UNOLS
FIC report to UNOLS Council
September 26, 2002

National Science Foundation

Arlington, VA

Bottom Line

- The fleet replacement process has started (none to soon)
- We need to
  - Provide material as needed
  - Muster community support
  - Be adaptable to changing agency schemes (funding schemes)

House Armed Services Committee Authorization Report FY03 107-436

The committee recognizes the age of the UNOLS fleet and the need for a rational plan for renewal of the fleet over the next ten years.

Therefore, the committee directs the Secretary of the Navy to submit to the Senate Committee on Armed Services and House Committee on Armed Services no later than February 1, 2003, a report detailing specific requirements and outlining a specific plan for UNOLS fleet renewal.

The report should include specific recommendations on the numbers of each class of ship to be maintained in the UNOLS fleet, their geographic distribution, the schedule for their replacement, and estimates of ship construction costs."

House Armed Services Committee Authorization Report FY03 107-436

The committee believes that scientific knowledge of the oceans and ocean environments makes a critical contribution to U.S. national security and commercial vitality. The committee notes, that in large part, U.S. scientific expertise in oceanography and ocean sciences is sustained by the Office of Naval Research and the National Science Foundation partnership that provides oversight of the University-National Oceanographic Laboratory System (UNOLS) fleet.

NSF Mechanism for Funding New Research Vessels

- Dr. Yoder indicated NSF is seeking a way to fund ‘intermediate infrastructure’.
- Support for <$25M Regional Ships may be possible
- Will need regional ship SMR soon (December)

