CONTRIBUTIONS

GOAL:
(1) Reduce SST error by:
   a) improve cloud masking
   b) generate routine RTM based algorithms
   c) correct for aerosol
   d) improve match up validation through inclusion of NCEP analyses.
(2) Prepare for future SST missions (MetOp, NPP, NPOESS, GOES-R).

SUBTASK I: SST EDRS

• Operational SST Satellite
  EDRS validated to IORD II specifications.
• Best value blended SST products

KNOWLEDGE BASE

- Explore MODIS SST data for NPP RR
  RSMAS vs. SeaWiFS process
  Error analysis
- Generate AQUA/AMSRE MW SST
- Generate WindSAT SST
  Influence of RFI
  Coastal side lobe issues
- MW IR estimate of cloud removal biases
  Operational validation
  Error characterization
- Algorithm Dev
  Diurnal SST signal
  Validate GOES/POES blend
  Trans cloud removal
- INCLUDE upper air analysis in retrieval
- Probability based cloud detection
- Resolve midnight effect
- Cloud probability distributions
- Optran modeled
GOALS:
1. Acquire calibrated characterized radiances from GOES and POES platforms.
2. Apply cloud mask to characterized radiances.
3. Apply aerosol correction.
4. Generate RTM based algorithms to generate climate quality SSTs.

CONTRIBUTIONS
- Reprocess climate quality POES SSTs
- Reprocess climate quality GOES SSTs
- Select best oceanographic climatologies

SUBTASK 2: SST CDRs

Climate quality global SST CDRs within 0.1° C

- Acquire/compare difference of ground-based climatologies
- Select best SST climatology. Mean and standard deviation with space-time days

- Merge with NCEP re-analysis
- Radiometric quality control
- Cloud screening
- Aerosol correction
- Time-series analysis to established temporal stability

Reprocess new data

- Ground based
- GOES based
- POES based
**SUBTASK 3: SST CALIBRATION/VALIDATION**

**GOALS:**
1. Develop a validation system to maintain and monitor the quality of SST products.
2. Identify uncertainties in the SST products based on validation results.
3. Correct the uncertainties in SST products and regenerate.

**CONTRIBUTIONS**

*Knowledge Base*

- SST Cal/Val system to reduce uncertainties in SST measurements for skin/bulk

*Contributions*

- Satisfy research/monitoring requirements
- Production of different cross-consistent SST products
- Self-consistent SST products

**Active Phase**

- Quality assure ground-based data
- Explore bulk to skin conversion using NCEP data
- Produce bulk to skin conversion using NCEP data

**Maintenance Phase**

- Reduce cross platform and cross sensor biases
- Reduce artificial SST dependences (i.e. aerosols, view angle, ambient clouds, glintage)

**Goals:**
- Develop a validation system to maintain and monitor the quality of SST products.
- Identify uncertainties in the SST products based on validation results.
- Correct the uncertainties in SST products and regenerate.

**Launch Dates**

- NOAA-18
- GOES-R
- MetOP1
- GOES-O
- VIIRS
- NOAA-N'
- NPOESS
- GOES-P
- MetOP2
- GOES-R

**Fiscal Year**

- 05
- 06
- 07
- 08
- 09
- 10
- 11
- 12
SUBTASK 4: SST APPLICATIONS

Ability to generate high quality satellite-only SST products in areas lacking in situ data

CONTRIBUTIONS

GOALS:
1. Identify user needs.
2. Develop SST products to suit user needs.
3. User validation.
4. High quality satellite-only SSTs

CONCEPTUAL BLOCK CHART

Knowledge Base

Launch Dates

Fiscal Year

Fiscal Year

05 06 07 08 09 10 11 12

GENERATE BLENDED SST PRODUCTS AT VARIABLE RESOLUTIONS

GENERATE HIGH RESOLUTION BLENDED SST PRODUCTS FOR SHALLOW COASTAL WATERS

VALIDATE MODELS WITH BLENDED SST PRODUCTS

GENERATE SST BASED PRODUCTS TO IDENTIFY DYNAMIC FEATURES E.G. FRONTS/CURRENTS

OCEAN DYNAMICS

Users

Frontal products

Ocean currents

CRW

Users

Improve GOES/POES blended SST products

Bulk SST at Depth (TaD)

