NDSF Data Management Update

- NLF Award for "Data Convergence & Telepresence
  - Development of unified data processing and data access systems
  - Study/white paper on use of telepresence/ telecommunications for operational and engineering purposes
- Experience with strawman systems on *Sally Ride* SVC

NDSF Data Management Update

- Common code base — common processing
  - Drive to commonality: all three vehicles rely on a common code base (control + nav)
  - Essential differences in code driven by vehicle differences, operational methods, differing requirements, and vehicle-specific operational tempo
    - Data logging differences
    - Navigation structural differences
- Goal: common products and delivery mechanism
  - Should be agnostic to differences in processing

NDSF Data Management Update

- **Processing**
  - All vehicles now using variants of same post-processing code ("dslpp")
    - Includes both renavigation and science-delivery record formatting
    - *Jason*, *Alvin* systems are modeled upon *Sentry* with essential differences
  - Further effort will work out details and responsibilities and resolve differences as appropriate

NDSF Data Management Update

- Data QA/QC and delivery
  - Currently very different between vehicles
- Decided to evaluate OpenVDM
  - System is intended to adapt to existing models rather than forcing models to adapt to systems
  - Goal is uniform approach to data availability and transfer
  - Used by NOAA, URI, SOI, others
  - Extended software to handle cruise/dive, not just cruise

NDSF Data Management Update

- Second part of NLF Award: Telepresence use for operational/engineering purposes (not just science and outreach)
  - Employed Willis Peligian to perform cost/benefit study
    - Can we reduce NDSF at-sea manpower requirements?
    - Increase services/efficiency?
    - Study to include new methodologies and technological opportunities
    - Wide ranging surveys of community with exceptional levels of cooperation from NSF, NOAA, UNOLS, SIO/HSN, URI/ISC, others
  - Cooperating with related DeSSC and ISC efforts

NDSF Data Management Update

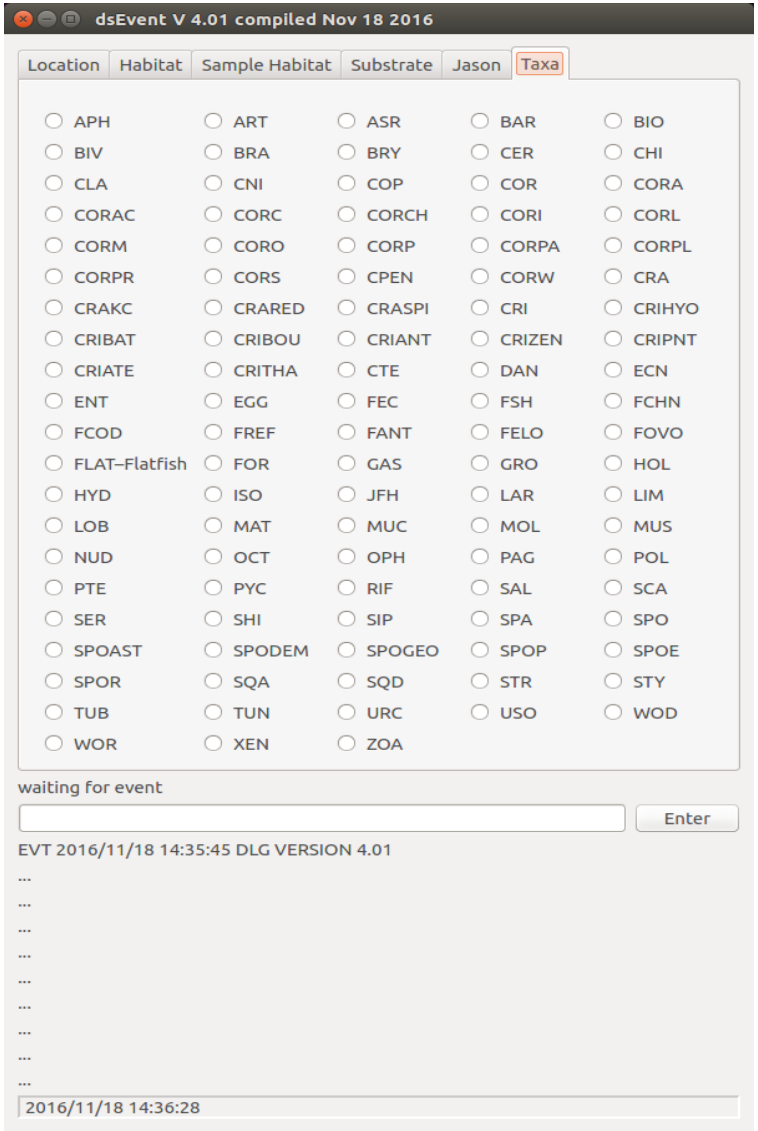
- Telepresence use for operational/ engineering purposes
  - Expect draft report by end of month
  - Will incorporate tests/lessons learned on *Sally Ride* SVC
  - It should not be a surprise that the low hanging fruit is data and data processing, but study is not limited to that

