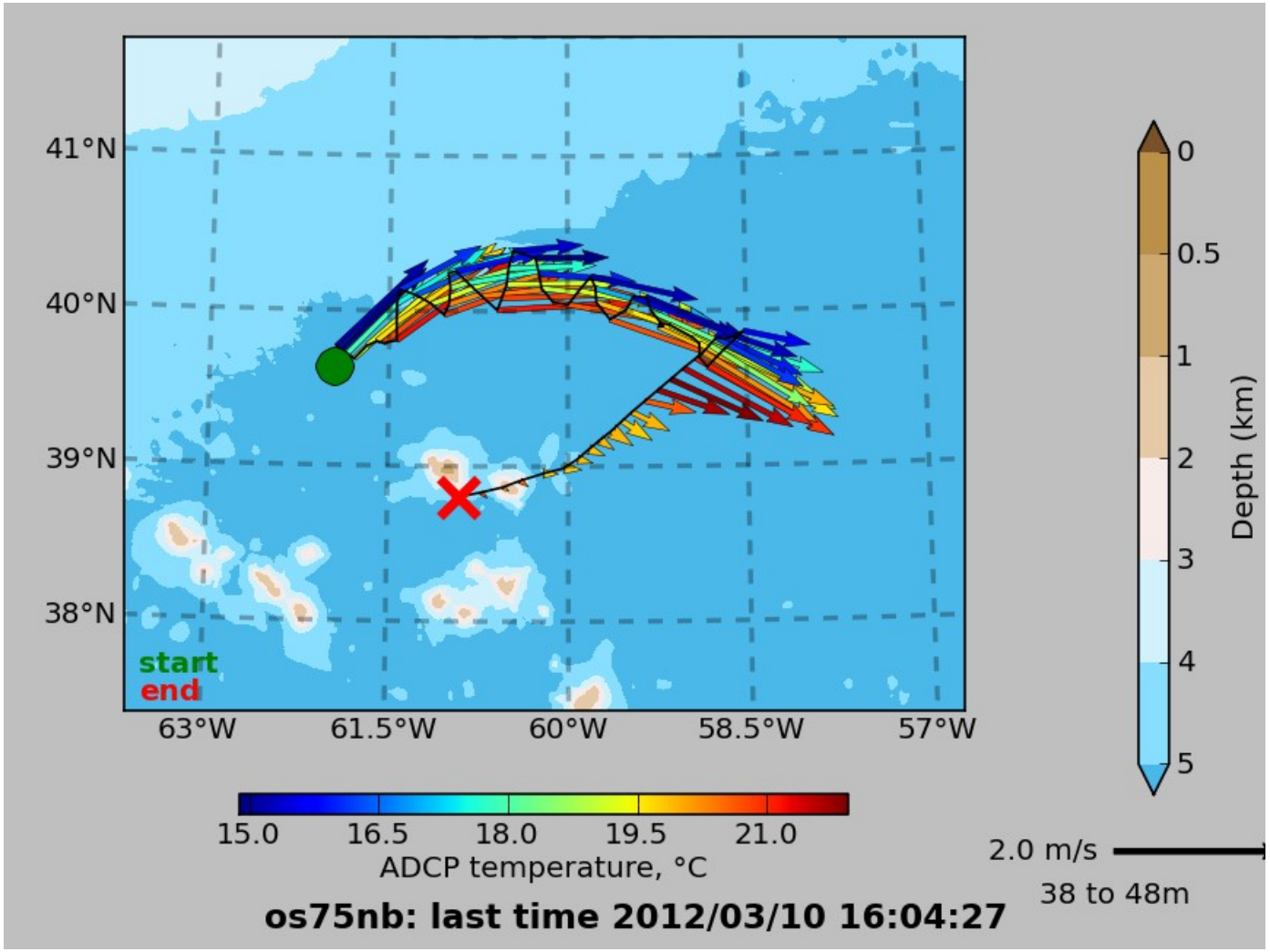
RVTEC Oct 2018 – UHDAS/ADCP

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)
  - Portable code and documentation
- **Stewardship** (improve QA, accessibility, visibility, understanding)
  - Central location for community knowledge (http://uhdas.org)

50% of typical open ocean velocity signal

Thurs: Nauset III (Data Management & IT) 15:00 (last talk)

UHDAS Systems (2018)

- **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
- **4 "other" research ships:** Falkor, Pt Sur, Investigator, Kristine Bonnevie
- **3** (+) **Volunteer Observing Ship**: Oleander, Norrona, RCCL Adventure of the Seas (coming soon: RCCL Flora)

UHDAS: recap of 2018

New developments:

- moving to Xubuntu 18.04 (newest Long-Term Stable)
- switching to Python3 for all activities:
  - additional testing for at-sea programs
  - new graphical editor for post-processing
  - new GUI: guide users through preliminary processing
  - new documentation for editor and processing
  - new CODAS processing Virtual Computer w/ Python3
- improvements to ticketing system

UHDAS: recap of 2018

- meetings:
  - Environmental Data Management (Wa. DC) - Jules

- workshop:
  - Univ. Alaska Fairbanks

(3 days: ADCPs, UHDAS, CODAS Processing)

