EXHIBIT R-2, RDT&E Budget Item Justification						DATE: May 2009		
APPROPRIATION/BUDGET ACTIVITY RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY / BA-7			R-1 ITEM NOMENCLATURE 0305160N NAVY METEOROLOGICAL & OCEAN SENSORS-SPACE (METOC)					
COST ($ in Millions)	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
Total PE Cost	**4.550**	**8.182**	**28.094**					
0524 METOC Space-Based Sensing Capabilities	3.547	2.671	1.085					
1452 Geosat Follow-on	1.003	5.511	27.009					
Quantity of RDT&E Articles								

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

This program element supports the Naval service's unique requirements in meteorological and oceanographic (METOC) space-based remote sensors. Beginning in FY2009 requirements include the development of a Future Naval Altimetry Satellite as required to ensure continuing support to Operational Warfighters. The altimeter provides global measurement of Sea Surface Height (SSH), SSH is combined with other measurements to compute daily sound speed profiles of the ocean, which are used to compute acoustic propagation in ASW tactical decision aids. Tactical decision aids allow ASW asset commanders to optimize system performance and posture forces.

Funding increases to the Geosat Follow-on project in FY10 represent the inclusion of full mission efforts for the Future Naval Altimetry Satellite including all payload components, spacecraft, launch vehicle, launch operations, on-orbit acceptance, and upgrades to existing ground infrastructure necessary for satellite control and payload data processing. Specifically, in FY10 the Satellite's Preliminary Design is scheduled for approval leading to the beginning of the final design phase.

These requirements include commitments to satellite, sensor, and operational demonstration/development activities as well as transition to fleet applications associated with four 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 SMEI (Solar Mass Ejection Imager) instruments, 4) the Geodetic/geophysical Satellite (GEOSAT) Follow-On (GFO) altimetry satellite funded entirely by Navy and 5) a future 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, specifically participation in the calibration and validation of instruments and delivery of satellite products to the Fleet. The passive microwave instruments carried on DMSP and future NPOESS satellites provide global oceanic 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 NPOESS satellites' Microwave Imaging Sensor (MIS) instrument. The future altimetry satellite will be a Navy program to provide continuity in altimetry data. 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.

(U) 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	DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY / BA-7	R-1 ITEM NOMENCLATURE 0305160N NAVY METEOROLOGICAL & OCEAN SENSORS-SPACE (METOC)

(U) C. PROGRAM CHANGE SUMMARY:

(U) Funding:	FY 2008	FY 2009	FY 2010	FY 2011
FY09 President's Submit	4.782	8.208	18.999	
FY10 President's Submit	4.550	8.182	28.094	
Total Adjustments	(0.232)	(0.026)	9.095	
Summary of Adjustments				
Program Adjustments	(0.232)		9.500	
Miscellaneous Adjustments		(0.026)	(0.405)	
Subtotal	(0.232)	(0.026)	9.095	

(U) Schedule:

The schedule for the Future Naval Altimetry Satellite effort has been refined/updated to reflect the inclusion of the launch vehicle and payload integration.

(U) Technical:

Not Applicable

EXHIBIT R-2a, RDT&E Project Justification						DATE: May 2009		
APPROPRIATION/BUDGET ACTIVITY RDT&E,N / BA-7	PROGRAM ELEMENT NUMBER AND NAME 0305160N NAVY METEOROLOGICAL & OCEAN SENSORS-SPACE (METOC)				PROJECT NUMBER AND NAME 0524 NAVY METOC SUPPORT (SPACE)			
COST ($ in Millions)	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
Project Cost	**3.547**	**2.671**	**1.085**					
RDT&E Articles Qty								

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

The Navy Meteorological and Oceanographic (METOC) Support (Space) project provides for the naval service's unique sensor development efforts (Navy Satellite Based Wind Speed (WindSat) and Future Naval Altimeter Satellite) and Navy participation in Defense Meteorological Satellite Program (DMSP) Special Sensor Microwave/Imager (SSM/I) and Special Sensor Microwave Imager Sounder (SSM/IS) 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 National Polar-orbiting Operational Environmental Satellite System (NPOESS) satellites' Conical Microwave Imaging Sensor (CMIS) instrument. The passive microwave instruments carried on DMSP and future NPOESS 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 National Polar-orbiting Operational Environmental Satellite System (NPOESS) and the National Oceanic and Atmospheric Administration's (NOAA) Geostationary Operational Environmental Satellites (GOES). These efforts fulfill naval service unique requirements that are not funded within the DMSP, NPOESS or GOES programs, and are in accordance with current inter-agency agreements.

