Status of ARRV Design

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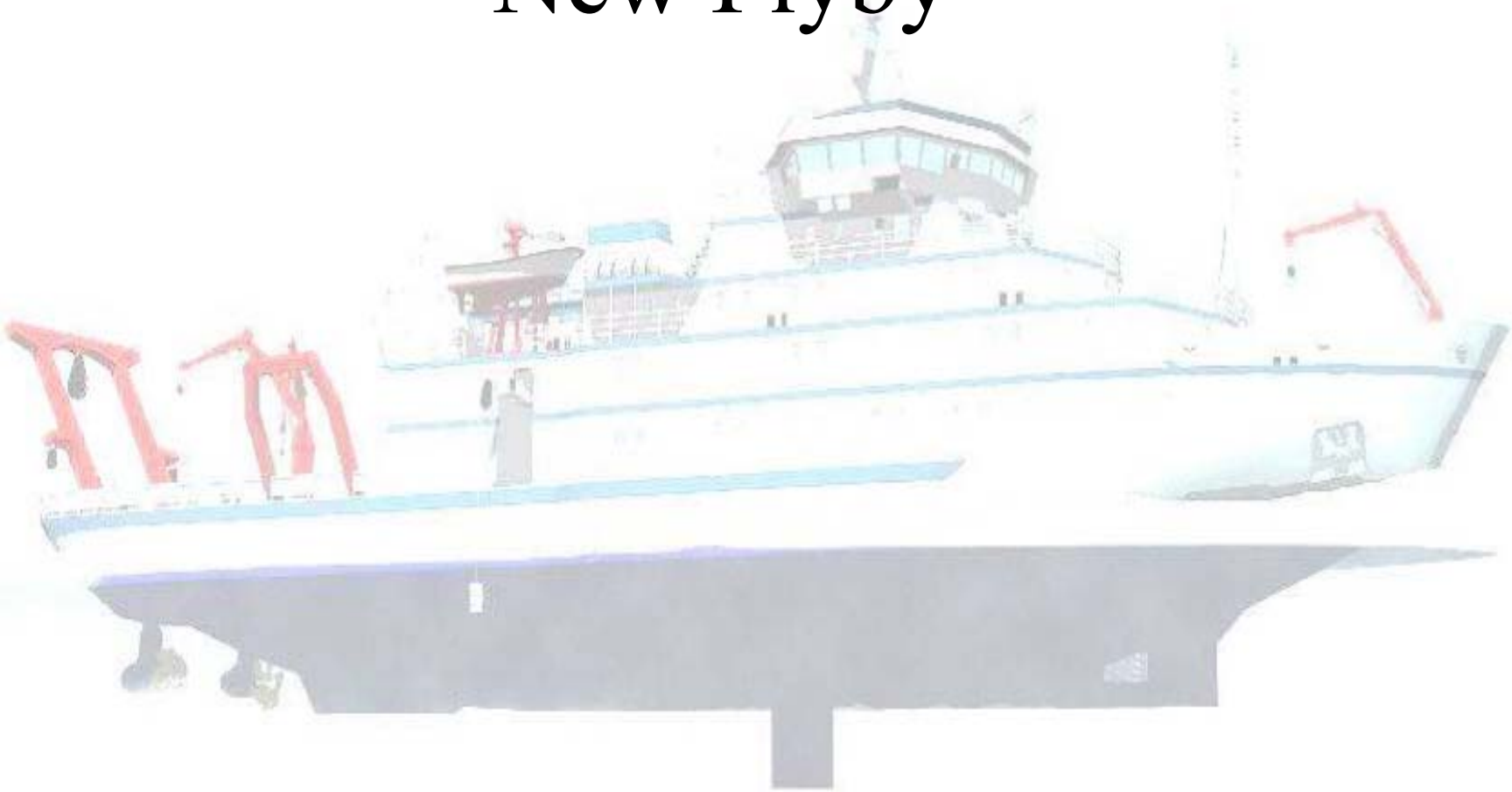
Alaska Region Research Vessel

Basic Characteristics

- Overall Length – 236 ft
- Waterline Length – 210 ft
- Maximum Beam – 52 ft
- Draft – 18 ft
- Freeboard Main Deck – 9 ft
- Maximum Speed – 14 knots
- Crew Size – 17-20
- Scientific Party – 26
- ADA Accommodations – first for NSF ship

