Exhibit R-2, RDT&E Budget Item Justification: PB 2012 Navy										DATE: February 2011	
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 7: *Operational Systems Development*				R-1 ITEM NOMENCLATURE PE 0305160N: *Navy Meteorological and Ocean Sensors-Space(METOC)*							
COST ($ in Millions)	**FY 2010**	**FY 2011**	**FY 2012 Base**	**FY 2012 OCO**	**FY 2012 Total**	**FY 2013**	**FY 2014**	**FY 2015**	**FY 2016**	**Cost To Complete**	**Total Cost**
Total Program Element	27.687	63.878	0.904	-	0.904	0.822	5.419	5.433	27.860	Continuing	Continuing
0524: *Navy METOC Support (SPACE)*	1.057	0.936	0.904	-	0.904	0.822	0.833	0.880	0.890	Continuing	Continuing
1452: *GEO SAT*	25.833	62.942	-	-	-	-	4.586	4.553	26.970	Continuing	Continuing
9999: *Congressional Adds*	0.797	-	-	-	-	-	-	-	-	0.000	0.797

A. Mission Description and Budget Item Justification

This program element supports the Navy's requirements in meteorological and oceanographic (METOC) space-based remote sensors. These requirements include commitments to satellite, sensor, and operational demonstration/development activities as well as the transition to fleet applications associated with three satellite programs: 1) the joint Defense Meteorological Satellite Program (DMSP), 2) the jointly funded Coriolis satellite which includes Navy Satellite Based Wind Speed (WindSat) and Air Force Solar Mass Ejection Imager instruments, 3) the Geodetic/geophysical Satellite (GEOSAT) Follow-On 2 (GFO-2) altimetry satellite funded entirely by Navy.

The Navy METOC Space-Based Sensing Capabilities project provides for Navy participation in Navy/Air Force cooperative efforts leading to DMSP sensor development, and specifically participation in the calibration and validation of instruments and delivery of satellite products to the fleet. The passive microwave instruments carried on the DMSP satellites provide global and atmospheric data of direct operational relevance, including sea surface wind, sea ice, and precipitation. WindSat is a partnered program that meets multiple naval remote sensing requirements and provides a significant risk reduction for the Joint Polar Orbiting Satellite System (JPSS) formerly National Polar-orbiting Operational Environmental Satellite System (NPOESS) satellites' Microwave Imaging Sensor instrument.

The GEOSAT Follow-On project, and GFO-2 program, will provide a polar-orbiting satellite that measures sea surface topography using a precise altimeter. Both the GEOSAT Follow-On and Navy METOC Support (Space) projects fulfill Navy's obligation to develop naval service-unique, mission critical space-based METOC technology.

Starting in FY12 the Navy has delayed all Geodetic/geophysical Satellite (GEOSAT) Follow-On 2 (GFO-2) altimetry satellite development efforts until FY 2014.

JUSTIFICATION FOR BUDGET ACTIVITY: BA-7: This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it encompasses engineering and manufacturing development for upgrade of existing, operational systems.

Exhibit R-2, RDT&E Budget Item Justification: PB 2012 Navy	DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 7: *Operational Systems Development*	**R-1 ITEM NOMENCLATURE** PE 0305160N: *Navy Meteorological and Ocean Sensors-Space(METOC)*

B. Program Change Summary ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Previous President's Budget	28.774	63.878	57.148	-	57.148
Current President's Budget	27.687	63.878	0.904	-	0.904
Total Adjustments	-1.087	-	-56.244	-	-56.244
• Congressional General Reductions		-			
• Congressional Directed Reductions		-			
• Congressional Rescissions	-	-			
• Congressional Adds		-			
• Congressional Directed Transfers		-			
• Reprogrammings	-0.182	-			
• SBIR/STTR Transfer	-0.884	-			
• Program Adjustments	-	-	-56.235	-	-56.235
• Section 219 Reprogramming	-0.020	-	-	-	-
• Rate/Misc Adjustments	-	-	-0.009	-	-0.009
• Congressional General Reductions Adjustments	-0.001	-	-	-	-

