

Partnering Earth Observations for People Living Environmentally (PEOPLE) JCTD *“FY 10 Rolling Start”*

“Proactive Incident & Environmental Decision Support”



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The Current Situation

- **Partner nations (i.e., developed and third world countries) face security risks because of an inability to respond to, plan for and monitor environmental change, natural disasters, and the associated humanitarian challenges.**
 - Involvement is in US best interest – especially providing low cost decision support systems that can enhance a country's or region's awareness and preparedness
- **Partner nations need enhanced capability for day-to-day resource management and emergency preparedness:**
 - Monitor, prepare for, and coordinate responses
 - Efficiently manage ecological resources
 - Identify and address environmental trends
 - Better manage precious land and water resources
- **The sharing of Earth Observation data and analysis reduces individual country's risks and costs while supporting the global environmental mission**

Loss of lives, poor policy decisions, economic disruption, and loss of critical resources



PEOPLE JCTD

Addresses Building Partnership JCAs



- **Provide Aid to Foreign Partners and Institutions - The ability to provide assistance, materiel, or services to foreign partners or institutions for the purpose of advancing U.S. national security or shared global security interests.**
- **Identify Aid Requirements - The ability to identify requirements and required resources to provide assistance to foreign partners or institutions.**
- **Enhance Partner Capabilities and Capacities - The ability to facilitate the development of partner capabilities and capacities in a manner that advances partnership goals and mutual interests.**



Partner Nations / Joint / Interagency Operational Problem



Ineffective use of existing earth observation data for regional decision making, planning or reactions to environmental issues, resources management, and associated humanitarian challenges

- No overarching operational architecture for data & tool integration for decision making
- Inconsistent regional institutionalization / utilization of data products and model outputs
- No universal core system (i.e., hardware, software, models, data sources) for pressing environmental and resource management issues
- Slow pace of enabling data sharing policies
- Insufficient ability to build partnership capacity; to equip and train partner nations to address environmental and resource management issues
- Insufficient ability to develop regional environmental & ecological management plans (e.g., evacuations, land use, water use, environmental impact)

Insufficient ability to plan for, monitor and respond to environmental activities, resource management by capitalizing on global resources



Desired Capabilities by FY11

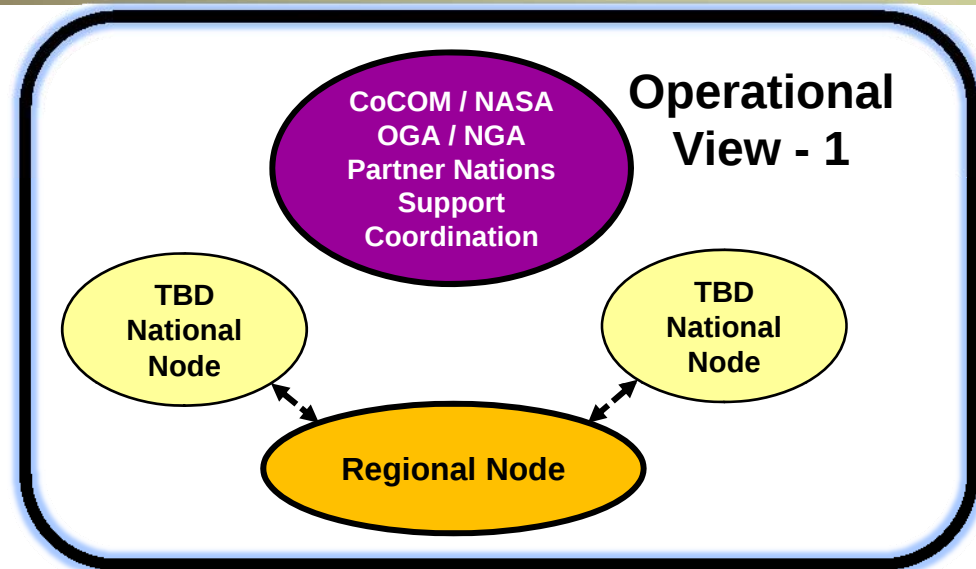
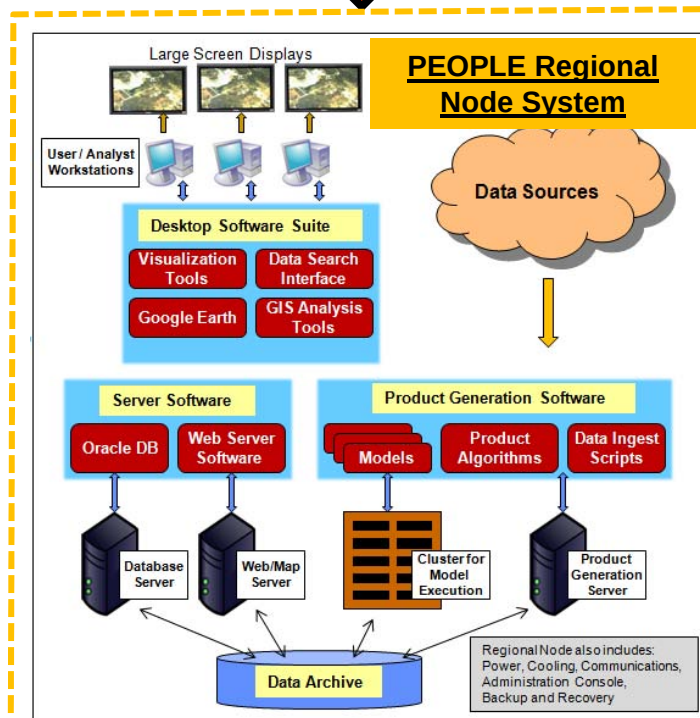
- **A monitoring, analysis, and visualization decision support system for environmental, resource management, and humanitarian challenges, forecasting and management**
 - Capitalizes on existing space, air, and ground-based decision support architecture
 - Integrates & interoperates w/ existing & developing satellite imagery, in-situ, and disparate data sources
 - Timely and actionable decision support tools
- **Partner Nations and research organizations (e.g. Group on Earth Observation System of Systems) engaged in collaborative data sharing and product/model development**
 - Integration of data in standardized formats provided by partner nations and participating organizations.
 - Management tools for decision making
- **A cross-border, interdependent, regional, and national solution**
 - Capable of delivering land, sea and atmospheric products/tools (e.g., Water Resources, Water Pollution, Urban Development, Forest Fires, etc.)
 - Displays and overlays multiple geospatial data information products (e.g. fires, weather prediction, climate change, land cover mapping, flooding data)
 - Helps define patterns of normal and abnormal human behavior and environmental conditions
 - Generates and sends automated alerts based on and user-defined criteria
- **Scalable, adaptable, and sustainable core system**
 - Operational in austere or mature environments
 - Tailorable to regional and national areas of coverage and needs
 - Cost effective, owned, and operated by the in-country users
- **CONOPS and TTP**
 - Compatible with and supports broader Building Partnership Capacity (BPC) strategies



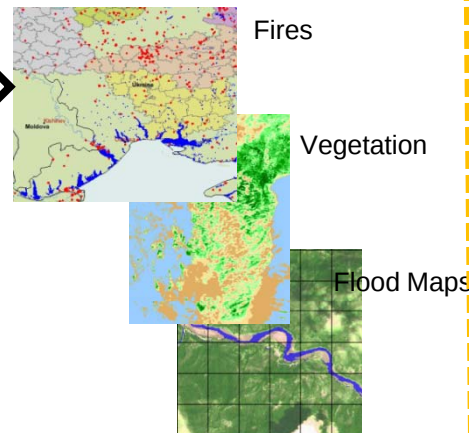
Operational Configuration & OV-1



Global, Regional and Local Data Resources



Regional Decision Support Products



National Node

Decision Makers

- Policy
- Management Decisions

- *Rapid Response*
- *Capacity Building*
- *Environmental Monitoring*
- *Sustained Development*
- *Better Living Conditions*
- *Policy Changes*





Overall Demonstration Strategy



- Operates at unclassified and commercially secured information levels
- Ability to access data in a Web-based construct
- Participants: EUCOM, NASA, DLR, UAHuntsville, VCSI and Partner Nations Operators / Analysts and Decision-makers
- Technical and Operational Demonstrations, FY10 - 11
 - Technical:
 - Performs final component integration test and demonstration
 - Reduces risk via test-fix-test approach and operator / user input
 - TD serve as “dress rehearsal” for operational demonstration (OD)
 - TD: Nov 2010, National Space Science and Technical Center (NSSTC), MSFC NASA
 - Operational:
 - Captures independent operator / user assessments and determines operational utility
 - OD: Feb 2011: EUCOM, Stuttgart Germany, (one regional node and two national nodes)
 - OUA: Mar / May 2011



