

**FIC report to  
UNOLS Annual Meeting  
September 27, 2002**



**National Science Foundation  
Arlington, VA**

# Fleet Renewal

## Parallel Effort by Agencies and UNOLS

**Regional Class**

**NSF (< \$25M)**

**Ocean Class**

**Navy**

**SMRs and  
Community oversight**

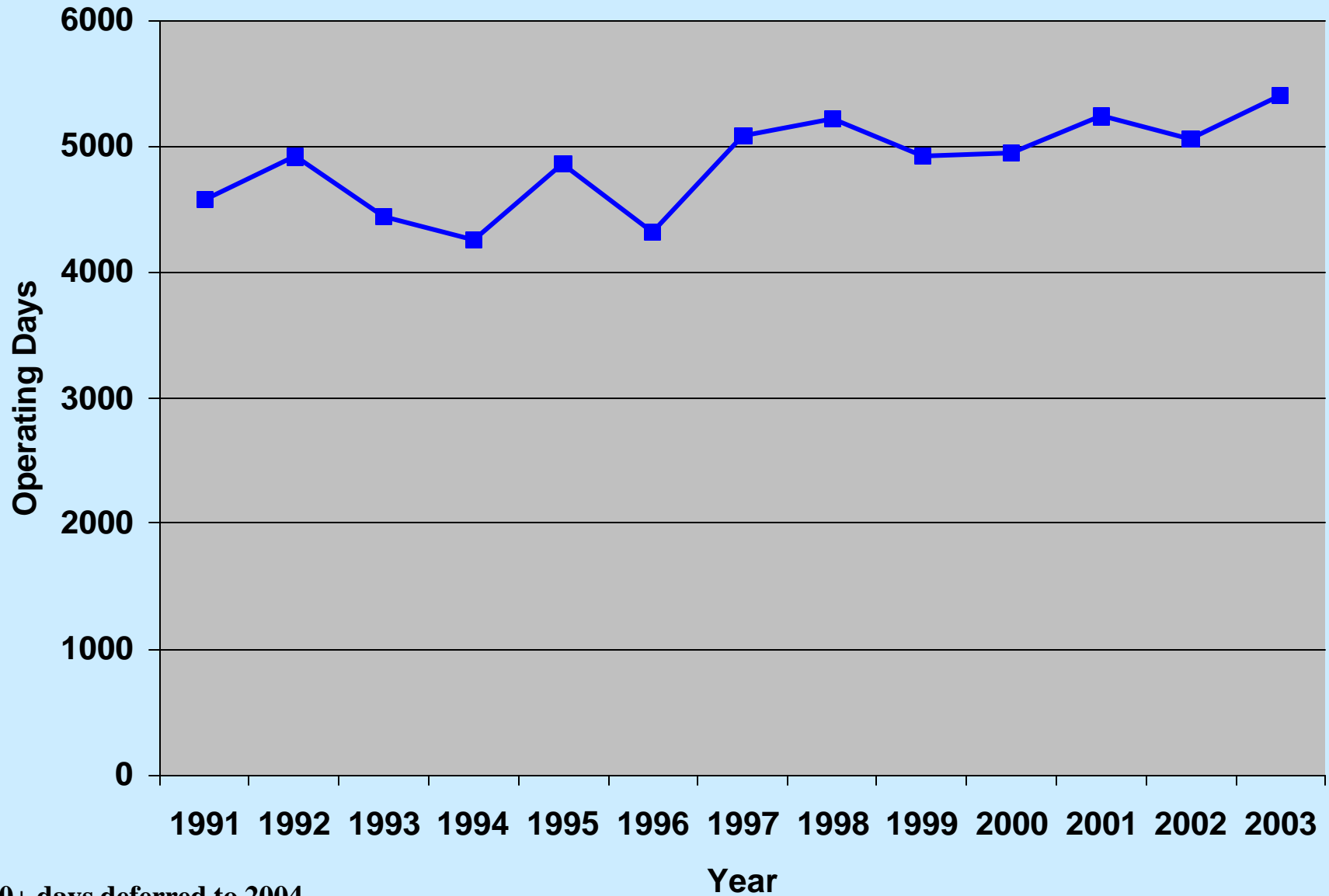
**UNOLS/FIC**

**Plans Requested**

**HASC**

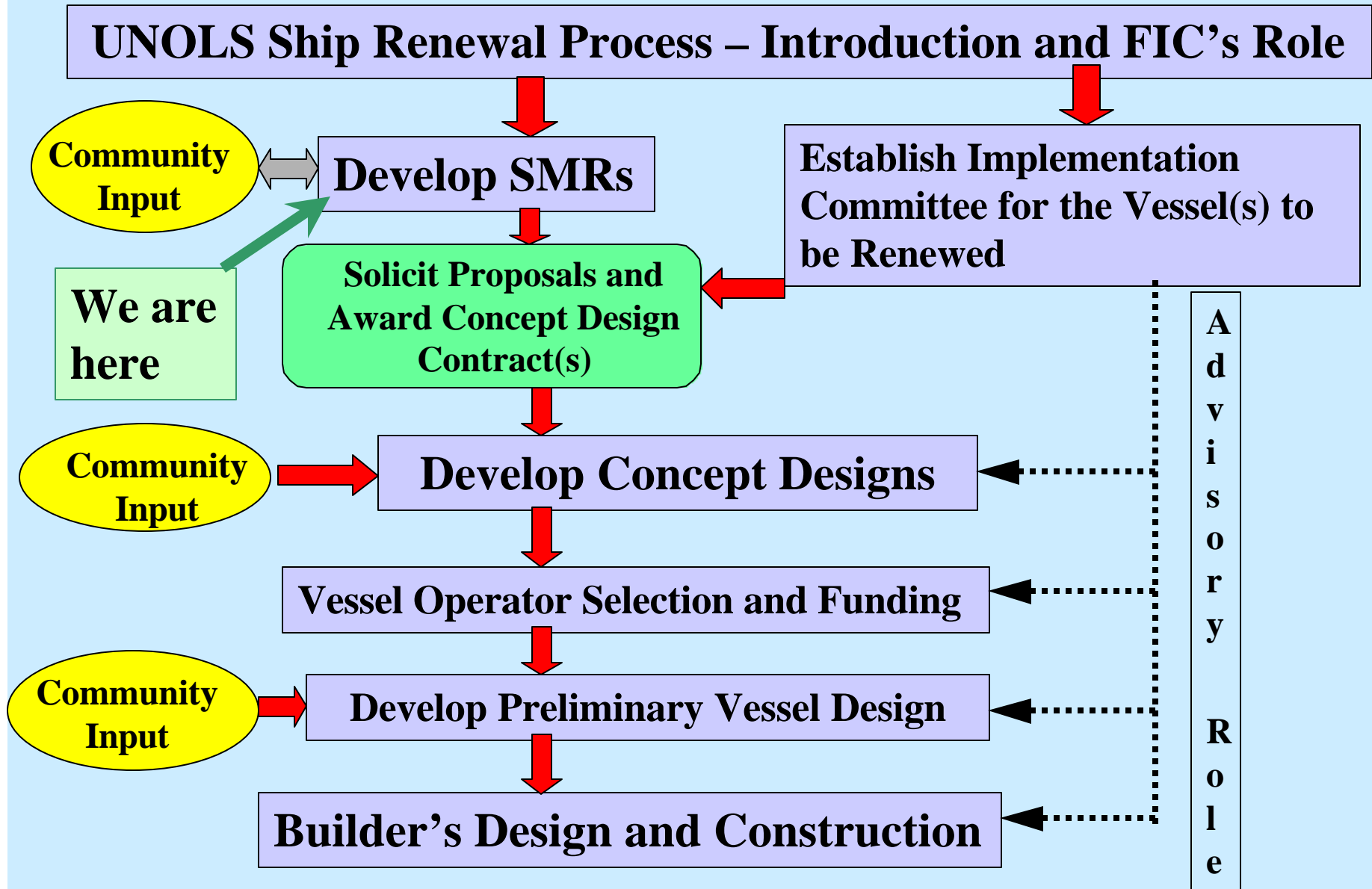


### Fleet Utilization (1991-2003)\*



\*100+ days deferred to 2004

# FIC Roadmap



# 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 and Regional Class SMR

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

# **Ocean Class and Regional Class SMRs**

## **~ Issues Requiring Additional Attention ~**

- **Regulatory Concerns.** Should regional stay <500 GT and < \$25M
- **The “Gap”** – Regionals smaller and Ocean bigger
- **Should the Regional Class be a “class” of vessels that are identical or nearly identical?**
- **Geographic Differences in Regional Ships**

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



# 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 constraints on the layout and operation of the vessel.

Seakeeping is often very high on prioritized list of attributes.