EXHIBIT R-2a, RDT&E Project Justification		DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY RDT&E,N / BA-7	PROGRAM ELEMENT NUMBER AND NAME 0305160N NAVY METEOROLOGICAL & OCEAN SENSORS-SPACE (METOC)	PROJECT NUMBER AND NAME 0524 NAVY METOC SUPPORT (SPACE)

(U) B. Accomplishments/Planned Program

METOC Space-Based Sensing Capabilities	FY 08	FY 09	FY 10	FY 11
Accomplishments/Effort/Subtotal Cost	3.547	2.671	1.085	
RDT&E Articles Quantity				

FY08 - Prepared for launch of F-18. Developed additional Warfighter products (sea ice coverage); continued risk reduction to MIS through Navy Satellite Based Wind Speed (WindSat) data exploitation and ground control and operations of Coriolis and monitor state of health of the WindSat on-orbit payload. Monitored Special Sensor Microwave/Imager (SSM/I) and SSMIS performance and continued calibration and validation.

FY09 - Continue performance assessments of microwave imagers (e.g.: SSMIS/SSMI/MIS) and continue to calibrate sensors and validate data and resolve anomalies. Continue ground control and operations of the Coriolis spacecraft and monitor the state of health of the WindSat on-orbit payload.

FY10 - 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.

EXHIBIT R-2a, RDT&E Project Justification		DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY	**PROGRAM ELEMENT NUMBER AND NAME**	**PROJECT NUMBER AND NAME**
RDT&E, N / BA-7	0305160N NAVY METEOROLOGICAL & OCEAN SENSORS-SPACE (METOC)	0524 NAVY METOC SUPPORT (SPACE)

(U) C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. & Name

Not Applicable

(U) D. ACQUISITION STRATEGY:

WindSat provides risk reduction data and developmental technology that the National Polar-orbiting Operational Environmental Satellite System (NPOESS) Integrated Program Office (IPO) will use in the development of the Conical Microwave Imager Sounder (CMIS). CMIS can be viewed as the follow-on instrument to the Special Sensor Microwave (SSM) instruments Navy developed for the Defense Meteorological Satellite Program (DSMP). It will be the primary instrument for satisfying 20 NPOESS Integrated Operational Requirements Document (IORD) Environmental Data Records (EDRs). These CMIS sensors will be acquired as part of the NPOESS 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.

(U) E. MAJOR PERFORMERS:

Naval Research Laboratory, Washington D.C. Satellite Mission and Technical Support, Sensor Calibration and Data Validation

Exhibit R-3 Cost Analysis (page 1)											DATE: May 2009		
APPROPRIATION/BUDGET ACTIVITY RDT&E,N / BA-7			PROGRAM ELEMENT 0305160N NAVY METEOROLOGICAL & OCEAN SENSORS-SPACE (ME				PROJECT NUMBER AND NAME 0524 NAVY METOC SUPPORT (SPACE)					
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 09 Cost	FY 09 Award Date	FY 10 Cost	FY 10 Award Date	FY 11 Cost	FY 11 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Product Development												
Spacecraft Development	FF	Spectrum Astro, AZ	2.500		N/A		N/A					
Spacecraft Development	CP	TRW, Redondo Beach, CA	4.885		N/A		N/A					
Assimilation/Prediction Models	WR	NRL	4.316	1.115	N/A	0.437	N/A					
Subtotal Product Development			11.701	1.115	N/A	0.437	N/A					
Remarks:												
Support Costs												
WindSat-Sensor/Observing Systems (Space)	CP	Various	88.948	0.805	N/A	0.330	N/A					
IOMI PM and System Engineering	CP	Various	3.754		N/A		N/A					
SSMIS Cal/Val	CP	Various	10.139	0.617	N/A	0.253	N/A					
Future Mission Engineering	CP	Various	0.316		N/A		N/A					
APMIR	CP	Various	1.590		N/A		N/A					
Subtotal Support Costs			104.747	1.422	N/A	0.583	N/A					
Remarks:												