Operational Demonstration Approach



- **Conduct OD with Partner Nations, Interagency and DoD Operators / Users**
 - Captures operational utility assessments (OUA) and transition recommendations:
 - OD / OUA, February, FY11
 - Interim capability:
 - **Participants:** EUCOM, NASA, DLR, UAHuntsville, VCSI and Partner Nations Operators / Analysts and Decision-makers
 - **Demonstrate:** Detect, observe, monitor, predict and visualize Water Resources, Water Pollution, Urban Development, and Forest Fires, to provide information for decision makers within a national, regional, or international cooperative framework
 - **Demonstration Configuration:** One “*Virtual*” Regional node, two or more National nodes (Stuttgart)
 - **Regions / Scenarios:**
 - Regions: Turkey / Ukraine; North Africa; Vietnam; Norway / Scandinavia (optional)
- **OD is 2 weeks long, not including installation, check-out and training**
- **Retrospective data sets will be available and employed**
- **Enables transition of operational capability with participating countries**
- **Products for training of operators / users and maintenance and sustainment provided during JCTD**



Top Level Regions & Scenarios

(1 of 3)



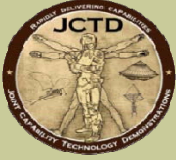
Region: Turkey / Ukraine

Scenarios	Tools / Providers	Models
Water Availability	GEOSS	SHIELDS (MSFC)
Water Pollution	DLR	DLR
Forest Fires	GSFC Fire & Smoke	GSFC Fire & Smoke Emissions
	DLR	DLR
Urban Development	SEDAC	SEDAC/CIESEN Data Base
	PSGM	Spatial Growth Model
	DLR	DLR

Potential Source Datasets
MODIS
AMSER-E
Landsat
ASTER
GRACE
MODIS / AWIFS
TRMM
GOES (NOAA)
AVHRR (NOAA)
TSX-ASAR(PLSAR)
Test: Rapid Eye
RASAT (Turkey micosat)
RADARSAT (Canada)
Commerical (Ikonos/Quickbird)

Datasets Legend:

- **Blue:** NASA or NOAA
- **Red:** Non-US in Country
- **Green:** Commercial



Top Level Regions & Scenarios

(2 of 3)



Region: North Africa

Scenarios	Tools / Providers	Models
Water Availability	MENA (GSFC)	LDAS (GSFC)
	SERVIR	SERVIR
Food Supply	ARTEMIS	ARTEMIS Real Time
	FEWSNET	FEWSNET
Migration	SEDAC	SEDAC Migration / Population
	TIDES	TIDES

Potential Source Datasets
MODIS
AMSER-E
Landsat
ASTER
GRACE
TRMM
GOES (NOAA)
AVHRR (NOAA)
MERIS (ESA)
ASAR (ESA)
RADARSAT (Canada)
Commerical (Ikonos/Quickbird)

Datasets Legend:

- Blue: NASA or NOAA
- Red: Non-US in Country
- Green: Commercial



Top Level Regions & Scenarios

(3 of 3)



Region: Vietnam

Scenarios	Tools / Providers	Models
Climate Variability	LDAS (GSFC)	LDAS (GSFC)
	Met Models (e.g., WRF)	Met Models (e.g., WRF)
Food Supply	SEDAC	SEDAC Migration / Population
	ARTEMIS	ARTEMIS Real Time
	FEWSNET	FEWSNET
Sea Level Rise	Pacific Disaster Center	Pacific Disaster Center
Urban Planning	SEDAC	SEDAC Migration / Population
	PSGM	Spatial Growth Model
	DoD Ho Chi Min Study	DoD Ho Chi Min Study
	DLR	Urban Sprawl & Impervious

Potential Source Datasets
MODIS
Landsat
ASTER
GRACE
SRTM
TRMM
GOES (NOAA)
AVHRR (NOAA)
RADARSAT (Canada)
Commerical (Ikonos/Quickbird)

Datasets Legend:

- **Blue:** NASA or NOAA
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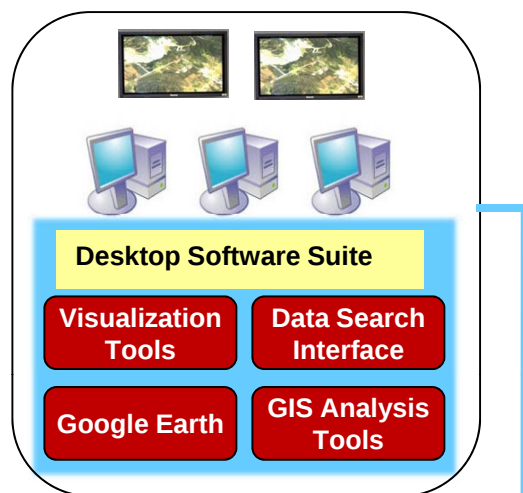
Capabilities Solution



- **Combined hardware and software system consisting of the following:**
 - Processing and Service Software
 - Web service (HTTP / HTTPS) Application
 - Relational Data base Management Software
 - Database Interface (Web Map Service)
 - Geographic Information System (GIS) application
 - Image Processing Software Applications
 - Product Generation Software
 - Google Earth Professional Edition
 - Spatial Datasets and Analysis
 - Satellite Data(e.g., Landsat, MODIS (Aster and Terra) , EO-I ALI ,QuickBird, IKONOS, FORMOSAT, RADARSAT, ENVISAT, TERRASAR-X, COSMOS SKYMED
 - Airborne Data (e.g., AirSAR, Star – 3i, Aerial Photography, LIDAR
 - Marine data (e.g., MODIS: Sea Surface Temperature; surface winds (buoy))
 - Tabular Data (e.g., stream gauge, surface temperature, surface winds, soil saturation, weather radar, seismic , buoy data etc.)
 - Framework Data (e.g. topographic, political, geologic, transportation, land cover, etc.)
 - Geophysical and human dimension model results (e.g., WRF)
 - Network and Security Services Infrastructure (scalable, equitable, interoperable, tailorable)
 - Unclassified, commercially secured Internet / Intranet connectivity
 - Continuous 24/7 information access
 - Hardware (dedicated web, database, data archive servers, displays) & workstations
 - CONOPS and TTP

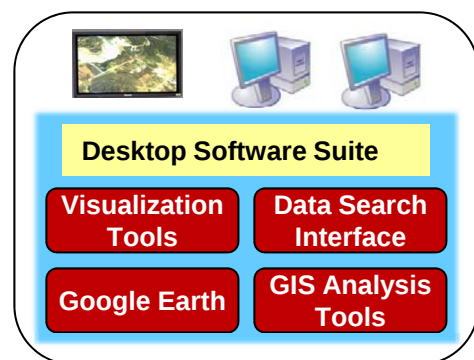


System View-1 (SV-1)

