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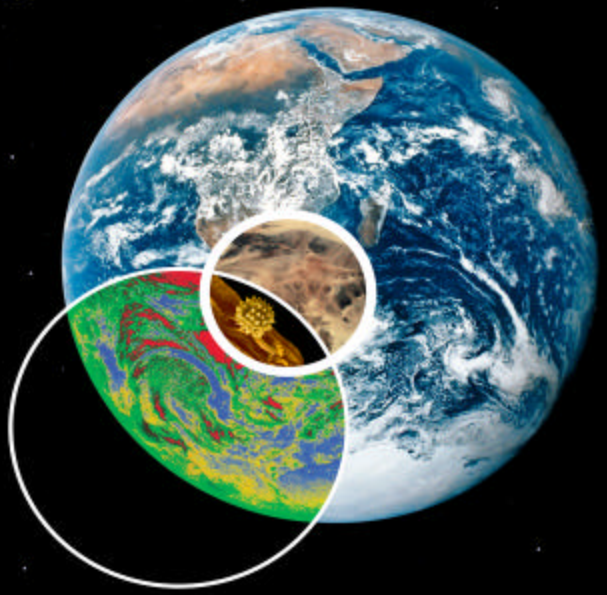

Research Vessel Maurice Ewing in the Gulf of Corinth August 2001

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The Research Vessel *Maurice Ewing*

Length:	237 feet
Disp. Tonnage:	2598 long tons
Year Built:	1983 (converted 1989- 1990)
Endurance:	50 days
Science Berths:	29

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Mid-Life Refit Questions:

How might ***Ewing*** be upgraded to best address the scientific needs of the community?

What additional capabilities should the ship have?

What are the tradeoffs between optimizing seismic capabilities and general-purpose capabilities?

What is practical - reasonable - optimal?

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These questions must be answered in the context of both:

- The evolving science needs of the U.S. community
- The strengths and capabilities of the other vessels within the UNOLS fleet
- The Federal plan for fleet enhancement and replacement over the next 15 years

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The Scientific Needs:

- Exploration of the fourth dimension (time) through in situ measurements of active processes
- Characterizing and modeling nonlinear geosystems (e.g. climate, seismogenesis sediment dynamics)
- Determining the central role of fluids (water and magma) as agents for geochemical cycling among the solid earth, hydrosphere and atmosphere
- Exploring the role of biological activity on geological processes
- Investigating the long-term variability of geological processes
- Abrupt climate change

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To tackle these problems the community needs:

- Ocean Observatory Systems
- High Res bathymetry/sidescan and advanced seafloor imaging and sampling
- 2D and 3D Multichannel seismics and large arrays of OBS/OBH
- Broadband seismic instruments
- Repeat seismic surveys, seafloor geodetic instruments
- Time series measurements of ocean currents and properties
- Hard rock and water sampling capabilities; heat flow measurements
- High resolution subbottom profiling
- Long sediment cores and large volume shallow cores
- Active archives of MGG data; centralized searchable online metadata catalog

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The Process

- Solicitation of input from community via EOS ad; direct mailing; requests in community Newsletters
- Establishment of new internal advisory committee
- Establishment of a community-wide steering committee
- Production of extensive set of ‘Technical Option Papers’
- Workshop Activity and production of workshop report
- Formulation of set of feasible options for discussion

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Workshop: Overall Summary & Conclusions

Key Statements:

• A refit of ***Ewing*** cannot improve 2-D MCS ***and*** provide an effective multiple streamer capability (for 3D) ***and*** substantially improve general-purpose operations.

• Quality of present ***Ewing*** MCS operations would be substantially improved through increased repeatability of the sound source.

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Key Statements *(continued):*

• In the refit of ***Ewing,*** use of a linear airgun array forces serious compromises in OBS and general purpose operations.

• In the refit of ***Ewing,*** without a linear airgun array, there are excellent options for new lab and deck layouts.

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Workshop Recommendations:

If the goal is to:

- Tow multiple long streamers
- Improve source repeatability using linear gun arrays

and

- Improve general purpose/OBS capabilities

then

- ***Ewing*** cannot satisfy these needs, and the possibility of securing a used industry vessel should be studied

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Being guided by these Workshop recommendations, and using the substantial volume of technical data that were used in the preparation of the Technical Option papers for the Workshop, we formulated a set of three options, that we believe best capture the reasonable alternatives that require our consideration.

