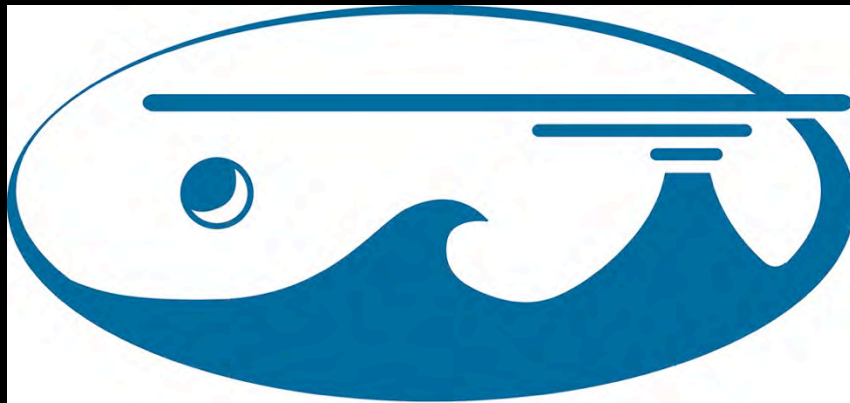


# University of Hawai 'i/SOEST ROV Lu`ukai



**SCHOOL OF OCEAN AND EARTH  
SCIENCE AND TECHNOLOGY**

UNIVERSITY OF HAWAI'I AT MĀNOA



# The Lu`ukai story

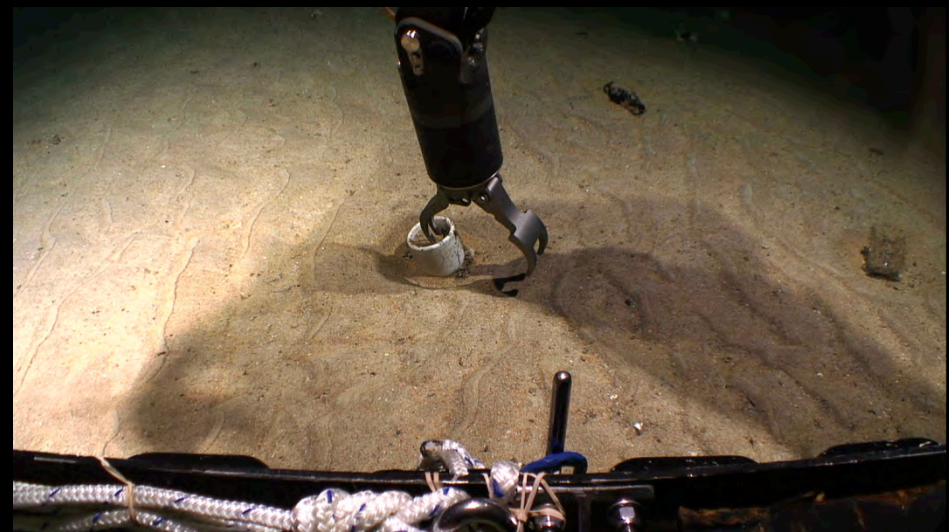
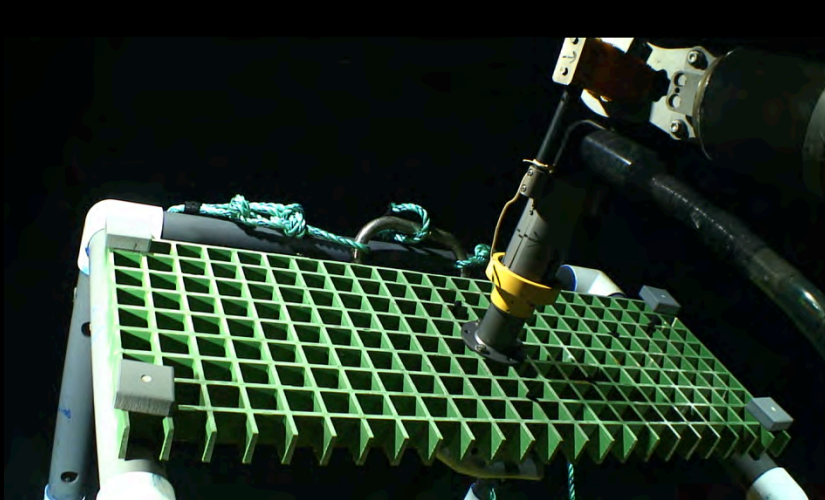
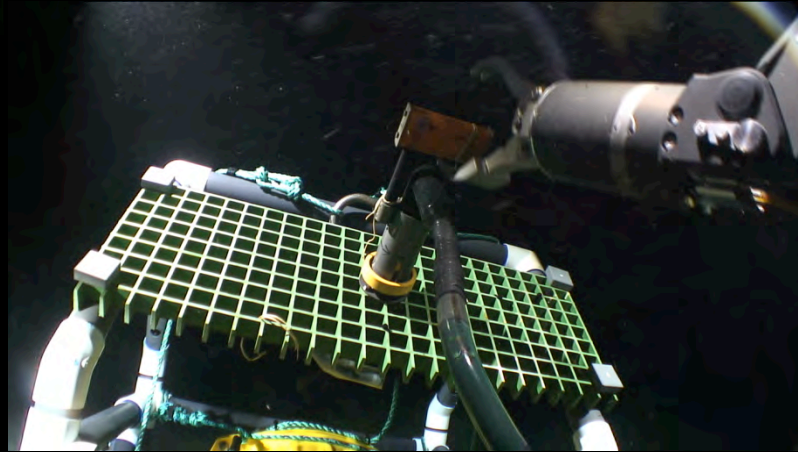
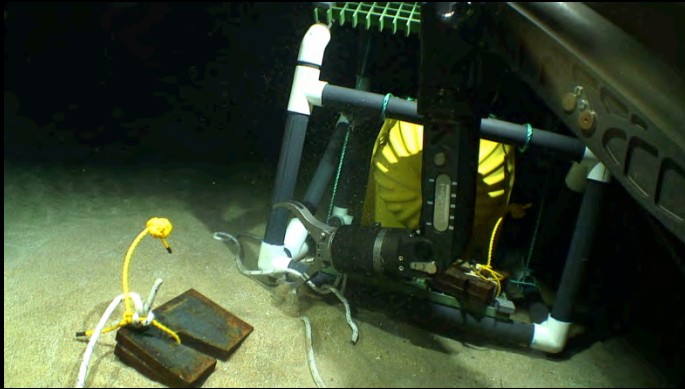
- Purchased by SOEST, designed and manufactured by DOER Marine, delivered in 2013
- Larger, more powerful, and deeper diving version of the Scripps vehicle (to 6000 m, >lift capacity)
- Operated and maintained by a diverse group, mostly HURL personnel, along with OTG ship techs and HMRG engineers
- A series of unfortunate experiential and engineering events ensued, followed by better ones of each as redesign and familiarity improved
- Finally achieved success in Sept 2015 by bringing ACO, the world's deepest internet connected ocean bottom observatory (>4700 m), back online
- Numerous scientific and applied research entities have expressed interest in its use, partially due to its mid-Pacific base of operations and accessibility

# 2016 Activities

- First half of 2016: the ROV system was returned to the manufacturer, DOER Marine, for major modifications & upgrades, with the intent to make the system more robust in operations & standard maintenance more user friendly.
- July: system returned from DOER Marine after a significant refit and installed at the new UH Marine Center at Pier 35, Honolulu. Reintegrating and testing the various components of the ROV in the hangar followed.
- August: Implemented and tested ROV mechanical and software upgrades with teams from DOER Marine and Greensea Inc. Stood by for R/V *Kilo Moana* to support ship board ROV integration, sea trials, and ACO service in September.
- Due to significant control system refit issues, *Kilo Moana* had to cancel all science work, including ROV support until December. ACO service work was postponed to 2017.



# ACO mock-up practice & other manipulator training



# Maintenance at new UH Marine Center facility





# In the ROV control van aboard Kilo Moana



To date, ROV *Lu'ukai* has completed 50+ dives with an average bottom time of under 3 hours at work and training sites

# ROV Lu`ukai plans for 2017

- Extend the on-site endurance of the system
- Enable software controlled operations such as Auto X-Y-Z, station keeping, and ground fault monitoring, based on the new Greensea control system
- Integrate 10km .681 UNOLS umbilical wire to streamline mob/demob operations
- Successfully complete two currently scheduled missions: ACO service and a 3-4 week deployment to the CCZ poly-metallic nodule fields