Exhibit R-3 Cost Analysis (page 1)

Exhibit R-3 Cost Analysis (page 2)										DATE: May 2009		
APPROPRIATION/BUDGET ACTIVITY RDT&E,N / BA-7			**PROGRAM ELEMENT** 0305160N NAVY METEOROLOGICAL & OCEAN SENSORS-SPACE (METOC)					**PROJECT NUMBER AND NAME** 0524 NAVY METOC SUPPORT (SPACE)				
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 09 Cost	FY 09 Award Date	FY 10 Cost	FY 10 Award Date	FY 11 Cost	FY 11 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Test & Evaluation												
Subtotal Test & Evaluation			0.000	0.000		0.000						
Remarks:												
Management Services												
	CP	Various	0.182	0.134	N/A	0.065	N/A					
Subtotal Management Services			0.182	0.134	N/A	0.065	N/A					
Remarks:												
Total Cost			116.630	2.671	N/A	1.085	N/A					

EXHIBIT R4, Schedule Profile																															**DATE:** May 2009
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-7					**PROGRAM ELEMENT NUMBER AND NAME** 0305160N DEFENSE METEOROLOGICAL SATELLITE PROGRAM (SPACE)																**PROJECT NUMBER AND NAME** 0524 NAVY METOC SUPPORT (SPACE)											
Fiscal Year	2008				2009				2010				2011				2012				2013				2014				2015			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
WindSat / Coriolis	Risk reduction demonstration. →																															
Microwave Imager	Sensor Calibration / Data Validation →																															

EXHIBIT R4, Schedule Profile

Exhibit R-4a, Schedule Detail							**DATE:** May 2009	
APPROPRIATION/BUDGET ACTIVITY RDT&E **BA-7**	**PROGRAM ELEMENT** 0305160N NAVY METEOROLOGICAL & OCEAN SENSORS-SPACE (METOC)					**PROJECT NUMBER AND NAME** 0524 NAVY METOC SUPPORT (SPACE)		
Schedule Profile	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
WindSat / Coriolis								
Risk reduction demonstration	1Q - 4Q	1Q - 4Q	1Q - 4Q					
Microwave Imager								
Sensor Calibration/Data Validation	1Q - 4Q	1Q - 4Q	1Q - 4Q					

Exhibit R-4a, Schedule Detail

EXHIBIT R-2a, RDT&E Project Justification						DATE: May 2009		
APPROPRIATION/BUDGET ACTIVITY RDT&E,N / BA-7	PROGRAM ELEMENT NUMBER AND NAME 0305160N NAVY METEOROLOGICAL & OCEAN SENSORS-SPACE (METOC)				PROJECT NUMBER AND NAME 1452 GEOSAT FOLLOW-ON			
COST ($ in Millions)	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
Project Cost	1.003	5.511	27.009					
Quantity of RDT&E Articles								

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

This project provides a satellite-borne radar altimeter sensor to obtain ocean topography measurements from which tactically significant features such as ocean fronts and eddies, wave heights, internal acoustic structure, and sea-ice edges are derived. Topography provides a unique and important data source in support of a number of naval service unique warfare areas such as anti-submarine and undersea warfare. Geodetic/geophysical Satellite (GEOSAT) Follow-On (GFO) data are made freely available to other agencies such as the National Oceanic and Atmospheric Administration (NOAA) and the National Aeronautics and Space Administration (NASA) who value its input to studies involving global warming and climate change including El Nino Southern Oscillation (ENSO) effects. Ocean topography data was previously provided by GEOSAT from 1985 until the satellite failed in January 1990. The GFO satellite was launched in February 1998 and is nearing its end of life. A future Naval Altimetry Satellite will provide for continuation of this capability.