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2010	FY 2011
Project: 9999: *Congressional Adds*		
Congressional Add: *Integration of Adv Wide Field of View Sensor Testbed System*	0.797	-
Congressional Add Subtotals for Project: 9999	0.797	-
Congressional Add Totals for all Projects	0.797	-

Change Summary Explanation

Technical: The Navy has delayed all Geodetic/geophysical Satellite (GEOSAT) Follow-On 2 (GFO-2) altimetry satellite development efforts until FY 2014.

Schedule: The Navy has delayed all Geodetic/geophysical Satellite (GEOSAT) Follow-On 2 (GFO-2) altimetry satellite development efforts until FY 2014.

Exhibit R-2A, RDT&E Project Justification: PB 2012 Navy			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 7: *Operational Systems Development*	R-1 ITEM NOMENCLATURE PE 0305160N: *Navy Meteorological and Ocean Sensors-Space(METOC)*	PROJECT 0524: *Navy METOC Support (SPACE)*	

COST ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
0524: *Navy METOC Support (SPACE)*	1.057	0.936	0.904	-	0.904	0.822	0.833	0.880	0.890	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

The Meteorology and Oceanography (METOC) Space-Based Sensing Capabilities project provides for the naval service's unique sensor development efforts Navy Satellite Based Wind Speed (WindSat) and Navy participation in the Defense Meteorological Satellite Program (DMSP) Special Sensor Microwave/Imager and Special Sensor Microwave Imager Sounder calibration/validation efforts in support of the fleet operational requirements. WindSat, an initiative begun in 1997, is a partnered program that meets multiple naval remote sensing requirements and provides a significant risk reduction for the Joint Polar Satellite System (JPSS) satellites' Conical Microwave Imaging Sensor instrument. The passive microwave instruments carried on DMSP and future JPSS satellites provide global oceanic and atmospheric data of direct operational relevance, including sea surface wind speed, sea ice, and precipitation.

The METOC Space-Based Sensing Capabilities project ensures the naval service's operational requirements are satisfied primarily through demonstration of technologies for inclusion on operational constellations such as DMSP, the JPSS and the National Oceanic and Atmospheric Administration's Geostationary Operational Environmental Satellites (GOES). These efforts fulfill naval service unique requirements that are not funded within the DMSP, JPSS or GOES programs, and are in accordance with current inter-agency agreements.

The primary focus of the FY 2012 request is the continuation of the microwave imager sensors data anomaly resolution, and to continue ground control and operations of the Coriolis spacecraft and monitor the state of health of the Navy Satellite Based Wind Speed (WindSat) on-orbit payload.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
Title: METOC Space-Based Sensing Capabilities	1.057	0.936	0.904
Articles:	0	0	0
FY 2010 Accomplishments: Continued performance assessments of microwave imagers (e.g.: Special Sensor Microwave Imager Sounder (SSMIS) / Special Sensor Microwave Imager (SSMI) / Microwave Imager Sounder (MIS)) and continued to calibrate sensors and validate data and resolve anomalies. Continued limited ground control and operations of the Coriolis spacecraft and monitored the state of health of the Navy Satellite Based Wind Speed (WindSat) on-orbit payload.			
FY 2011 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2012 Navy		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 7: *Operational Systems Development*	R-1 ITEM NOMENCLATURE PE 0305160N: *Navy Meteorological and Ocean Sensors-Space(METOC)*	PROJECT 0524: *Navy METOC Support (SPACE)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
Continue performance assessments of microwave imagers (e.g.: SSMIS/SSMI/MIS) and continue to calibrate sensors and validate data and resolve anomalies. Continue limited ground control and operations of the Coriolis spacecraft and monitor the state of health of the WindSat on-orbit payload. ***FY 2012 Plans:*** Conduct performance assessments, sensor calibrations and perform quality control on National Polar-orbiting Operational Environmental Satellite System Preparatory Project (NPP) and Defense Meteorological Satellite Program (DMSP) satellite sensor suits. Continue limited ground control and operations of the Coriolis spacecraft and monitor the state of health of the Navy Satellite Based Wind Speed (WindSat) on-orbit payload.			
Accomplishments/Planned Programs Subtotals	1.057	0.936	0.904