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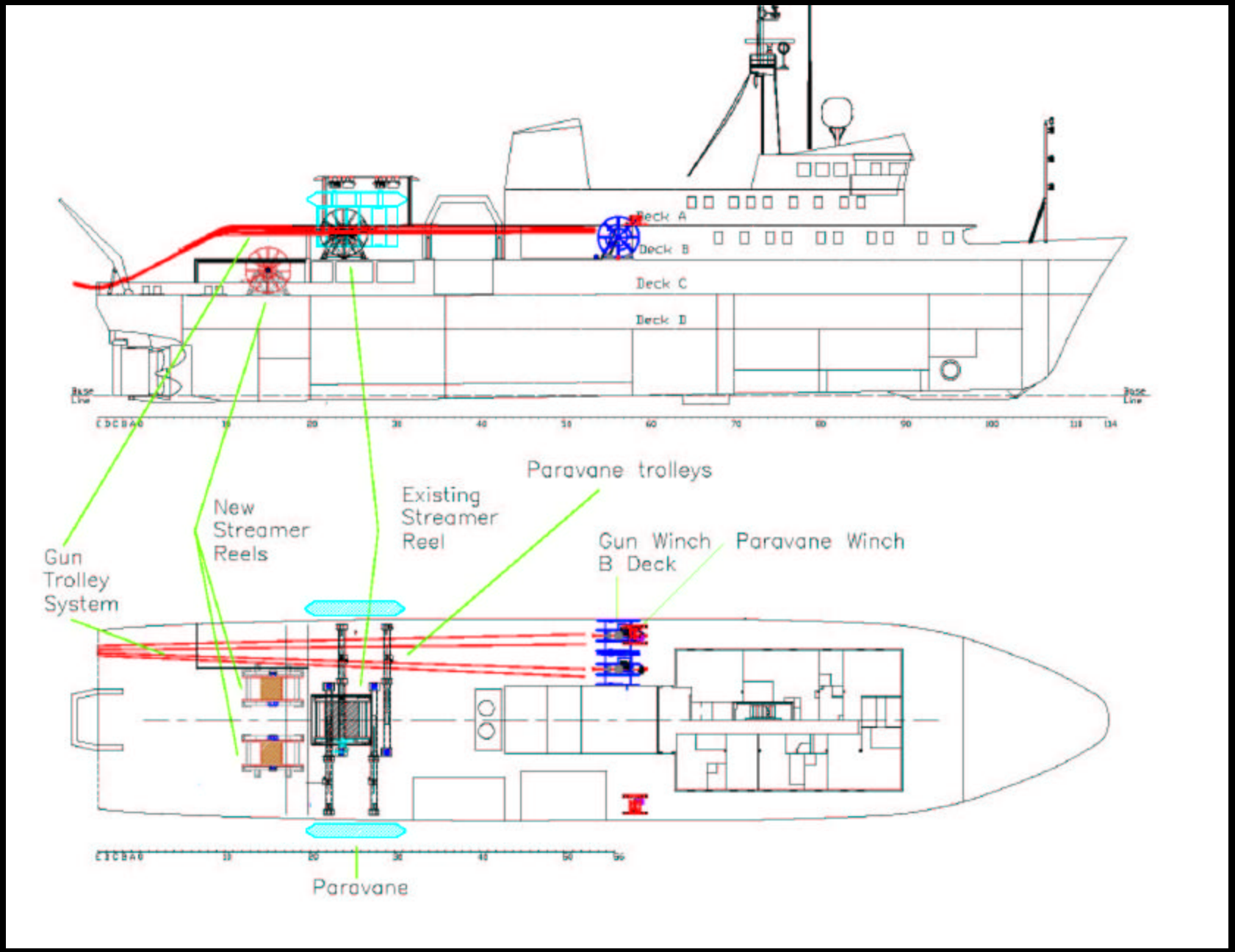
Three Options for Discussion:

1. Maximize ***Ewing*** general purpose capabilities, and enhance conventional MCS.

2. Outfit ***Ewing*** with Linear Gun arrays

3. Replacement Vessel


Deck A
Deck B
Deck C
Deck D
Paravane trolleys
New
Streamer
Reels
Existing
Streamer
Reel
Gun Winch
B Deck
Paravane Winch
Gun
Trolley
System
Paravane

