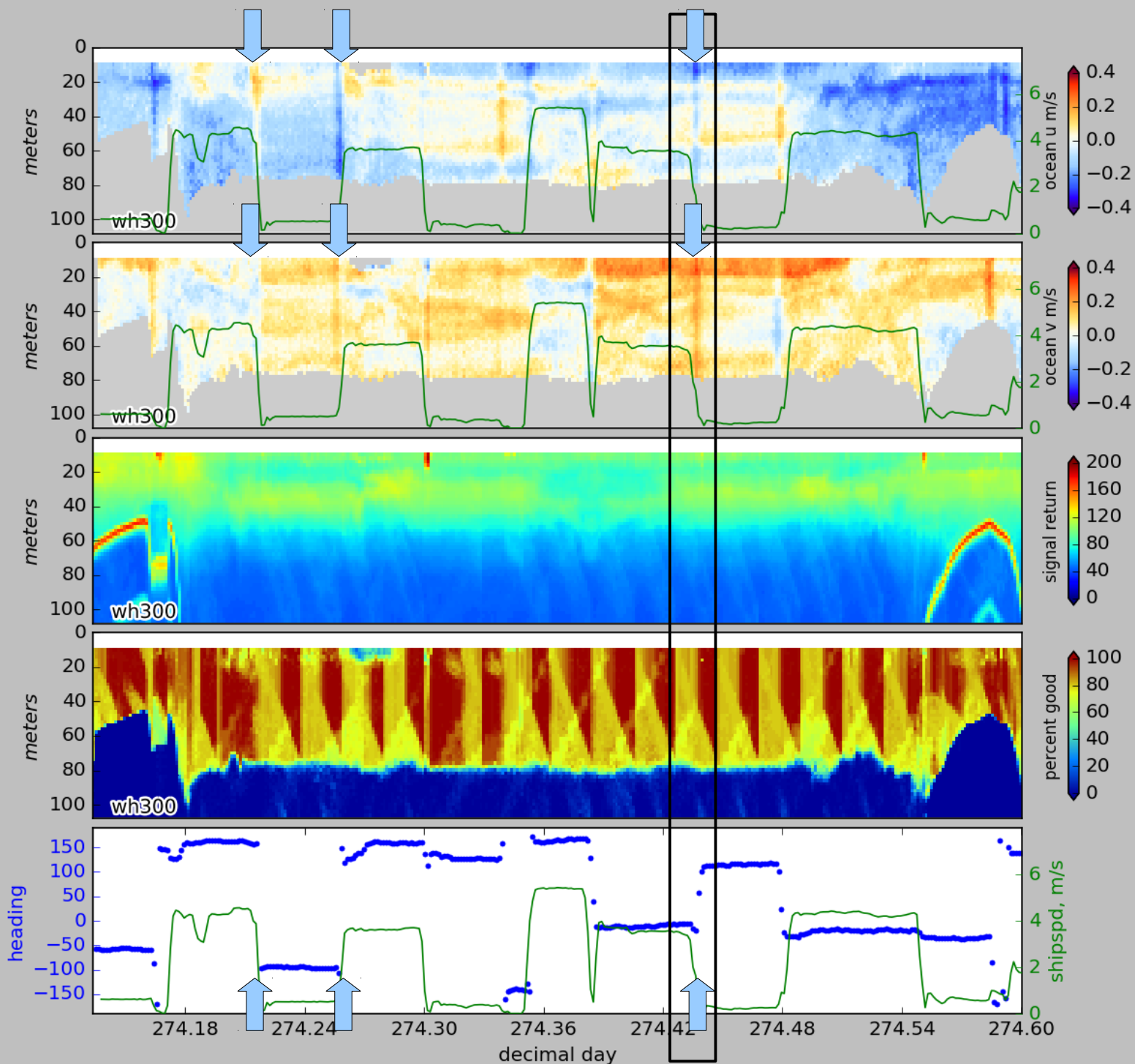
daily email
payload (~50K)

(~50K)

(~120K)

(~500K)





last time: dday=274.602, 2017/10/02 14:26:28 UTC

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

| <u>ship</u> | <u>instrument</u> | <u>repair</u> |
|----------------|-------------------|----------------|
| • 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 VS330 | Savannah | (gyro) | WH300 bottomtrack |
| SpatialDual | Endeavor | ADU2,ADU5 | WH300 bottomtrack |
| glitchy POSMV | Healy Langseth | Seapath 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

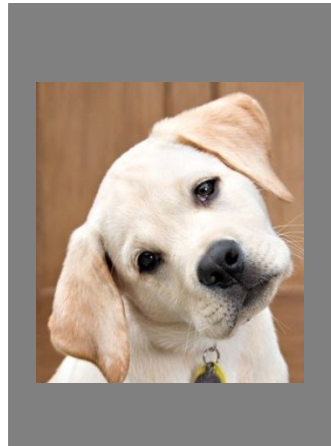
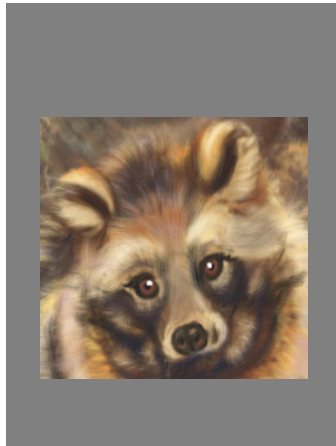
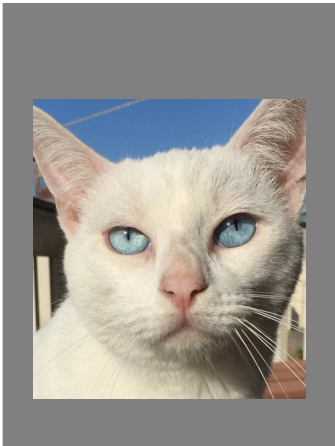
KM1701/adcp/KM1701b

KM1701/adcp/KM1701c

Final request

... as always:

Send your needy scientists to ~~Jules~~



**The
UHDAS
Team!**