NCEP JCSDA

Improve GOES/POES blended SST products

Merge SST and forecast fields

COASTAL/OCEAN

Users

Improve GOES/POES blended SST products

Ability to generate high quality satellite-only SST products in areas lacking in situ data

GOALS:
1. Identify user needs.
2. Develop SST products to suit user needs.
3. User validation.
4. High quality satellite-only SSTs

CONCEPTUAL BLOCK CHART

Knowledge Base

Launch Dates

Fiscal Year

05 06 07 08 09 10 11 12

GENERATE BLENDED SST PRODUCTS AT VARIABLE RESOLUTIONS

GENERATE HIGH RESOLUTION BLENDED SST PRODUCTS FOR SHALLOW COASTAL WATERS

VALIDATE MODELS WITH BLENDED SST PRODUCTS

GENERATE SST BASED PRODUCTS TO IDENTIFY DYNAMIC FEATURES E.G. FRONTS/CURRENTS

OCEAN DYNAMICS

Users

Frontal products

Ocean currents

CRW

Users

Improve GOES/POES blended SST products

Bulk SST at Depth (TaD)

NCEP JCSDA

Improve GOES/POES blended SST products

Merge SST and forecast fields

COASTAL/OCEAN

Users

Improve GOES/POES blended SST products
Task 1: Altimeter Data Sets

**GOALS:**
1. REDUCE SSH UNCERTAINTY
2. IMPROVE TIMELINESS AND EXPAND APPLICATIONS

**CONSIDER ALTIMETER CDRS TO IORD II SPECIFICATIONS**
- Evaluate delayed Doppler data for ocean dynamics and bathymetry
- Install, test, integrate in OSDPD
- Automated quality assessment
- Improve algorithms, corrections
- Increase length of data set to 22 years
- Improve accuracy to 4cm (new orbits and corrections)
- Create merged comprehensive GDR

**CONTRIBUTIONS**
- Integrate NPOESS altimetry flow in OSDPD system
- Implement operational continuity of SSH data set
- Create web-based, user-driven archive
- Create 6-yr archive for climate studies
- Create archive suitable for retracking

**NPOESS**
- Maintain operational continuity of SSH data set
- Implement operational exact repeat, near-real-time altimetry
- Create web-based, user-driven archive
- Create 6-yr archive for climate studies
- Create archive suitable for retracking

**RADS**
- Increase length of data set to 22 years
- Improve algorithms, corrections

**CRYOSAT**
- Automated quality assessment

**JASON 2**
- Install, test, integrate in OSDPD

**GEOSAT**
- Evaluate delayed Doppler data for ocean dynamics and bathymetry

**Launch:** International Polar Year

**Fiscal Year**
- 2005
- 2006
- 2007
- 2008
- 2009
- 2010
- 2011
- 2012

**REVISED 7/18/05**
Task 2: Ocean Dynamics

**GOALS:**
1. **Reduce Uncertainty in Surface Currents from Altimetry**
2. **Apply Satellite Altimetry to Research Problems and Operational Applications in Areas of Ocean Circulations and Climate**

**OPERATIONAL MONITORING OF ABSOLUTE DYNAMIC TOPOGRAPHY AND GLOBAL SEA LEVEL TO IORD II SPECIFICATIONS**

**CONTRIBUTIONS**

- **Arctic Absolute Dynamic Topography**
  - Establish improved arctic geoid & dynamic topography
- **Coastal Currents**
  - Create high resolution coastal current data set
  - Implement global surface currents for climate & operational applications
- **Data Fusion: OSCAR w/ CODAR**
- **Expand to Tropical Atlantic & Pacific**
- **Expand to mid-latitudes**
- **Increase spatial resolution to improve coastal coverage**
- **Transfer to OSDPD for operational use**
- **Evaluate GRACE, GOCE, CRYOSAT for arctic gravity & geoid**

**Launch Dates**

- International Polar Year
- Fiscal Year

*REVISED 7/18/05*
Task 3: Gravity and Bathymetry (G&B)

Goal: Reduce uncertainty and improve resolution of global ocean gravity and bathymetry (G&B) products.

Knowledge Base:
- Global, average SSH slopes on a 1 nautical mile grid accurate to 1 microradian.
- Ocean bottom roughness products for modeling, ocean mixing, and energy dissipation.
- Evaluate delay Doppler ocean altimeter.
- Evaluate GRACE, GOCE, CryoSat, ArcGP data for geoid & sea level in the Arctic Ocean.