UHDAS: recap of 2018

- new ships:

  RCCL Adventure of the Seas

- UHDAS code update: (many, for Ashtech QC plots)
- replace operating system (xenial 16.04) (bionic 18.04)
  - Walton Smith, Healy, Sikuliaq, Endeavor, Healy, Ron Brown
  - Kilo Moana, Bigelow, Nancy Foster, Bell Shimada

    Oceanus, Hugh Sharp, (L.M.Gould, N.B.Palmer)
  - new instrument:
    - Sikuliaq WH300 on drop keel: can trigger it (Ethan Roth)

Problems: ADCP instruments

ship	instrument	repair
Bigelow	OS150	2018
Investigator	OS150	2018
Okeanos Expl	WH300	2018
Kilo Moana	WH300	2018 (KOK)
Oceanus	WH300	(2018)
Pt Sur	WH300	(2018)
Okeanos Expl	OS38	2019

Problems: Computer, feeds

ship **computer**

- N.B.Palmer : primary failed (use spare)
- Ron Brown : primary failed (use spare)
- Oceanus : power supply died (used spare)
- Healy : primary computer running slow (still troubleshooting)

ship **description**

- Healy : POSMV timestamps (buffering?)
- K.Bonnevie: missing seapath UDP messages

- Oceanus : remapped serial ports

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, Gunter, Walton Smith
  - **poor/glitchy**: Lasker, Hugh Sharp, Langseth
- **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)
  - **ABX-TWO**: Healy

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
Hemisphere	Sally Ride	Seapath, Phins	
Trimble (BX982)	Sally Ride Pt Sur	Phins ADU800	

(1) Accurate heading is critical to good shipboard ADCP velocities

(2) Vetting new devices is difficult (impossible) without direct comparison

(3) Manufacturer's claims do not necessarily match real-world use:

must test accuracy and reliability

(4) Sweet Spot for ADCP still seems to be Ashtech: model= **ABX-TWO**

Wed: Racepoint (Technical Demonstrations) 11:30

Evaluate Headings, cont

Sweet Spot for ADCP still seems to be Ashtech: model= **ABX-TWO**

Recommendations:

- pay the money to put new devices near something good; compare
- buy ABX-TWO for any ship with ADCPs and no accurate heading
  (recognizing that the “should work” but have a spotty history)
  (Pt Sur, Savannah, Oceanus, Endeavor (replace ADU5 ?))

2019 improvements/projects

- new installations:
  - RCCL Flora
- renewals
  - Xubuntu 18.04 (Bionic Beaver)
- directions for improvement:
  - work with R2R to improve QA tools
  - better tracking of serial metadata and history
- further refinements to the documentation

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:

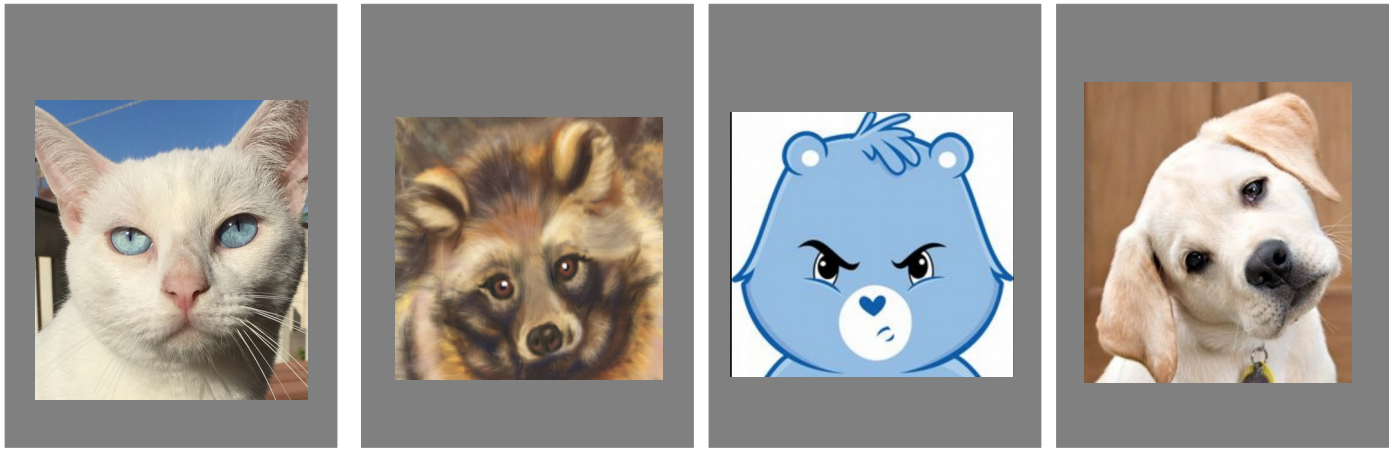
web site: http://uhdas.org
email uhdas@hawaii.edu

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

Final request

… as always:

Send your needy scientists to ~~Jules~~



The UHDAS Team!

Thur AM: Nauset V
Catching Shipboard ADCP System Problems Early: Visualization and Diagnosis