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
• RDTEN/0603207N/2342: *METOC DATA ASSIMILATION AND MOD*	18.685	15.311	10.636	0.000	10.636	11.321	10.026	10.022	9.995	0.000	85.996

D. Acquisition Strategy

Naval service unique, space based METOC requirements. Particular sensors or data sources with unique naval service mission needs are targeted to accelerate acquisition or ensure threshold accomplishment of Joint or converged national program plans. Navy Satellite Based Wind Speed provides risk reduction data and developmental technology that the Joint Polar Satellite System (JPSS) program will use in the development of the Conical Microwave Imager Sounder (CMIS). CMIS will collect global microwave radiometry and sounding data to produce microwave imagery and other meteorological and oceanographic data. CMIS can be viewed as the follow-on instrument to the Special Sensor Microwave (SSM) instruments Navy developed for the Defense Meteorological Satellite Program. These CMIS sensors will be acquired as part of the JPSS architecture which supports these Navy requirements in the future. Maintenance of rigorous sensor calibration and data validation for operational SSM instruments continues along with algorithm development in support of fleet applications. The Advanced Altimeter technologies will improve radar altimeter resolution and aerial coverage to support Navy requirements for sea surface topography measurement in the littorals.

E. Performance Metrics

Goal: Provide precise and near real-time METOC forecasting to the warfighter using existing and future space-based satellite derived data, including ocean surface wind speed, rain rate, ice concentration, and soil moisture measurements.
Metric: Provide precise ocean surface wind speed within plus or minus 2.0 meters per second, the rain over land and ocean rate within plus or minus 5.0 millimeters per hour, soil moisture measurements within plus or minus 10%; and sea ice concentrations within plus or minus 10%.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2012 Navy		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 7: *Operational Systems Development*	R-1 ITEM NOMENCLATURE PE 0305160N: *Navy Meteorological and Ocean Sensors-Space(METOC)*	PROJECT 0524: *Navy METOC Support (SPACE)*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2011 Cost	FY 2011 Award Date	FY 2012 Base Cost	FY 2012 Base Award Date	FY 2012 OCO Cost	FY 2012 OCO Award Date	FY 2012 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Spacecraft Development	C/FFP	Spectrum Astro:AZ	2.500	-		-		-		-	0.000	2.500	
Spacecraft Development	C/FP	TRW:Redondo Beach, CA	4.885	-		-		-		-	0.000	4.885	
Assimilation/Prediction Models	WR	Naval Research Laboratory:Washington, DC	5.845	-		-		-		-	0.000	5.845	
		Subtotal	13.230	-		-		-		-	0.000	13.230	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2011 Cost	FY 2011 Award Date	FY 2012 Base Cost	FY 2012 Base Award Date	FY 2012 OCO Cost	FY 2012 OCO Award Date	FY 2012 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
WindSat-Sensor/Observing Systems (Space)	C/FP	Various:Various	90.083	-		-		-		-	0.000	90.083	
WindSat-Sensor/Observing Systems (Space)	C/FP	Lockheed Martin:Maryland	-	0.919	Dec 2010	0.889	Dec 2011	-		0.889	Continuing	Continuing	Continuing
IOMI PM and System Engineering	C/FP	Various:Various	3.754	-		-		-		-	0.000	3.754	
SSMIS Cal/Val	C/FP	Various:Various	10.959	-		-		-		-	0.000	10.959	
Future Mission Engineering	C/FP	Various:Various	0.316	-		-		-		-	0.000	0.316	
APMIR	C/FP	Various:Various	1.590	-		-		-		-	0.000	1.590	
WindSat-Sensor/Observing Systems (Space)	WR	SMC DET 12:Kirtland AFB, New Mexico	-	0.017	Nov 2010	0.015	Nov 2011	-		0.015	0.000	0.032	
		Subtotal	106.702	0.936		0.904		-		0.904			