Contributions:
- Improved along-track resolution G&B.
- Improved Arctic geoid & dynamic topography.
- Improved G&B to incorporate in GEBCO maps.

Products & Applications:
- Improved Arctic GEOID & Dynamic Topography.

Launch Dates:
- International Polar Year

Fiscal Year: 05 - 06 - 07 - 08 - 09 - 10 - 11 - 12

REVISED 7/18/05
Task 4: Climate

**GOALS:**
1. **Reduce Uncertainty to Global Sea Level Rise (GSLR)**
2. **Apply Satellite Altimetry to Research Problems & Operational Applications in Areas of GSLR Climate Variability and Change**

**Operational Monitoring of Global Sea Level to IORD II Specifications**

- **CDR Development**
- **SSH Climate Products:** PDO, UAO, etc.
- **Analyze ARGO Profiler and Altimetry SSH Data for Volume and Mass Change**
- **Develop High Precision Tide Gauge Calibration**
- **Develop Systems for Routine and Automatic Calibration**
- **Monitor Vertical Land Motion**
- **Analyze ARGO Profiler and Altimetry SSH Data for Volume and Mass Change**
- **Oversee Production of NOAA/Jason2 Near-Real-Time Data Set**

**Contributions**

- **SSH Data Set??**
- **Create New ?? Based on Climate Indices**
- **Identify Contributions to GSLR**
- **Increase Confidence in GSLR to ??**
- **Improve Altimeter Calibrations**
- **Perform Data Quality Assessments**

**Launch Dates**

- International Polar Year
- Fiscal Year

**Revised 7/18/05**
### OPERATIONAL SURFACE WIND VECTORS

- Validated to IORD II specifications

### GOALS:

**IMPROVE MARINE FORECASTING**

1. NUMERICAL WEATHER MODEL INPUT
2. UTILIZATION BY HUMAN FORECASTERS (i.e. OPC, TPC, CPHC, WFOS)

### CONTRIBUTIONS

- **ASSESS IMPACT IN OPERATIONAL MARINE FORECASTING**
- **BEST WINDSAT WIND VECTOR RETRIEVALS: CHARACTERIZE RETRIEVAL PERFORMANCE IN LIMITING CONDITIONS**
- **BEST QUIKSCAT OCEAN WIND RETRIEVALS: CHARACTERIZE RETRIEVAL IN LIMITING CONDITIONS**

### KNOWLEDGE BASE

- Implement & validate new land mask to allow for QuikSCAT wind vector retrievals closer to coastal regions
- Investigate, develop and validate other WindSAT EDRs (i.e. SST, rain rate, TPW, sea ice)
- Validate QuikSCAT high wind speed model
- Develop & validate finer spatial resolution ASCAT wind products and NRCS imagery products similar to QuikSCAT
- Wind products into NWS operational environments
- Comparison of active and passive wind vector retrievals
- Evaluation & development of satellite wind vector retrievals in limiting environmental conditions
- Develop & validate WindSAT wind vector retrievals
- Ocean winds aircraft experimental program
- Comparison of active and passive wind vector retrievals
- Preparation for CMIS processing and validation
- ASCAT wind product to AWIPS
- ASCAT Calibration & product validation
- Extend aircraft experimental program to cover CMIS
- Ocean winds aircraft experimental program
- Sustain ops QuikSCAT wind vector retrievals
- Validate high resolution scatterometry products
- ASCAT operational processing preparations
- Extend experimental program to cover ASCAT cal/val

### APPLICATIONS

- Extend aircraft experimental program to cover CMIS
- Calibration and validation of CMIS wind vectors
- Extend experimental program to cover ASCAT cal/val
- ASCAT wind product to AWIPS
- ASCAT Calibration & product validation
- Preparation for CMIS processing and validation
- Ocean winds aircraft experimental program
- Sustain ops QuikSCAT wind vector retrievals
- Validate high resolution scatterometry products
- ASCAT operational processing preparations
- Extend experimental program to cover ASCAT cal/val

### SCATTEROMETRY

- Calibration and validation of CMIS wind vectors
- Ocean winds aircraft experimental program
- Sustain ops QuikSCAT wind vector retrievals
- Validate high resolution scatterometry products
- ASCAT operational processing preparations
- Extend experimental program to cover ASCAT cal/val

