

3rd Web Meeting 20 May 2004

# **Concept Definition**

#### Status of OCEAN Class Concept Design Effort

Meeting Date	Monohull	SWATH	X Craft
02-Apr-04	Initial Concept Design		Initial Concept Design
	- Hull Form		- Hull Form
	- Arrangement		- Arrangement
	- Seakeeping		- Propulsion
	- Propulsion		
27-Apr-04	Revised Concept Design	Initial Concept Design	Revised Concept Design
	- Arrangement Revised to Reflect	- Hull Form	- Z Drive Variant
	- PH Location sketch - fwd vs. midship	- Arrangement	- Waterjet Variant
	- Fuel endurance calc revised	- Propulsion	
20-May-04	Revised Design IAW Comments	Revised Design IAW Comments	Revised Design IAW Comments
	Op Cost Calcs	Op Cost Calcs	Op Cost Calcs
		Seakeeping Analysis	Additional ONR Investigation
In Progress	Const. Cost Analysis	Finish Seakeeping Analysis	Seakeeping Analysis
	Further refinement of design	Const. Cost Analysis	Const. Cost Analysis
		Further refinement of design	Further refinement of design

### **Concept Definition**

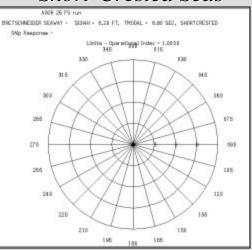
#### Seakeeping - SWATH and Monohull

#### Transit, MID SS4, Tm=8.8s

Long-Crested Seas

BIETSCHNEDER SERVEY - SIDNH - 6.28 FT. PHODAL - 6.88 SEC. LONGGRESTED Ship Response -Linita - Operatiggal Index + 1.8800 345 815 101 271 226 256 195