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2011 Cost	FY 2011 Award Date	FY 2012 Base Cost	FY 2012 Base Award Date	FY 2012 OCO Cost	FY 2012 OCO Award Date	FY 2012 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	C/FP	Various:Various	0.376	-		-		-		-	0.000	0.376	

Exhibit R-3, RDT&E Project Cost Analysis: PB 2012 Navy		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 7: *Operational Systems Development*	R-1 ITEM NOMENCLATURE PE 0305160N: *Navy Meteorological and Ocean Sensors-Space(METOC)*	PROJECT 0524: *Navy METOC Support (SPACE)*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2011 Cost	FY 2011 Award Date	FY 2012 Base Cost	FY 2012 Base Award Date	FY 2012 OCO Cost	FY 2012 OCO Award Date	FY 2012 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Acquisition Workforce	C/FP	Not Specified:Not Specified	0.013	-		-		-		-	0.000	0.013	
		Subtotal	0.389	-		-		-		-	0.000	0.389	

	Total Prior Years Cost	FY 2011		FY 2012 Base		FY 2012 OCO		FY 2012 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	120.321	0.936		0.904		-		0.904			

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2012 Navy			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 7: *Operational Systems Development*	R-1 ITEM NOMENCLATURE PE 0305160N: *Navy Meteorological and Ocean Sensors-Space(METOC)*	PROJECT 1452: *GEO SAT*	

COST ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
1452: *GEO SAT*	25.833	62.942	-	-	-	-	4.586	4.553	26.970	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

This project provides a Polar-orbiting satellite (the Geodetic/geophysical Satellite (GEOSAT) Follow-On 2 (GFO-2)) that measures sea surface topography using a precise altimeter. Mission data will be collected by the Spacecraft Operations Center and passed to the Payload Operations Center, and Altimetry Data Fusion Center, which are co-located at the Naval Oceanographic Office, Stennis Space Center, MS. Mission data is used in global and regional scale ocean forecast models. GFO-2 will provide a capability for precise mesoscale (e.g., fronts and eddies) and basin-scale oceanography. This capability will support tactical anti-submarine warfare, mine warfare, naval special warfare mission planning, tactical decision aids, and sensor/weapon performance prediction. GFO-2 will also provide an undersea warfare battlespace characterization capability that supports submarine detectability, weapon settings, sound velocity profiles, tropical cyclone intensity, and track forecasts.

GFO-2 data will be made freely available to other agencies, such as the National Oceanic and Atmospheric Administration and the National Aeronautics and Space Administration, who value its input to studies involving global warming and climate change, including El Nino Southern Oscillation effects.
Ocean topography data was previously provided by GEOSAT from 1985 until the satellite failed in January 1990. The Geodetic/geophysical Satellite Follow-On satellite was launched in February 1998 and deorbited in November 2008. The GEOSAT GFO-2 will provide for the continuation of this capability.

The Navy has delayed all Geodetic/geophysical Satellite (GEOSAT) Follow-On 2 (GFO-2) altimetry satellite development efforts until FY 2014.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
Title: GEO SAT	25.833	62.942	-
Articles:	0	0	
FY 2010 Accomplishments: Awarded the Geodetic/geophysical Satellite (GEOSAT) Follow On 2 (GFO-2) development contract. Began design phase of GFO-2. Began pre-Milestone B activities (System Requirements Review, System Design Review).			
FY 2011 Plans: Navy is assessing current program and mitigation strategies.			
Accomplishments/Planned Programs Subtotals	25.833	62.942	-

Exhibit R-2A, RDT&E Project Justification: PB 2012 Navy		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 7: *Operational Systems Development*	R-1 ITEM NOMENCLATURE PE 0305160N: *Navy Meteorological and Ocean Sensors-Space(METOC)*	PROJECT 1452: *GEO SAT*

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

Navy will revise pending restart in FY14.