### RADIOMETRY

- Calibrate and validation of CMIS wind vectors
- Ocean winds aircraft experimental program
- Sustain ops QuikSCAT wind vector retrievals
- Validate high resolution scatterometry products
- ASCAT operational processing preparations
- Extend experimental program to cover ASCAT cal/val

### BEST WINDSAT WIND VECTOR RETRIEVALS:

- Characterize retrieval performance in limiting conditions

### BEST QUIKSCAT OCEAN WIND RETRIEVALS:

- Characterize retrieval in limiting conditions

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**REVISED 7/18/05**

**OCEAN SURFACE WINDS TASKS**

- **APPLICATIONS**
  - **CONTRIBUTIONS**
  - **GOALS**
    - **IMPRESS MARINE FORECASTING**
      - **1) NUMERICAL WEATHER MODEL INPUT**
      - **2) UTILIZATION BY HUMAN FORECASTERS (i.e. OPC, TPC, CPHC, WFOS)**

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**CONTRIBUTIONS**

- Assess impact in operational marine forecasting
- Best WindSAT wind vector retrievals: Characterize retrieval performance in limiting conditions
- Best QuikSCAT ocean wind retrievals: Characterize retrieval in limiting conditions
**TASK 1: OCEAN COLOR MARINE OPTICAL BUOY (MOBY)**

- **Contribution:**
  - Provide absolute radiometric standard and maintain a reference for intercomparison of ocean color satellite missions, accurate to IORD II specifications.
  - Develop ocean color climate quality data products.

**GOALS:**
Operational vicarious calibrations of satellite ocean color sensors to reduce uncertainties in satellite ocean color measurements.

**Contributions**:
- **Satellite Calibration**
  - NPOESS/VIIRS initialization
  - NPP/VIIRS initialization
  - GOES-R initialization

- **End-to-End Characterization**
  - MOBY II implementation (Case 1 Waters)
  - MOBY II implementation (Case 2 Waters)
  - NPOESS/VIIRS calibration
  - NPP/VIIRS calibration
  - Develop MOBY East

- **Temporal Continuity Between Satellite Missions**
- **Reduction in Size and Cost for Multiple Deployments**
- **Hyperspectral Vicarious Calibration for All Ocean Color Sensors**
- **Reduce Uncertainties**

**Tasks**:
- MOBY II/COPY
  - Develop MOBY II technology
  - MOBY II implementation (Case 1 Waters)
  - MOBY II implementation (Case 2 Waters)
  - NPOESS/VIIRS calibration
  - NPP/VIIRS calibration
  - Develop MOBY East

**Knowledge Base**
- Terra
- Aqua
- MODIS
- SeaWiFS
- VIIRS
- NPP
- NPOESS
- VIIRS
- GOES-R

**Fiscal Year**
- 05
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**TASK 2: Ocean Color Marine Optical Characterization Experiment (MOCE)**

**GOAL:**
Develop and validate new and heritage ocean color algorithms for ocean bio-optical properties

### Contributions
- **Continuity of Bio-optical Measurements**
- **Hyper/Multispectral Geostationary Characterization**
- **NEW IOP Product Development and Error Analysis**
- **Validate Operational Ocean Color Products**

### Knowledge Base
- Operational ocean color measurements validated to IORD II Specifications
- Atmospheric correction, change in BDRF

### Ocean Color Retrieval
- **New product transition to operational**
- Hyper/multispectral algorithm development
- Hyper/multispectral geostationary characterization with increased satellite temporal, spatial, and spectral resolution

### Geostationary
- **NEW IOP PRODUCT DEVELOPMENT AND ERROR ANALYSIS**
- **VALIDATE OPERATIONAL OCEAN COLOR PRODUCTS**

### Current Products
- **CURRENT PRODUCTS**
- **COASTAL APPLICATION DEVELOPMENT**
- **COASTAL APPLICATION VALIDATION**
- **COASTAL APPLICATION TRANSITION TO OPERATIONS**
- **POC DEVELOPMENT**
- **POC VALIDATION**
- **POC TRANSITION TO OPERATION**
- **CDOM DEVELOPMENT**
- **CDOM VALIDATION**
- **CDOM TRANSITION TO OPERATION**
- **COASTAL APPLICATION DEVELOPMENT**
- **COASTAL APPLICATION VALIDATION**
- **COASTAL APPLICATION TRANSITION TO OPERATIONS**
- **POC DEVELOPMENT**
- **POC VALIDATION**
- **POC TRANSITION TO OPERATION**
- **CDOM DEVELOPMENT**
- **CDOM VALIDATION**
- **CDOM TRANSITION TO OPERATION**
- **POC DEVELOPMENT**
- **POC VALIDATION**
- **POC TRANSITION TO OPERATION**
- **CDOM DEVELOPMENT**
- **CDOM VALIDATION**
- **CDOM TRANSITION TO OPERATION**

