

The banner features a satellite in the upper left corner, a person's silhouette in the center, and a ship's structure on the right, all set against a background of a dark, rippling sea.

HiSeasNet

INTERNET FOR OCEANOGRAPHIC SHIPS AT SEA

HiSeasNet: 2011 Review

Jonathan Berger, Steve Foley, and John Orcutt
Scripps Institution of Oceanography

RVTEC Meeting New Orleans, November, 2011

HiSeasNet

- ◆ Since 2001, providing IP service to UNOLS Vessels
- ◆ 15 ships now in *HiSeasNet*
 - ◆ 7 C-Band global
 - ◆ 8 Ku-Band regional
- ◆ Teleport at San Diego Supercomputer Center
 - ◆ Two 7.2 m C-Band antennae
 - ◆ One 3.8 m Ku-band antenna
 - ◆ Main node on Internet Backbone

Pieces of *HiSeasNet*

Network
Manager

- ◆ Funding Agencies
- ◆ Research Vessels
- ◆ Satellite Operators
- ◆ Teleport Operator
- ◆ Internet Service Provider

HiSeasNet Services

- ◆ Installation, commissioning & licensing for ships
- ◆ Ship and shore equipment maintenance
- ◆ Satellite bandwidth management
 - ◆ Ku-Band - 4 Regional satellite beams
 - ◆ C-band – 3 Global satellite beams
- ◆ Hub station connection to Internet
 - ◆ Direct routing through to home institution
 - ◆ Run your own IP services however you want (email, web browsing, VoIP, video conferencing, etc.)