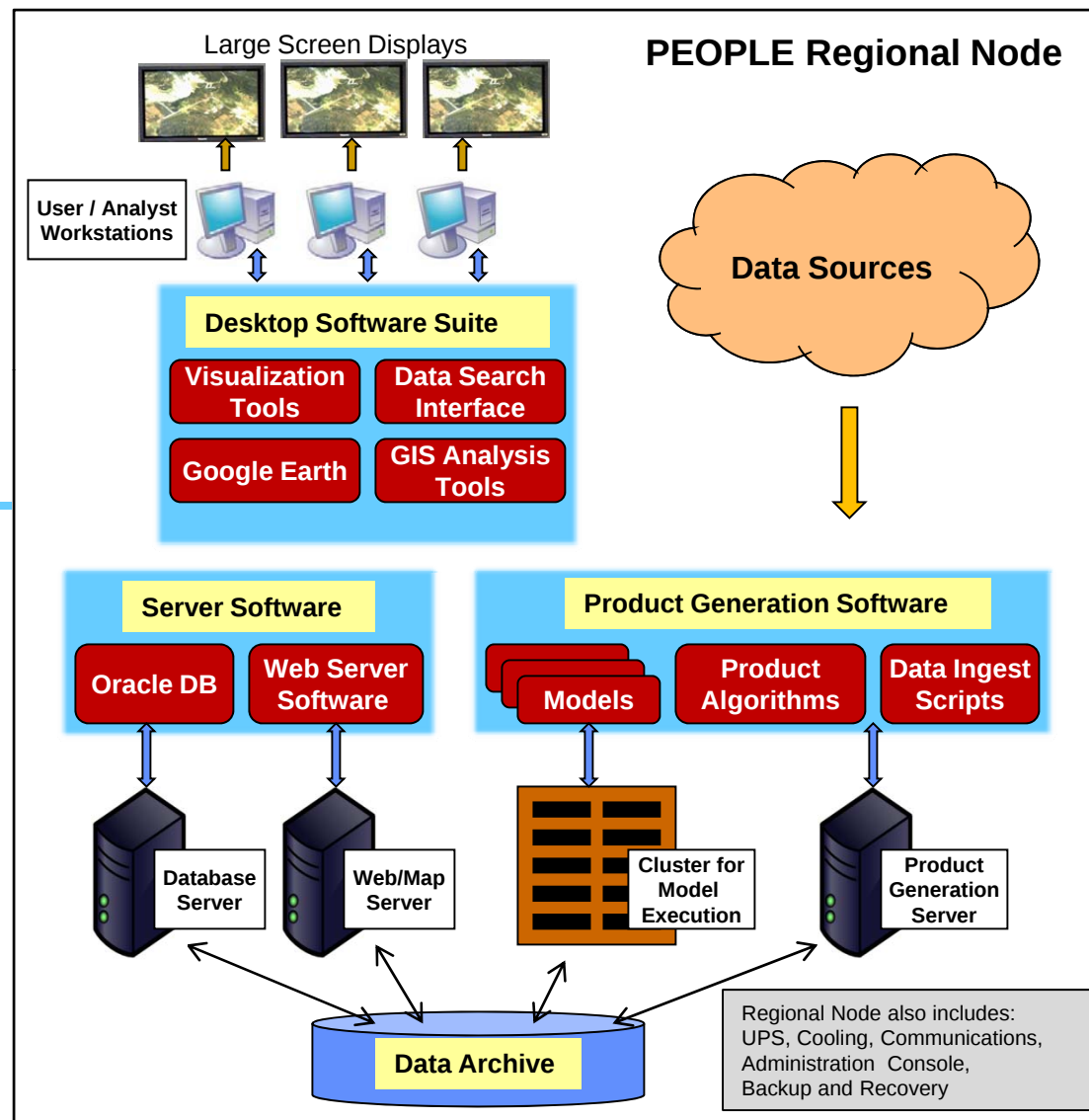


Virtual Regional Node

Nodes connected via Internet



National Node





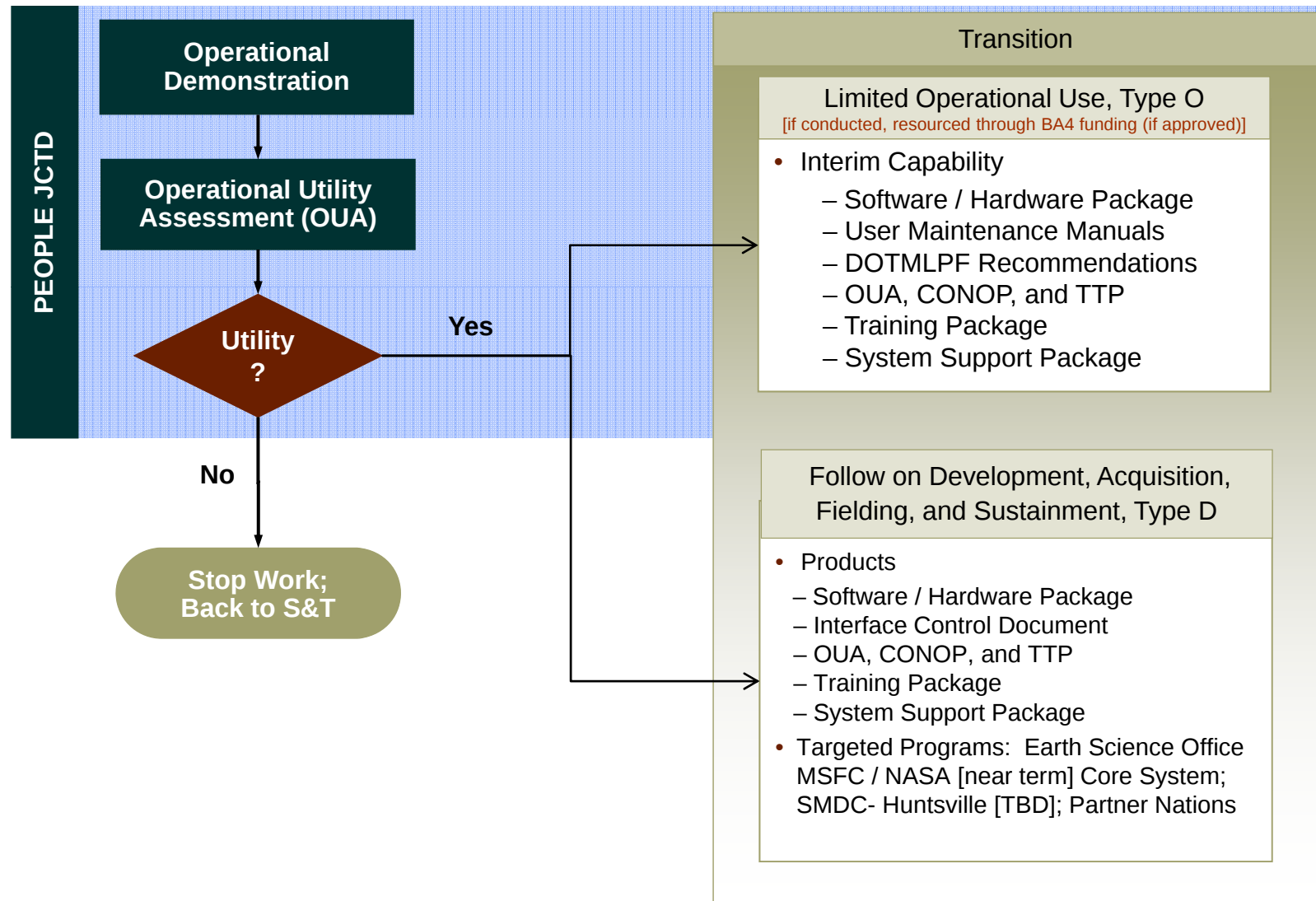
Core Technologies



Technology	Pre-JCTD	FY11
Architecture and Software		
Web-Server / Portal Implementation Tools	9	9
SOA for one-way (Unclassified to Classified SIPRNet) data-sharing with DoD C2 systems [note: push only]	6	8
Database Management Tools (e.g., Oracle GIS)	9	9
Visualization and Analysis tools (e.g., Google Earth Pro, ERDAS Imagine)	9	9
Data Product Generation and Models (e.g., Forecast Models)	8	9
Communications and Networking		
IP, Web-Based, Commercially Secure Network	9	9



Overall Transition Strategy





Limited Operational Use, Type O

If conducted, resourced through BA4 funding (if approved)



- **Conduct Limited Operational Use with operational components at demonstration sites in FY11**
 - Pending OUA starts in 3Q FY11
 - 6 months maximum
- **Includes hardware, software, and documentation (see Products / Deliverables)**
- **Finalizes CONOPS, TTP, training package, and DOTMLPF recommendations**
- **Qualitative feedback iterated with:**
 - EUCOM, Partner Nations, Partner Organizations, Earth Sciences Office (ESO), MSFC
- **NASA TM provides technical support**
- **Requires positive OUA**
- **Requires Partner Nations and Partner Organizations commitment for post-demonstration time frame**
- **Does not enhance capability or continue assessments**



