Sail-Assisted Research Vessels

Where the power of the wind meets science!

Low Drag, Low Impact

"Why would you roar into the rainforest in a Hummer to study butterflies."

Tom Wylie ~

What is a “sail-assisted vessel”

A Vessel that benefits from the use of the wind to propel it through the water. This in turn results in less fuel consumption, lower costs and a smaller carbon footprint.

Pros

Reduced fuel consumption

- An average of 70% fuel reduction vs. fuel-only vessels of equal size and capacity when powering
- Sailing/Powering ratio is about 50/50 based upon experience
- Significantly reduced carbon footprint
- Research and charter dollars go further and can be spent on science/equipment instead of on boat time

Onboard science lab for in-situ experiments

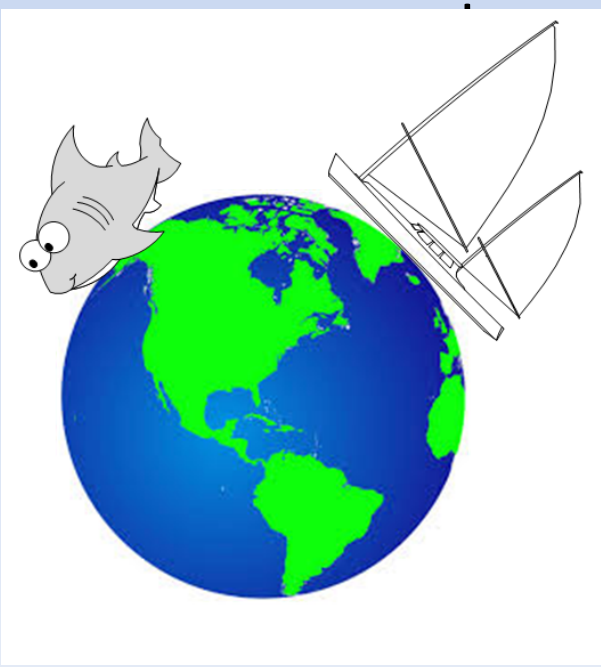
Speed while under sail

Noise reduction

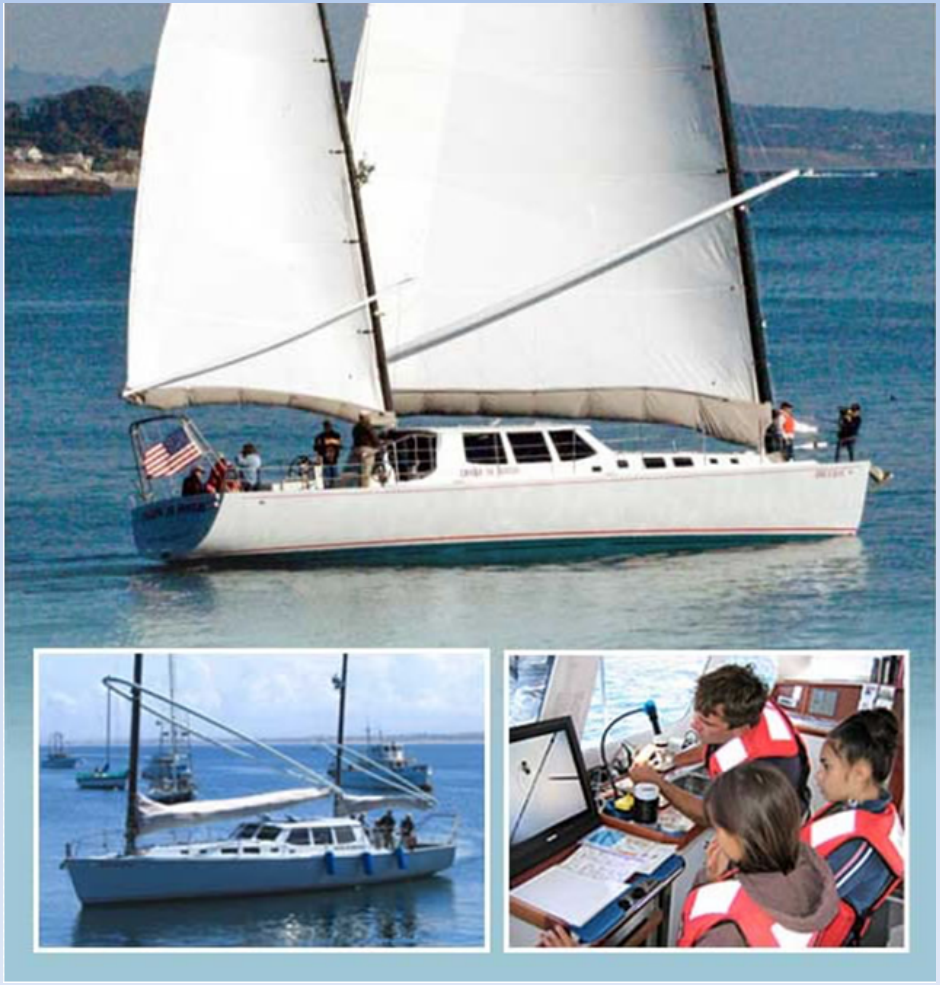
- Acoustic noise is reduced due to a smaller/ simpler power plant and more efficient hull shape
- Less impact upon marine mammals
- Easier to meet ICES noise standards
- Improved geophysical and biological acoustic data collection platform