HiSeasNet Timeline

R/V ROGER REVELLE
February 2002
State of California



ATLANTIC HUB AT SDSC
February 2005
Office of Naval Research



R/V KILO MOANA
March 2005, NSF



R/V SEWARD JOHNSON
March 2006, NSF



R/V WECOMA
May 2008
NSF



PACIFIC HUB AT SDSC
September 2003
Office of Naval Research

R/V THOMAS THOMPSON
December 2003
Office of Naval Research



R/V KNORR
March 2005, NSF



R/V PELICAN
August 2006, NSF



R/V WALTON SMITH
September 2007, NSF



SOUTH GEORGIA
IDA STATION
HOPE
October 2005
NSF/BAS

INITIATION OF INDIAN
OCEAN SERVICE
February 2007
NSF

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2002

2003

2004

2005

2006

2007

2008

R/V MELVILLE, December 2003
Office of Naval Research



R/V ATLANTIS, January 2005
NSF



R/V NEW HORIZONS
November 2005, NSF



R/V ENDEAVOR
June 2005, NSF



R/V POINT SUR
June 2007, NSF



R/V MARCUS LANGSETH
April 2007
NSF



R/V ATLANTIC EXPLORER
September 2008
NSF

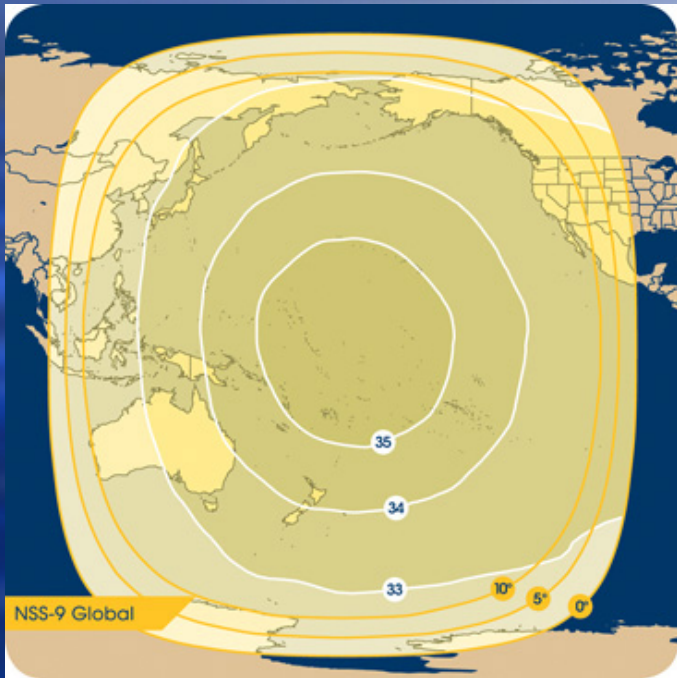
KU-BAND HUB AT SDSC
April 2005
NSF



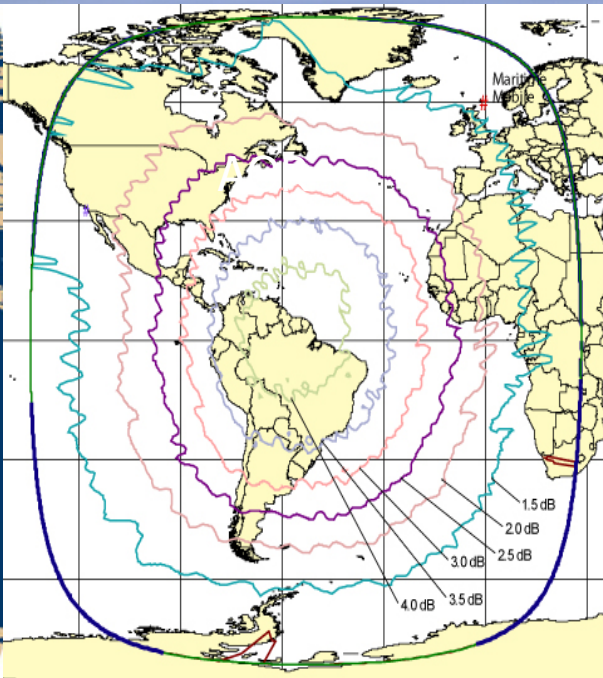
R/V OCEANUS
March 2007
NSF

C-Band Footprints

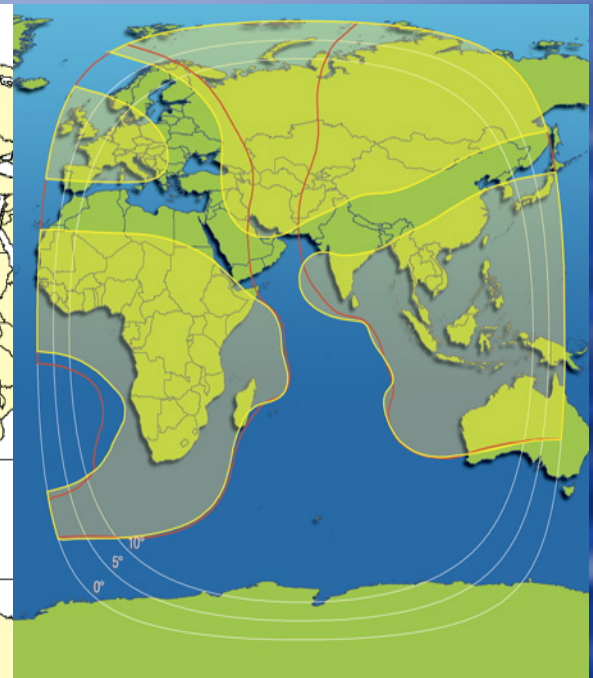
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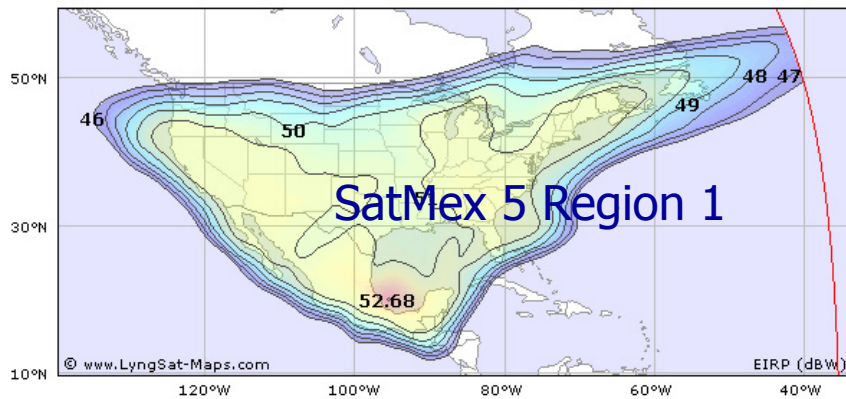
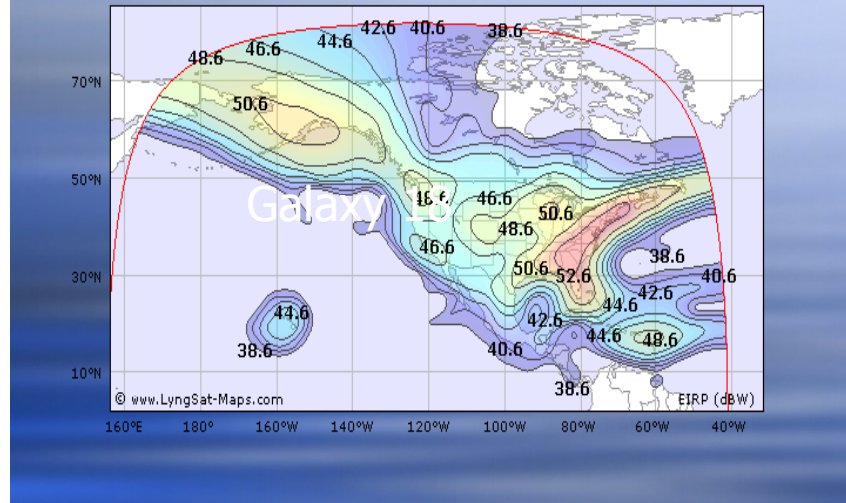
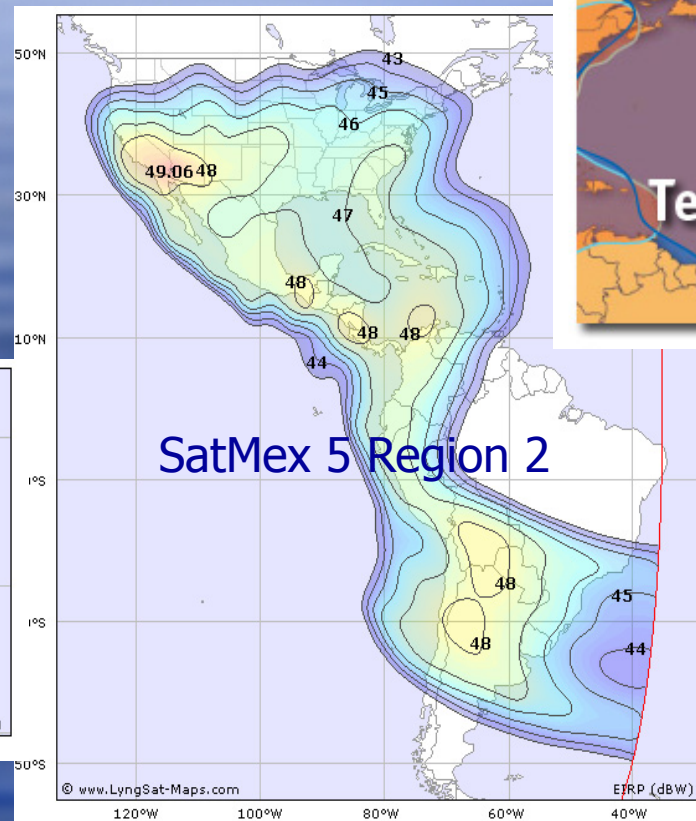
AOR