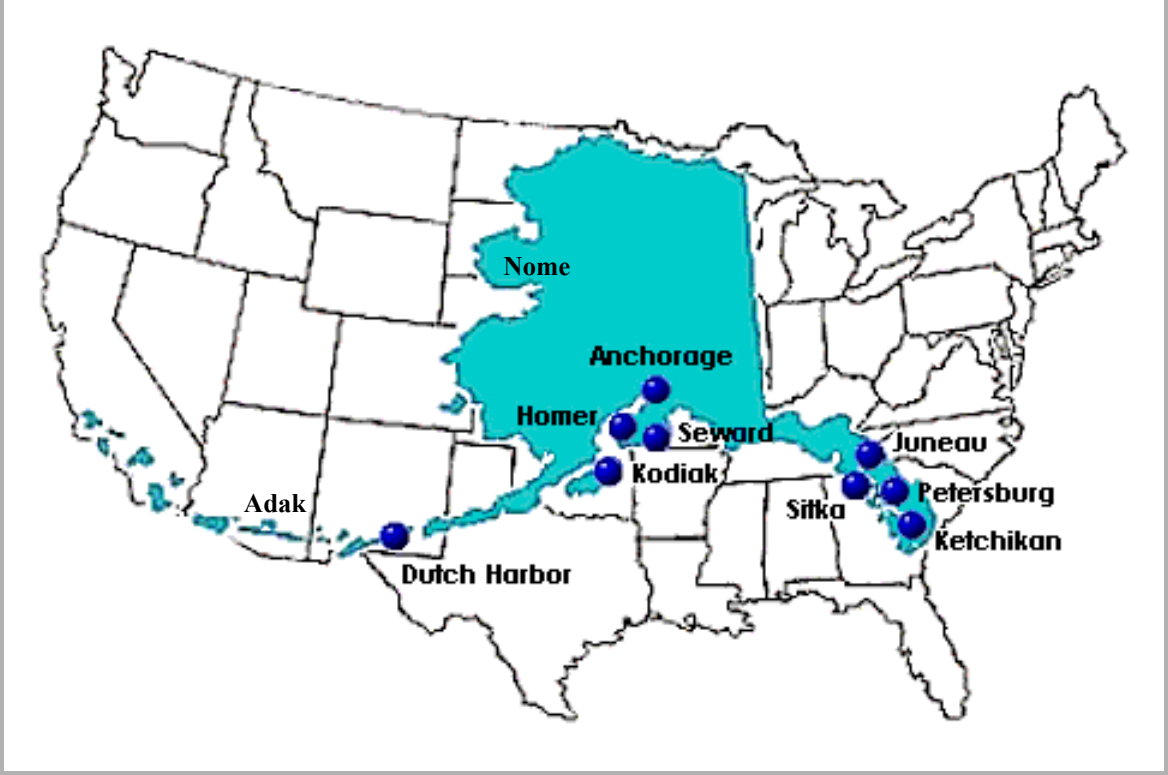
New Flyby



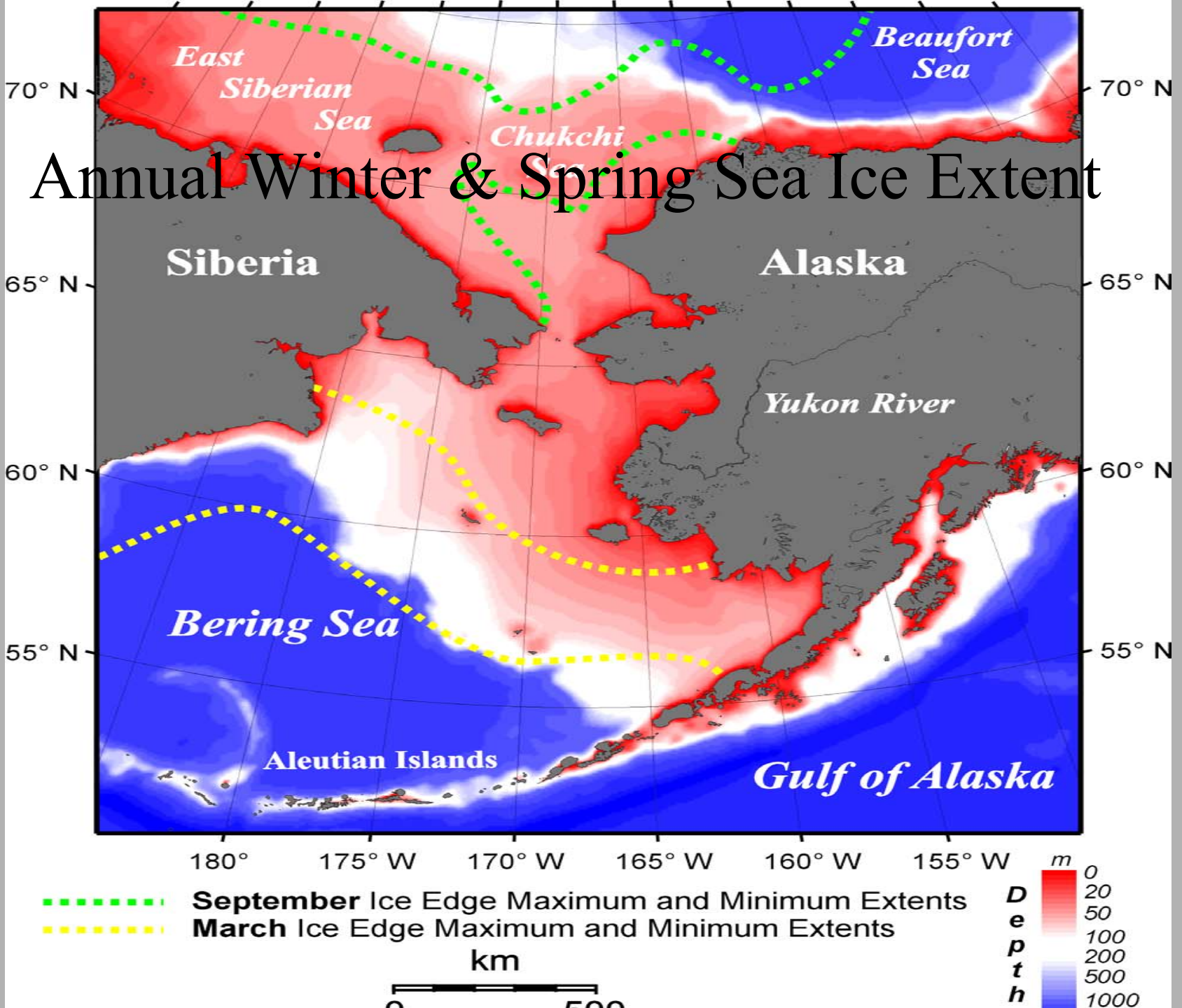
Alaska In Perspective

Huge Coastline Long Distances

Nasty Weather



Annual Winter & Spring Sea Ice Extent



Where Are We Now

- Scientific Mission Requirements April 2001
- Concept Design – Aug 2001
- Model Testing – April 2002
- Preliminary Design – Jan 2003
- Construction Design – July 2004
- Final Design – December 2005