### Fiscal Year
- 2005
- 2006
- 2007
- 2008
- 2009
- 2010
- 2011
- 2012

### Operational Ocean Color Measurements
- Terra
- Aqua
- MODIS
- SeaWiFS
- VIIRS
- NPP
- VIIRS
- NPOESS
- VIIRS
- GOES-R
- HES
**Task 3: Ocean Color Validation**

**Goal:**
To develop quantitative accuracy estimates to assess data quality

**Operational ocean color measurements** validated to IORD II Specifications

**Contributions**
- Quality Assurance of Products
- Validation
- Improve QA Capabilities
- Reduce Uncertainties

**Knowledge Base**
- Terra
- Aqua
- MODIS
- NPP
- VIIRS
- SeaWiFS
- NPOESS
- GOES-R
- HES

**Fiscal Year**
- 2005
- 2006
- 2007
- 2008
- 2009
- 2010
- 2011
- 2012

**Tasks**:
- Independent validation of acquisition program for operational products
- Validate NPP products
- Validate NPOESS products
- Validate GOES-R products
- Utilize MQABI to establish accuracies and monitor process and performance
- Add in situ match-up capabilities to MQABI
- Implement MODIS ocean Quality Assurance Browse Imagery (MQABI) tool into NOAA processing system
- Evaluate accuracy of new NOAA-unique operational products

**Conclusions**
- Operational ocean color measurements validated to IORD II Specifications
- Independent validation of acquisition program for operational products
- Validate NPP, NPOESS, and GOES-R products
- Utilize MQABI to establish accuracies and monitor process and performance
- Add in situ match-up capabilities to MQABI
- Implement MODIS ocean Quality Assurance Browse Imagery (MQABI) tool into NOAA processing system
- Evaluate accuracy of new NOAA-unique operational products
**GOAL:** To develop and maintain coastal and oceanic ocean color applications.

**TASK 4: OCEAN COLOR PRODUCTS AND APPLICATIONS**

- **APPLICATION DEVELOPMENT**
  - Implement primary production and maximum quantum yield products into CoastWatch processing system.
  - Transition to operations
  - Evaluate product
- **APPLICATION IMPLEMENTATION**
  - Develop coastal and oceanic ocean color applications utilizing increased temporal, spatial, and spectral resolutions
- **APPLICATION EVALUATION**
  - Validate and implement new ocean color products

**APPLICATION**

- Terra
- Aqua
- MODIS
- SeaWiFS
- NPP
- VIIRS
- NPOESS
- GOES-R
- HES

**CONTRIBUTIONS**

- Participate in Coastal Ocean Applications and Science Team to identify coastal applications and requirements for GOES-R CWI
- Multi/hyperspectral geostationary product development

**Fiscal Year**

- 2005
- 2006
- 2007
- 2008
- 2009
- 2010
- 2011
- 2012
**TASK 1: SEA ICE PRODUCT RESEARCH AND DEVELOPMENT**

**GOAL:**
Develop operational algorithms and products that provide required measurements of sea ice and other cryospheric parameters from available active and passive microwave, IR, and visible data.

**CONTRIBUTIONS**

- Ice Dynamics Algorithms & Products based on available interferometric & RGRS data
- Enhanced seasonal & classification algorithms & multiband active & passive obs
- Enhanced seasonal algorithms & products based on additional SAR bands & new MetOp ASCAT scatterometers obs
- Algorithms & products based on existing single polarization SAR C-band & QuikSCAT obs

**COMPLETE SEA ICE IORD II**

**EDR ALGORITHMS**

- Present Algorithm Improvement
  - Sea ice vectors
  - Glacial monitoring

- Seasonal Products Enhancement
  - Marginal ice zone characterization
  - Ice mask
  - Iceberg detection
  - High resolution sea ice imagery

- Improved ice classification

**PRESENT ALGORITHM IMPROVEMENT**

- Marginal ice zone characterization
  - Ice mask
  - Iceberg detection
  - High resolution sea ice imagery