NDSF Data Management Update

- *Sally Ride*/*Jason* Science Verification Cruise
- Telepresence included in cruise (SIO Initiative)
  - Piggybacking on science goals/applications
  - Decided to push OpenVDM experience into this cruise — it wasn't ready, but it was a useful "accelerator"
    - Shoreside support from *Capable Solutions* via telepresence
    - Seagoing personnel overtasked with integration into new vessel and software development concerns
  - Tested renavigation ashore (Colorado) — data moved ashore using OpenVDM

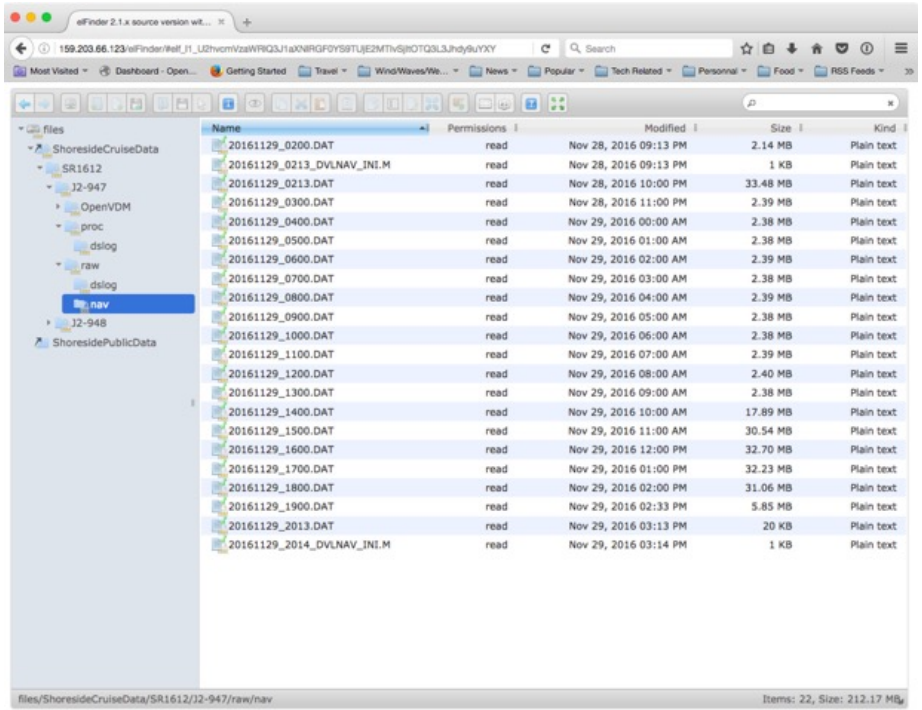
NDSF Data Management Update

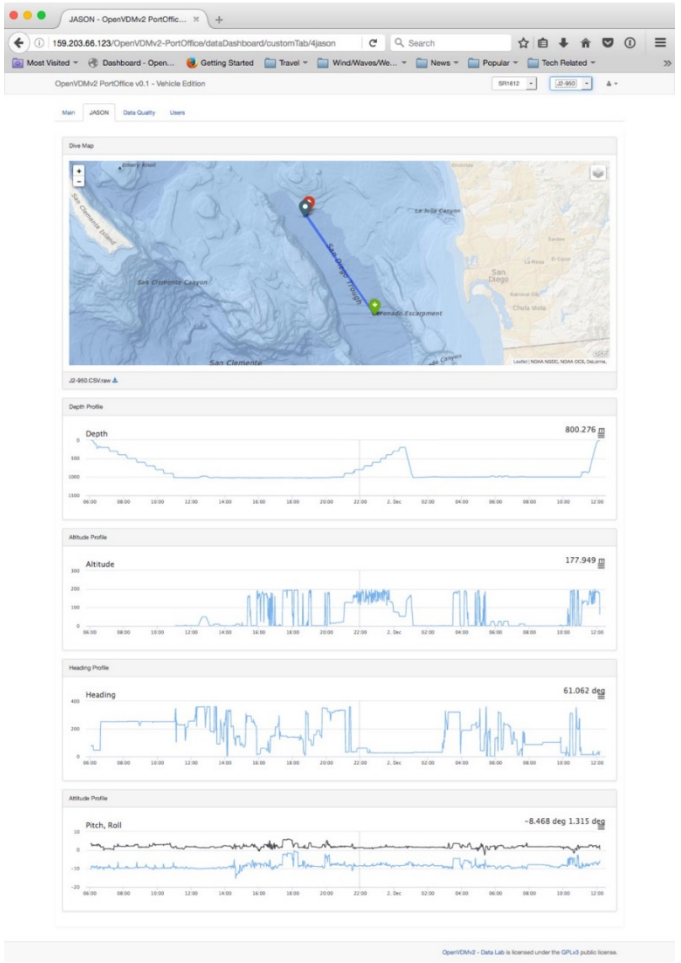
- *Sally Ride*/*Jason* Science Verification Cruise
  - Science was primary focus of telepresence effort
    - Shoreside support set up VM with event logger, at-sea port forwarding, etc
  - Distributed video and event logging with log data centralized at sea