Tasks Remaining before Construction

Final Design Spiral

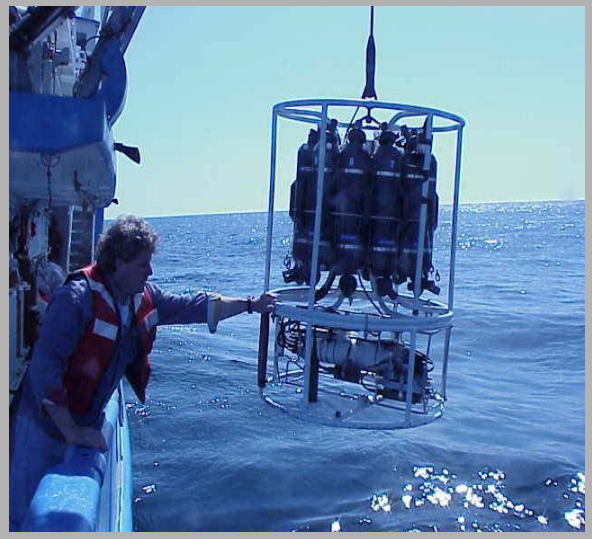
Enhance Ice Measurement Capabilities

Updated Science Instrumentation

Enhance ADA configuration

Update Science Justification

Encourage Community Support