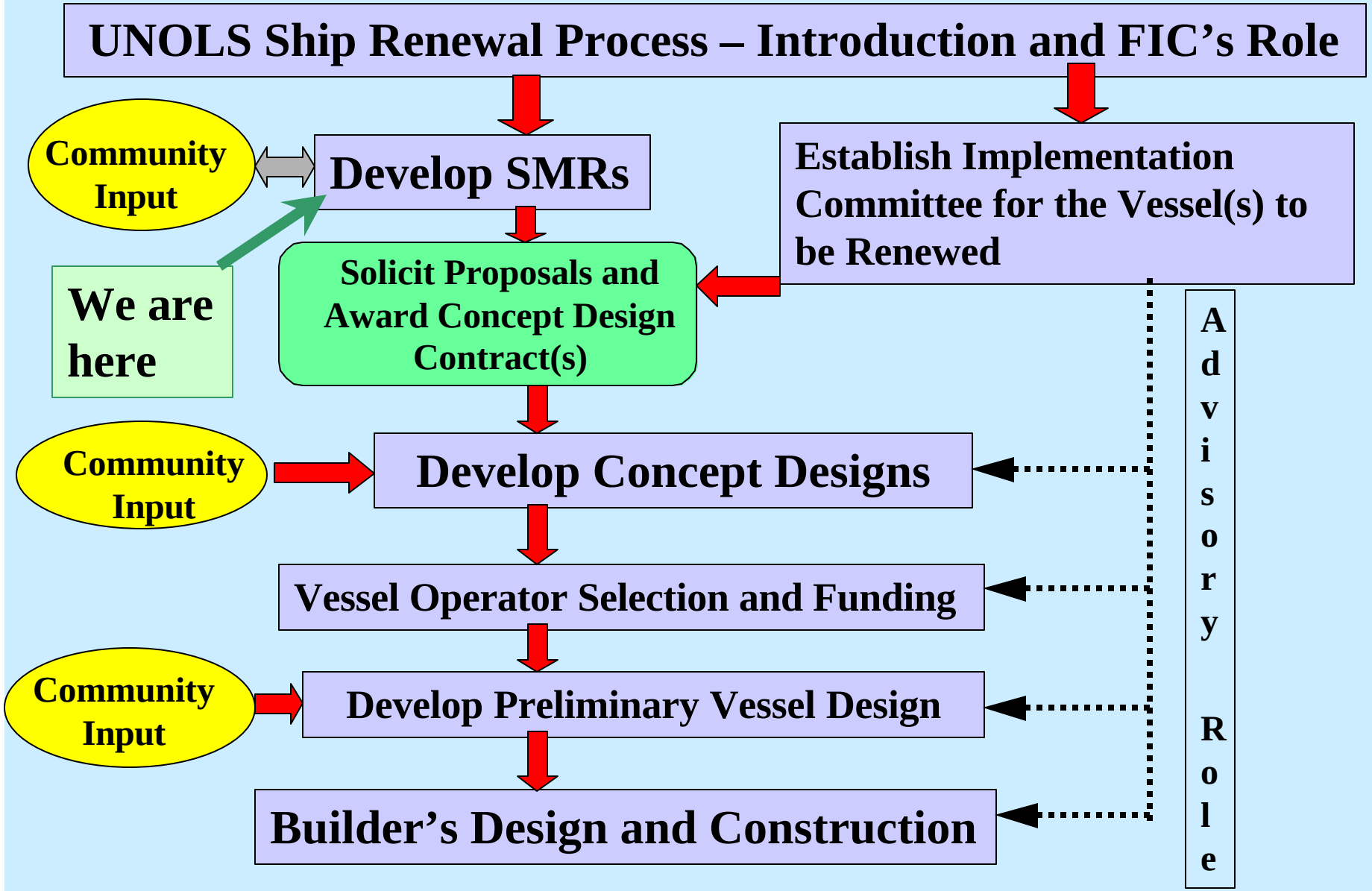
Navy
Scalable, Common Hull Study

To reduce the Navy's acquisition cost for new oceanographic ships by investigating the feasibility of using a common hull platform for future T-AGS(X) and UNOLS Ocean Class ships.

Navy Common Hull Study

- Results indicate that a Common Hull for the TAGS, TAGSX and Ocean Class vessels is not feasible.

FIC Roadmap


UNOLS Ship Renewal Process – Introduction and FIC's Role
Community Input
Develop SMRs
Establish Implementation Committee for the Vessel(s) to be Renewed
We are here
Solicit Proposals and Award Concept Design Contract(s)
Community Input
Develop Concept Designs
Vessel Operator Selection and Funding
Community Input
Develop Preliminary Vessel Design
Builder's Design and Construction
Advisory Role

Ocean and Regional Class SMR

- Community meetings held this summer.
- Draft SMR's available on website.
- Based on FIC meeting
  - Summary added
  - Table of parameters (re. Henlopen)
- SMRs being reviewed by workshop participants then by oceanographic community

Science Mission Requirements

Mission statement, size and general requirements

Accommodations and habitability

Accommodations – crew & non-crew;
Habitability

Operational characteristics

Endurance; Range; Speed; Sea keeping;
Station keeping; Track line following;
Ship control; Ice strengthening

Over-the-side and weight handling

Over the side handling; Winches; Wires;
Cranes; Towing

Science working spaces

Working deck area
Laboratories: Type & number; Layout & construction; Services
Vans; Storage; Science load; Work boats;
Masts; On deck incubations
Marine mammal/bird observations

Science and shipboard systems

Navigation; Data network and onboard computing; Real time data acquisition system;
Communications - internal;
Communications – external;
U/W data collection & sampling;
Acoustic systems; Visiting system installation and power; Discharges

Construction, operation & maintenance

Maintainability; Operability; Life cycle costs;
Regulatory issues

Ocean Class and Regional Class SMRs
~ Issues Requiring Additional Attention ~

- Identify areas where consensus could not be reached
- Regulatory Concerns. Should regional stay <500 GT and < $25M
- The “Gap” - Should the Regional Class be a “class” of vessels that are identical or nearly identical?
- Geographic Differences
- Other Issues?