Funding increase in FY2010 represent the inclusion of the full mission efforts for the Future Naval Altimetry Satellite including all payload components, spacecraft, launch vehicle, launch operations, on-orbit acceptance, and upgrades to existing ground infrastructure necessary for satellite control and payload data processing. Specifically, in FY2010 the Satellite's Preliminary Design is scheduled for approval leading to the beginning of the final design phase. The development of the Future Naval Altimetry Satellite, required to ensure continuing support to Operational Warfighters, begins in FY2009. Altimeters provide global measurements of Sea Surface Height (SSH). SSH is combined with other measurements to compute daily sound speed profiles in the ocean. Sound speed profiles are used to compute acoustic propagation in ASW tactical decision aids. Tactical decision aids allow ASW asset commanders to optimize system performance and posture forces.

EXHIBIT R-2a, RDT&E Project Justification		DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY	**PROGRAM ELEMENT NUMBER AND NAME**	**PROJECT NUMBER AND NAME**
RDT&E,N / BA-7	0305160N NAVY METEOROLOGICAL & OCEAN SENSORS-SPACE (METOC)	1452 GEOSAT FOLLOW-ON

(U) B. Accomplishments/Planned Program

Meteorology and Oceanography (METOC) Space	FY 08	FY 09	FY 10	FY 11
Accomplishments/Effort/Subtotal Cost	1.003	5.511	27.009	
Quantity of RDT&E Articles				

FY08 - Continued investigations and implementation of life extension solutions as work arounds for degraded components. Continued performance assessments and continued to calibrate payload and validate data and resolved anomalies. Continued assessing the impact of differing orbits on metric effectiveness. Completed GFO Performance Validation Reports (every 17 days) and GFO Engineering Anomaly Resolution Reports (upon retirement of anomaly). Completed METOC metric end of year report.

FY09 - Continue Geodetic/geophysical Satellite (GEOSAT) Follow-On (GFO) performance assessments and continue to calibrate GFO payload and validate data and resolve anomalies. Continue investigations and implementation of life extension solutions as work arounds for degraded components of GFO. Complete GFO Performance Validation Reports (every 17 days) and GFO Engineering Anomaly Resolution Reports (upon retirement of anomaly). The GFO is no longer operational, since November 2008, all resources have since been realigned to expedite the follow on capability, the Naval altimetry data satellite (or the Geodetic/geophysical Satellite (GEOSAT) Follow-On 2 (GFO-2)). Begin engineering analysis of alternative configurations for a future satellite based altimeter and prepare acquisition documentation.

FY10 - Begin Design phase of the Naval altimetry data satellite. Complete preliminary design and conduct Preliminary Design Review (PDR) for the Naval altimetry data satellite. The GFO is no longer operational, since November 2008, all resources have since been realigned to expedite the follow on capability, the Naval altimetry data satellite (or the Geodetic/geophysical Satellite (GEOSAT) Follow-On 2 (GFO-2)).

EXHIBIT R-2a, RDT&E Project Justification		DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY	**PROGRAM ELEMENT NUMBER AND NAME**	**PROJECT NUMBER AND NAME**
RDT&E,N / BA-7	0305160N NAVY METEOROLOGICAL & OCEAN SENSORS-SPACE (METOC)	1452 GEOSAT FOLLOW-ON

(U) C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. & Name

Not Applicable

(U) D. ACQUISITION STRATEGY:

The naval service requires a satellite-borne radar altimeter sensor on orbit to obtain ocean topography measurements from which tactically significant features such as ocean fronts and eddies, wave heights, internal acoustic structure, and sea-ice edges are derived. Rigorous payload calibration, data validation and precision orbit determination maintain accuracy and usefulness of data. Continued refinement of sensor performance works toward satisfying the Navy and Marine Corps' littoral data requirements. As the Geodetic/geophysical Satellite GEOSAT Follow-On (GFO) satellite reaches its end of life, the program will transition to a future on-orbit altimeter to satisfy naval service unique altimetry requirements.

(U) E. MAJOR PERFORMERS:

Ball Aerospace, Boulder, CO Satellite Mission Support; Computer Sciences Corporation (CSC), Monterey, CA Sensor Calibration, Data Validation and Technical Support. MAXIM Systems, San Diego, CA. TBD (competitive award) for prime contractor for future Naval altimetry satellite.