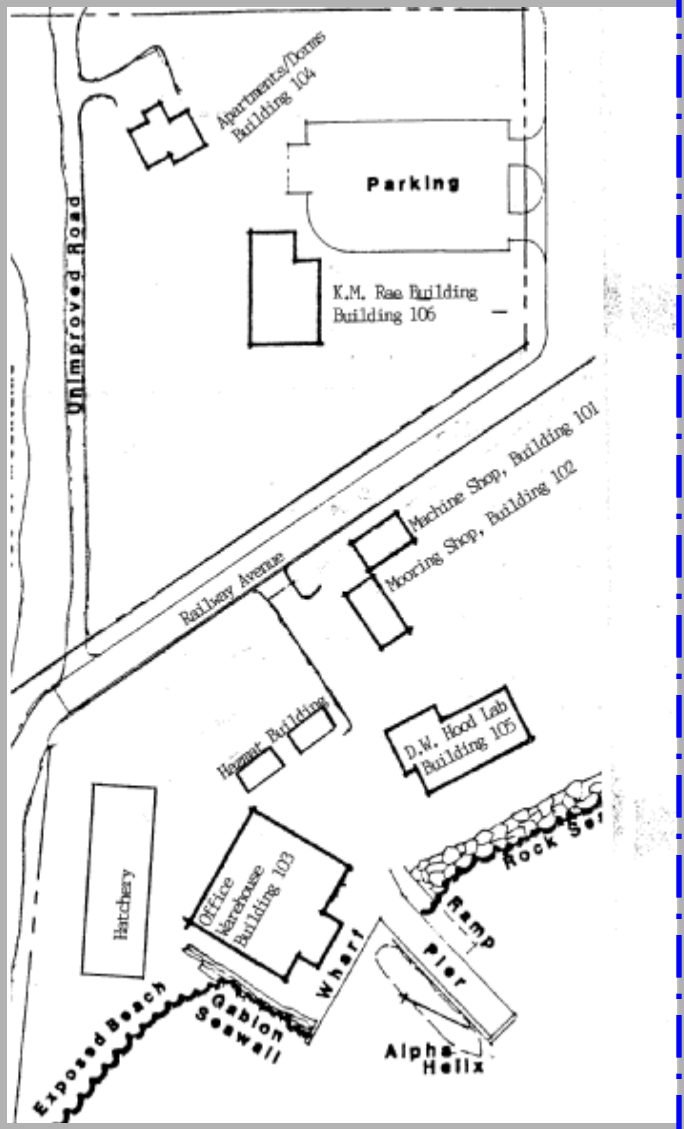


Seward Marine Center

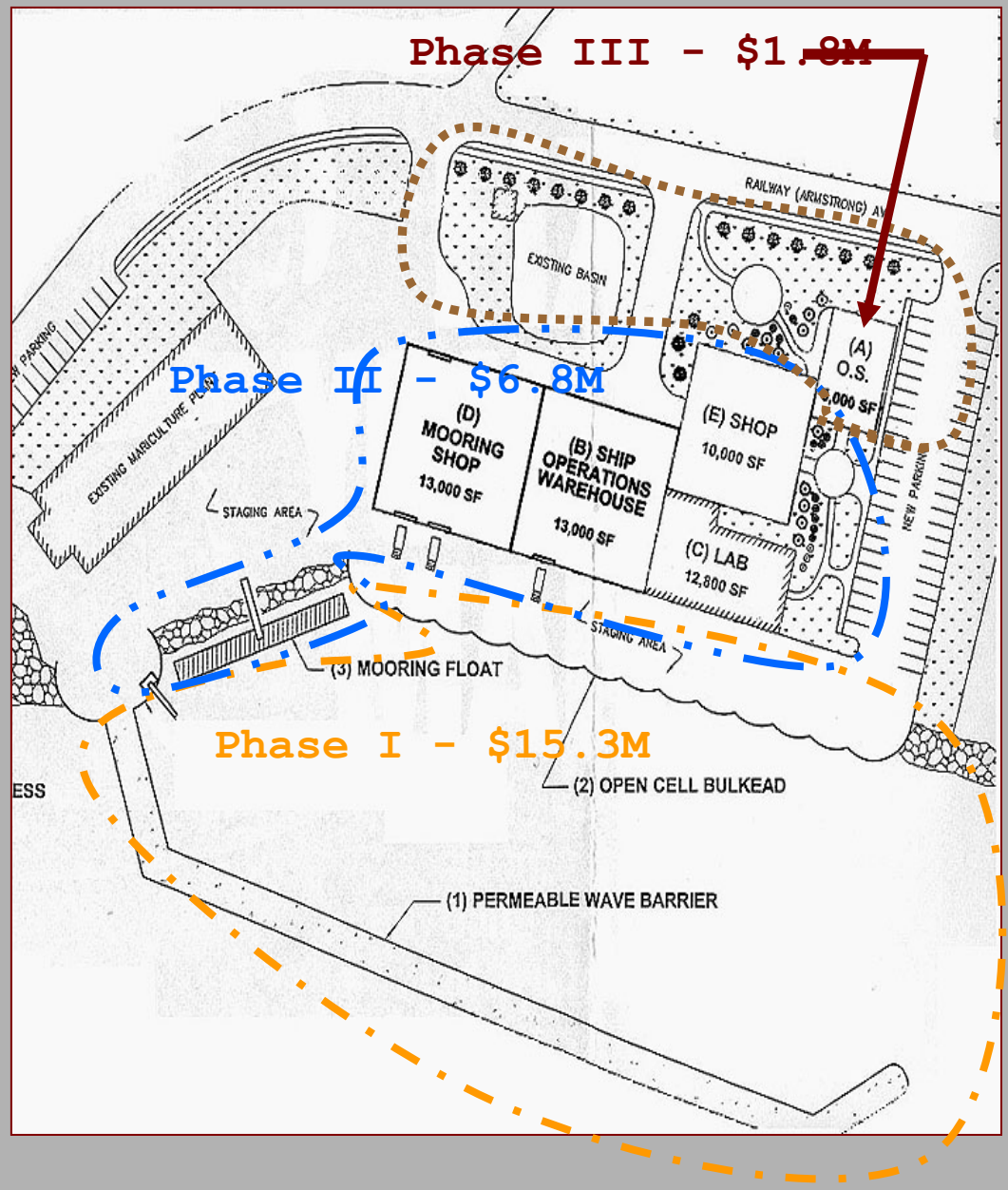
ARRV Support Needs

- All Weather Dock
- Dedicated Warehouse
- Shops
- Administrative Offices

Current Facility