SMR Areas that need closer attention to the details

- Speed
  - Ranges ok, speed control values realistic
- Seakeeping
  - May need better definitions of terms (RMS) and tied to existing vessel performance, check actual values, specify type of work and best heading for some criteria.
- Station keeping
  - Are limits realistic and required?
- Trackline following
  - Crab angle, speed, distance off track
- Ice strengthening (Ocean Class only)
  - specify classification?
- Weight handling & Cranes
  - Are values realistic and how do they compare to existing?
  - Define minimum (required) and desired (maximum) values
- Towing
  - Do values relate to actual experience?

SMR Areas that need closer attention to the details

- Deck, labs & storage size (square or cubic footage)
  - Review to be sure sizes are realistic and how they compare to existing.
- Deck and bolt down strength
  - Is ABS criteria for deck strength adequate, higher point loads?
  - What is the required strength rating for 1” bolt down sockets?
- HVAC, noise and other environmental standards
  - Cite specific standards or references or at least refer to them as current examples.
- Electrical for labs, vans and decks
  - Verify required voltages, amps, etc. and specify quality (droop, freq)
- Acoustic systems
  - One degree resolution for multi-beam?
  - Are we be specific enough or too specific for all system?
- **Maintainability, operability, life cycle costs and regulatory issues**
  - Need operator review and input on these sections
- **Mission scenarios and regional/ocean differences**
  - Need more scenarios and better definition of regional differences

FINISH SMRs! STAY FOCUSSED

- Get community input to SMR's
  - Prepare short summary and table of SMR's
  - Get article in EOS for both SMR's.
  - Regional Class
    - Add section upfront noting regional differences
    - Because of NSF deadlines we need process completed by December. Approval by email by FIC
  - Ocean Class
    - Available at AGU/San Francisco
    - FIC approval at winter meeting.

Alaska Regional Research Vessel

- Model tests nearly complete and reports ready
- Helo pad removed
- Stateroom size reduced to increase berthing
- Funding will be mentioned by Director Colwell tomorrow.

Assessment of the Kilo Moana

The RV KILO MOANA is the first SWATH vessel in the UNOLS fleet.

The unique characteristics of this vessel make at-sea operations different than normally done on a standard monohull vessel.

The design of a SWATH vessel puts constrains on the layout and operation of the vessel.

This questionnaire is to evaluate the use of a SWATH vessel for oceanographic research and aid in any decision process of constructing future SWATH vessels and improvements to this platform.

Kilo Moana Shakedown Planning

- Goal - assure adequate assessment by oceanographers for oceanographers
- Process
  - Post Cruise Debrief Interviews
  - Science Systems Testing
  - Hull Evaluation

Post Cruise Debrief

Personal call from FIC member and questions in advance

Please describe all of the different scientific operations conducted during the cruise. Examples are CTD casts, water sampling, coring (both piston and box), mooring deployment and recovery, towing of scientific packages (nets, CTD, ADCP, etc) and acoustic systems (ADCP, multibeam).

A. What were the most positive aspects of your research cruise on the R/V KILO MOANA with a SWATH hull form compared to your previous experience on a monohull?
B. What were the most negative aspects of your research cruise on the R/V KILO MOANA with a SWATH hull form compared to your previous experience on a monohull?
C. Did you have difficulty loading/unloading the scientific gear from the ship?

Post Cruise Debrief (continued)

D. Were the labs adequate (location, size, accessibility) for you?
E. Were the underway systems (thermosalinograph, running seawater) working adequately?
F. Were communications with the bridge, winch and crane operators easy to conduct?
G. Were the accommodations adequate (e.g., size, location, accessibility)?
H. Were there ship vibrations or other motions that made it difficult to work and live on the ship?
I. At any time, did you feel the ship was not sea-worthy at certain sea states? Were there times when you felt that you rather be on a monohull ship? A SWATH ship?

Post Cruise Debrief (continued)

J. Were deck crane and winch operations safe and efficient? Did it take more personnel to perform the operation that you expected?