**FUTURE DATES**

- Cryosat
- ALOS
- MetOp
- TERRA SAR-X/L
- RADARSAT 2
- RADARSAT FOLLOW-ON
- MetOp 2
- U.S. SAR
- MetOp 2

**FISCAL YEAR**

- 05
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- 12
Task 2: Sea Ice Altimetry

**Goal:**
Provide validated capability to estimate sea ice thickness from microwave altimeters satellites.

**Knowledge Base:**
- Develop sea ice freeboard estimation capability for climate research

**Contributions:**
- Provide improved understanding of the impact of climate change on the Arctic & Southern Oceans
- Isolate the dynamic oceanography height component & develop new satellite sea ice height algorithms
- Validate techniques for deriving freeboard estimates from satellite altimeters

**Pending Sensor Availability:**
- CryoSat sea ice height (freeboard)
- ENVISAT altimeter sea ice height
- ENVISAT & CryoSat Cal/Val
- ERS-2 altimeter sea ice height

**Sea Height Estimation Algorithms:**
- Freeboard connection to waning sea ice, age, and tracking

**Climate Change Links:**
- Develop more accurate geoid from GRACE

**Fiscal Year:**
- 05
- 06
- 07
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- 12

**Technologies:**
- Terra SAR-X/L
- RADARSAT 2
- MetOp2
- RADARSAT Follow-On
- U.S. SAR
- InSAR

**Cal/Val:**
- ENVISAT altimeter sea ice height
- CryoSat sea ice height (freeboard)
- ERS-2 altimeter sea ice height
- ENVISAT & CryoSat Cal/Val

**Dates:**
- CryoSat
- ALOS
- Terra SAR-X/L
- RADARSAT
- RADARSAT Follow-On
- MetOp2
- MetOp
- U.S. SAR
- InSAR

**Sea Height Estimation Algorithms:**
- Terra SAR-X/L
- RADARSAT
- MetOp2
- RADARSAT Follow-On
- U.S. SAR
- InSAR
**Task 3: National Ice Center (NIC) Polar Research**

**Goals:**
1) Reduce sea ice detection & characterization uncertainty
2) Sustain & develop operational sea ice products, models, & forecasts to meet NIC requirements as NOAA's operational ice services activity

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**Knowledge Base**

- Reduce uncertainty in the accuracy of sea ice products & forecasts

- Improve global short-term forecast accuracy
- Improve accuracy of regional climate forecasts
- Improve coupled ice-ocean models through satellite data assimilation
- Develop accurate nowcast sea ice concentration and edge all-weather products
- Improve user accessibility of product via GIS
- Update and develop sea ice products as new sensors become available
- Develop near-real-time access to Antarctic SAR data
- Maintain access to Arctic SAR, IR, visible, and other microwave data

**Contributions**

- Provide improvements through integration of satellite observations
- Maintain operational capability with available sensors
- Assure access to required satellite data

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**Real-Time Data Access**

- Terra SAR-X/L
- MetOp
- RADARSAT
- RADARSAT Follow-On
- ALOS
- U.S. SAR

**Fiscal Year**

05 06 07 08 09 10 11 12
SUBTASK I: SST EDRs

**Goal:**
1. Reduce SST error by:
   a) improve cloud masking
   b) generate routine RTM based algorithms
   c) correct for aerosol
   d) improve match up validation through inclusion of NCEP analyses.

**Contributions**
- Generate SST analysis using PC RTM from MODIS/AIRS
- Assimilate MODIS/GOES SST into 2D model
- Generate SST algorithms for MODIS & validate
- Generate RTM algorithms from MODIS radiance data ±0.5°C
- IR MW blend
- Generate RTM algorithms ±0.6°C, IR SST

**Knowledge Base**
- Operational SST Satellite
  - EDRS validated to IORD II specifications.
  - Best value blended SST products

- Explore MODIS SST data for NPP RR
  - RSMAS vs. SeaWiFS process
  - Inst. Cal
  - Error analysis

- Generate AQUA/AMSRE MW SST
- Generate WindSAT SST
  - Influence of RFI
  - Coastal side lobe issues

- MW IR estimate of cloud removal biases
- Operational validation
- Error characterization
  - Algorithm Dev
  - Diurnal SST signal
  - Validate GOES/POES blend
  - Trans cloud removal

- Probability based cloud detection
- Resolve midnight effect
- Cloud probability distributions
- OPTRAN modeled
- Include upper air analysis in retrieval

**Subtask 1:** SST EDRs

**Generate SST analysis using PC RTM from MODIS/AIRS**
SUBTASK 2: SST CDRs

GOALS:
1. Acquire calibrated characterized radiances from GOES and POES platforms.
2. Apply cloud mask to characterized radiances.
3. Apply aerosol correction.
4. Generate RTM based algorithms to generate climate quality SSTs.