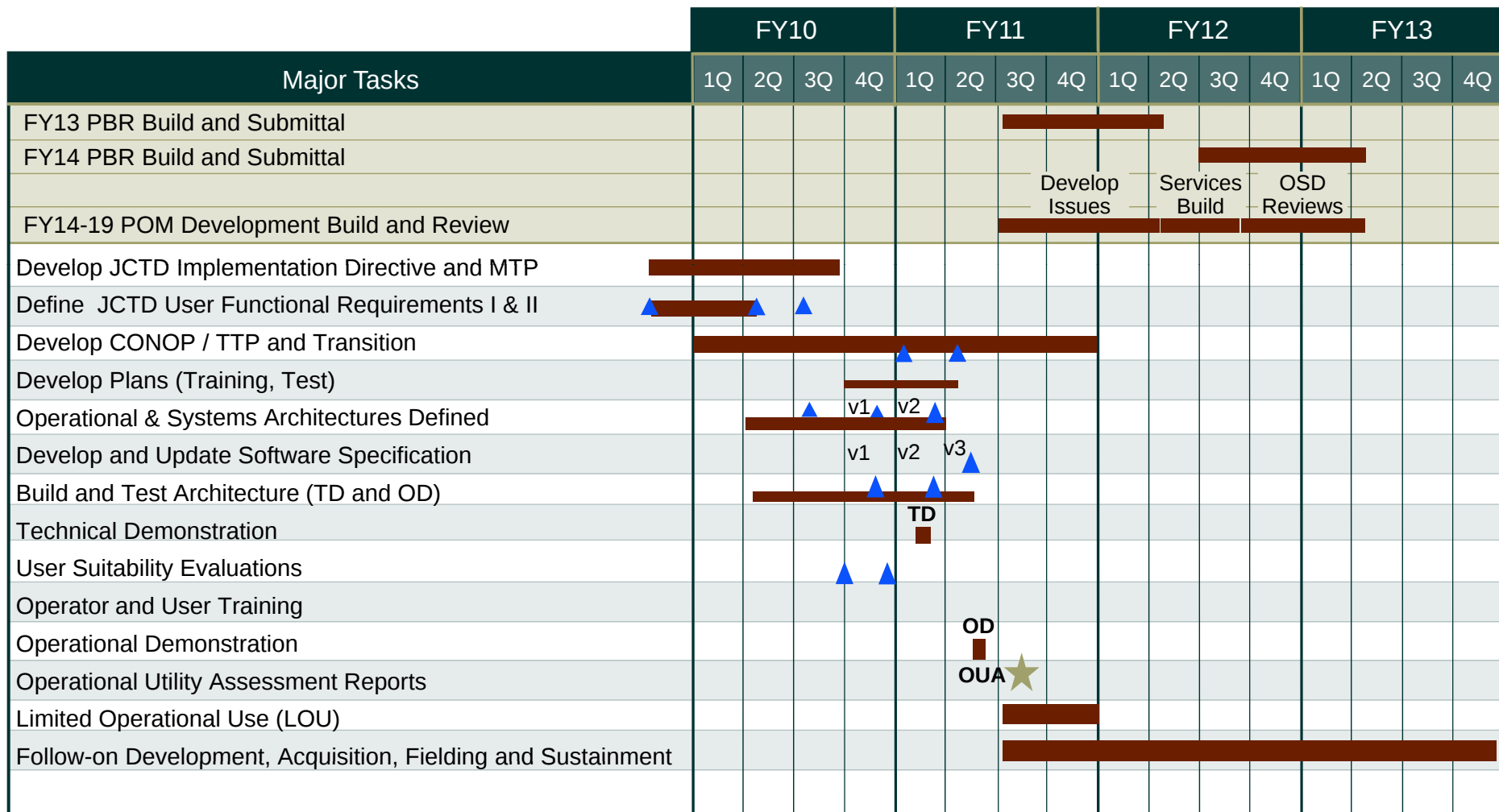
Follow-on Development / Production / Fielding / Sustainment, Type D



- **Products and deliverables transitioned to ESO program, and Partner Nations pending successful OUA, FY11 and resource sponsor commitment:**
 - Targeted Programs: Partner Nations; Partner Organizations: Earth Science Office, MSFC / NASA ; SMDC-HSV
- **Limited follow-on development [6mos] required if PEOPLE JCTD configuration replicated**
 - Obtain and reestablish the data feeds
 - Obtain alternative data feed if the original is not available
 - Update framework data for new area
 - Update data products for new area
 - Develop and establish as applicable community of interest of Partner Nations
- **Follow-on development [18mos] of custom product generation required to support additional specific user needs**
 - Determine institutional eligibility
 - Define user requirements
 - Determine feasibility of system to meet user requirements
 - Develop and establish as applicable community of interest of Partner Nations
 - Develop specific system tools, data, models as applicable
- **Deployment and fielding starts FY13**
- **Equipment should be COTS / GOTS to the greatest extent possible**

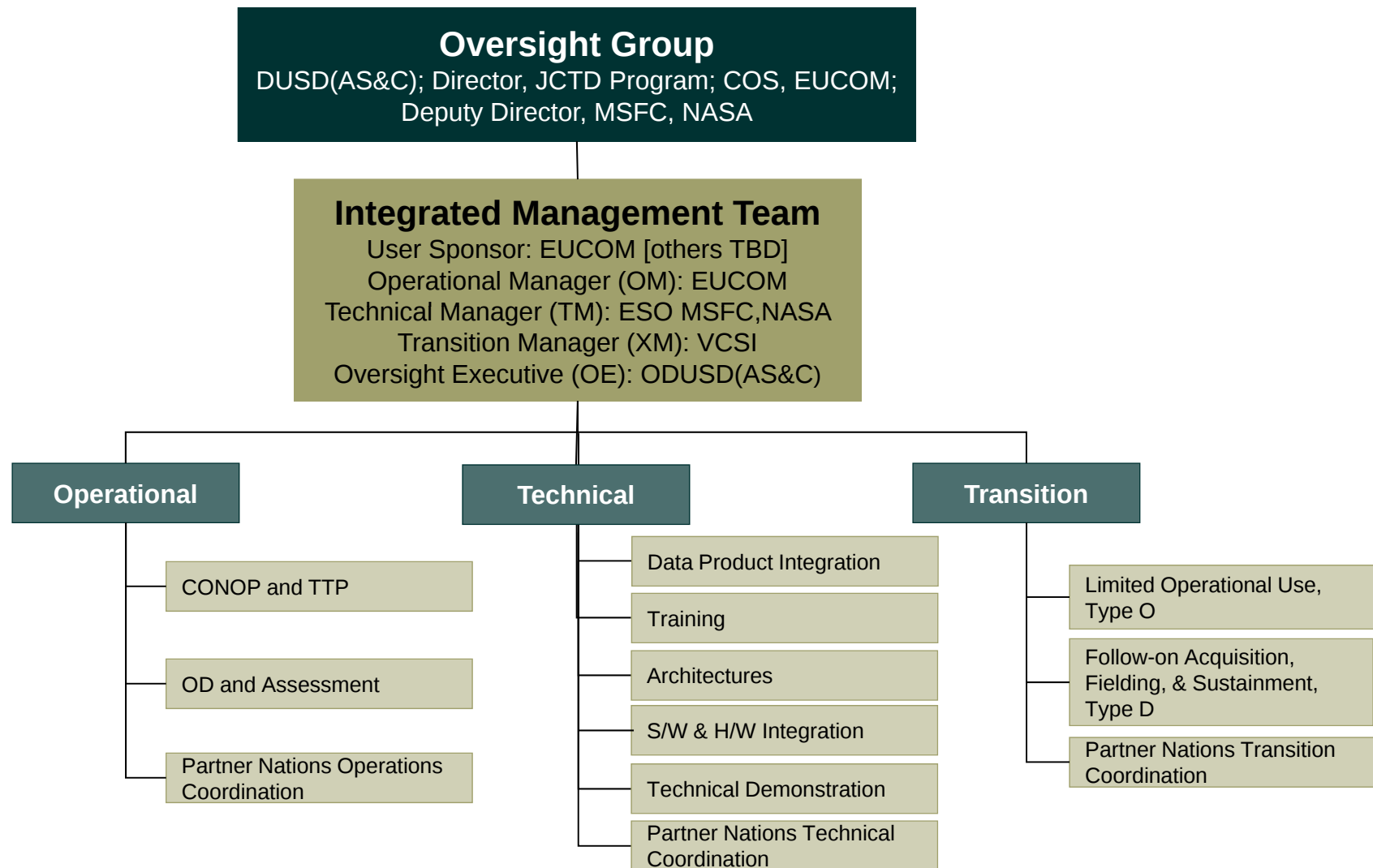


Schedule





Organizational Structure, Roles, and Responsibilities



Supporting narrative descriptions for each management area provided in Proposal Paper



Cost Plan



2009 Candidate Review Board PEOPLE JCTD Functional Cost Estimation (\$ Thousands)				
Task / Item	FY10	FY11		TOTAL
Operational				
Operational Utility Assessments (OUA) & Interim and OUA Reports	\$250	\$250		\$500
Functional Requirements, Operational Demonstration and CONOP / TTP	\$400	\$380		\$780
Travel	\$40	\$80		\$120
Operational Total Estimate	\$690	\$710		\$1,400
Technical				
Datasets Integration and Test	\$689	\$411		\$1,100
Models Integration and Test	\$1,280	\$20		\$1,300
Hardware and Software Procurement	\$1,230	\$131		\$1,361
System and Operational Architectures	\$400	\$170		\$570
Hardware and Software System Integration & Test	\$810	\$230		\$1,040
Licenses	\$25	\$0		\$25
Training	\$0	\$20		\$20
Training Package	\$15	\$5		\$20
Technical Demonstration	\$0	\$96		\$96
Travel	\$60	\$40		\$100
Technical Total Estimate	\$4,509	\$1,123		\$5,632
Transition				
Transition Planning	\$175	\$150		\$325
Travel	\$15	\$15		\$30
Transition Total Estimate	\$190	\$165		\$355
TOTAL	\$5,389	\$1,998		\$7,387
<i>FY 11 Limited Operational Use (LOU) of Interim Capability Sustainment (BA4 transition funding [if approved])</i>			\$110	

NOTE: Potential BA4 Limited Operational Use funding [\$110K] not included in Total JCTD Costs, FY10-11



Funding (Proposed)