K. Were there any weight distributions problems with heavy science payload such as vans?

L. Was dynamic positioning used? And was it useful?

M. Were the multibeam or acoustic Doppler systems working properly under all conditions?

N. Were any heavy gear deployments undertaken such as moorings or sediment sampling?

O. Comments to Dave Hebert or Terry Whitledge

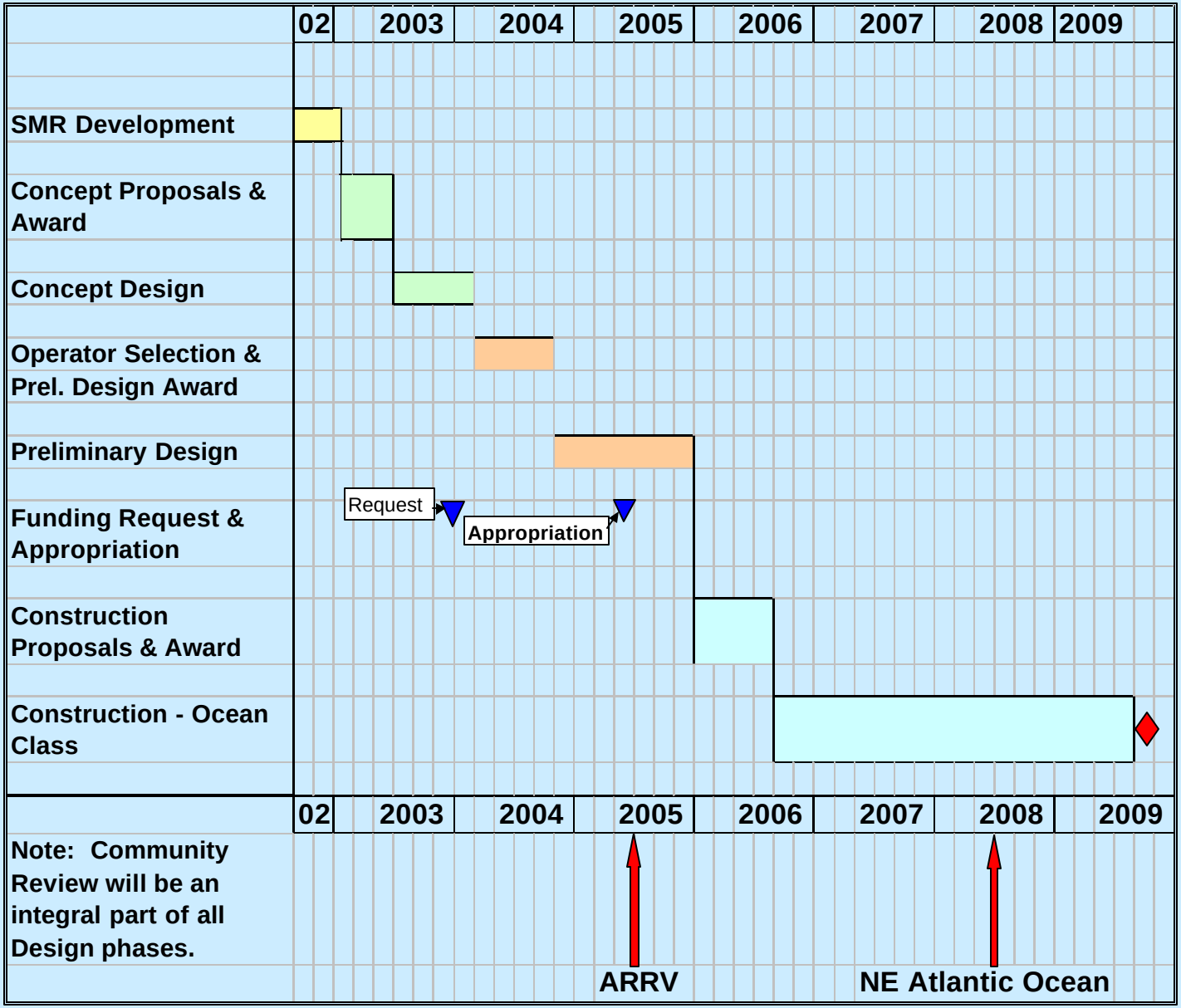
SWATH – MONO Evaluation

- Recommend NSF/ONR support proposals to evaluate ship motion on SWATH and mono-hull vessels.