CONTRIBUTIONS
- Reprocess climate quality POES SSTs
- Reprocess climate quality GOES SSTs
- Select best oceanographic climatologies

CLIMATE QUALITY SST CDRs within 0.1°C

Knowledge Base

Ground Based
- Acquire/compare difference of ground-based climatologies
- Select best SST climatology. Mean and standard deviation with space-time days

GoES Based
- Merge with NCEP re-analysis
- Radiometric quality control
- Cloud screening
- Aerosol correction
- Time-series analysis to established temporal stability
- Reprocess new data

POES Based
- Merge with NCEP re-analysis
- Radiometric quality control
- Cloud screening
- Aerosol correction
- Time-series analysis to established temp. stability
- Reprocess new data

Acquire/compare difference of ground-based climatologies
Select best SST climatology. Mean and standard deviation with space-time days

Launch Dates
- GOES
- MetOp1
- NOAA-N
- NPP
- VIIRS
- GOES
- GOES-R
- MetOp2
- HES

Fiscal Year
05 06 07 08 09 10 11 12
**SUBTASK 3: SST CALIBRATION/VALIDATION**

**GOALS:**
1. Develop a validation system to maintain and monitor the quality of SST products.
2. Identify uncertainties in the SST products based on validation results.
3. Correct the uncertainties in SST products and regenerate.

**CONTRIBUTIONS**
- Satisfy research/monitoring requirements
- Production of different cross-consistent SST products
- Self-consistent SST products

**KNOWLEDGE BASE**
- SST Cal/Val system to reduce uncertainties in SST measurements for skin/bulk

**ACTIVE PHASE**
- Quality assure ground-based data
- Reduce cross platform and cross sensor biases
- Explore bulk to skin conversion using NCEP data
- Produce bulk to skin conversion using NCEP data

**MAINTENANCE PHASE**
- Reduce artificial SST dependences (i.e. aerosols, view angle, ambient clouds, glintage)

**GOALS:**
1. Develop a validation system to maintain and monitor the quality of SST products.
2. Identify uncertainties in the SST products based on validation results.
3. Correct the uncertainties in SST products and regenerate.
CONTRIBUTIONS

GOALS:
1. Identify user needs.
2. Develop SST products to suit user needs.
3. User validation.
4. High quality satellite-only SSTs

Ability to generate high quality satellite-only SST products in areas lacking insitu data

Coastal/Ocean Users

- Improve GOES/POES blended SST products
- Generate blended SST products at variable resolutions
- Generate high resolution blended SST products for shallow coastal waters
- Validate models with blended SST products
- Generate SST based products to identify dynamic features e.g., fronts/currents

CRW Users

- Improve GOES/POES blended SST products
- Bulk SST at Depth (TaD)

NCEP JCSDA

- Improve GOES/POES blended SST products
- Merge SST and forecast fields
- Extend to entire GEO global domain, i.e., GOES, MSG, MTSAT, GOES 10

Frontal products

- Improve GOES/POES blended SST products

Ocean currents

Users

- Improve GOES/POES blended SST products
- Bulk SST at Depth (TaD)

COASTAL/OCEAN

Users

- Improve GOES/POES blended SST products

CRW

Users

- Improve GOES/POES blended SST products
- Bulk SST at Depth (TaD)

NCEP JCSDA

- Improve GOES/POES blended SST products
- Merge SST and forecast fields

Frontal products

- Improve GOES/POES blended SST products

Ocean currents

Users

- Improve GOES/POES blended SST products
- Bulk SST at Depth (TaD)

Knowledge Base

GOALS:
1. Identify user needs.
2. Develop SST products to suit user needs.
3. User validation.
4. High quality satellite-only SSTs

Launch Dates

- GOES-R
- MetOp1
- NOAA-N
- MetOp2
- NPOESS
- GOES-P
- VIIRS
- NOAA-18

Fiscal Year

Fiscal Year

Fiscal Year

Fiscal Year