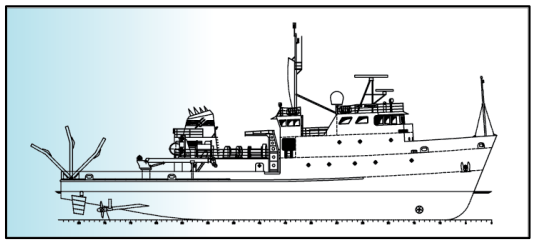
California-based Intermediate Class & smaller ships

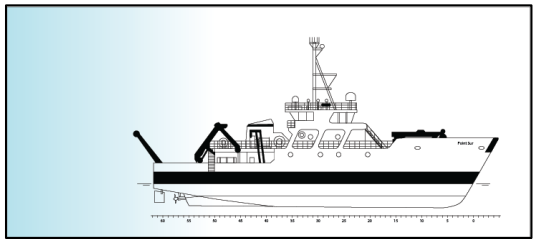
Research vessels able to carry out California's local research and education needs have decreased from 3 to 1, with the last remaining ship approaching the end of its service life.

A new vessel is needed.



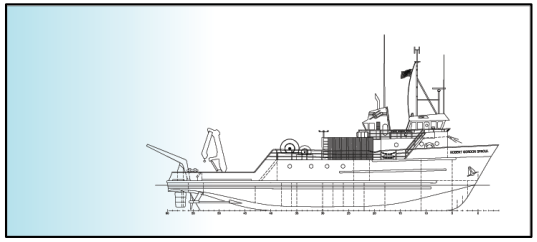
INTERMEDIATE

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



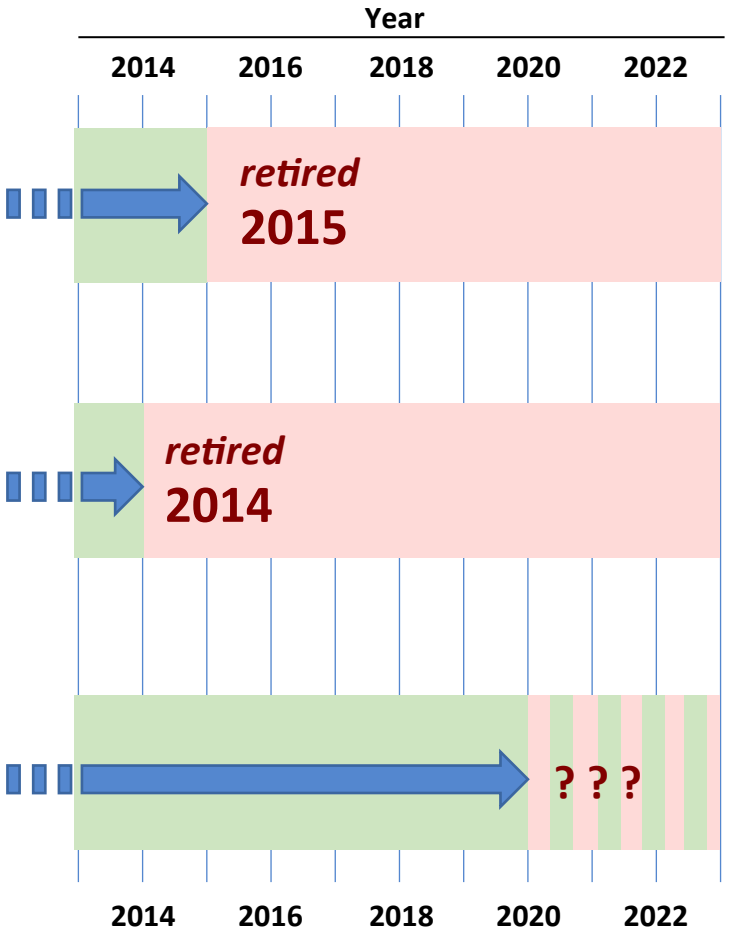
REGIONAL

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



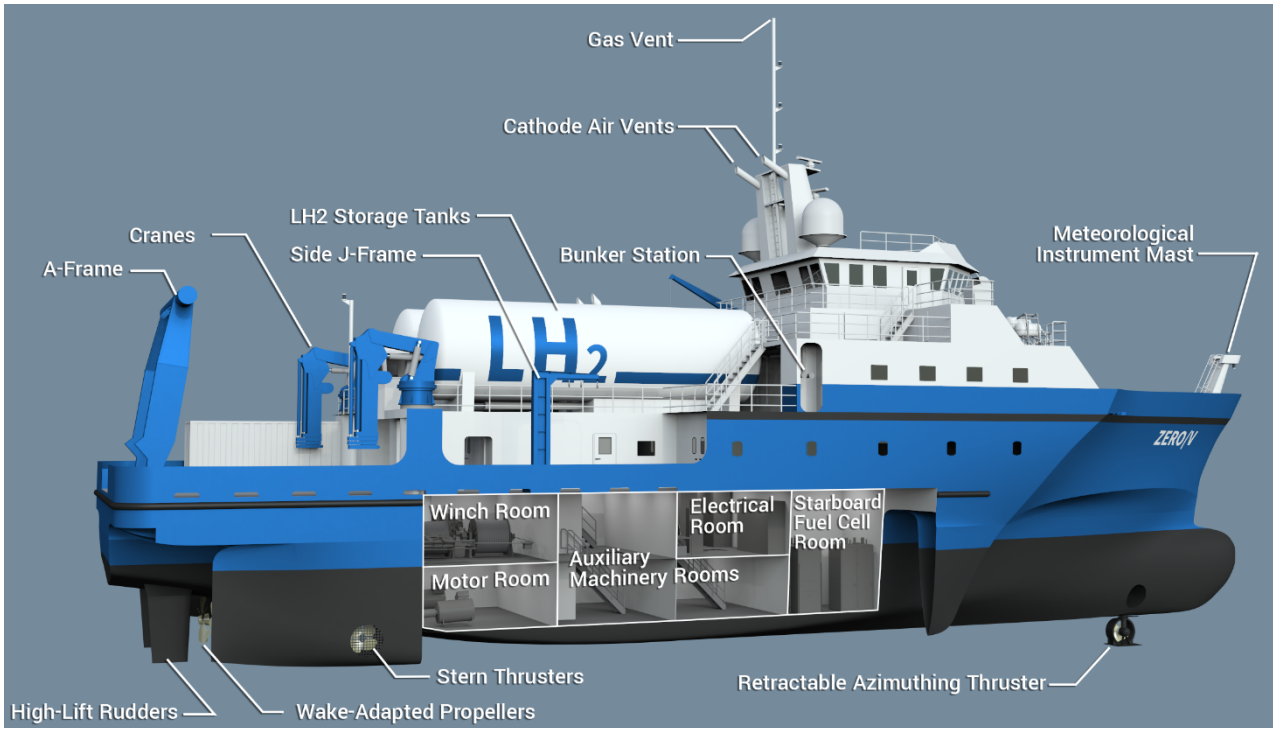
LOCAL / COASTAL

R/V Robert Gordon Sproul
125 feet / 14-day endurance
5 crew / 12 scientists



Needed