Oversight Executive								02-Jun-09	
LTC Dave Lee									
Funding Risk:	Green								
						Yellow \$\$ Cells are Formula Driven			
PEOPLE JCTD						\$ in thousands			
Organization	(Note 1) Commitment	Type of Funding	² Funding Description	³ Program Element (PE)	Project #	FY-10	FY-11	Total	
N/A			Cash		N/A			\$ -	
		Total Service & Defense Agency (committed)				\$ -	\$ -	\$ -	
DUSD (AS&C)	Committed	RDT&E/6.3	Cash	0603648D8Z	648	\$ 3,739	\$ 1,548	\$ 5,287	
			Total Cash Committed Funding:			\$ 3,739	\$ 1,548	\$ 5,287	
			Stated JCTD Cash Requirement			\$ 3,739	\$ 1,548	\$ 5,287	
			Delta to Cash Requirement			\$ -	\$ -	\$ -	
Service/Agency Committed:		\$ -							
Percent Cash Committed		0%				AS&C Percent Total: Cash Only			100%
Funding Risk (Cash):		Green				AS&C Percent Cash:			100%
Dink Section									
Organization	(Note 1) Commitment	Type of Funding	² Funding Description	³ Program Element (PE)	Project #	FY-10	FY-11	Total	
ESO,MSFC, NASA	Committed	R&D	Dink		N/A	\$ 150	\$ 150	\$ 300	
EUCOM	Committed	O&M	Dink		N/A	\$ 300	\$ 300	\$ 600	
SERVIR	Committed	R&D	Dink		N/A	\$ 500		\$ 500	
PDC	Committed	R&D	Dink		N/A	\$ 300		\$ 300	
DLR	Committed	R&D	Dink		N/A	\$ 200		\$ 200	
GSFC, NASA	Committed	R&D	Dink		N/A	\$ 200		\$ 200	
			Total Cash & Dink Committed Funding:			\$ 5,389	\$ 1,998	\$ 7,387	
			Stated JCTD Cash & Dink Req			\$ 5,389	\$ 1,998	\$ 7,387	
			Delta to Cash & Dink Requirement			\$ -	\$ -	\$ -	
FY-11 Interim Capability Thru Limited Operational Use [if conducted, resourced through BA4 funding (if approved)] \$110K									



JCTD Risk Management and Mitigation Approach



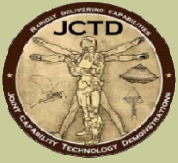
Risk Factors (JCTD)		Risk Assessment	Mitigation Strategy	Expected Result
Operational	▪ Operational users availability	Low	▪ Use of EUCOM personnel— Nations are participants/observers	▪ Users trained and available for OD
	▪ Facilities availability	Low	▪ Use of EUCOM provided facilities	▪ Facilities available for OD
Technical	▪ Loss of critical on-orbit asset	Low	▪ None Required	▪ All on-orbit assets available for TD & OD
	▪ Integration of DoD datasets	Low	▪ Initial focus on use of DoD commercially available data	▪ Targeted datasets integrated and functioning for TD and OD
Cost	▪ Data integration or modeling efforts	Medium	▪ Perform trade-off analysis for selection of data sets and modeling tools ▪ De-scope to simply solutions if required	▪ Technical and Operational Demonstrations successfully accomplished
Funding	▪ DUSD(AS&C) Direct Cash ID Commitment	Medium	▪ Co-develop and coordinate Implementation Directive (ID) with ODUSD(AS&C) Oversight Executive	▪ Direct Cash funding fully committed to JCTD
Schedule	▪ Coordination of technical and operational tasks	Medium	▪ Develop and maintain detailed WBS ▪ Focus on use of available technology	▪ OD conducted as planned
Transition	▪ No PORs or resources committed to transition capability	High	▪ Develop detailed Transition Plan and Technology / Capability Transition Agreements and obtain PM-level resource commitment	▪ Transition is funded and immediately implemented following OD pending satisfactory OUA



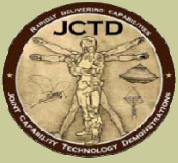
Summary and Payoffs

- True Multi-Agency, Multi-National, Building Partnership Capacity effort
- Builds national capacity and regional partnering, enhancing global security
- Provides low cost, mature planning and decision support system for Partner Nations and COCOMs
 - Environmental and ecological disasters
 - Land & water assets management
 - Human migration and the associated risks – disease, hunger, threat of terror
 - Enables the capability to predict regional needs in time to plan
- Integration of DoD, NASA, International & commercial data sets enable partnering
- Easy to install and use, and can be rapidly deployed
- Transition plan supports the promulgation of new nodes to other regions and addition of new products depending on regional requirements

JCTD – Directly Contributes to Building Partnership Capacity
*Increases Situational Awareness for Natural Disasters and Emergencies,
Saves Lives, Protects Property, Maintains Regional Stability*



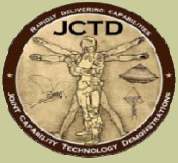
Back-up Charts



Top Level Capabilities & Metrics



Desired Capability	Task or Attribute	Measure	Metric	Baseline FY 2009	Targeted Threshold Value FY 11	Objective Value
A monitoring, analysis, and visualization decision support system for environmental, resource management, and humanitarian challenges, forecasting and management	Capitalizes on existing space, air, and ground-based decision support architecture	Existing assets exploited	Number of relevant assets	1 (NASA SERVIR)	2 (PEOPLE)	2
	Integrates & interoperates w/ existing & developing satellite imagery, in-situ, and disparate data sources	Data integration and interoperability	Number of Sources of data integrated	2 (Civil U.S. Gov't and Commercial)	5 (Baseline + DLR, In Region Country, and DoD)	7 (Additional countries)
	Timely and actionable decision support tools	User rating of the system to enhance decision making	1-5 rating scale (1 = Unsatisfactory 5 = Exceptional)	2	4	5



Top Level Capabilities & Metrics



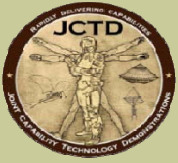
Desired Capability	Task or Attribute	Measure	Metric	Baseline FY 2009	Targeted Threshold Value FY 11	Objective Value
Partner Nations and research organizations (e.g. Group on Earth Observation System of Systems) engaged in collaborative data sharing and product/model development	Integration of data in standardized formats provided by partner nations and participating organizations.	Integration of disparate data into PEOPLE platform	Number of data sources	2 (Civil U.S. Gov't and Commercial)	5 (Baseline + DLR, In Region Country, and DoD)	7 (Additional countries)
	Management tools for decision making	User rating of the system to enhance decision making	1-5 rating scale (1 = Unsatisfactory 5 = Exceptional)	2	3	4



Top Level Capabilities & Metrics



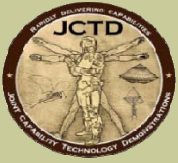
Desired Capability	Task or Attribute	Measure	Metric	Baseline FY 2009	Targeted Threshold Value FY11	Objective Value
Cross-border, interdependent, regional, and national solution	Capable of delivering land, sea and atmospheric products/tools (e.g., Water Resources Water Pollution Urban Development Forest Fires, etc.)	Products/tools Delivered	Number of products/tools delivered	2	4	20
	Displays and overlays multiple geospatial data information products (e.g., fires, weather prediction, climate change, land cover mapping, flooding data)	Demonstrated products displayed and overlaid	Number of	1	2	5
	Helps define patterns of normal /abnormal human behavior and environmental conditions	User rating of the system capability to detect, observe, monitor, and understand human behavior within the selected regions	1-5 rating scale (1 = Unsatisfactory 5 = Exceptional)	1	3	4
	Generates and sends automated alerts based on user-defined criteria	User rating of the system capability to generate and send alerts	1-5 rating scale (1 = Unsatisfactory 5 = Exceptional)	1	2	3



Top Level Capabilities & Metrics



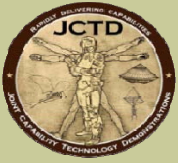
Desired Capability	Task or Attribute	Measure	Metric	Baseline FY 2009	Targeted Threshold Value FY11	Objective Value
Scalable, adaptable, and sustainable core system	Operational in austere or mature environments	User rating of the ability of the system to maintain operation in representative conditions	1-5 rating scale (1 = Unsatisfactory 5 = Exceptional)	1	3	4
	Tailorable to regional and national areas of coverage and needs	User rating of the system ability to tailor the system to meet regional and national needs	1-5 rating scale (1 = Unsatisfactory 5 = Exceptional)	1	3	4
	Cost effective, owned, and operated by the in-country users	User rating of the system cost AND ownership /operations of the system	1-5 rating scale (1 = Unsatisfactory 5 = Exceptional)	1	3	4