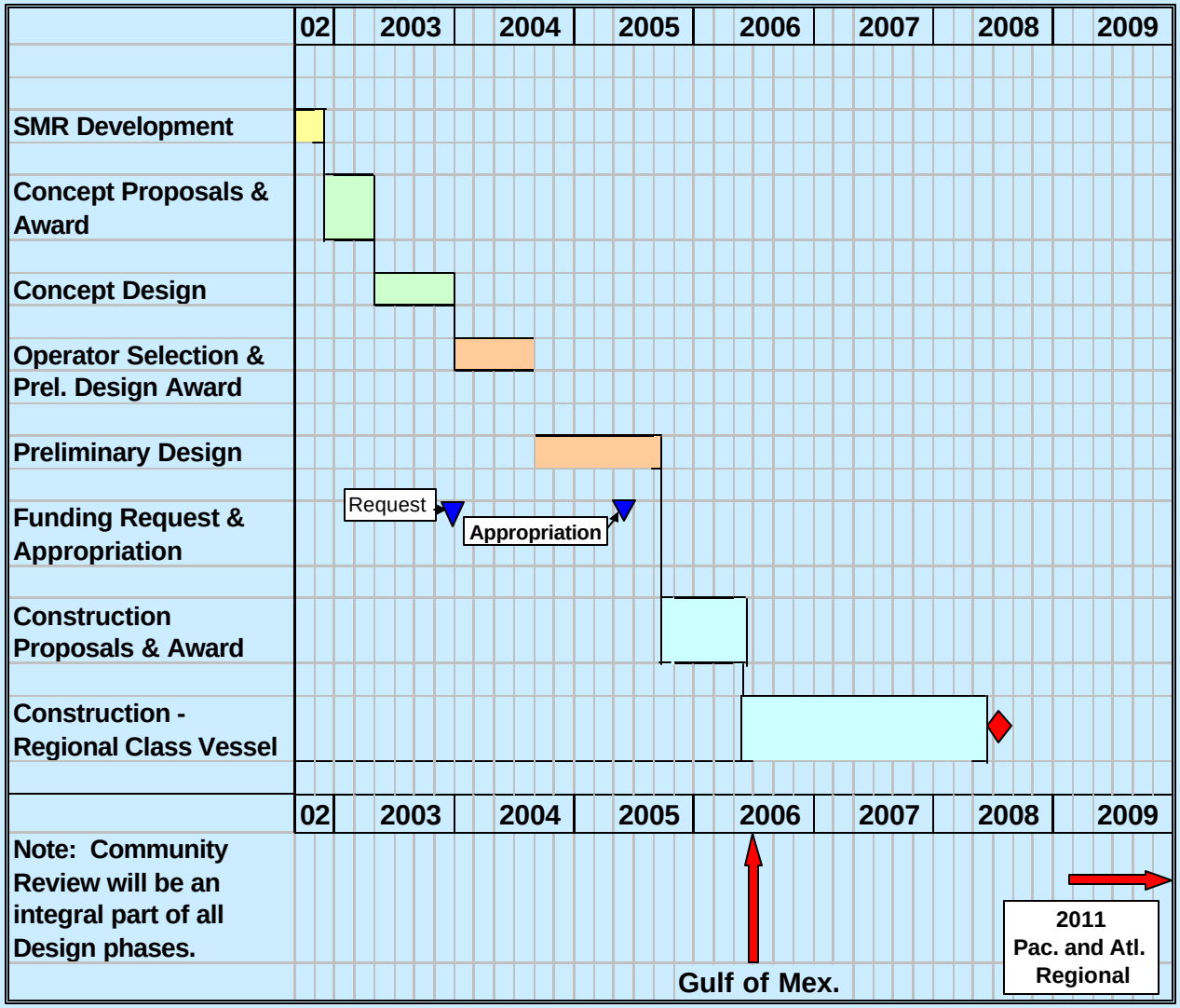
Cape Henlopen Replacement

- Highly capable 138’ ship 33’ beam.
- ~$10M
- Model of how to do it.
- Construction starts 2004
- In business 2006

Design and Construction Timeline: Ocean Class



Design and Construction Timeline: Regional Class



FIC Tasks

- Proceed with SMR's – Community Input
- Keep the Renewal Process Moving
- Revise *Kilo Moana* debriefing questions and intiate process
- Recommend NSF/ONR support proposals to evaluate ship motion on SWATH and mono-hull vessels.
- FIC review of RV Cape Henlopen
- Call for nominations for new members of FIC

The Emerging Mosquito Fleet
R/V FAY SLOVER - ODU Vessel
8,400 lbs over the stern tests

Ocean Class Research Vessel

PROGRAM COST DISTRIBUTION

	"Low Risk Model"	
Design, Incl. Model Tests & support during const	10%	$ 5,000,000
Management: Program, contracting & on site	5%	$ 2,500,000
Initial Outfit - ship's gear & spares	4%	$ 2,000,000
Science outfit	5%	$ 2,500,000
Construction	**63%**	**$ 31,500,000**
Reserve, Change Orders, etc.	8%	$ 4,000,000
Mission Trials 60 day operations with science	2%	$ 1,000,000
Post Shakedown Availability	3%	$ 1,500,000
Total Program	**100%**	**$ 50,000,000**

Regional Class Research Vessel

PROGRAM COST DISTRIBUTION

	"Low Risk Model"	
Design, Incl. Model Tests & support during const	10%	$ 2,500,000
Management: Program, contracting & on site	5%	$ 1,250,000
Initial Outfit - ship's gear & spares	4%	$ 1,000,000
Science outfit	5%	$ 1,250,000
Construction	**63%**	**$ 15,750,000**
Reserve, Change Orders, etc.	8%	$ 2,000,000
