California-based Intermediate Class & smaller ships

Research vessels able to carry out California’s local research and education needs have decreased from 3 to 1, with the last remaining ship approaching the end of its service life. **A new vessel is needed.**

**INTERMEDIATE**
- R/V New Horizon
- 170 feet / 40-day endurance
- 12 crew / 19 scientists
- Retired 2015

**REGIONAL**
- R/V Pt Sur
- 135 feet / 21-day endurance
- 8 crew / 12 scientists
- Retired 2014

**LOCAL / COASTAL**
- R/V Robert Gordon Sproul
- 125 feet / 14-day endurance
- 5 crew / 12 scientists
- Needed 2020 onward
Collaborating on a shared research vessel

Vision: establish a new kind of partnership within California, involving public and private universities, research institutions, state agencies and non-governmental organizations to support a new California Coastal Research Vessel (CCRV) for seagoing education and research.

Efforts to date:

• Moss Landing Marine Laboratories (California State University) and the Scripps Institution of Oceanography (University of California) have agreed to collaborate jointly on this effort.

• Committed significant seed funding from each institution

• Assembled Scripps Small Ship Task Force to define institutional needs

• Sent Dear Colleague letter to 100+ ship users statewide to solicit input

• Scripps began a DOT-sponsored feasibility study (with Sandia National Labs) of a zero-emission research vessel (ZERo/V), including conceptual design
Hydrogen Fuel Cell Use in Maritime Applications

H₂ Fuel Cell Power Provides:
- Zero emissions
- No fuel Spills
- Quiet Operation

H₂ + O₂ → 2 H₂O

SF-BREEZE Optimization
ZERO-V: Trimaran DESIGN

Zero/V Mission
- Zero emissions
- General purpose R/V
- Coastal operations – CA
- 2500 nm range
- Dynamic positioning
- 18 scientists, 11 crew
- Large lab spaces
- Large working deck
- Substantial over-the-side handling systems
- Low underwater noise
- Capable hydro acoustic suite

Vessel Particulars
- Length: 170’-0”
- Beam: 56’-0”
- Draft: 12’-0”
- Depth: 21’-0”

Fuel Cell Power:
- $\text{LH}_2$: ~ 1.4 MW
- $\text{LH}_2$: ~ 8,000 kg