Top Level Capabilities & Metrics



Desired Capability	Task or Attribute	Measure	Metric	Baseline FY 2009	Targeted Threshold Value FY 11	Objective Value
CONOPS and TTP	Compatible with and supports broader Building Partnership Capacity (BPC) strategies	User rating of ability of system to support identification of aid requirements	1-5 rating scale (1 = Unsatisfactory 5 = Exceptional)	1	2	4
		User rating of ability of system to establish partnership agreements	1-5 rating scale (1 = Unsatisfactory 5 = Exceptional)	1	3	4
		User rating of ability of system to support enhancement of partner capabilities and capacities	1-5 rating scale (1 = Unsatisfactory 5 = Exceptional)	1	3	4



Solution Trade-off Analysis (STA)

Key Assumptions and Guidelines



- **Competitive alternatives must :**
 - Provide the Desired Capabilities and Task / Attributes through a fully integrated suite of decision support tools
 - Be operationally available to any COCOM and associated nations, regions
 - Have core technologies at TRL 5 or better
 - Be able to easily integrate existing and developing data sources, models and products based on user needs
 - Be a proven system with demonstrated performance and outcomes
 - Be highly compatible with Building Partner Capacity (BPC) strategies
 - Be third party sustainable
 - Be capable of distributed regional and/or country processing and data distribution nodes
 - Be able to operate in unclassified environment with partner nations
 - Be able to integrate ITAR compliant commercial off the shelf technology



STA Alternatives Identification & Comparison

Desired Capability: A monitoring, analysis, and visualization decision support system for environmental, resource management, and humanitarian challenges, forecasting and management

(1 of 2)



Desired Capability: A monitoring, analysis, and visualization decision support system for environmental, resource management, and humanitarian challenges, forecasting and management

Task Attributes	Capitalizes on existing space, air, and ground-based decision support architecture	Integrates & interoperates w/ existing & developing satellite imagery, in-situ, and disparate data sources	Timely and actionable decision support tools
PEOPLE JCTD Candidate	Should be highly efficient in collecting, storing, and disseminating satellite and <i>in situ</i> spatial and temporal data sources, including NASA, DoD, commercial and EU.	Needs to be highly flexible in interoperability with existing/future satellite data and other data sets.	Priority for disseminating real time data and model output for decision support making by stakeholders.
Status Quo	Depends on what kind of data you want versus what is available. Have to be linked to large number of data systems to retrieve appropriate satellite data.	Yes, but cumbersome. Have to search many databases to retrieve specific spatial and <i>in situ</i> data for specific locations.	Yes, but again cumbersome. Real time data for specific objectives may be available or is lacking.
FEWSNET (USAID)	Primarily established for food security (famine early warning system). Primarily NOAA AVHRR data.	No. Maps and satellite data are not integrated.	Monthly market prices and most recent annual production rates.
ICPAC (IGAD Climate & Prediction Centre)	Building a database for acquiring and ingesting remote sensing and GIS formatted data.	Appears that satellite and GIS databases are in development stage.	Aimed at climate prediction and applications for climate risk management, environmental management, and sustainable development, but non-real time at present.
UNEDRA (University Network for Disaster Risk Reduction in Africa – ITC Netherlands)	No. Focus is on education and training for disaster risk/management.	No.	No. Only workshops, training and research.
GDEST (Global Dialogues on Emerging Science & Technology)	No. Focus is on science & engineering conferences related to new/emerging science & technology.	No. Workshop held in 2005 in Japan to discuss future Japan/U.S. sensors and sensing systems.	No.
GEOSS (Global Earth Observation System of Systems)	Yes. Links existing and planned observing systems.	Yes. Fairly comprehensive integration of <i>in situ</i> and satellite observations.	Yes. Goal is to improve this capability in the future as the system continues to develop.

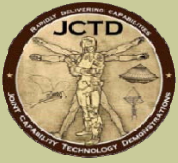


STA Alternatives Identification & Comparison

Desired Capability: A monitoring, analysis, and visualization decision support system for environmental, resource management, and humanitarian challenges, forecasting and management
(2 of 2)



Desired Capability: A monitoring, analysis, and visualization decision support system for environmental, resource management, and humanitarian challenges, forecasting and management			
Task Attributes	Capitalizes on existing space, air, and ground-based decision support architecture	Integrates & interoperates w/ existing & developing satellite imagery, in-situ, and disparate data sources	Timely and actionable decision support tools
National Space Agency of the Ukraine	System under development. Use of various NASA and European Earth satellite assets is proposed for Ukraine.	Indeterminate.	Appears they want to have relatively near-real time data available for use in flooding situations.
Dartmouth Flood Observatory	Yes, but focus is on observing and modeling floods and flood risks globally.	Yes. Integrates satellite data with surface water records and inundation maps and flood detection tools.	Site specific, but data are timely.
CIESEN/SEDAC (Center for Earth Science Information Network/Social and Economic Data Analysis Center)	Yes. Focus is on spatial data integration related to the social, natural, and information sciences.	Yes. Large collection of satellite and <i>in situ</i> data related to social, natural, and information sciences.	Not necessarily real-time but definitely provides decision support tools.
ARTEMIS (Africa Real Time Environmental Monitoring System)	Yes. Extensive library of satellite images for Africa	Yes. Portals contain both satellite and ancillary data.	Yes. Data are supplied for real time decision making.
GDACS (Global Disaster Alert and Coordination System)	Not necessarily. Has portal links to satellite databases globally, but does not directly contain satellite data.	Portal links to individual databases.	Subscribers can be alerted to natural disasters globally in real time.
GRDEMS (Global, Real-time Disaster & Environmental Monitoring System)	System under development with goal to provide real time remote sensing capability. (Part of Full Spectrum Imaging Project)	Basically a geospatial search engine.	Goal is to provide real time satellite, <i>in situ</i> , and ancillary data for environmental & disaster management decision making.
Google Earth	Yes – and No. Integrates commercial and NASA data	Satellite and other data for visualization.	No.



STA Alternatives Identification & Comparison

Desired Capability: Partner Nations and research organizations (e.g. Group on Earth Observation System of Systems) engaged in collaborative data sharing and product/model development

(1 of 2)



Desired Capability: Partner Nations and research organizations (e.g. Group on Earth Observation System of Systems) engaged in collaborative data sharing and product/model development

Task Attributes	Integration of data in standardized formats provided by partner nations and participating organizations.	Management tools for decision making
PEOPLE JCTD Candidate	An absolute requisite. Capability to ingest standardized satellite and <i>in situ</i> data with different taxonomies.	Output from satellite and <i>in situ</i> data and models in formats that can be easily used by decision makers.
Status Quo	Can be done on a very limited basis.	Output products can be applied to limited applications for decision making.
FEWSNET (USAID)	No. Limited capabilities for food security.	Some capabilities for decision making regarding food shortages and food security.
ICPAC (IGAD Climate & Prediction Centre)	No. System is in development.	Climate prediction output products for decision making in the Horn of Africa are its goal.
UNEDRA (University Network for Disaster Risk Reduction in Africa – ITC Netherlands)	No. Focus is on education and training.	Education and training only.
GDEST (Global Dialogues on Emerging Science & Technology)	No. Focus is on science & engineering conferences.	None.
GEOSS (Global Earth Observation System of Systems)	Yes. Integration of <i>in situ</i> and satellite data and products via various portals.	Not directly, but provides access to satellite and <i>in situ</i> data sets within portals.



STA Alternatives Identification & Comparison

Desired Capability: Partner Nations and research organizations (e.g. Group on Earth Observation System of Systems) engaged in collaborative data sharing and product/model development

(2 of 2)



Desired Capability: Partner Nations and research organizations (e.g. Group on Earth Observation System of Systems) engaged in collaborative data sharing and product/model development

Task Attributes	Integration of data in standardized formats provided by partner nations and participating organizations.	Management tools for decision making
National Space Agency of the Ukraine	No.	Potential for near real time flood/drought forecasting.
Dartmouth Flood Observatory	For flood & drought data only	Yes for flooding and droughts. Already integrated within SERVIR
CIESEN/SEDAC (Center for Earth Science Information Network/Social and Economic Data Analysis Center)	Yes for environmental health, environmental sustainability, hazard vulnerability assessment, population/land use, poverty and food security.	Yes via various output products from satellite and <i>in situ</i> data.
ARTEMIS (Africa Real Time Environmental Monitoring System)	Yes via portals for human and natural resource data for Africa.	Routine satellite products over 10 day, and monthly periods.
GDACS (Global Disaster Alert and Coordination System)	Links to satellite data sets via portals but these data may not be standardized.	Yes, as related to global disasters only.
GRDEMS (Global, Real-time Disaster & Environmental Monitoring System)	System under development.	System not operational at this time, but goal is to provide management tools for disaster and environmental monitoring.
Google Earth	Yes, but for visualization only.	Great for visualization of global land conditions but not real time.