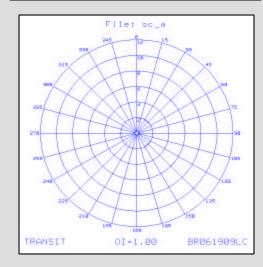
#### Short-Crested Seas

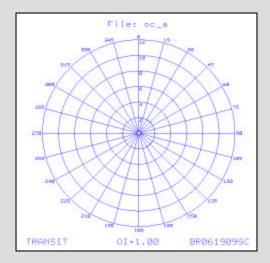


**SWATH** 









#### Seakeeping - SWATH and Monohull

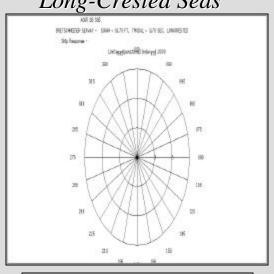
### **Concept Definition**

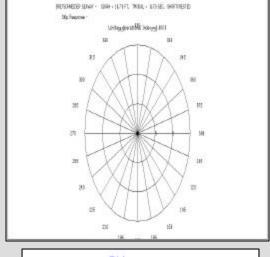
#### Transit, MID SS5, Tm=9.7s

Long-Crested Seas

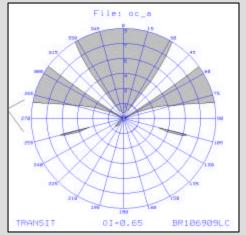
Short-Crested Seas

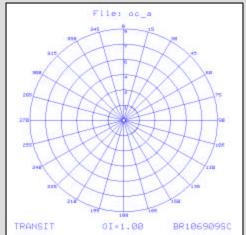
**SWATH** 





Monohull





Shaded Areas Exceed Motion Criteria

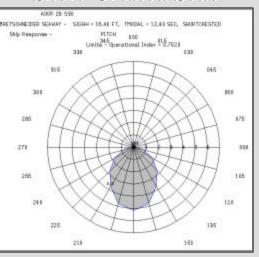
### **Concept Definition**

#### Seakeeping - SWATH and Monohull

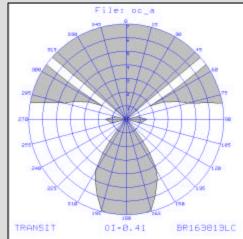
#### Transit, MID SS6, Tm=12.4s

Long-Crested Seas

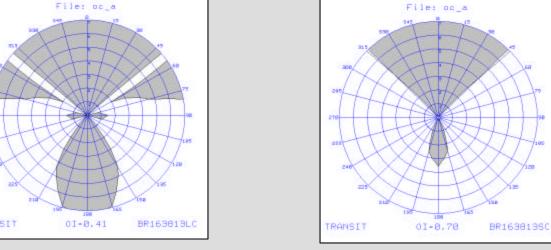
Short-Crested Seas



**SWATH** 



Monohull



Shaded Areas Exceed Motion Criteria

3rd UNOLS Web Meeting, 20 May 2004

# Fuel Operating Cost Calculation

	Monohull													
	Cruise			ansit			owing/Su		On St		Total Days	Avg Daily Fuel Cost	Cruise Fuel Cost	Yearly Fuel & Lube Cost
		Speed	Days	NM	\$/day fuel	Speed	Days	\$/day fuel	Days	\$/day fuel				
1	2D,3D High Res Sonar	12	2	576	\$5,043	5	30	\$1,945	2	\$2,226	34	\$2,144	\$72,894	FOY =
2	Piston Coring	12	4	1,152	\$5,043				20	\$2,226	24	\$2,696	\$64,697	300
3	Observatory Servicing	12	1	288	\$5,043	10	7	\$3,397	6	\$2,226	14	\$3,013	\$42,179	days
4	Current Meter Moorings, etc.	12	3	864	\$5,043	8	10	\$2,518	14	\$2,226	27	\$2,647	\$71,475	
5	Bio & Physical Survey	14	1	336	\$8,485	12	2	\$5,043	7	\$2,226	10	\$3,416	\$34,155	
6	Deployment of Moorings	10	20	4,800	\$3,397	10	1	\$3,397	4	\$2,226	25	\$3,210	\$80,241	
7	LaGrangian Float Studies	12	8	2,304	\$5,043	10	27	\$3,397			35	\$3,773	\$132,057	
8	Open Ocean Bio/Chem Int.	12	2	576	\$5,043	6	26	\$2,013			28	\$2,229	\$62,421	
9	Laying Cable for Observ.	12	5	1,440	\$5,043	5	5	\$1,945	10	\$2,226	20	\$2,860	\$57,202	
10	Moving Ship Tomography	12	15	4,320	\$5,043				15	\$2,226	30			
			61				108		78		247	\$2,887		\$866,2
	SWATH													
													Cruise	Yearly Fuel
	Cruise			ansit			owing/Su		On St		Total Days	Avg Daily Fuel Cost	Fuel Cost	Lube Cost
		Speed	Days	NM	\$/day fuel	Speed	Days	\$/day fuel	Days	\$/day fuel				
1	2D,3D High Res Sonar	12	2	576	\$5,828	5	30	\$2,363	2	\$2,800	34	\$2,592	\$88,130	FOY =
2	Piston Coring	12	4	1,152	\$5,828				20	\$2,800	24	\$3,305	\$79,310	300
3	Observatory Servicing	12	1	288	\$5,828	10	7	\$4,375	6	\$2,800	14	\$3,804	\$53,253	days
4	Current Meter Moorings, etc.	12	3	864	\$5,828	8	10	\$3,238	14	\$2,800	27	\$3,298	\$89,058	
5	Bio & Physical Survey	14	1	336	\$7,840	12	2	\$5,828	7	\$2,800	10	\$3,910	\$39,095	
6	Deployment of Moorings	12	20	5,760	\$5,828	10	1	\$4,375	4	\$2,800	25	\$5,285	\$132,125	
7	LaGrangian Float Studies	12	8	2,304	\$5,828	10	27	\$4,375			35	\$4,707	\$164,745	
8	Open Ocean Bio/Chem Int.	12	2	576	\$5,828	6	26	\$2,538			28	\$2,773	\$77,630	
	Laying Cable for Observ.	12	5	1,440	\$5,828	5	5	\$2,363	10	\$2,800	20	\$3,448	\$68,950	
9														
_	Moving Ship Tomography  X Craft - Propeller D	12 Drive	15 61	4,320	\$5,828		108		15 78	\$2,800	30 247	\$3,680		\$1,104,
9	Moving Ship Tomography  X Craft - Propeller D		61		\$5,828	7		nev	78		30 247		Cruise	\$1,104,0
_	Moving Ship Tomography	Prive	61	ansit			owing/Su		78 On St	ation	30	\$3,680  Avg Daily Fuel Cost	Cruise Fuel Cost	
_	Moving Ship Tomography  X Craft - Propeller L  Cruise		61		\$5,828 \$/day fuel \$7,028	T Speed 5		**************************************	78		30 247	Avg Daily		Yearly Fuel
10	Moving Ship Tomography  X Craft - Propeller L  Cruise  2D,3D High Res Sonar	Orive Speed 12	Tra  Days 2	ansit NM 576	\$/day fuel \$7,028	Speed	owing/Su Days	\$/day fuel	On St	sation \$/day fuel \$2,887	30 247 <b>Total Days</b>	Avg Daily Fuel Cost \$2,473	<b>Fuel Cost</b> \$84,093	Yearly Fuel Lube Cost FOY =
10	Moving Ship Tomography  X Craft - Propeller L  Cruise  2D,3D High Res Sonar Piston Coring	Speed 12 12	61  Tra	nsit NM 576 1,152	\$/day fuel \$7,028 \$7,028	Speed	owing/Su Days 30	\$/day fuel \$2,142	78  On St  Days 2 20	**************************************	30 247 <b>Total Days</b> 34 24	Avg Daily Fuel Cost \$2,473 \$3,577	\$84,093 \$85,858	Yearly Fuel Lube Cost  FOY = 300
1 2	Moving Ship Tomography  X Craft - Propeller L  Cruise  2D,3D High Res Sonar Piston Coring Observatory Servicing	Speed 12 12 12 12	7ra  Days  2 4 1	NM 576 1,152 288	\$/day fuel \$7,028 \$7,028 \$7,028	<b>Speed</b> 5	Days 30	\$/day fuel \$2,142 \$4,780	78  On St  Days  2  20  6	\$/day fuel \$2,887 \$2,887 \$2,887	30 247 <b>Total Days</b> 34 24 14	Avg Daily Fuel Cost \$2,473 \$3,577 \$4,129	\$84,093 \$85,858 \$57,812	Yearly Fuel Lube Cost FOY =
1 2 3 4	Moving Ship Tomography  X Craft - Propeller L  Cruise  2D,3D High Res Sonar Piston Coring Observatory Servicing Current Meter Moorings, etc.	Speed 12 12 12 12	7776 Days 2 4	nsit  NM  576  1,152  288  864	\$/day fuel \$7,028 \$7,028 \$7,028 \$7,028	<b>Speed</b> 5 10 8	7	\$/day fuel \$2,142 \$4,780 \$3,388	78  On St  Days 2 20 6 14	\$/day fuel \$2,887 \$2,887 \$2,887 \$2,887 \$2,887	30 247 Total Days 34 24 14 27	Avg Daily Fuel Cost \$2,473 \$3,577 \$4,129 \$3,533	\$84,093 \$85,858 \$57,812 \$95,387	Yearly Fuel Lube Cost FOY = 300
1 1 2 3	Moving Ship Tomography  X Craft - Propeller L  Cruise  2D,3D High Res Sonar Piston Coring Observatory Servicing Current Meter Moorings, etc. Bio & Physical Survey	Speed 12 12 12 12 14	772	NM 576 1,152 288 864 336	\$/day fuel \$7,028 \$7,028 \$7,028 \$7,028 \$7,028 \$10,179	<b>Speed</b> 5	Days 30	\$/day fuel \$2,142 \$4,780 \$3,388 \$7,028	78  On St  Days  2  20  6	\$/day fuel \$2,887 \$2,887 \$2,887 \$2,887 \$2,887 \$2,887	30 247 Total Days 34 24 14 27 10	Avg Daily Fuel Cost \$2,473 \$3,577 \$4,129 \$3,533 \$4,445	\$84,093 \$85,858 \$57,812 \$95,387 \$44,446	Yearly Fuel Lube Cost FOY = 300