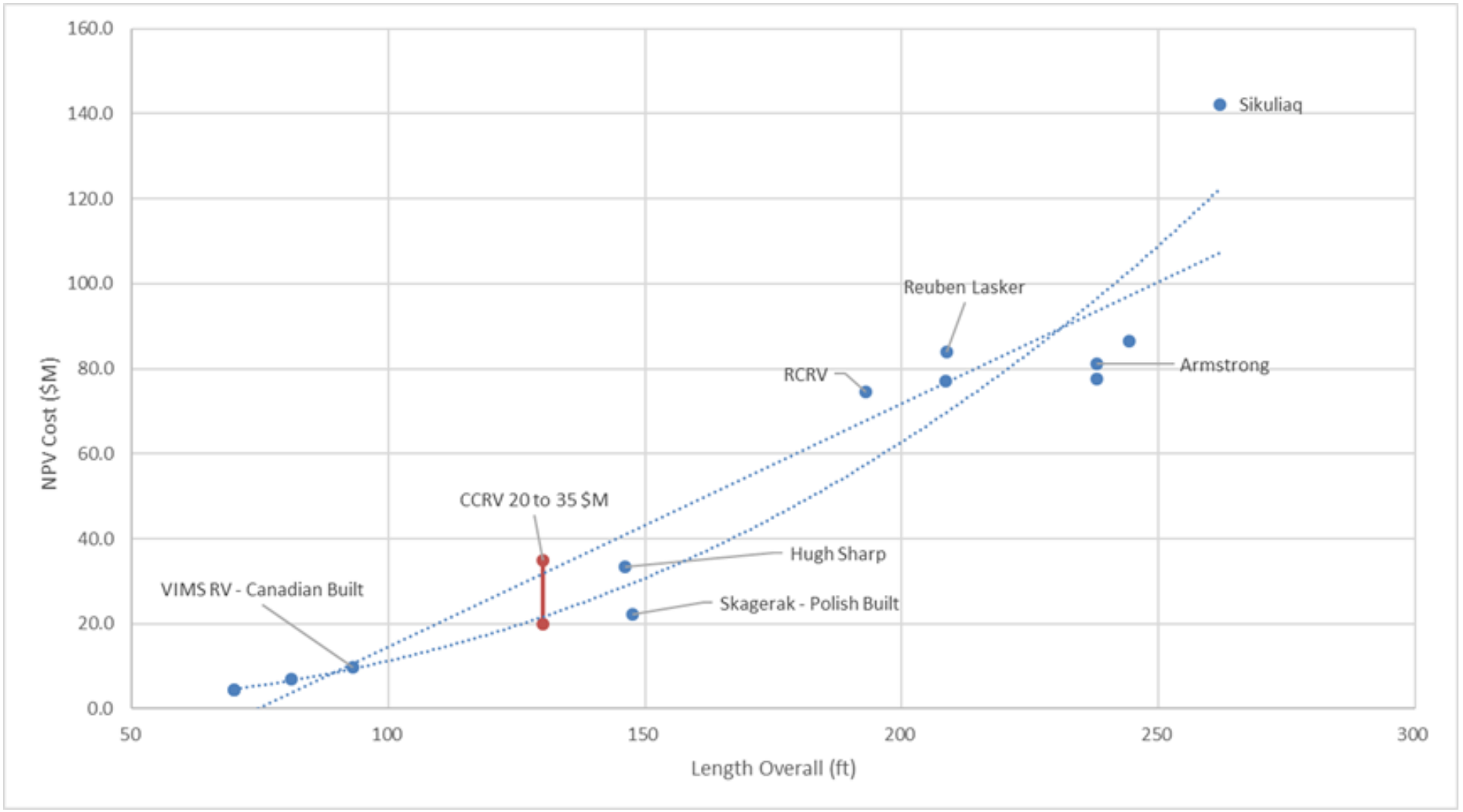
Zero-emission research vessel feasibility study: ZERo/V



- Design study funded by MARAD for a new coastal / local vessel
- Liquid hydrogen fuel
- Zero emissions: clean!
- Electric drives: quiet!
- **Feasible: YES**, using existing technology
- Hydrogen fuel cells
- Next: create affordable green design to replace *Robert Gordon Sproul*

The zero-emission research vessel (ZERo/V) concept vessel has a range of 2,400 nm with berths for 24 scientists, supporting general-purpose missions. Anticipated construction cost: $80 million.

Characteristic	CCRV
Length	120-135
Beam	30
Draft	12 Max
Gross tonnage	< 300 (uninspected)
Crew - Multi Day Trips > 12 hrs	8
Crew - Day Trips < 12 hrs	3 to 4
Science Berthing Multi-Day Trips	12 to 14 non crew incl techs
Science Personnel (Day Trips <12h)	40 non crew incl techs
Speed, transit (kts)	10
Speed, maximum (kts)	12
Dynamic positioning	yes - not Classed
Sea keeping (SS operating)	SS4-SS5
Endurance (days)	14 - 21
Range (transit, nm)	3,500
Wet lab (sq ft)	150
Dry lab (sq ft)	400-500
Computer lab (sq ft)	120
Work deck (sq ft)	1200
Stbd Rail Working Length (ft)	40
Freeboard (ft)	3 to 4 ft
Day rate	$10K/24hrs less for 12 hours


160.0
140.0
120.0
100.0
80.0
60.0
40.0
20.0
0.0
NPV Cost ($M)
50
100
150
200
250
300
Length Overall (ft)
Sikuliaq
Reuben Lasker
RCRV
Armstrong
CCRV 20 to 35 $M
Hugh Sharp
VIMS RV - Canadian Built
Skagerak - Polish Built