STA Alternatives Identification & Comparison

Desired Capability: Cross-border, interdependent, national and regional solution

(1 of 2)



Desired Capability: Cross-border, interdependent, regional and national solution				
Task Attributes	Capable of delivering land, sea and atmospheric products/tools (e.g., Water Resources, Water Pollution, Urban Development, Forest Fires, etc.)	Displays and overlays multiple geospatial data information products (e.g. fires, weather prediction, climate change, land cover mapping, flooding data)	Helps define patterns of normal and abnormal human behavior and environmental conditions	Generates and sends automated alerts based on and user-defined criteria
PEOPLE JCTD	Needs to be readily accessible by users to deliver products and model output for human, socioeconomic & environmental analysis and assessment.	Integrated data sets are a requisite. Needs to have geospatial data resident in multiple overlays to enhance data accessibility.	Needs to provide spatial/temporal data that can either directly or indirectly provide information on human condition, environmental states and impacts.	Users must have accessibility to the database to obtain alerts for environmental/human conditions along with alert status/bulletins in real time.
Status Quo	The data are out there, but it can be user-intensive to "mix and match" needed data sets.	Yes, but again it can be cumbersome and time consuming to search many databases to obtain the needed data.	Only limited to a number of databases primarily Africa, Near East, and Central America.	Only for limited circumstances (i.e., natural disasters).
FEWSNET (USAID)	Good for famine detection. Also has livelihood products but they are market based .	No. Satellite data and maps are in separate files. Does have a weather hazards data base but quite crude.	Livelihood products give breakdown for different wealth groups highlighting market opportunities and constraints.	Does not appear to do so.
ICPAC (IGAD Climate & Prediction Centre)	Objective is to provide data on climate variability and climate risk mapping, but products are not defined at present.	Development objectives are primarily in areas of climate change and climate risk impacts for environmental assessment and sustainability.	Development objective is to do this on a broad scale but not currently operational.	Products are 10 day, monthly, and seasonal climate/weather bulletins; climate watch/El Nino updates; annual climate summaries.
UNEDRA (University Network for Disaster Risk Reduction in Africa – ITC Netherlands)	Focus is to forge interaction amongst universities in Africa with interest in teaching on disaster risk reduction, through information sharing, capacity building and collaborative research .	No	No	Only through workshops and disaster management training courses.
GDEST (Global Dialogues on Emerging Science & Technology)	No.	No.	No.	No.
GEOSS (Global Earth Observation System of Systems)	Yes. GEO portal provides data on a host of areas (e.g., agriculture, disasters, water, weather).	Yes, via various portals.	Not directly. Data portals provide inferential information related to human behavior.	Not directly, but provides abundant data from satellite and ancillary sources.



STA Alternatives Identification & Comparison

Desired Capability: Cross-border, interdependent, national and regional solution

(2 of 2)



Desired Capability: Cross-border, interdependent, regional and national solution				
Task Attributes	Capable of delivering land, sea and atmospheric products/tools (e.g., Water Resources, Water Pollution, Urban Development, Forest Fires, etc.)	Displays and overlays multiple geospatial data information products (e.g. fires, weather prediction, climate change, land cover mapping, flooding data)	Helps define patterns of normal and abnormal human behavior and environmental conditions	Generates and sends automated alerts based on and user-defined criteria
National Space Agency of the Ukraine	Developing data products related to flooding in the Ukraine.	System under development. Sensor observation and catalog services are proposed.	No	Alert services are proposed.
Dartmouth Flood Observatory	Flood focused only.	Yes. Models and flood detection tools have integrated data sets.	No.	Yes. Provides information on active areas of flooding and flood risk as well as droughts.
CIESEN/SEDAC (Center for Earth Science Information Network/Social and Economic Data Analysis Center)	Yes, via SEDAC, and the World Data Center for Human Interactions in the Environment.	Yes, but primarily focused on environmental health, environmental sustainability, hazard vulnerability assessment, population/land use, poverty/food security.	Yes as noted in previous block. Rich data set related to socioeconomic /population resources.	Not necessarily real-time, but an abundance of data for decision making.
ARTEMIS (Africa Real Time Environmental Monitoring System)	Yes. Various portals available for human and natural resource data in Africa and other parts of the world.	Yes. Portals contain spatial data that exist as multiple overlays or from which multiple overlays can be developed.	Potentially can be inferred from portal data. Very coarse scale data for the most part.	Provides routine satellite-derived products, but over 10-day, monthly periods.
GDACS (Global Disaster Alert and Coordination System)	Focused on natural disasters (earthquakes, cyclones, floods, tsunamis , volcanoes).	Access to individual databases but does not appear to have multiple overlays.	No. Just natural disasters.	Yes. Subscribers can be alerted to natural disasters.
GRDEMS (Global, Real-time Disaster & Environmental Monitoring System)	Has links to other environmental & disaster management web sites.	Full Spectrum Imaging is end-to-end system for doing remote sensing. Link with GRDEMS goal is to provide integration with satellite and non-satellite data.	Not at this time.	Products, in the form of images, tables, charts, graphs, etc.
Google Earth	No.	Can be used as tool for integrating data sources, but not directly usable for fires, etc.	No.	No.



STA Alternatives Identification & Comparison

Desired Capability: Scalable, Adaptable, and Sustainable core System

(1 of 2)



Desired Capability: Scalable, Adaptable, and Sustainable core System			
Task Attributes	Operational in austere or mature environments	Reconfigurable national and regional areas of coverage and needs	Cost effective, owned, and operated by the in-country users
PEOPLE JCTD	Adaptable for operation in austere of mature environment.	Regional focus for specific areas around the world (continents, regions, countries) is a requisite.	Should be accessed at no cost to increase usage and operation by host of nations around the world. International data input is required for complete functionality.
Status Quo	Only for natural disasters. Have to search multiple databases for real time information.	Possible, but most likely a cumbersome and time consuming process.	For the most part yes, but restricted to specific areas around the globe.
FEWSNET (USAID)	No	No	USAID funded. Collaboration with partners countries in Africa, Central America, Caribbean, and Central Asia.
ICPAC (IGAD Climate & Prediction Centre)	No	No	Operated by Heads of State and Governments of the Intergovernmental Authority on Development (IGAD) with focus on the Horn of Africa.
UNEDRA (University Network for Disaster Risk Reduction in Africa – ITC Netherlands)	No	No	Run and operated by cooperating universities in Africa.
GDEST (Global Dialogues on Emerging Science & Technology)	No.	No.	Collaboration with China, India, Japan, and EU countries, but no system is operational.
GEOSS (Global Earth Observation System of Systems)	Yes, but primarily meteorological data and products.	Yes, particularly as the system evolves.	Yes. Data are free to registered users.



STA Alternatives Identification & Comparison

Desired Capability: Scalable, Adaptable, and Sustainable core System

(2 of 2)



Desired Capability: Scalable, Adaptable, and Sustainable core System			
Task Attributes	Operational in austere or mature environments	Reconfigurable national and regional areas of coverage and needs	Cost effective, owned, and operated by the in-country users
National Space Agency of the Ukraine	Indeterminate.	Focused on the Ukraine.	Indeterminate.
Dartmouth Flood Observatory	Yes, in response to flooding and drought.	Global coverage focused on flooding or flood-prone areas of the world.	Yes. Integrated with SERVIR.
CIESEN/SEDAC (Center for Earth Science Information Network/Social and Economic Data Analysis Center)	No, but close observation of events affecting populations around the world.	Yes – CIESEN/SEDAC does have reconfigurable data and is working to have more data sets usable for a variety of spatial data needs.	Yes. NASA-funded with global focus.
ARTEMIS (Africa Real Time Environmental Monitoring System)	No. 10-Day and monthly cycles.	Primarily focused on Africa and the Near East.	Data are free. Collaboration with nations in Africa and the Near East.
GDACS (Global Disaster Alert and Coordination System)	Yes. Alerts provided on real time basis.	Yes. Natural disasters only.	Yes. Data are free.
GRDEMS (Global, Real-time Disaster & Environmental Monitoring System)	Undefined at this time. System under development.	Undefined at this time. System under development.	The primary goal of the System is to make geo-located information available to anybody who needs it, in a format that is easy to use, as quickly as possible.
Google Earth	No.	Zoom in/Zoom out capabilities for observing land surface/land use at various scales.	No Cost.