1 2 3 4 5	Moving Ship Tomography  X Craft - Propeller L  Cruise  2D,3D High Res Sonar Piston Coring Observatory Servicing Current Meter Moorings, etc.	Speed 12 12 12 12	7ra  Days  2  4 1 3	nsit  NM  576  1,152  288  864	\$/day fuel \$7,028 \$7,028 \$7,028 \$7,028	5 10 8 12	Towing/Su  Days  30  7  10  2	\$/day fuel \$2,142 \$4,780 \$3,388 \$7,028 \$4,780	78  On St  Days  2  20  6  14  7	\$/day fuel \$2,887 \$2,887 \$2,887 \$2,887 \$2,887	30 247 Total Days 34 24 14 27	Avg Daily Fuel Cost \$2,473 \$3,577 \$4,129 \$3,533	\$84,093 \$85,858 \$57,812 \$95,387	Yearly Fuel Lube Cost FOY = 300
1 2 3 4 5 6	Moving Ship Tomography  X Craft - Propeller L  Cruise  2D,3D High Res Sonar Piston Coring Observatory Servicing Current Meter Moorings, etc. Bio & Physical Survey Deployment of Moorings	Speed 12 12 12 12 12 14	772 Days 2 4 1 3 1	NM 576 1,152 288 864 336 5,760	\$/day fuel \$7,028 \$7,028 \$7,028 \$7,028 \$10,179 \$7,028	5 10 8 12 10	7 10 2 1	\$/day fuel \$2,142 \$4,780 \$3,388 \$7,028	78  On St  Days  2  20  6  14  7	\$/day fuel \$2,887 \$2,887 \$2,887 \$2,887 \$2,887 \$2,887	30 247 Total Days 34 24 14 27 10 25	Avg Daily Fuel Cost \$2,473 \$3,577 \$4,129 \$3,533 \$4,445 \$6,276	\$84,093 \$85,858 \$57,812 \$95,387 \$44,446 \$156,896	Yearly Fuel Lube Cost FOY = 300
1 2 3 4 5 6 7	Moving Ship Tomography  X Craft - Propeller L  Cruise  2D,3D High Res Sonar Piston Coring Observatory Servicing Current Meter Moorings, etc. Bio & Physical Survey Deployment of Moorings LaGrangian Float Studies	Speed 12 12 12 12 12 12 14 14 12 12	7ra  Days  2  4  1  3  1  20  8	NM 576 1,152 288 864 336 5,760 2,304	\$/day fuel \$7,028 \$7,028 \$7,028 \$7,028 \$10,179 \$7,028 \$7,028	5 10 8 12 10 10	7 10 2 1 27	\$/day fuel \$2,142 \$4,780 \$3,388 \$7,028 \$4,780 \$4,780	78  On St  Days  2  20  6  14  7	\$/day fuel \$2,887 \$2,887 \$2,887 \$2,887 \$2,887 \$2,887	30 247 Total Days 34 24 14 27 10 25 35	Avg Daily Fuel Cost \$2,473 \$3,577 \$4,129 \$3,533 \$4,445 \$6,276 \$5,294	\$84,093 \$85,858 \$57,812 \$95,387 \$44,446 \$156,896 \$185,289	Yearly Fuel Lube Cost FOY = 300
1 2 3 4 5 6 7 8 9	Moving Ship Tomography  X Craft - Propeller L  Cruise  2D,3D High Res Sonar Piston Coring Observatory Servicing Current Meter Moorings, etc. Bio & Physical Survey Deployment of Moorings LaGrangian Float Studies Open Ocean Bio/Chem Int. Laying Cable for Observ.	Speed 12 12 12 12 14 12 14 12 12	7772	NM 576 1,152 88 864 336 5,760 2,304 576	\$/day fuel \$7,028 \$7,028 \$7,028 \$7,028 \$10,179 \$7,028 \$7,028 \$7,028	5 10 8 12 10 10 6	7 10 2 1 27 26	\$/day fuel \$2,142 \$4,780 \$3,388 \$7,028 \$4,780 \$4,780 \$2,477	78  On St  Days 2 20 6 14 7 4	**************************************	30 247 <b>Total Days</b> 34 24 14 27 10 25 35 28	Avg Daily Fuel Cost \$2,473 \$3,577 \$4,129 \$3,533 \$4,445 \$6,276 \$5,294 \$2,802	\$84,093 \$85,858 \$57,812 \$95,387 \$44,446 \$156,896 \$185,289 \$78,452	Yearly Fuel Lube Cost FOY = 300
1 2 3 4 5 6 7 8 9	Moving Ship Tomography  X Craft - Propeller L  Cruise  2D,3D High Res Sonar Piston Coring Observatory Servicing Current Meter Moorings, etc. Bio & Physical Survey Deployment of Moorings LaGrangian Float Studies Open Ocean Bio/Chem Int.	Speed 12 12 12 12 12 12 14 12 12 12 12	7778  Days  4  1  3  1  20  8  2  5	NM 576 1,152 288 864 336 5,760 2,304 576 1,440	\$/day fuel \$7,028 \$7,028 \$7,028 \$7,028 \$10,179 \$7,028 \$7,028 \$7,028 \$7,028	5 10 8 12 10 10 6	7 10 2 1 27 26	\$/day fuel \$2,142 \$4,780 \$3,388 \$7,028 \$4,780 \$4,780 \$2,477	78  On St  Days 2 20 6 14 7 4	\$/day fuel \$2,887 \$2,887 \$2,887 \$2,887 \$2,887 \$2,887 \$2,887	30 247 Total Days 34 24 14 27 10 25 35 28 20	Avg Daily Fuel Cost \$2,473 \$3,577 \$4,129 \$3,533 \$4,445 \$6,276 \$5,294 \$2,802 \$3,736	\$84,093 \$85,858 \$57,812 \$95,387 \$44,446 \$156,896 \$185,289 \$78,452	Yearly Fuel Lube Cost FOY = 300 days
1 2 3 4 5 6 7 8 9	Moving Ship Tomography  X Craft - Propeller L  Cruise  2D,3D High Res Sonar Piston Coring Observatory Servicing Current Meter Moorings, etc. Bio & Physical Survey Deployment of Moorings LaGrangian Float Studies Open Ocean Bio/Chem Int. Laying Cable for Observ.	Speed 12 12 12 12 14 12 12 12 12 12 12 12 12 12 12 12 12 12	772 Days 2 4 1 3 1 20 8 2 5	NM 576 1,152 288 864 336 5,760 2,304 576 1,440	\$/day fuel \$7,028 \$7,028 \$7,028 \$7,028 \$10,179 \$7,028 \$7,028 \$7,028 \$7,028	5 10 8 12 10 10 6	7 10 2 1 27 26 5	\$/day fuel \$2,142 \$4,780 \$3,388 \$7,028 \$4,780 \$4,780 \$2,477	78  On St  Days 2 20 6 14 7 4	\$/day fuel \$2,887 \$2,887 \$2,887 \$2,887 \$2,887 \$2,887 \$2,887	30 247 Total Days 34 24 14 27 10 25 35 28 20 30	Avg Daily Fuel Cost \$2,473 \$3,577 \$4,129 \$3,533 \$4,445 \$6,276 \$5,294 \$2,802 \$3,736 \$4,958	\$84,093 \$85,858 \$57,812 \$95,387 \$44,446 \$156,896 \$185,289 \$78,452	Yearly Fuel Lube Cost  FOY = 300
1 2 3 4 5 6 7 8	Moving Ship Tomography  X Craft - Propeller L  Cruise  2D,3D High Res Sonar Piston Coring Observatory Servicing Current Meter Moorings, etc. Bio & Physical Survey Deployment of Moorings LaGrangian Float Studies Open Ocean Bio/Chem Int. Laying Cable for Observ. Moving Ship Tomography  X Craft - Waterjet Di	Speed 12 12 12 12 14 12 12 12 12 12 12 12 12 12 12 12 12 12	7rd Days 2 4 1 3 1 20 8 2 5 15 61	NM 576 1,152 288 864 336 5,760 2,304 576 1,440	\$/day fuel \$7,028 \$7,028 \$7,028 \$7,028 \$10,179 \$7,028 \$7,028 \$7,028 \$7,028	5 10 8 12 10 10 6 5	7 10 2 1 27 26 5	\$/day fuel \$2,142 \$4,780 \$3,388 \$7,028 \$4,780 \$4,780 \$2,477 \$2,142	78  On St  Days 2 20 6 14 7 4	\$2,887 \$2,887 \$2,887 \$2,887 \$2,887 \$2,887 \$2,887 \$2,887	30 247 Total Days 34 24 14 27 10 25 35 28 20 30	Avg Daily Fuel Cost \$2,473 \$3,577 \$4,129 \$3,533 \$4,445 \$6,276 \$5,294 \$2,802 \$3,736 \$4,958	\$84,093 \$85,858 \$57,812 \$95,387 \$44,446 \$156,896 \$185,289 \$78,452 \$74,724	Yearly Fuel Lube Cost FOY = 300 days