Extended Range

- Potentially unlimited range to reach an unlimited wealth of habitats and locations that may not have been studied much and that remain mysterious.
- Creates an opportunity to learn more about particular species and their habits in real time to the ability to follow or observe for extended durations.



Derek M Baylis



Top speed under sail - 18 knots
Top speed under engine – 11.5 knots
Passenger count over 12hrs - 8
Passenger count under 12hrs - 41
LOA – 64' 11.5"
DWL – 57' 6"
Beam - 14' 9"
Draft -8' 4"

COI range –
North to Alaska
West to Midway
South to Panama

Past research jobs -
MBARI 2003
RTC 2003
Woods Hole 2003
Monterey Bay Aquarium 2004 to 2016
NSF 2010 and 2012
Cascadia Research Collective 2012 to 2014
OSU 2010 and 2012
NOAA 2010
SFEI 2017 to 2018

Concerns Raised to Date

Concern

- "Sail-assisted" vessels may heel suddenly in a wind gust and this is may disrupt science activities

Reality

- A "sail-assisted "vessel generally heels at a steady angle, whereas a "non sail-assisted" vessel will pitch and roll - the primary cause of motion sickness. "Sail-assisted" vessels tend to be more comfortable, and more passenger comfort leads to better science!

Concern

- "Sail-assisted" vessels lack the load limits and have greatly limited working deck space

Reality

- If the "sail-assisted" vessel is purpose built (such as the Derek M. Baylis), the work deck space is considerable and many of the same missions can be accomplished

Concern

- It is difficult for a sail assisted vessel to hold station

Reality

- Not only is it just as easy for a "sail-assisted" vessel to hold station, it is actually easier in some cases

Concern

- The power available for science is too limited

Reality

- It has to date proven sufficient on the Baylis for instrument deployment and operation. Secondary generators could be employed if necessary for specific research requirements

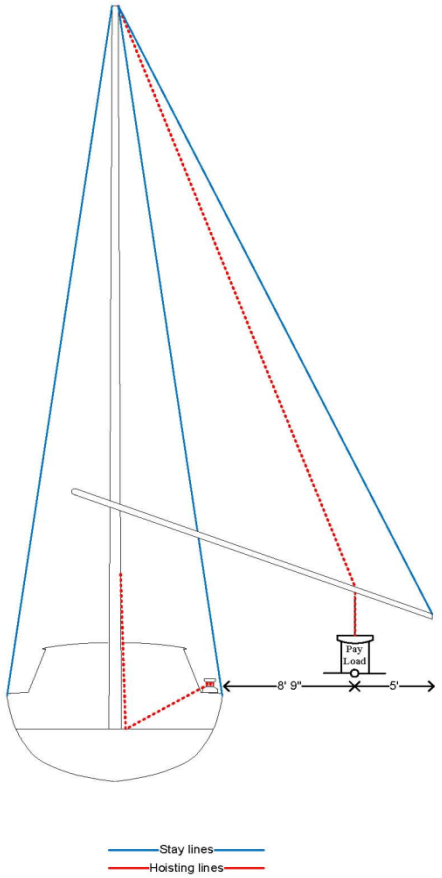
Doing Science Aboard a Sail-Assisted Research Vessel