E. Performance Metrics

Goal: Provide METOC GEOSAT derived mission data to improve the accuracy of global and regional scale oceanographic forecast models.

Metric: Anti-Submarine Warfare capability is highly dependent on the operational environment. GEOSAT Follow-On 1 demonstrated that a space based altimeter provided the equivalent of approximately a 500-fold increase in available subsurface observations and a 10-fold increase in available surface observations, critical to characterization of the ocean environment and oceanographic modeling. War-gaming models show that this increased knowledge of the subsurface acoustic propagation resulting from one altimeter reduced the probability of losing a ship to subsurface attack from 80% to 20% for various scenarios.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2012 Navy		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 7: *Operational Systems Development*	R-1 ITEM NOMENCLATURE PE 0305160N: *Navy Meteorological and Ocean Sensors-Space(METOC)*	PROJECT 1452: *GEO SAT*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2011 Cost	FY 2011 Award Date	FY 2012 Base Cost	FY 2012 Base Award Date	FY 2012 OCO Cost	FY 2012 OCO Award Date	FY 2012 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
GFO - Hardware Development	C/FP	Ball Aerospace:Boulder, CO	85.984	-		-		-		-	0.000	85.984	
Software Development	C/FP	Various:Various	8.045	-		-		-		-	0.000	8.045	
GFO - System Engineering	C/FP	Ball Aerospace:Boulder, CO	3.628	-		-		-		-	0.000	3.628	
System Engineering	C/FP	Various:Various	5.867	-		-		-		-	Continuing	Continuing	Continuing
GFO-2 (Naval Altimetry Satellite)	C/FP	Ball Aerospace:Boulder, CO	25.403	-		-		-		-	0.000	25.403	
TBD	TBD	TBD:TBD	-	62.942	Sep 2011	-		-		-	0.000	62.942	
		Subtotal	128.927	62.942		-		-		-			

Remarks

Navy has delayed all GFO-2 efforts until FY14. Navy is assessing current program and mitigation strategy.

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2011 Cost	FY 2011 Award Date	FY 2012 Base Cost	FY 2012 Base Award Date	FY 2012 OCO Cost	FY 2012 OCO Award Date	FY 2012 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
GFO	C/FP	Various:Various	0.200	-		-		-		-	0.000	0.200	
GFO-2	C/CPIF	MAXIM Systems:San Diego, CA	4.294	-		-		-		-	0.000	4.294	
Acquisition Workforce	C/FP	Various:Various	0.026	-		-		-		-	0.000	0.026	
		Subtotal	4.520	-		-		-		-	0.000	4.520	

	Total Prior Years Cost	FY 2011 Cost	FY 2011 Award Date	FY 2012 Base Cost	FY 2012 Base Award Date	FY 2012 OCO Cost	FY 2012 OCO Award Date	FY 2012 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	133.447	62.942		-		-		-			

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2012 Navy			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 7: *Operational Systems Development*	R-1 ITEM NOMENCLATURE PE 0305160N: *Navy Meteorological and Ocean Sensors-Space(METOC)*	PROJECT 9999: *Congressional Adds*	

COST ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
9999: *Congressional Adds*	0.797	-	-	-	-	-	-	-	-	0.000	0.797
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

Congressional Adds.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011
Congressional Add: Integration of Adv Wide Field of View Sensor Testbed System	0.797	-
FY 2010 Accomplishments: Began integration for Advanced Wide Field of View Sensor with Reusable, Reconfigurable Payload Processing Testbed System.		
Congressional Adds Subtotals	0.797	-

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

Congressional Adds.

E. Performance Metrics

Congressional Adds.