NDSF Data Management Update

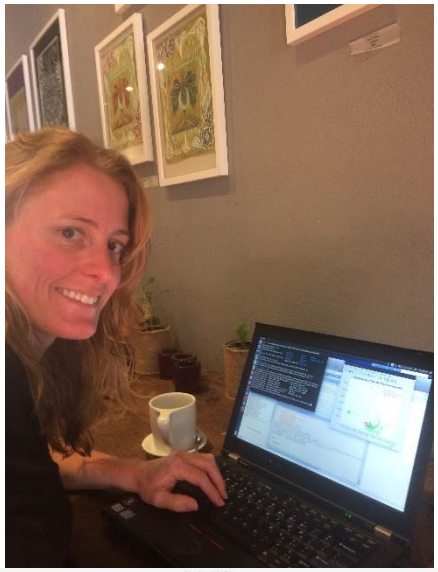
Five days into the cruise, dive data was transparently moving to an accessible repository with some QC/QA being performed, as well as ashore via HSN/Port Office

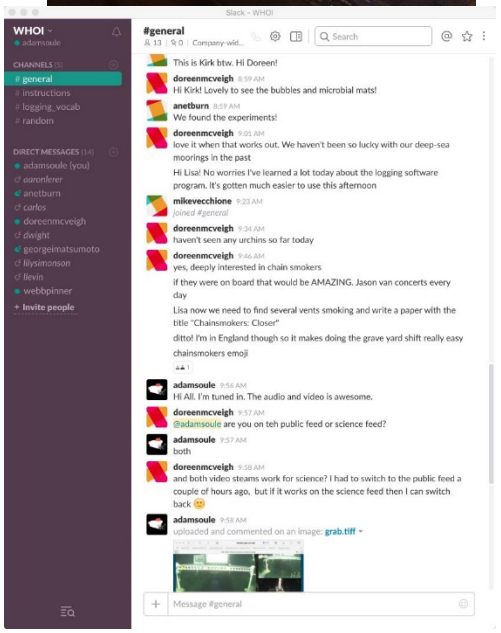




NDSF Data Management Update

- *Sally Ride/Jason* SVC
  - Mission renav performed ashore but bedeviled by new DVL and associated new formats, both ashore and at sea
  - Video (GoPro) and audio link used for troubleshooting
  - Slack used extensively for interaction with those ashore, both science and ops
  - Multibeam files (sample) transferred ashore testing a variety of methods





NDSF Data Management Update

- **Preliminary Results**
  - Shoreside support was outstanding, a huge force-multiplier, and showed the potential for operational use of telecommunications
  - Effort at-sea was transferred to effort ashore — both vehicle/data and telecommunications troubleshooting
  - Experience of those doing renav ashore was identical to that at sea
  - Security concerns and restrictive network topology were an obstacle to transparent use of the network. This prevented us, for example, from using phones/Skype for vehicle troubleshooting. This was a cruise specific issue.
  - OpenVDM showed potential for use:
    - No science use (not ready)
    - Transparent transfer of nav data ashore
    - Cruise was useful accelerant for evaluation

NDSF Data Management Update

- **Immediate Plans**
  - Review and release of telecommunications white paper
  - Review of OpenVDM experience
    - Achievements
    - Challenges
    - Extension to other vehicles and requirements
      - Science users
      - NDSF Data Manager
      - Vehicle managers
      - Developers