Workstations and Displays

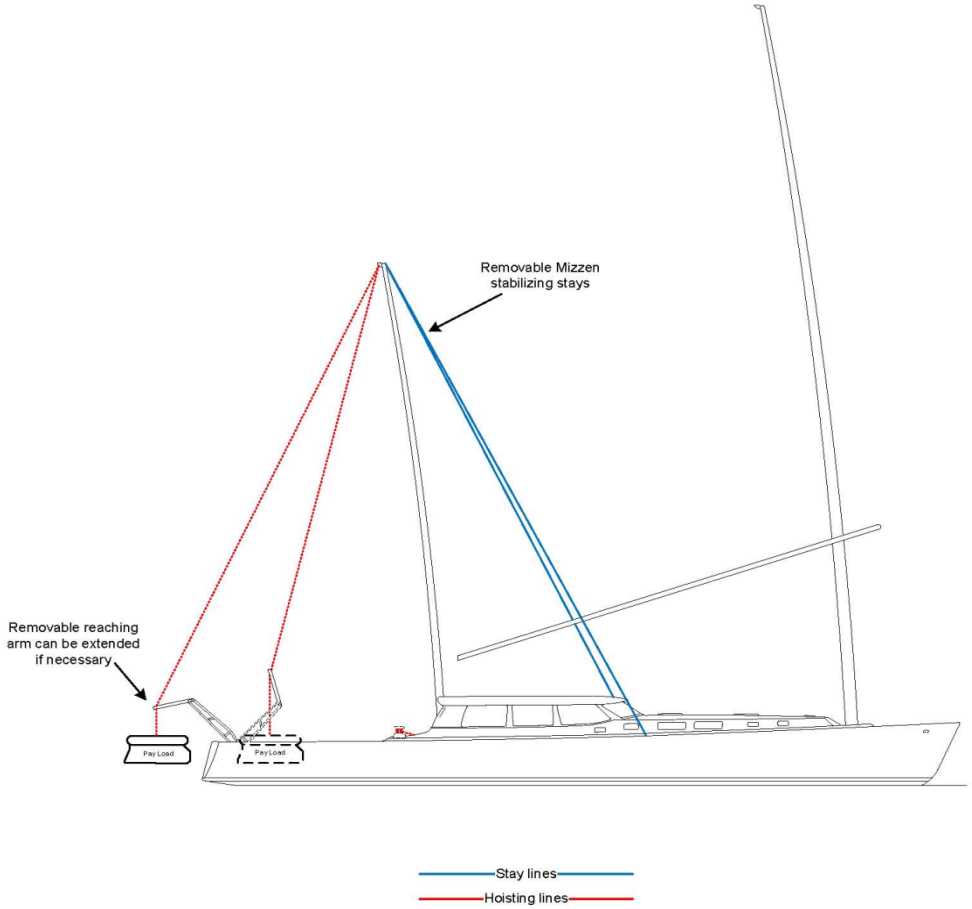
Transducer pole

The versatility of the mast and boom/wishbone

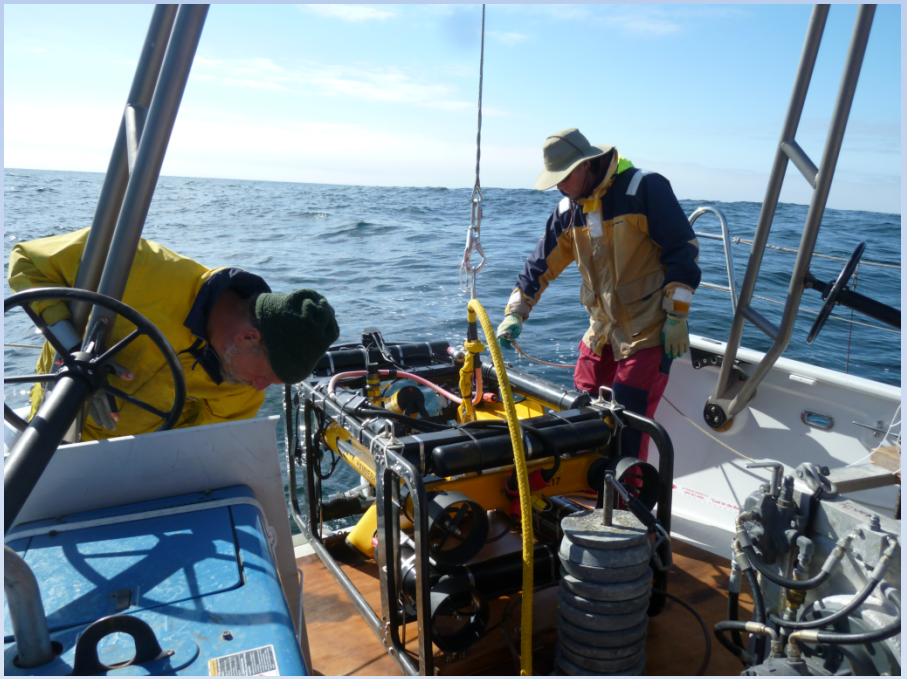
Hoisting arrangement using mizzen mast as a crane