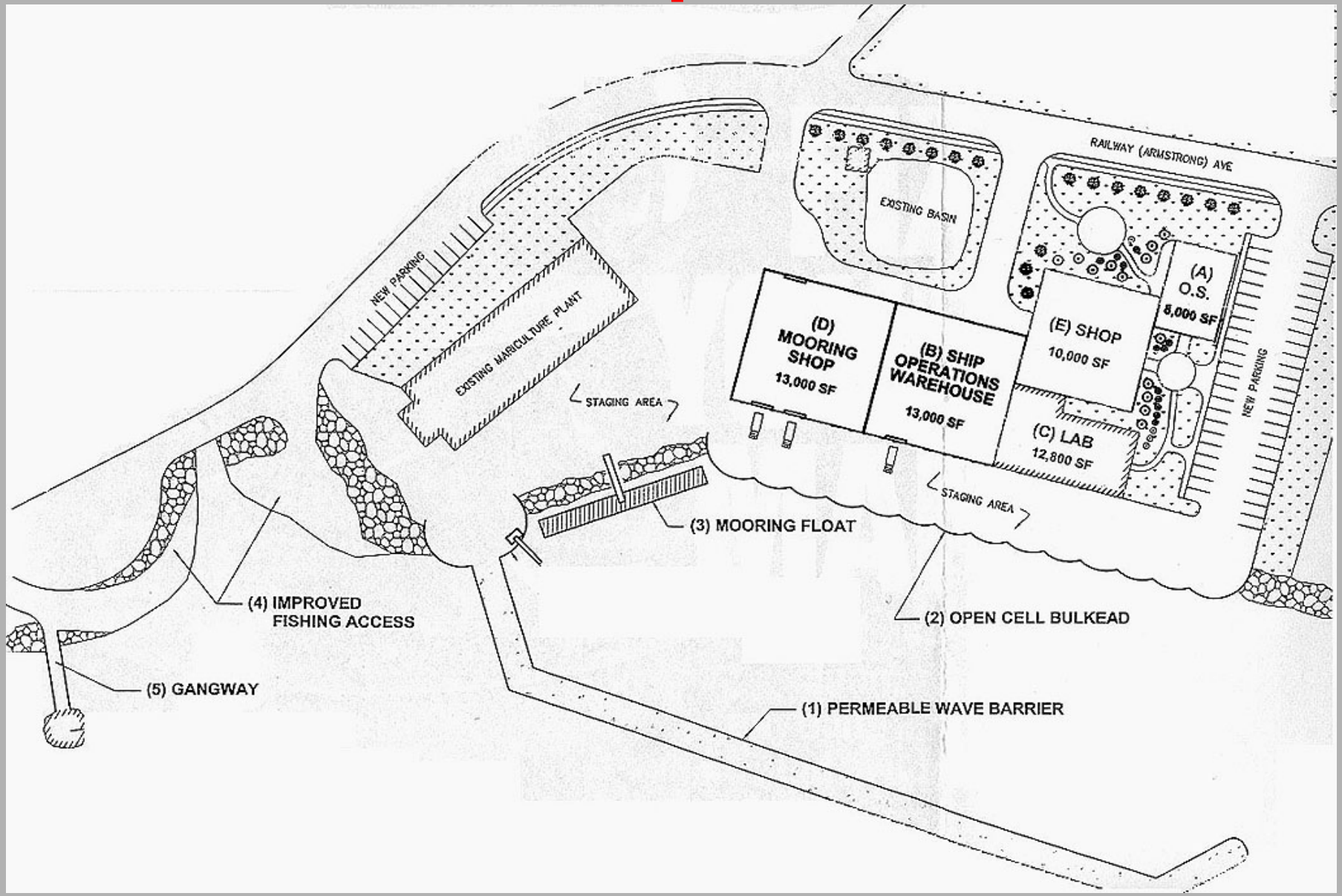


Proposed Facility



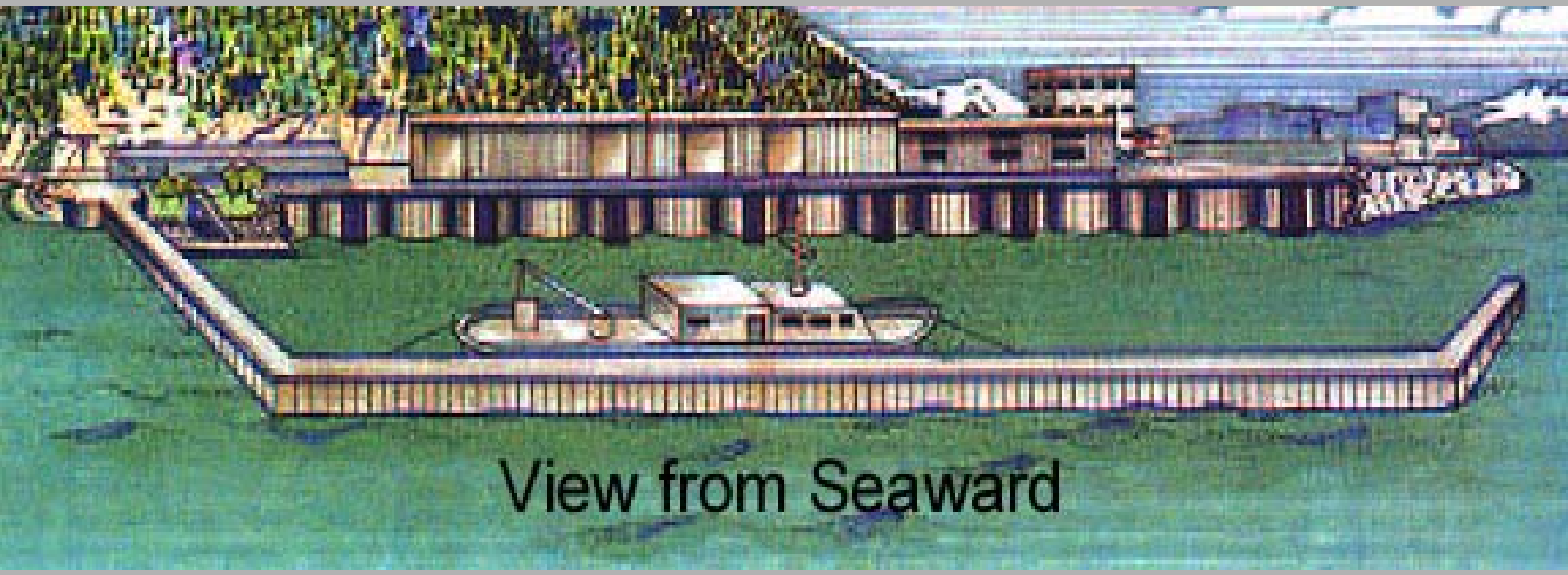
Seward Marine Center

Conceptual Plan



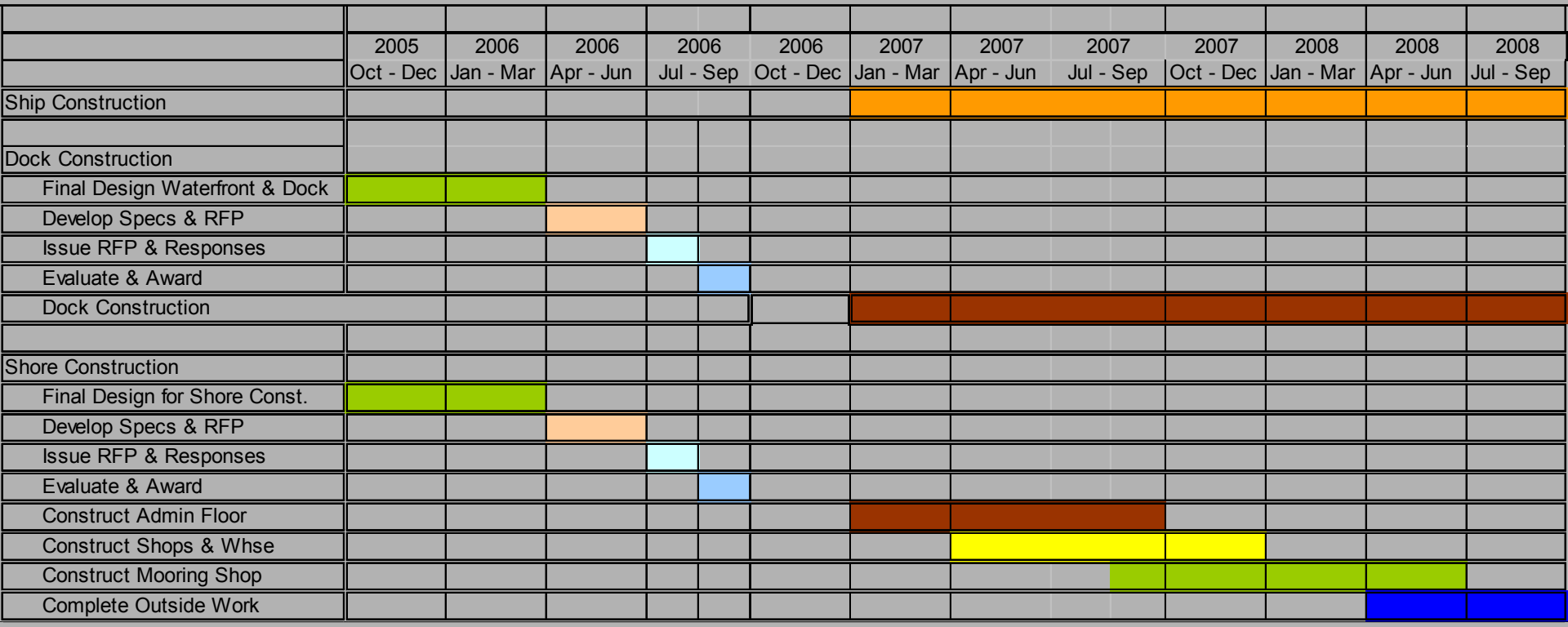
Seward Marine Center

Conceptual Plan



Seward Marine Center

Ship & Dock Construction Timeline




R/V Alpha Helix

Bridge Wings Discussion

Enhance Ice Measurement Capabilities

Comment was received that ARRV schematics did not show over hanging bridge wings which are important to scientists making sea ice measurements.

