

# SIO IT Staffing

SIO's journey, and brief intro to Ship Cyber Infrastructure Services (ShipCIS)

<https://scripps.ucsd.edu/it/shipcis>

October 23, 2023

UC San Diego

# Thanks

- National Science Foundation (NSF), Ocean Sciences (OCE) division
  - United States Department of the Navy's Office of Naval Research (ONR)
  - National Science Foundation (NSF), Office of Polar Programs (OPP) division
  - Leadership within UC San Diego (UCSD) and Scripps Institution of Oceanography (SIO)
- ...have all supported a multi-year effort to form ShipCIS!



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# IT scope-of-work for SIO



## NSF OCE, ONR

R/V Roger Revelle, R/V Sally Ride, R/V Robert Gordon Sproul

Support all possible Cyber Infrastructure (CI) (operational and scientific) to CMMC V2 L1 with the goal of mimicking university laboratories/buildings as much as feasible



## NSF OPP

USCGC Healy

Support scientific systems to USCG DISA standards, in collaboration with USCG Polar Science Network personnel. Gain benefits of scale, alongside the NSF OCE/ONR effort



## SIO/UC San Diego, State of California

Coastal Class Research Vessel

In collaboration with TrustedCI, participate in the design process for CCRV in order to incorporate good cyber hygiene, planning from the design to deployment

# ShipCIS Origin Story at-a-glance

- Increasing technology use on the ships – IT and OT
    - Ship Operations (core infrastructure and crew)
    - Research Mission (fixed instrumentation and science parties)
  - Growing number of cybersecurity audit requirements
  - Only resource was via science support technician
  - Increased throughput and resiliency of ships' Internet connections has created the capability to reliably accomplish remote cyber maintenance and support
- SIO decided to create a dedicated unit to support technology on the ships it supports

# Origins: 2016-2019

- 2016
  - Receipt of R/V Sally Ride – more instrumentation directly competes with time formerly used for IT
  - Amplification of crew IT needs in parallel
  - Introduction of VMware clusters to ships – better resiliency for critical services
- 2017
  - Experiments with high-speed Internet boost confidence in remote work capabilities
  - Difficulties hiring IT specialists who are proficient and interested in remote location work
- 2018
  - Overhaul of R/P Flip cyber
  - Overhaul of R/P Sally Ride network
  - Started hearing noise about CMMC requirements for grants/charters at UC San Diego
- 2019
  - Overhaul of R/V Robert Gordon Sproul cyber
  - TrustedCI engagement for ARF initiated
  - USCGC Healy begins to apply Defense Information Systems Agency (DISA) regulations to their civilian network

# Origins: 2020-2021

- 2020
  - midlife for Revelle
  - Introduction of VMware "Virtual Desktop" clusters to ships
  - Increased emphasis on remote work, when possible
  - Increased emphasis on communications uptime and throughput as a result
  - Begin hiring sailing technicians who specialize in remote location work but not necessarily IT
- 2021
  - International Maritime Organization (IMO) cybersecurity regulations go into effect
  - Amplification of the need for responsive IT support due to IMO
  - Staff attrition, particularly IT-related
  - Amplification of USCGC Healy security standards

# Origins: 2022-2023

- 2022
  - Q1: Non-conformance report (NCR) for MarFac (an inspected facility). Our facility plan is tied to our vessels, so this affects all ship-based operations for SIO
  - Coastal Class Research Vessel (CCRV) design work starts
  - IT data exfiltration security reviews for POs — multi-month delays in purchasing at times
- 2023
  - Q1: formation of ShipCIS
    - Broad plan: 1 IT analyst per ship, with coverage either laterally or up the org chart
    - Major scopes of work include
      - Support for crew and science: R/V Roger Revelle, R/V Sally Ride, R/V Robert Gordon Sproul
      - Ship-based Science Technical Support in the Arctic (STARC)
      - Coastal Class Research Vessel (CCRV): cyber accounted for in ship's design
  - Q2: NCR cleared, with assist from OmniSOC, ShipCIS, campus security
  - Better awareness, engagement with campus efforts through IT Director's participation in ShipCIS
  - TrustedCI engagement for CCRV
  - Active planning with USCGC Healy personnel
  - Active support cases for ship's mariners, with results
  - Beginning to network ship's OT

# Open Discussion

# Ideas for discussion

- All questions/ideas welcome! Goal of this discussion is to share where we're all at
- Where is your institution at in this journey?
- IT needs not mentioned here?
- Balancing instrumentation, science support and IT
- International Maritime Organization (IMO) 2021 regulations
- Cybersecurity Maturity Model Certification (CMMC) requirements from home institutions
- Controlled Unclassified Information (CUI)
- Network segmentation
- Networking Operational Technology (OT) for remote support

# Thanks again! Questions?

ShipCIS maintains an email-capable issue tracker.  
Contact the team at [shiphelp@ucsd.edu](mailto:shiphelp@ucsd.edu).