1 2 3 4 5 6 7 8 9	Moving Ship Tomography  X Craft - Propeller L  Cruise  2D,3D High Res Sonar Piston Coring Observatory Servicing Current Meter Moorings, etc. Bio & Physical Survey Deployment of Moorings LaGrangian Float Studies Open Ocean Bio/Chem Int. Laying Cable for Observ. Moving Ship Tomography	Speed 12 12 12 12 12 12 12 12 12 12 12 12 12	7rd Days 2 4 1 3 1 20 8 2 5 15 61	NM 576 1,152 288 864 336 5,760 2,304 576 1,440 4,320	\$/day fuel \$7,028 \$7,028 \$7,028 \$7,028 \$10,179 \$7,028 \$7,028 \$7,028 \$7,028	5 10 8 12 10 10 6 5	Pays 30 7 10 2 1 1 27 26 5 5 108	\$/day fuel \$2,142 \$4,780 \$3,388 \$7,028 \$4,780 \$4,780 \$2,477 \$2,142	78  On Se  Days 2 20 6 14 7 4 10 15 78	\$2,887 \$2,887 \$2,887 \$2,887 \$2,887 \$2,887 \$2,887 \$2,887	30 247 Total Days 34 24 14 27 10 25 35 28 20 30 247	Avg Daily Fuel Cost \$2,473 \$3,577 \$4,129 \$3,533 \$4,445 \$6,276 \$5,294 \$2,802 \$3,736 \$4,958 \$4,958	\$84,093 \$85,858 \$57,812 \$95,387 \$44,446 \$156,896 \$185,289 \$78,452 \$74,724	Yearly Fuel Lube Cost FOY = 300 days \$1,374,4
1 2 3 4 5 6 7 8 9	Moving Ship Tomography  X Craft - Propeller L  Cruise  2D,3D High Res Sonar Piston Coring Observatory Servicing Current Meter Moorings, etc. Bio & Physical Survey Deployment of Moorings LaGrangian Float Studies Open Ocean Bio/Chem Int. Laying Cable for Observ. Moving Ship Tomography  X Craft - Waterjet Di	Speed 12 12 12 14 12 12 12 12 12 12 12 12 12 12 12 12 12	770 Days 2 4 1 1 3 3 1 20 8 2 5 61	NM 576 1,152 288 864 336 5,760 2,304 5,76 1,440 4,320	\$/day fuel \$7,028 \$7,028 \$7,028 \$7,028 \$7,028 \$7,028 \$7,028 \$7,028 \$7,028	\$peed 5 10 8 12 10 10 6 5 5	Days 30 7 10 2 1 27 26 5	\$/day fuel \$2,142 \$4,780 \$3,388 \$7,028 \$4,780 \$2,477 \$2,142	78  On St  Days 2 20 6 14 7 4 10 15 78	\$2,887 \$2,887 \$2,887 \$2,887 \$2,887 \$2,887 \$2,887 \$2,887	30 247 Total Days 34 24 14 27 10 25 35 28 20 30 247	Avg Daily Fuel Cost \$2,473 \$3,577 \$4,129 \$3,533 \$4,445 \$6,276 \$5,294 \$2,802 \$3,736 \$4,958 \$4,580	\$84,093 \$85,858 \$57,812 \$95,387 \$44,446 \$156,896 \$185,289 \$78,452 \$74,724	Yearly Fuel Lube Cost FOY = 300 days
1 2 3 4 5 6 6 7 8 8 9 110	Moving Ship Tomography  X Craft - Propeller L  Cruise  2D,3D High Res Sonar Piston Coring Observatory Servicing Current Meter Moorings, etc. Bio & Physical Survey Deployment of Moorings LaGrangian Float Studies Open Ocean Bio/Chem Int. Laying Cable for Observ. Moving Ship Tomography  X Craft - Waterjet Dia  Cruise	Speed 12 12 12 12 12 12 12 12 12 12 12 12 12	7ra  Days  2  4  1  3  1  20  8  2  5  15  61	NM 576 1,152 288 864 336 5,760 2,304 576 1,440 4,320	\$/day fuel \$7,028 \$7,028 \$7,028 \$7,028 \$10,179 \$7,028 \$7,028 \$7,028 \$7,028 \$7,028	\$peed 5 10 8 12 10 10 6 5 5 77 \$Speed	Days 30 7 10 2 1 27 26 5 108	\$/day fuel \$2,142 \$4,780 \$3,388 \$7,028 \$4,780 \$4,780 \$2,477 \$2,142	78  On St  Days 2 2 20 6 14 7 4 10 15 78  On St  Days	### ##################################	30 247 Total Days 34 24 14 27 10 25 35 28 20 30 247 Total Days	Avg Daily Fuel Cost \$2,473 \$3,577 \$4,129 \$3,533 \$4,445 \$6,276 \$5,294 \$2,802 \$3,736 \$4,958 \$4,580	\$84,093 \$84,093 \$85,858 \$57,812 \$95,387 \$44,446 \$156,896 \$155,289 \$74,424 Cruise Fuel Cost	Yearly Fuel Lube Cost FOY = 300 days \$1,374,
1 2 3 4 5 6 7 8 9 10	Moving Ship Tomography  X Craft - Propeller L  Cruise  2D,3D High Res Sonar Piston Coring Observatory Servicing Current Meter Moorings, etc. Bio & Physical Survey Deployment of Moorings LaGrangian Float Studies Open Ocean Bio/Chem Int. Laying Cable for Observ. Moving Ship Tomography  X Craft - Waterjet Dia  Cruise  2D,3D High Res Sonar	Speed   12   12   12   12   12   12   12   1	770 Days 2 4 1 1 20 8 2 5 15 61 Days 2 2	nsit  NM 576 1,152 288 864 336 5,760 2,304 576 1,440 4,320  NM 576	\$7,028 \$7,028 \$7,028 \$7,028 \$7,028 \$10,179 \$7,028 \$7,028 \$7,028 \$7,028	\$peed 5 10 8 12 10 10 6 5 5 77 \$Speed	Owing/Su  Days 30 7 10 2 1 1 27 26 5 108	\$/day fuel \$2,142 \$4,780 \$3,388 \$7,028 \$4,780 \$4,780 \$2,477 \$2,142	78  On St  Days 2 20 6 14 7 4 10 15 78  On St  Days 2	\$2,887 \$2,887 \$2,887 \$2,887 \$2,887 \$2,887 \$2,887 \$2,887 \$2,887	30 247 Total Days 34 24 14 27 10 25 35 28 20 30 247 Total Days	Avg Daily Fuel Cost \$2,473 \$3,577 \$4,129 \$3,533 \$4,445 \$6,276 \$5,294 \$2,802 \$3,736 \$4,958 \$4,580 Avg Daily Fuel Cost \$3,043	### Cost  \$84,093 \$85,858 \$57,812 \$95,387 \$44,446 \$156,896 \$185,289 \$78,452 \$74,724   Cruise Fuel Cost \$103,473	Yearly Fuel Lube Cost  FOY =  \$1,374,  Yearly Fuel Lube Cost  FOY =
1 2 3 4 5 5 6 7 8 9 9 10	Moving Ship Tomography  X Craft - Propeller L  Cruise  2D,3D High Res Sonar Piston Coring Observatory Servicing Current Meter Moorings, etc. Bio & Physical Survey Deployment of Moorings LaGrangian Float Studies Open Ocean Bio/Chem Int. Laying Cable for Observ. Moving Ship Tomography  X Craft - Waterjet Di  Cruise  2D,3D High Res Sonar Piston Coring Observatory Servicing	Speed 12 12 12 12 12 12 12 12 12 12 12 12 12	774  Days 2 4 1 1 20 8 8 2 5 15 61  Tra  Days 2 4	NM 576 1,152 288 864 336 5,760 2,304 4,320 4,320	\$/day fuel \$7,028 \$7,028 \$7,028 \$7,028 \$7,028 \$7,028 \$7,028 \$7,028 \$7,028 \$7,028 \$7,028 \$11,646	\$peed 5 10 8 12 10 10 6 5 5 \$peed 5 5 TT \$peed 5	Days 30 7 10 2 1 27 26 5 108	\$\frac{\\$\delta \text{fuel}}{\\$2,142} \\ \$4,780 \\ \$3,388 \\ \$7,028 \\ \$4,780 \\ \$4,780 \\ \$2,477 \\ \$2,142 \\ \$2,480 \\ \$7,826	78  On St  Days 2 2 20 6 14 7 4 10 15 78  On St  Days 2 20	**************************************	30 247 Total Days 34 24 14 27 10 25 35 28 20 30 247 Total Days 34 24	Avg Daily Fuel Cost \$2,473 \$3,577 \$4,129 \$3,533 \$4,445 \$6,276 \$5,294 \$2,802 \$3,736 \$4,958 \$4,580 Avg Daily Fuel Cost \$3,043 \$4,347 \$5,982	\$84,093 \$84,093 \$85,858 \$57,812 \$95,387 \$44,446 \$156,896 \$155,289 \$78,452 \$74,724 Cruise Fuel Cost \$103,473 \$104,330	Yearly Fuel Lube Cost FOY = 300 days \$1,374, Yearly Fuel Lube Cost FOY = 300