IOR



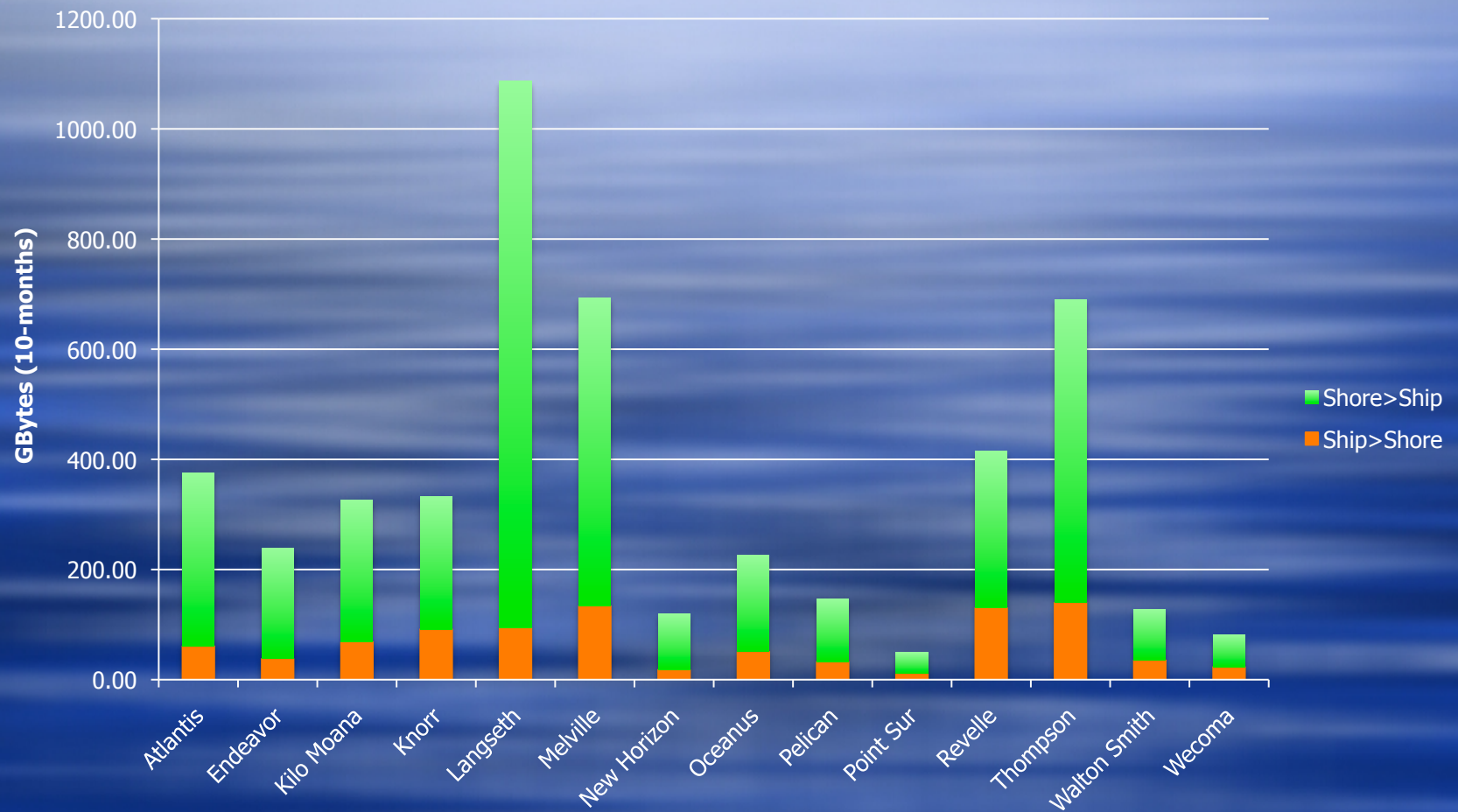
Ku-Band Footprints



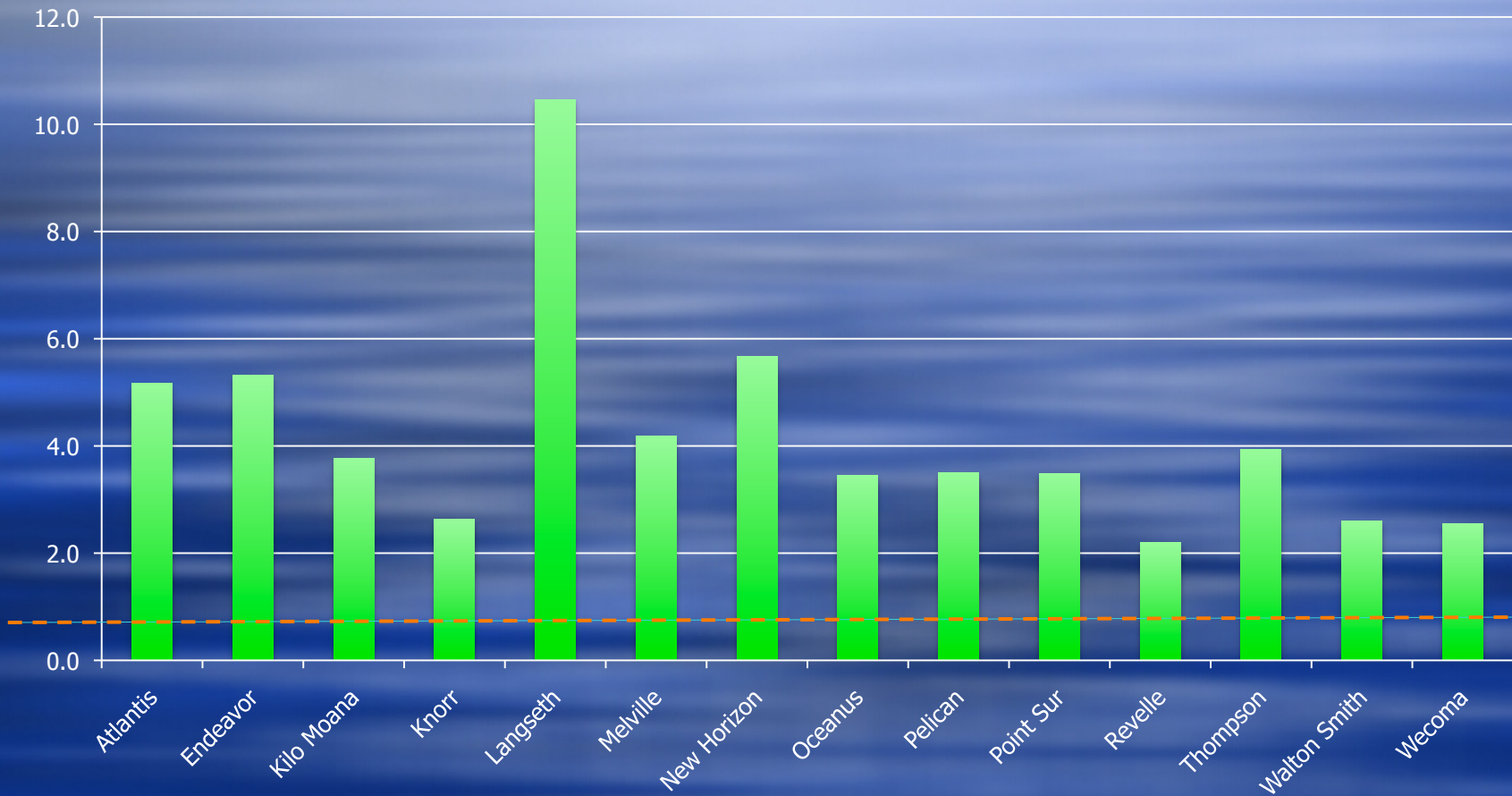
2011 Bandwidth Distribution Total Capacity

Region	Shared To-Ship GB/month	Dedicated To-Shore GB/month	Max # ships
C-Band POR	165	31	5
C-Band AOR	165	31	4
C-Band IOR	62	31	2
Ku-Band SM5 Beam 2	83	21	4
Ku-Band SM5 Beam 1	62	21	3
Ku-Band Telstar 11N	21	21	1