Mission Trials 60 day operations with science	2%	$ 500,000
Post Shakedown Availability	3%	$ 750,000
Total Program	**100%**	**$ 25,000,000**

FIC Membership

UNOLS Operator Reps:

Dave Hebert, URI - Physical O. (9/99 – 9/02)

->Bill Smethie, LDEO – Marine Geochemistry (10/96 – 10/02)

Kelly Falkner – OSU – Chemist – West Coast

Terry Whitledge, U.Alaska – Arctic Research/Bio O. (7/00-9/04)

Non-Operator Reps:

Larry Atkinson, ODU - Coastal/Physical O. (7/95-10/03)

->Mark Brzezinski, UCSB - Biological O. (9/99-9/02)

->???

Ron Benner – Micro – South Car., non op

Hugh Ducklow – VIMS – micro – non-op

Karen Van Damm – UNH – geochem non-op

Al Hine – USF – geo – non-op

Any UNOLS Inst:

FIC Membership

The UNOLS Charter requires that at least three FIC members be from UNOLS operator institutions, at least three members be from institutions or organizations other than operators, and two members be from any UNOLS institution. Terms for all members are three years, for no more than two consecutive terms.

• The two vacancies on the FIC are both for Non-operator Institution representatives.

•An individual with a biology background would be beneficial for one of the FIC positions.

•An individual from the West Coast is also desired for one of the positions.

•Individuals with an interest in Fleet Renewal issues (particularly the Ocean Class and Regional Class efforts) should be considered.

Note: Bill Smethie will complete 2nd term in October 02 – will need to fill Operator position: Discipline = geochemistry