How will we make the choice between SWATH and monohull? What are the tradeoffs?

# 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 and other characteristics of SWATH and mono-hull vessels.

# **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

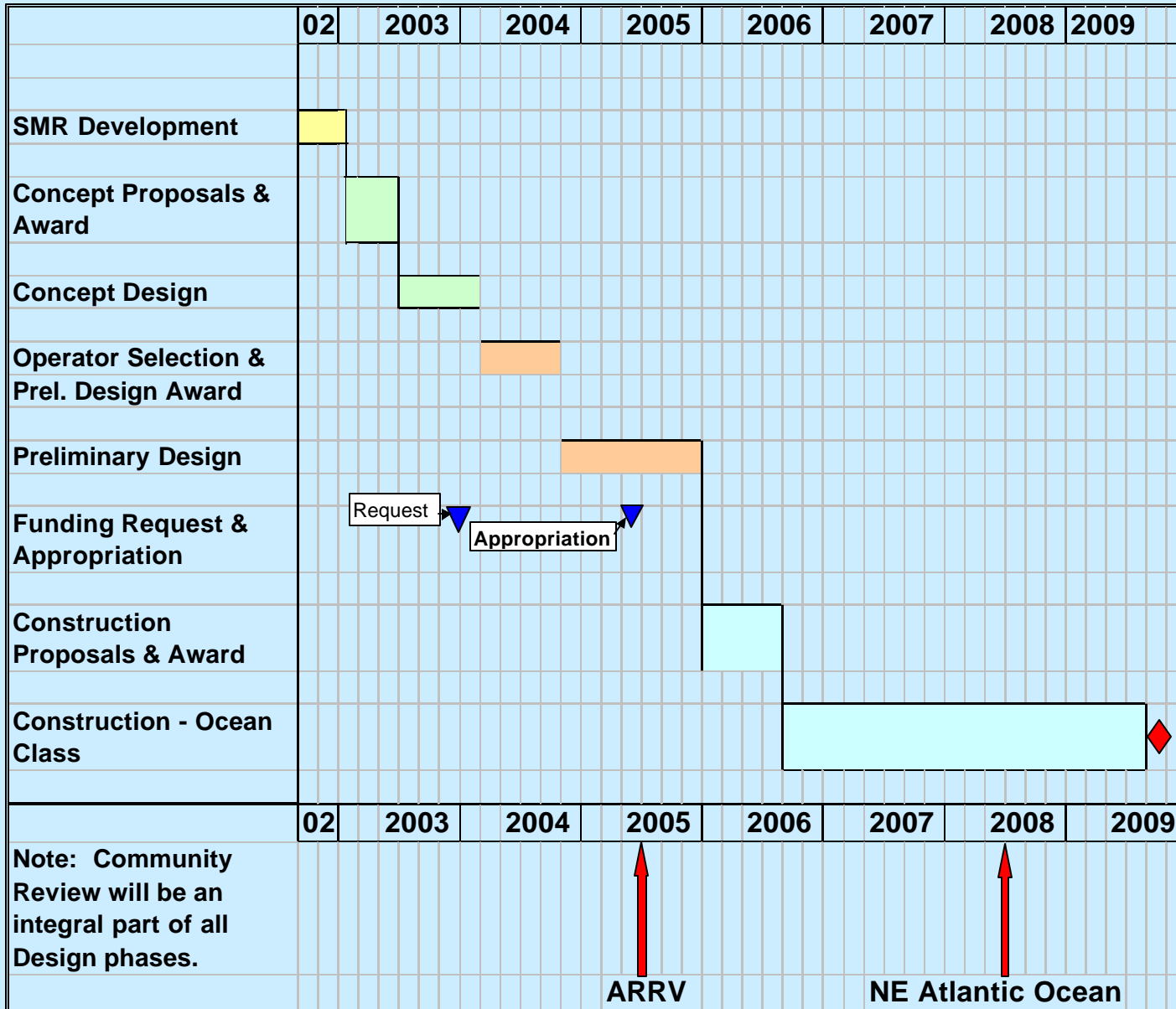
- **Speed**
  - Ranges ok, speed control values realistic
- **Seakeeping**
  - May need better definitions of terms (RMS) and tied to existing vessel performance, check actual values, specify type of work and best heading for some criteria.
- **Station keeping**
  - Are limits realistic and required?
- **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?



