



NOAA

Presentation to the National Academy of Sciences: Transportation Research Board - Marine Board

Toward Decarbonization: The Future of Marine Energy and Propulsion

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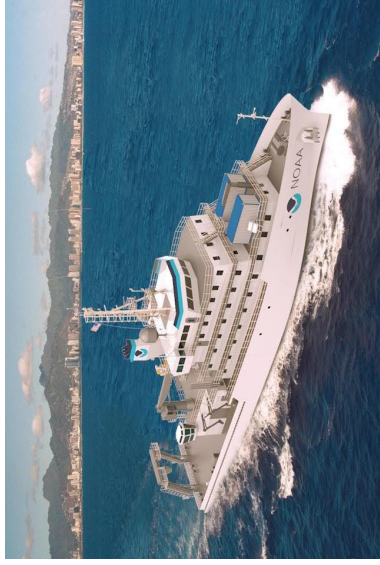
What can we do about de-Carbonization and Today's NOAA Fleet?

- Shipboard Energy Efficiency Management Program (SEEMP)
plans on each ship.
 - Technology upgrades (e.g. LED lights)
 - Fuel flow planning and monitoring for efficient operations
- Utilization of B5 biofuel mixtures whenever available
- Power management systems on more modern platforms
- Sharing the responsibility with all involved parties
- How about we build new ships and explore new tech?!



NOAA's Recapitalization Effort

- Vessel Recapitalization Underway - Detail Design and Construction of *Oceanographer* and *Discoverer*
- *Where possible incorporate the latest proven technologies*
- *First NOAA Vessels to meet high efficiency environmentally friendly EPA Tier 4 diesel engine emission certification standards*
- *Emissions controls for stack gases*
- *New information technology tools for monitoring shipboard systems, and underwater scientific research and survey equipment.*



Artist Rendition of NOAA Class A

Uncrewed Operations (UxS)

- UxS efforts since 2000 (earlier?!)
- OMAO Uncrewed Operations Center established in 2020
 - 5 year plan with 5 goals
- Use of Uncrewed Surface Vehicles (USVs) to increase survey efficiency
 - Increase efficiency of surveys to reduce ship time by $\frac{1}{3}$.
 - Planned acceptance testing in FY22 with integration aboard NOAA vessels in FY23
- Augment/replace ships for certain missions using gliders collecting ecosystem information using renewable energy



Challenges of Decarbonization

- Infrastructure
- Policy focus has been on (in water) pollution control/prevention and sound pollution
- Demands for information in difficult to reach places
- Cultural Change
- Autonomous systems take time to become...well... autonomous

Thank you!