1 2 3 4 5 6 7 8 8 9 10	Moving Ship Tomography  X Craft - Propeller L  Cruise  2D,3D High Res Sonar Piston Coring Current Meter Moorings, etc. Bio & Physical Survey Deployment of Moorings LaGrangian Float Studies Open Ocean Bio/Chem Int. Laying Cable for Observ. Moving Ship Tomography  X Craft - Waterjet Di  Cruise  2D,3D High Res Sonar Piston Coring Observatory Servicing Current Meter Moorings, etc.	Speed   12   12   12   12   12   12   12   1	77a  Days  2  4  1  3  1  20  8  2  5  15  61	nsit  NM 576 1,152 288 864 336 5,760 2,304 576 1,440 4,320  NM 576 1,152 288	\$/day fuel \$7,028 \$7,028 \$7,028 \$10,179 \$7,028 \$7,028 \$7,028 \$7,028 \$7,028 \$7,028 \$1,049 \$1,046 \$11,646 \$11,646	\$peed 5 10 8 12 10 10 6 5 5 \$T\$ \$\$ \$\$ \$\$ \$\$ \$\$ \$\$ \$\$ \$\$ \$\$ \$\$ \$\$ \$\$	Owing/Su  Days  30  7 10 2 1 27 26 5 108	\$/day fuel \$2,142 \$4,780 \$3,388 \$7,028 \$4,780 \$2,477 \$2,142 \$2,142 \$2,480	78  On Se  Days 2 20 6 14 7 4 10 15 78  On Se  Days 2 2 6 6	**************************************	30 247 Total Days 34 24 14 27 10 25 35 28 20 30 247 Total Days 34 24	Avg Daily Fuel Cost \$2,473 \$3,573 \$4,129 \$3,533 \$4,445 \$6,276 \$5,294 \$2,802 \$3,736 \$4,958 \$4,580 Avg Daily Fuel Cost \$3,043 \$4,347	### Cost  \$84,093 \$85,858 \$57,812 \$95,387 \$44,446 \$156,896 \$185,289 \$78,452 \$74,724   **Cruise Fuel Cost \$103,473 \$104,330 \$83,749	Yearly Fuel Lube Cost FOY = 300 days \$1,374, Yearly Fuel Lube Cost FOY = 300
1 2 3 4 5 6 7 8 9 9 10	Moving Ship Tomography  X Craft - Propeller L  Cruise  2D,3D High Res Sonar Piston Coring Observatory Servicing Current Meter Moorings, etc. Bio & Physical Survey Deployment of Moorings LaGrangian Float Studies Open Ocean Bio/Chem Int. Laying Cable for Observ. Moving Ship Tomography  X Craft - Waterjet Di  Cruise  2D,3D High Res Sonar Piston Coring Observatory Servicing	Speed   12   12   12   12   12   12   12   1	770  Days  2  4  1  3  1  20  8  2  5  15  61   Tro  Days  4  1  3  3  1  3  1  3  4  1  3  4  1  3  4  1  3  4  1  3  4  1  3  4  4  4  4  4  4  4  4  4  4  4  4	NM 576 1,152 288 864 336 5,760 1,462 1,4320 NM 576 1,152 288 864 864	\$/day fuel \$7,028 \$7,028 \$7,028 \$7,028 \$10,179 \$7,028 \$7,028 \$7,028 \$7,028 \$7,028 \$7,028 \$11,646 \$11,646 \$11,646	\$peed 5 10 8 12 10 10 6 5  \$ \$peed 5 5	Owing/Su  Days  30  7 10 2 1 27 26 5  108  Owing/Su  Days 30  7 10	\$\frac{\\$\day \text{fuel}}{\\$2,142}\$ \$4,780 \$3,388 \$7,028 \$4,780 \$2,477 \$2,142  \$\frac{\\$\day \text{fuel}}{\\$\day \text{fuel}}\$ \$2,480 \$7,826 \$4,872 \$11,646	78  On St  Days 2 20 6 14 7 4 10 15 78  On St  Days 2 20 6 14 14 14	\$2,887 \$2,887 \$2,887 \$2,887 \$2,887 \$2,887 \$2,887 \$2,887 \$2,887 \$2,887 \$2,887 \$2,887 \$2,887 \$2,887 \$2,887	30 247 Total Days 34 24 14 27 25 35 28 20 30 247 Total Days 34 24 14 27	Avg Daily Fuel Cost \$2,473 \$3,577 \$4,129 \$3,533 \$4,445 \$6,276 \$5,294 \$2,802 \$3,736 \$4,958 \$4,580 Avg Daily Fuel Cost \$3,043 \$4,347 \$5,982 \$4,596	### Cost  \$84,093 \$85,858 \$57,812 \$95,387 \$44,446 \$156,896 \$155,289 \$78,452 \$74,724   **Cruise Fuel Cost  \$103,473 \$104,330 \$83,749 \$124,082	Yearly Fuel Lube Cost FOY = 300 days \$1,374, Yearly Fuel Lube Cost FOY = 300
1 2 3 4 5 6 6 7 8 9 9 9 10	Moving Ship Tomography  X Craft - Propeller L  Cruise  2D,3D High Res Sonar Piston Coring Observatory Servicing Current Meter Moorings, etc. Bio & Physical Survey Deployment of Moorings LaGrangian Float Studies Open Ocean Bio/Chem Int. Laying Cable for Observ. Moving Ship Tomography  X Craft - Waterjet Dia  Cruise  2D,3D High Res Sonar Piston Coring Observatory Servicing Current Meter Moorings, etc. Bio & Physical Survey	Speed   12   12   12   12   12   12   12   1	Days   2   4   1   3   1   1   1   1   1   1   1   1	nsit  NM 576 1,152 288 864 336 5,760 2,304 576 1,440 4,320  NM 576 1,152 288 864 336	\$/day fuel \$7,028 \$7,028 \$7,028 \$7,028 \$10,179 \$7,028 \$7,028 \$7,028 \$7,028 \$7,028 \$1,028 \$1,046 \$11,646 \$11,646 \$11,646 \$11,646 \$11,646	\$peed 5 10 8 12 10 10 6 5  \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	Days 30 7 10 2 1 1 27 26 5 108  Towing/Su 30 7 10 2 2 1 2 2 2 2 2 2 3 2 2 2 2 2 2 2 2 2 2	\$\frac{\\$\day \tel}{2},142 \$4,780 \$3,388 \$7,028 \$4,780 \$2,477 \$2,142 \$\frac{\\$\day \tel}{2},442 \$\frac{\\$\day \tel}{2},480 \$7,826 \$4,872	78  On St  Days 2 20 6 14 7 4 10 15 78  On St  Days 2 2 0 6 14 7	**************************************	30 247 Total Days 34 24 14 27 10 25 35 28 20 30 247 Total Days 34 24 14 27 10	Avg Daily Fuel Cost \$2,473 \$3,577 \$4,129 \$3,533 \$4,445 \$6,276 \$5,294 \$2,802 \$3,736 \$4,958 \$4,580 Avg Daily Fuel Cost \$3,043 \$4,347 \$5,982 \$4,596	\$84,093 \$84,093 \$85,858 \$57,812 \$95,387 \$44,446 \$156,896 \$155,289 \$74,4724 Cruise Fuel Cost \$103,473 \$104,330 \$83,749 \$124,082 \$61,061	Yearly Fuel Lube Cost FOY = 300 days \$1,374, Yearly Fuel Lube Cost FOY = 300