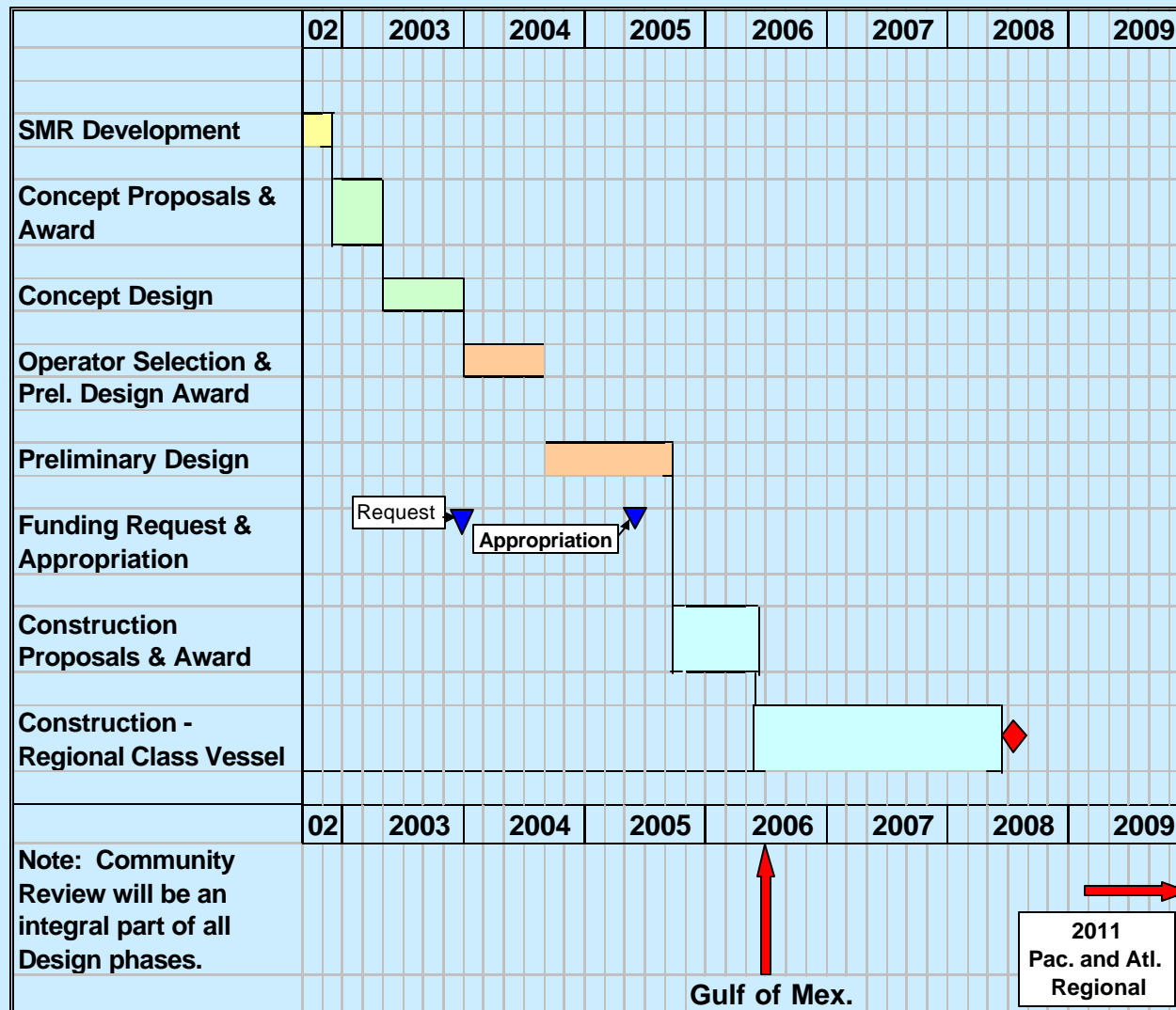
## SMR Areas that need closer attention to the details

- 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

# Design and Construction Timeline: Ocean Class



# Design and Construction Timeline: Regional Class



# **Role of Ocean Science Community**

- Participate in the SMR process.  
Whether you are on committees or not you can have influence.
- Talk with your UNOLS representative occasionally.
- Stay informed.

# Other Renewal Activities

- R/V *Kilo Moana* – Construction Complete
- Alaska Region Research Vessel – Preliminary Design development
- *Cape Henlopen* Replacement
- *Ewing* Midlife Refit Plans
- Many smaller, capable coastal vessels.

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



# R/V SLOVER – Dock and Sea Trials