Hoisting arrangement using A-frame in conjunction with mizzen mast



ROV deployment



18’skiff and shark tagging

Amenities and Educational Opportunities

Living Aboard

The future stewards of our globe

On our trips with educational institutions we have been able to:

- Foster a more complete understanding of our seas and the atmosphere by including wind power in the program
- Allow the youth and grad students to experience the sounds of the sea and wind with the absence of engine noise
- Explain the physics of sailing: how a sailing vessel can sail upwind - To be a good sailor requires a working knowledge of both oceanography and meteorology.

Coming soon to a coast near you!

The beginning of the Wylie40 fleet

Low Operations and Maintenance Alternative for Local Coastal Education, Outreach and Research Missions

Top speed under engine – 8.2 knots

Top speed under sail - 18 knots

LOA – 39’ 8"
DWL – 34’ 2"
Beam - 11’ 3"
Draft - 6’ 6"
Air draft (water level to highest point of the vessel) – 61'

Work deck size - 82 sq ft
Below deck lab space - 90 sq ft
aft deck cargo hatches - 2 @ 1.7' W X 4.7' L
Passenger count under 12hrs - 22
Passenger count over 12hrs - 6
Sleeps - 6

The vessel is fully customizable to increase lab or cabin space

Concept ship for the NSF 165’ LOA

Top speed under engine - 18 knots

LOA - 165'
DWL – 150'
Beam - 31' 9"
Draft – 13'
Air draft (water level to highest point of the vessel) - 130'

Top speed under sail - 25 knots

Work deck size - 2,520 sq ft
Below deck lab space - 1,350 sq ft
aft deck cargo hatches - 3 @ 5.5' W X 7' L
Passenger count under 12hrs - 36
Passenger count over 12hrs - 36
Sleeps - 36

The vessel is fully customizable to increase lab or cabin space

Concept ship for OSU 240’ LOA

Top speed under engine - 22 knots

LOA – 240'
DWL – 227' 6"
Beam - 39' 2"
Draft - 17'
Air draft (water level to highest point of the vessel) – 130'

Top speed under sail - 22 knots

Work deck size - 2,888 sq ft
Below deck lab space - 1,190 sq ft
aft deck cargo hatches - 3 @ 7.5' W X 10' L
Passenger count under 12hrs - 48
Passenger count over 12hrs - 48
Sleeps - 48

The vessel is fully customizable to increase lab or cabin space

Testimonials

The use of the Baylis generally improved data quality through the reduction of self-noise, and for a fixed budget it allowed us to triple the length of the cruise. At that point I was sold on using wind power on research vessels as a solution to budget and data quality problems. If the opportunity arises again, we'll be using the Baylis for future work.

~Chris Goldfinger - Oregon State University OSU College of Earth, Ocean and Atmospheric Sciences

The Derek M. Baylis provided us with a quiet and relatively stable platform while under sail, which increases our chances at successful acoustic detection of relatively quiet beaked whales.

Our fuel use was just a trickle of what would typically be required for this type of work and our carbon footprint was more of a toe print. We recommend this vessel for projects of this nature, and hope to use it again in the future.

~John Calambokidis - Research Biologist, Cascadia Research Adjunct Faculty, Evergreen State College