Exhibit R-3 Cost Analysis (page 1)													DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY RDT&E,N / BA-7			PROGRAM ELEMENT 0305160N NAVY METEOROLOGICAL & OCEAN SENSORS-SPACE (METOC)					PROJECT NUMBER AND NAME 1452 GEOSAT FOLLOW-ON					
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 09 Cost	FY 09 Award Date	FY 10 Cost	FY 10 Award Date	FY 11 Cost	FY 11 Award Date	Cost to Complete	Total Cost	Target Value of Contract	
Product Development													
Software Development	CP	Ball Aerospace	85.984		N/A		N/A						
	CP	Various	8.045		N/A		N/A						
Systems Engineering	CP	Ball Aerospace	3.456	0.215	N/A	0.215	N/A						
	CP	Various	3.711	0.911	N/A	0.885	N/A						
Naval Altimetry Satellite	CP	TBD		1.700	TBD	24.300	TBD						
Subtotal Product Development			101.196	2.826	N/A	25.400	N/A						
Remarks:													
Support Costs													
Subtotal Support Costs			0.000	0.000	N/A	0.000	N/A						
Remarks:													

Exhibit R-3 Cost Analysis (page 1)

Exhibit R-3 Cost Analysis (page 2)										DATE: May 2009		
APPROPRIATION/BUDGET ACTIVITY RDT&E,N / BA-7		PROGRAM ELEMENT 0305160N NAVY METEOROLOGICAL & OCEAN SENSORS-SPACE (METOC)						PROJECT NUMBER AND NAME 1452 GEOSAT FOLLOW-ON				
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 09 Cost	FY 09 Award Date	FY 10 Cost	FY 10 Award Date	FY 11 Cost	FY 11 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Test & Evaluation												
Subtotal Test & Evaluation			0.000	0.000								
Remarks:												
Management Services												
	CP	Various	0.200	0.000	N/A	0.000	N/A					
		MAXIM Systems, San Diego, CA		2.685	11/08	1.609	N/A					
Subtotal Management Services			0.200	2.685	N/A	1.609	N/A					
Remarks:												
Total Cost			101.396	5.511	N/A	27.009	N/A					

Exhibit R-3 Cost Analysis (page 2)

EXHIBIT R4, Schedule Profile | **DATE:** May 2009

APPROPRIATION/BUDGET ACTIVITY
RDT&E,N / BA-7

PROGRAM ELEMENT NUMBER AND NAME
0305160N NAVY METEOROLOGICAL & OCEAN SENSORS-SPACE (METOC)

PROJECT NUMBER AND NAME
1452 GEOSAT FOLLOW-ON

Fiscal Year	2008				2009				2010				2011				2012				2013				2014				2015			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Naval Altimetry Satellite							Key Decision Point B ◇					Key Decision Point C ◇																						
							Pre-Acq Activities ▲				Prel Design ▲																							
								Prime Contract Award				PDR																						
GFO Altimeter Satellite			GFO Cal/Val/Life Extension Solutions →																													

NOTE: The schedule for the Future Naval Altimetry Satellite effort has been refined/updated to reflect the inclusion of the launch vehicle and payload integration.

EXHIBIT R4, Schedule Profile

Exhibit R-4a, Schedule Detail						**DATE:** May 2009		
APPROPRIATION/BUDGET ACTIVITY RDT&E,N / BA-7	**PROGRAM ELEMENT** 0305160N NAVY METEOROLOGICAL & OCEAN SENSORS-SPACE (METOC)				**PROJECT NUMBER AND NAME** 1452 GEOSAT FOLLOW-ON			
Schedule Profile	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
GFO Altimeter Satellite	1Q - 4Q	1Q - 4Q	1Q - 4Q					
Future Naval Altimeter Satellite								
Pre-Acquisition Activities		1Q - 3Q						
Key Decision Point B		3Q - 4Q						
Prime Contract Award		4Q						
Preliminary Design Review (PDR)			3Q					
Key Decision Point C			4Q					

NOTE: The schedule for the Future Naval Altimetry Satellite effort has been refined/updated to reflect the inclusion of the launch vehicle and payload integration.

Exhibit R-4a, Schedule Detail