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Paravanes

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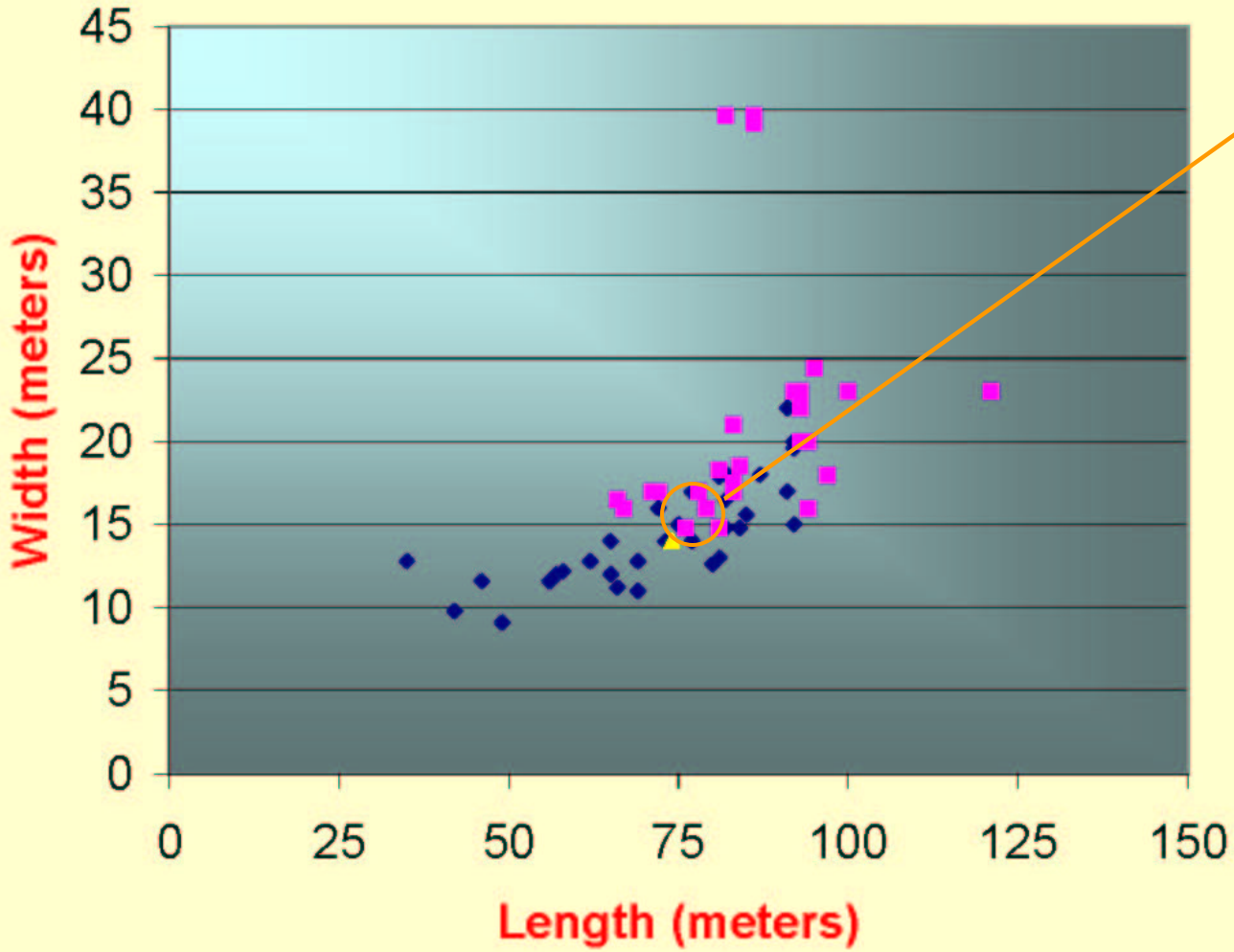
Summary Statement

- There are two solid options, both of which offer increases in capability
- A refit *Ewing* will offer substantially improved general purpose capabilities, a multi streamer high res system and modest improvements in the single streamer seismic ops (longer streamer but existing gun configuration)
- Replacing the *Ewing* with a used industry vessel would revolutionize US academia's capability to collect MCS and OBS seismic data

3D Seismic Vessels Length vs Width



Target Area

More Space than Ewing

But, not too Big

- Built before 1990
- Built after 1990
- R/V Ewing


WESTERN
LEGEND
WESTERN LEGEND

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Replacement Vessel Science Capabilities

Streamers:	4 Streamers x 6 km (8 km) with separation up to 200m
Sound Source:	4 Linear Gun Arrays (Dual Source) with separation +-50m
DP:	Twin Screw with bow tunnel thruster and to include forward azimuthing thruster
Sonars:	Pod with high resolution 1°x1° Deep Sea Multibeam and high resolution 0.5°x1° shallow multibeam and subbottom profiler
Over the Side:	Ability to match or exceed Ewing for over the side handling
Lab Area:	Lab area far exceeds Ewing's capacity
Open Main Deck:	More open deck than Ewing
Portable Vans:	5 Van/Container capacity without effecting other operations

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Replacement Vessel – Western Legend

(*EWING* after midlife in parenthesis)

Length:	235 feet *(237 feet)*
Beam:	56 feet *(46 feet)*
Displacement Lightship Tonnage:	2578 metric tons *(1867 metric tons)*
HP:	7200 HP *(3200 HP)*
Bollard Pull:	86.2 metric tonnes *(20.2 metric tonnes)*
Compressor Capacity:	2x2750cfm *(3x1000cfm)*
Speed Cruising/Max:	12/14 kt *(11/13 kt)*
Ship's Complement/	
Minimum Science Party	60/40 people *(50/29 people)*


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