1 2 3 4 5 6 7 7 8 9 9 10	Moving Ship Tomography  X Craft - Propeller L  Cruise  2D,3D High Res Sonar Piston Coring Current Meter Moorings, etc. Bio & Physical Survey Deployment of Moorings LaGrangian Float Studies Open Ocean Bio/Chem Int. Laying Cable for Observ. Moving Ship Tomography  X Craft - Waterjet Di  Cruise  2D,3D High Res Sonar Piston Coring Current Meter Moorings, etc. Bio & Physical Survey Deployment of Moorings Current Meter Moorings, etc. Bio & Physical Survey Deployment of Moorings	Speed   12   12   12   12   12   12   12   1	Tra  Days  2  4  1  3  1  20  Tra  Tra  Days  4  1  3  1  20  Tra  Days  2  4  1  3  1  20	nsit  NM 576 1,152 288 864 336 5,760 2,304 5,760 1,440 4,320  NM 576 1,152 288 864 338 864 338 864 336	\$/day fuel \$7,028 \$7,028 \$7,028 \$7,028 \$10,179 \$7,028 \$7,028 \$7,028 \$7,028 \$7,028 \$11,646 \$11,646 \$11,646 \$11,646 \$11,646 \$11,646	\$peed 5 10 8 12 10 10 6 5  \$ \$peed 5 5 10 8 12 10 10 10 10 10 10 10 10 10 10 10 10 10	owing/Su  Days  30  7 10 2 1 27 26 5  108  Owing/Su  Days 30 7 10 2 1	\$\frac{\\$\day \tel}{2}\$,142 \$4,780 \$3,388 \$7,028 \$4,780 \$2,477 \$2,142 \$\frac{\\$\day \tel}{2}\$,42 \$\frac{\\$\day \tel}{2}\$,42 \$\frac{\\$\day \tel}{2}\$,480 \$7,826 \$4,872 \$11,646 \$7,826	78  On St  Days 2 20 6 14 7 4 10 15 78  On St  Days 2 2 0 6 14 7	**************************************	30 247 Total Days 34 24 14 27 10 25 35 28 20 30 247 Total Days 34 24 14 27 10 25 10 25 10 20 20 20 20 20 20 20 20 20 20 20 20 20	Avg Daily Fuel Cost \$2,473 \$3,577 \$4,129 \$3,533 \$4,445 \$6,276 \$5,294 \$2,802 \$3,736 \$4,958 \$4,580 Avg Daily Fuel Cost \$3,043 \$4,347 \$5,982 \$4,596 \$6,106	\$84,093 \$85,858 \$57,812 \$95,387 \$44,446 \$156,896 \$185,289 \$78,452 \$74,724 Cruise Fuel Cost \$103,473 \$104,330 \$83,749 \$124,082 \$61,061 \$252,303	Yearly Fuel Lube Cost FOY = 300 days \$1,374, Yearly Fuel Lube Cost FOY = 300
1 2 3 4 5 6 7 7 8 8 9	Moving Ship Tomography  X Craft - Propeller L  Cruise  2D,3D High Res Sonar Piston Coring Observatory Servicing Current Meter Moorings, etc. Bio & Physical Survey Deployment of Moorings LaGrangian Float Studies Open Ocean Bio/Chem Int. Laying Cable for Observ. Moving Ship Tomography  X Craft - Waterjet Di  Cruise  2D,3D High Res Sonar Piston Coring Observatory Servicing Current Meter Moorings, etc. Bio & Physical Survey Deployment of Moorings LaGrangian Float Studies	Speed 12 12 12 12 12 12 12 12 12 12 12 12 12	Tra Days 2 4 1 1 3 1 1 20 8 1 1 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1	NM 576 1,152 288 864 4,320 4,320 4,320 288 864 336 5,760 2,304 4,320 4,320	\$7,028 \$7,028 \$7,028 \$7,028 \$7,028 \$10,179 \$7,028 \$7,028 \$7,028 \$7,028 \$7,028 \$11,646 \$11,646 \$11,646 \$11,646 \$11,646 \$11,646 \$11,646 \$11,646 \$11,646 \$11,646 \$11,646	\$peed 5 10 8 12 10 10 6 5 \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	Days 30 7 10 2 1 27 108 108 108 108 108 108 108 108 108 108	\$\frac{\\$\day fuel}{\\$2,142}\$ \$4,780 \$3,388 \$7,028 \$4,780 \$2,477 \$2,142  \$\frac{\\$\day fuel}{\\$\day fuel}\$ \$2,480 \$7,826 \$4,872 \$11,646 \$7,826 \$7,826	78  On St  Days 2 20 6 14 7 4 10 15 78  On St  Days 2 2 0 6 14 7	**************************************	30 247 Total Days 34 24 14 27 10 25 35 28 20 30 247 Total Days 34 24 14 27 10 25 35 30 247	Avg Daily Fuel Cost \$2,473 \$3,573 \$4,129 \$3,533 \$4,445 \$6,276 \$5,294 \$2,802 \$3,736 \$4,958 \$4,580 Avg Daily Fuel Cost \$3,043 \$4,347 \$5,982 \$4,596 \$6,106 \$6,106 \$10,092 \$8,699	\$84,093 \$84,093 \$85,858 \$57,812 \$95,387 \$44,446 \$156,896 \$185,289 \$78,452 \$74,724 Cruise Fuel Cost \$103,473 \$104,330 \$83,749 \$124,082 \$61,061 \$252,303 \$304,463	Yearly Fuel Lube Cost FOY = 300 days \$1,374; Yearly Fuel Lube Cost FOY = 300
1 2 3 4 5 5 6 6 7 8 9 9 10 1 2 3 4 4 5 5 6 6 7 7 8	Moving Ship Tomography  X Craft - Propeller L  Cruise  2D,3D High Res Sonar Piston Coring Observatory Servicing Current Meter Moorings, etc. Bio & Physical Survey Deployment of Moorings LaGrangian Float Studies Open Ocean Bio/Chem Int. Laying Cable for Observ. Moving Ship Tomography  X Craft - Waterjet Di  Cruise  2D,3D High Res Sonar Piston Coring Observatory Servicing Current Meter Moorings, etc. Bio & Physical Survey Deployment of Moorings LaGrangian Float Studies Open Ocean Bio/Chem Int.	Speed   12   12   12   12   12   12   12   1	77a  Days  2  4  1  3  1  20  8  2  4  1  3  1  20  8  1  20  8  2  4  1  20  8  2	nsit  NM 576 1,152 288 864 336 5,760 2,304 576 1,440 4,320  NM 576 1,152 288 864 336 5,760 2,304 5,760	\$/day fuel \$7,028 \$7,028 \$7,028 \$10,179 \$7,028 \$7,028 \$7,028 \$7,028 \$7,028 \$7,028 \$11,646 \$11,646 \$11,646 \$11,646 \$11,646 \$11,646 \$11,646 \$11,646 \$11,646 \$11,646 \$11,646 \$11,646 \$11,646 \$11,646 \$11,646 \$11,646 \$11,646 \$11,646	5	owing/Su  Days  30  7 10 2 1 27 26 5  108  Towing/Su  Days 30  7 10 2 1 27 26 5 108	\$\frac{\\$\day fuel}{\\$2,142}\$ \$4,780 \$3,388 \$7,028 \$4,780 \$2,477 \$2,142  \$\frac{\\$\day fuel}{\\$\day fuel}\$ \$2,480 \$7,826 \$4,872 \$11,646 \$7,826 \$7,826 \$7,826 \$3,082	78  On Se  Days 2 0 6 14 7 4 10 15 78  On Se  Days 2 2 0 6 14 7 4 4 4	**************************************	30 247 Total Days 34 24 14 27 10 25 35 28 20 30 247 Total Days 34 24 14 27 10 25 35 28 20 30 247	Avg Daily Fuel Cost \$2,473 \$3,577 \$4,129 \$3,533 \$4,445 \$6,276 \$2,802 \$3,736 \$4,958 \$4,580 Avg Daily Fuel Cost \$3,043 \$4,347 \$5,1982 \$4,596 \$6,106 \$6,1092 \$8,699 \$3,694	\$84,093 \$84,093 \$85,858 \$57,812 \$95,387 \$44,446 \$156,896 \$185,289 \$74,724 \$74,724 \$103,473 \$104,330 \$83,749 \$124,082 \$61,061 \$252,303 \$304,463 \$103,473 \$104,330	Yearly Fuel Lube Cost FOY = 300 days \$1,374; Yearly Fuel Lube Cost FOY = 300