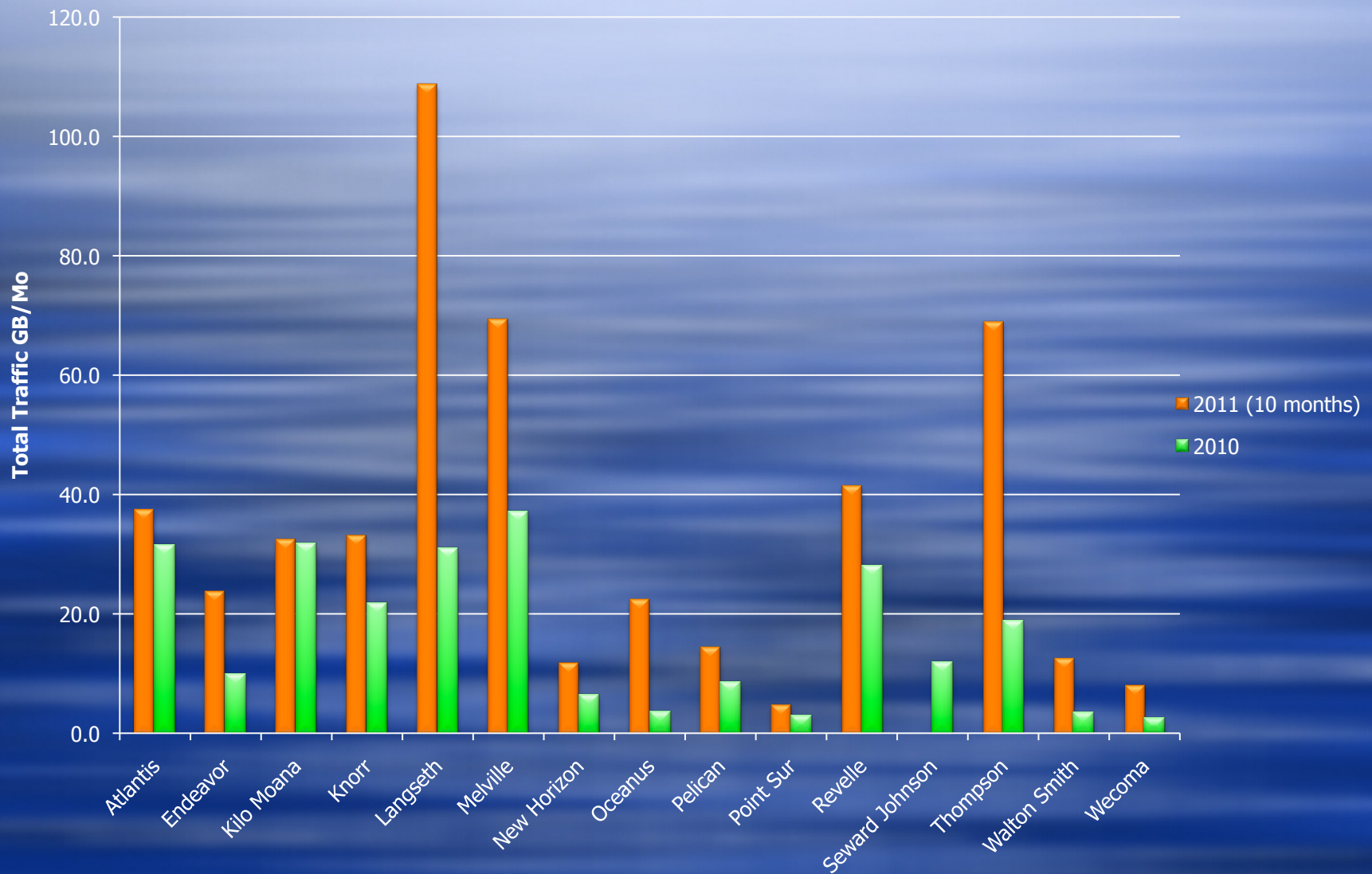
2011 Total HiSeasNet Traffic



2011 Ratio of To-Ship / To-Shore Traffic



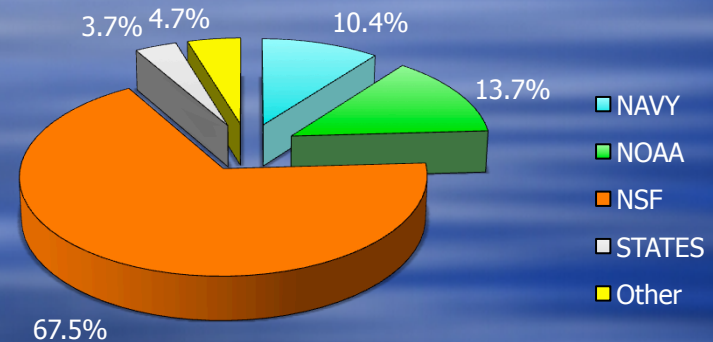
Average *HiSeasNet* Traffic



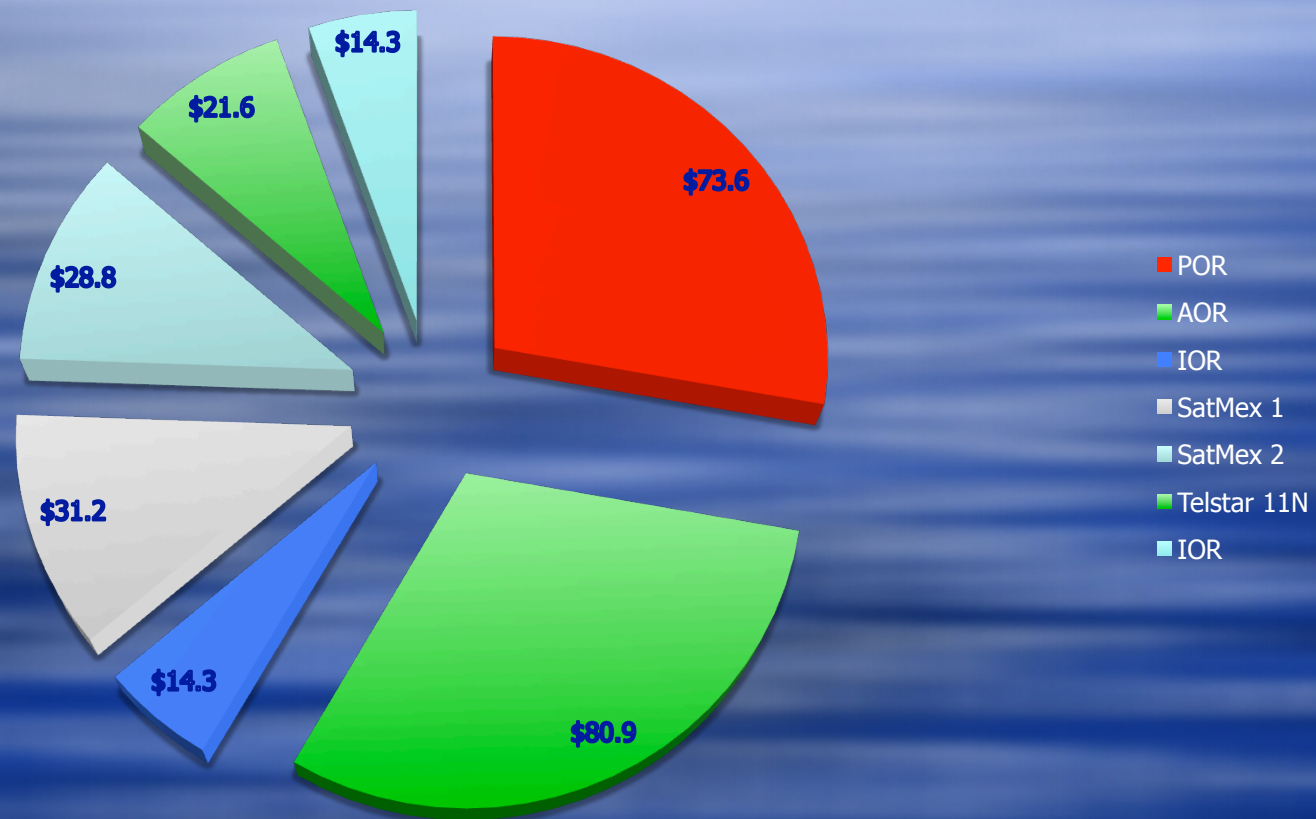
2011 *HiSeasNet* Summary

- ◆ C-band Ships
average 287
days/yr = 79%
- ◆ Ku-band ships
average 189
days/yr = 52%

2011 Funding Source



2011 Satellite Lease Costs (\$K)



Some Highlights of 2011 Activities

- ◆ - IOR Service for two ships via the Intelsat Fuchsstadt teleport.
- ◆ - R/V Thompson switched between C and Ku-band.
- ◆ - AOR Gateway upgraded to 150W SSPA for improved coverage
- ◆ - Accelerators upgrades to version 7.
- ◆ - Temporary increase in ship-to-shore bandwidths to accommodate video conferencing for Point Sur and Wecoma.
- ◆ Melville antenna canister failure

2012 Tentative Slot Schedule

- ◆ POR – up to 5 ships
- ◆ AOR – up to 3 ships (3 month with 1 ship)
- ◆ IOR – no ships after April

- ◆ SatMex beam 1 – ½ year 1 ship, ½ year 2 ships
- ◆ SatMex beam 2 – up to 4 ships