A more detailed description of the advantage of bridge wings—

"The Nathaniel B. Palmer has **bridge wings** and I have been spoiled by those wings. The value to someone like me is that they enhance sea ice observations and estimation of sea ice thickness as floes are turned on their side by the ice-breaking action of the ship. Ice thickness estimation is aided by suspending an object of known dimensions over the side of the ship a short distance astern of one of the bridge wings. Having an uninterrupted view of that object from the bridge wing improves ice thickness estimation" ***M. Jeffries, UAF***

Design Committee Comments

- "**extended bridge wings** may be impractical. This is not only because of mooring problems in a large tidal range, but also when nesting alongside another ship in order to exchange personnel, stores….."

- "I don't remember the Healy having these and it seems that incorporating a boom is a better option, given the other issues involved with overhanging bridge wings that I foresee."

- "I am not convinced that overhanging bridge wings are needed until we know more about the problem that we are trying to solve."

- "The MANHATTAN during its two NW Passage transits had a sea ice package mounted on a boom over the bow. It included both sonic and camera systems. My recollection is that it worked reasonably well although the camera lens required frequent cleaning."

- “A human occupied space up there adds high, off-center weight, which is bad”

- “Structure beyond the hull will be cumbersome and in the way blocking the view of bridge watch standers. It will also be subject to wave damage in high seas and to ice accretion”

- “Can’t this be solved electronically? Sturdy and steady (but light) outriggers with image stabilized, high-def videos/digital cameras.”

- “I am wondering if they mean a bridge wing open to the weather but one that does not protrude past the hull boundary of the ship.”

- “OK, open bridge wings are vastly different from bridge extensions. Personally, I like open bridge wings but I am a dinosaur and grew up with them. As a deck officer, I liked to be able to go outside and look around unobstructed, almost. Maybe we should consider one side with an open bridge wing and the other closed for warmth.”

- "I looked at numerous ice breaker pictures and only one had extended bridge wings. It, the Swedish breaker ODEN, really has what I would call an extended and enclosed flying bridge. Its extension is above the wheelhouse and does project several feet beyond the vessel's sides."

- "It would seem that we should be able to devise an arrangement to support these kinds of ice thickness measurements without altering the bridge design."

- "The ODEN bridge wings do not in fact extend beyond the reamers."

- "The 1991 expedition to the Pole describes a sensor package mounted on the ship's rail about 17m above sea level. This package contained a 5.3 GHz radar scatterometer, a video camera and a laser profilometer for recording ice characteristics. From the description it sounds like this was a portable package that was mounted to some convenient ship's structure, i.e. no special structure or booms were installed."

Latest Comments - Sunday

- In your discussions be sure to distinguish between "bridge wings" and "extended bridge wings". This flap started with the former and now seems to have evolved into the latter. Bridge wings in some configuration or another are always helpful. Extended bridge wings are a nuisance and should be avoided. *Bob Disnmore, seconded by Dick Pittenger, Al Suchy*
- Catwalks (aka bridge wings) on the Palmer that went around both sides of the bridge to the front were very useful during the GLOBEC cruises a couple of years ago. If done in similar fashion, I suspect they would not be a costly addition to the ARRV design. *Peter Wiebe*
- The ship really needs functional catwalks outside the bridge windows to allow easy access for cleaning the windows. *Dan Oliver via Dale Chayes*

Extended? Bridge Wings on ARRV?

It is the consensus of the ARRV design committee that the final design spiral should include consideration of **equipment** needed to accurately measure ice characteristics.

The entire committee membership were in agreement that **overhanging bridge wings** were not a good idea.

The ice community will be queried for the “best option” approach to making sea ice measurements from the ARRV. The ice package described for the ODEN or new refinements to that package would appear to be easy to include without a redesign of the ARRV bridge.

Bridge Wings Discussion