# Operating Cost Calculation

	Avg Expenses Global Class 98/99 \$ (from ONR)	Global Class Escalated to '04\$	Ratio By	Monohull	SWATH	X Craft, Prop	X Craft, WJ
Year \$	1998.5	2004					
Payroll Salaries, ship Salaries, shore Payroll Subtotal	\$1,729,043 \$247,965 <b>\$1,977,007</b>	\$2,034,279 \$291,739 <b>\$2,326,018</b>	Crew Size Unity	\$2,034,279 \$291,739 <b>\$2,326,018</b>	\$2,034,279 \$291,739 <b>\$2,326,018</b>	' ' '	' '
Maintenance Repairs & Maintenance Major Overhaul Maint Subtotal	\$283,377 \$333,199 <b>\$616,576</b>	\$333,403 \$392,020 <b>\$725,423</b>	Vessel Displ <sup>1</sup> Vessel Displ <sup>2</sup>	\$260,471 \$306,266 <b>\$566,737</b>	\$276,099 \$324,642 <b>\$600,741</b>	\$250,052 \$294,015 <b>\$544,067</b>	\$250,052 \$294,015 <b>\$544,067</b>
Other Costs Fuel, lube Food Insurance Stores Travel Shore Facility Misc Indirect Costs	\$562,800 \$95,177 \$66,984 \$215,998 \$100,143 \$105,872 \$167,894 \$460,975	\$662,153 \$111,979 \$78,809 \$254,129 \$117,822 \$124,562 \$197,533 \$542,352	Calculated Complement Vessel Displ Complement Crew Size Vessel Displ Vessel Displ Vessel Displ	\$866,243 \$111,979 \$61,569 \$254,129 \$117,822 \$97,314 \$154,323 \$423,713	\$1,104,011 \$111,979 \$65,263 \$254,129 \$117,822 \$103,153 \$163,582 \$449,136	\$59,107 \$254,129 \$117,822 \$93,422 \$148,150 \$406,764	\$111,979 \$59,107 \$254,129 \$117,822 \$93,422 \$148,150 \$406,764
Other Subtotal	\$1,775,843	\$2,089,340		\$2,087,092	\$2,369,076	\$2,565,483	\$3,151,422
Total Annual Ship Cost Operating Days	<b>\$4,369,426</b> 272.75	<b>\$5,140,781</b> 272		\$4,979,847 300	\$5,295,834 300	\$5,435,567 300	\$6,021,506 300
Day Rate	\$16,019.89	\$18,899.93		\$16,599.49	\$17,652.78	\$18,118.56	\$20,071.69
Tech Support Costs	\$4,000	\$4,706	Unity	\$4,706	\$4,706	\$4,706	\$4,706

3rd UNOLS Web Meeting, 20 May 2004

# Concept Design Capabilities Matrix

# **Concept Definition**

# Concept Design Capabilities

	<>		<ocea< th=""><th>N Class AGOR Var</th><th></th><th></th></ocea<>	N Class AGOR Var			
	Minimum	Desired	Monohull	SWATH (AGOR 26)	X Craft AGOR	AGOR 23/24 Class	AGOR 14/15 Class
Seakeeping:							
Seakeeping performance	SS6	SS6	SS6	SS6	tbd	SS6	SS6
Ship Dimensions:							
Length between perp, ft			210	172	240	254	250
Beam, ft			46	88	72	52.5	46
Depth to Main Deck, ft			24.9	38	tbd		
Draft, ft		19	16.9	25	14.6	17 to 19	16.5
Finished Deck Ht (ft)	7.5	8	8		tbd		
Displacement, long tons			2500	2542	2310	3400	2944
Propulsion:							
Dlant type	Integrated Diesel	Integrated Diesel	Integrated Diesel	Integrated Diesel	Integrated Diesel	Split Bus Diesel	Integrated
Plant type	Electric	Electric	Electric	Electric	Electric	Electric	Diesel Electric
# Screws			2	2	2	2	2
Total SHP			4,000	4,000	6,000	6,000	2,800
Speed, sustained		12	11	15	tbd	12	11.7
Speed, maximum		14-15	15	15.5	15	15	14
Speed, survey		12	12	12	tbd	12	11.7
Towing Requirement	10000@6, 25000@4	10000@6, 25000@4	10000@6, 25000@4	10000@6, 25000@4	10000@6, 25000@4		
Endurance Requirement	8000 nm @ opt spd, 20 days transit, 20 days station	10800 nm @ 12 kts, 20 days transit, 20 days station, or 30 days survey	10800 nm @ 12 kts, 20 days transit, 20 days station, or 30 days survey	10,000 nm at 11 kts	tbd	15,000 nm at 12 kts, 52 days	10,061 nm @ 11.7 kts, 40 days
Bow Thruster	Yes	Yes	900 HP	1100 HP	tbd		900 HP Retract

# **Concept Definition**

# Concept Design Capabilities

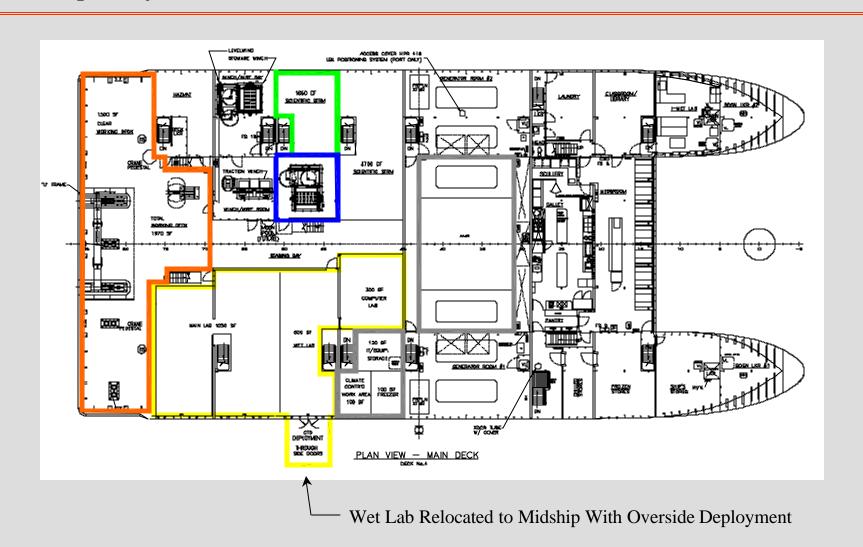
	<>		<oce< th=""><th>AN Class AGOR Va</th><th>riants&gt;</th><th></th><th></th></oce<>	AN Class AGOR Va	riants>		
	Minimum	Desired	Monohull	SWATH	X Craft AGOR	AGOR 23/24 Class	AGOR 14/15 Class
Accommodations:							
Crew		USCG	21 est.	21 est.	21 est.	21	21
Scientists	20	25+	25+	25	25	37	38
Total		43	43	46	46	58	59
Certifications:							
ABS	Yes	Yes	Yes	Yes	Yes	Yes	Yes
USCG	Subchap U	Subchap U	Subchap U	Subchap U	Subchap U	Subchap U	Subchap U
Ice Class	A0	A0	A0	D0	tbd	С	С
Space and Payload:							
Total Lab Space, sq ft	1,800	2,000	2,000	2,000	2,100	4,000	2,636
Main Lab	1,000	1000+	1,200				
Wet Lab	400	400+	415	330			
Computer Lab	300	300+	300	830			
Climate Contrl'd Work Area	100	100+	115	No			
Refrigerator/Freezer Space	100	100	100	No			
Number of Labs	4	4	4				
Electronics Repair Shop	Yes	Yes	Yes	Yes			
IT Equipment Space	No	Yes	Yes	Yes			
IT Storage	Yes	Yes	Yes	Yes			
ISO Vans	2	2	2	2			
Vans (Non ISO, 500ft ttl)		2	2	2			
Working Deck Space, sq ft	2,000	2,000	2,000	2,000	2,050	4,070	4,050
Clear Working Deck, sq ft	1,500	1,500	1,500	1,500			
Clear Rail Deck, sq ft	80' x 8'	80' x 8'	80' x 8'	Transverse			
Mission storage, cu ft		5,000	5,000	15,000			
Mission payload, long tons	100	200	200	100	100		
High Bay	Yes	Yes	Yes	Yes			

# Concept Design Capabilities

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	Minimum	Desired	Monohull	SWATH	X Craft AGOR	AGOR 23/24 Class	AGOR 14/15 Class
Mission Electronics Systems:							
Dynamic Positioning	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Deep multibeam	1 deg	1 deg	1 deg	(1x2 deg)	(1x2 deg)	2 deg	2 deg
Shallow multibeam	data to 50m	data to 50m	Yes	Yes	Yes	No	No
Single beam echosounder	12kHz	12kHz	12kHz	12kHz	12kHz	12kHz	12kHz
Subbottom profiler	2-8kHz	2-8kHz	2-8kHz	Yes	Yes	3.5kHz	3.5kHz
ADCP	38,75,150kHz	38,75,150kHz	38,75,150kHz	38,75,150kHz	38,75,150kHz	150kHz	150kHz
Acoustic positioning	Yes	Yes	Yes	Yes	Yes	Yes	
Handling Systems:							
Stern U frame	30000# 15'Hx25'Vx12'O	30000# 15'Hx25'Vx12'O	30000# 15'Hx25'Vx12'O	30000# 18'Hx25'Vx12'O	30000# 18'Hx25'Vx12'O	18000#	20000#
Towing crane				Yes	Yes	No	No
Boom cranes	10000# @12'	20000# @20'	20000# @20'	20000# @20'	20000# @20'	Two	Two
Traction winch	1	1	1	1	1	1	1
Hydrographic winch	2	2	2	2	2	2	3
Scientific Workboat	25'-30' LOA	25'-30' LOA	Yes	Yes	Yes		
Inflatable Work Boat	1 (16')	1 (16')	1 (16')	Yes	Yes	Yes	Yes

# Concept Design General Arrangements

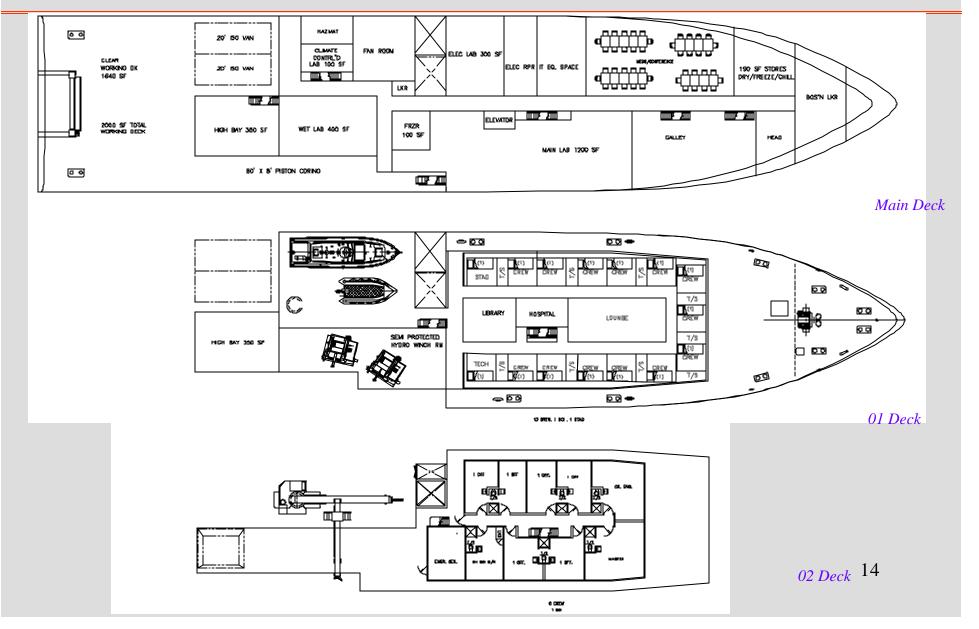
# SWATH Arrangement Update



### Monohull Arrangement Update

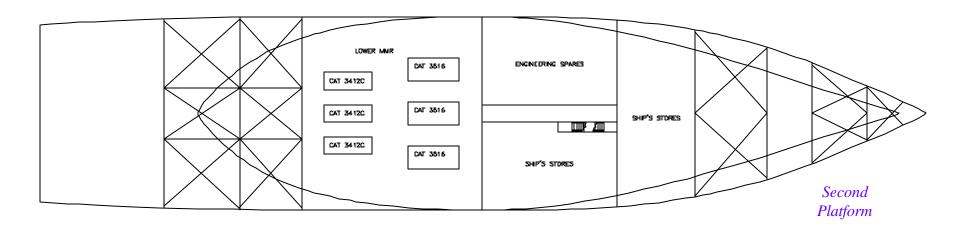
### **Concept Definition**

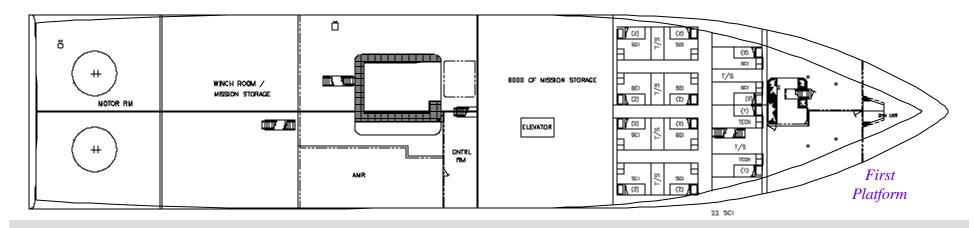
- Single SRs Throughout, Single Lounge, No Ch. Sci Day Room



### Monohull Arrangement Update

- Single SRs Throughout, Single Lounge, No Ch. Sci Day Room, Elevator





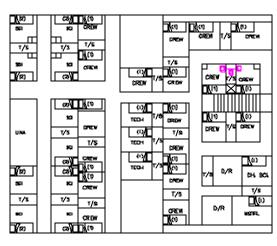
# **Concept Definition**

### X Craft Arrangement Update

- Arrangement Modified to Retain more of the Original X Craft Characteristics

View of X Craft Stern Showing Stern Well and Ramp





01 Deck

O SCIENTISTS

4 BOIENTISTS, 21 CREW