STA Alternatives Identification & Comparison

Desired Capability: CONOPS and TTP
(1 of 2)



Desired Capability: CONOPS and TTP	
Task Attributes	Compatible with and supports broader Building Partnership Capacity (BPC) Strategies
PEOPLE JCTD	Needs to be compatible with multiple needs and requirements of countries as focused on multiple problem analysis (e.g., a disaster in one country on a continent does not necessarily reflect itself as the same disaster in another country nearby). Use of multiple satellite assets (e.g., NASA, DoD) is a requisite.
Status Quo	Yes, but integration with broader partnership strategies is in some cases a “hit or miss” proposition depending on what part of the world you are focusing on.
FEWSNET (USAID)	Data are course in scale but can possibly be integrated into other strategies.
ICPAC (IGAD Climate & Prediction Centre)	Focus is on Horn of Africa nations but has links to other organizations such as WMO, United Nations Development Programme, and International Research Institute for Science and Society.
UNEDRA (University Network for Disaster Risk Reduction in Africa – ITC Netherlands)	No apparent spatial data sets to share. Primary focus is on education and research and outreach via training courses and workshops.
GDEST (Global Dialogues on Emerging Science & Technology)	No system operational or data sets to share.
GEOSS (Global Earth Observation System of Systems)	Yes. Data portals provide satellite data in particular, that can be used and integrated across broad partnership strategies.

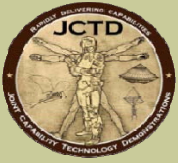


STA Alternatives Identification & Comparison

Desired Capability: CONOPS and TTP
(2 of 2)



Desired Capability: CONOPS and TTP	
Task Attributes	Compatible with and supports broader Building Partnership Capacity (BPC) Strategies
National Space Agency of the Ukraine	Ukraine-centric. They are developing ties with the EU.
Dartmouth Flood Observatory	Yes. As noted, integrated with SERVIR. Actively involved with flood- or drought-prone regions/countries around the world.
CIESEN/SEDAC (Center for Earth Science Information Network/Social and Economic Data Analysis Center)	Yes. Direct and indirect collaboration with many countries around the world.
ARTEMIS (Africa Real Time Environmental Monitoring System)	Yes, but data are at coarse spatial scales.
GDACS (Global Disaster Alert and Coordination System)	Yes, as related to natural disasters globally.
GRDEMS (Global, Real-time Disaster & Environmental Monitoring System)	Goal is to provide real time data globally similar to GEOSS.
Google Earth	Becoming the de facto "standard" baseline for visualization. of satellite data.



Solution Trade-off Analysis

Conclusions and Recommendations



Conclusions and Observations

- Over 20 capability solutions were assessed in proposing the JCTD. No single system currently contained the core capabilities in a timely manner to bring together the disparate data and models being proposed with the PEOPLE architecture and decision support system
- By capitalizing and enhancing on a key NASA architecture and decision support system, PEOPLE JCTD is the only solution that meets or exceeds all COCOM Desired Capabilities
- PEOPLE JCTD provides a capability for a cross-border, interdependent, national and regional monitoring, analysis and visualization decision support system for disaster and environmental management and humanitarian needs forecasting
- PEOPLE JCTD will enhance partner capabilities and capacities, enable greater collaboration, provide key assistance aligned with US national security interests, insure measurable outcomes.

Recommendation

Conduct the JCTD, FY10-11



Critical Operational Issues



Operational Suitability

What anticipated impact will PEOPLE JCTD have on current operational assets and capability?

How will the sustainment of the PEOPLE JCTD capability will be implemented?

How will the PEOPLE JCTD capability be configured, managed, and updated?

Will the PEOPLE JCTD capability be interoperable with Partner Nations nodes?

Operational Performance

How will PEOPLE JCTD Build Partnership Capacity (BPC)?

What impact will PEOPLE JCTD have on COCOM mission, roles and responsibilities?

What are the Partner Nations requirements for a node?

What [if any] additional or special training is required to use PEOPLE JCTD capability?

How well does the PEOPLE JCTD perform based on what it is designed to provide?



Top Level CONOP



A regional or country node is actively processing and integrating partnering nation data including space, air, in situ and maritime data (NASA, NOAA, DoD, ESA, DLR, In-Country Assets). The data which is shared and transmitted to various national nodes where it is graphically displayed on workstations to the operators and analysts located in each country. Products are developed based on user needs to enable decision makers to deal with a host of pressing matters – water resources, land use, urban planning, disease migration, etc.

The regional or country nodes are designed to meet user requirements and will have a variety of products available to convert the data into useful information for key decision makers. Products can address day to day needs, emergency requirements, or longer term environmental mapping requirements.

An operator /analyst monitoring the visualization graphics on a workstation in one of the national node detects, predicts, monitors environmental or resource management data. When there is a country boundary issue, the operator would contact partnering national nodes and the regional node to evaluate potential cross border impacts of the issue, e.g. a severe weather event such as a flood, hurricane, tsunami, forest fire, etc. Additional SMEs are called in for support as needed, as well as requests for additional detailed data or in-situ observations to further evaluate and confirm the issue.

The analysts inform the national decision maker(s), who then take appropriate steps to further plan, monitor, or direct mitigation actions if necessary. Cross border coordination between partners decision makers is conducted if needed.

The national decision makers may determine that further external support is required to assist in the appropriate action. The data is shared with external agencies to provide situational awareness should their assistance be requested. The data / output product is stored at the regional node (as appropriate) and made available via a variety of services as well.



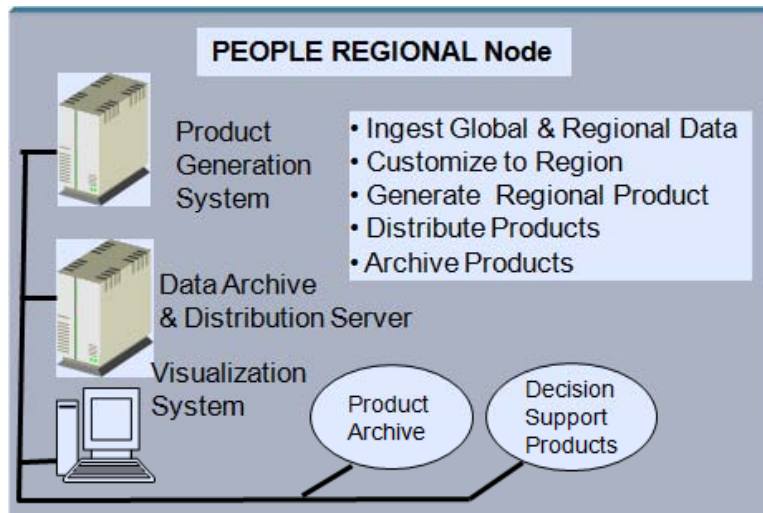
Operational Demonstration Configuration



- **Demonstrate:** Detect, observe, monitor, predict and visualize Water Resources, Water Pollution, Urban Development, and Forest Fires, to provide information for decision makers within a national, regional, or international cooperative framework
- **Operational Configuration**
 - Water Resources
 - Inputs – Satellite data (medium-to-high resolution multispectral imagery and/or synthetic aperture radar data, precipitation, soil moisture content), maps (topographic data, soils data), tabular data (stream gauge), models (precipitation rate and accumulation)
 - Processing – Image processing (feature extraction, change detection), GIS/modeling (flood extent delineation, flood extent prediction, threshold detection)
 - Outputs – Processed imagery, extent polygons, prediction polygons, alerts
 - Delivery – HTTP/HTTPS (imagery, polygons, alerts)
 - Water Pollution
 - Inputs – Satellite data (medium-to-high resolution multispectral imagery and/or synthetic aperture radar data, precipitation, soil moisture content), maps (topographic data, soils data), tabular data (stream gauge), models (precipitation rate and accumulation), Blue Algae Model
 - Processing – Image processing (feature extraction, change detection), GIS/modeling (flood extent delineation, flood extent prediction, threshold detection)
 - Outputs – Processed imagery, extent polygons, prediction polygons, alerts
 - Delivery – HTTP/HTTPS (imagery, polygons, alerts)
 - Urban Development
 - Inputs – Satellite data (time series high resolution panchromatic and multispectral imagery), Framework Data (e.g. topographic, political, geologic, transportation, land cover, etc.)
 - Processing – Image processing (feature extraction, change detection), GIS/modeling (threshold detection)
 - Outputs – Processed imagery, AOI points and polygons, planning tools, hydrology, impervious surface mapping
 - Delivery – HTTP/HTTPS (imagery, AOIs)
 - Forest Fires
 - Inputs – Satellite data (time series medium and high resolution panchromatic, thermal infrared, and multispectral imagery, wind speed/direction)
 - Processing – Image processing (feature extraction, change detection), GIS/modeling (threshold detection)
 - Outputs – Processed imagery, AOI points and polygons, alerts
 - Delivery – HTTP/HTTPS (imager, AOIs, alerts)
- **Hardware Configuration: “Virtual” Regional (1) & National Nodes (2) – Stuttgart; Regional Node – HSV**
 - Regional node – web server, database server, storage archive, cluster, analysis workstations, data product generation system, large screen displays. Connected via intranet and Internet. Supported with communications, backup & recovery, & cooling equipment.
 - Virtual regional node & national nodes – workstations with large monitor displays connected via internet to regional node

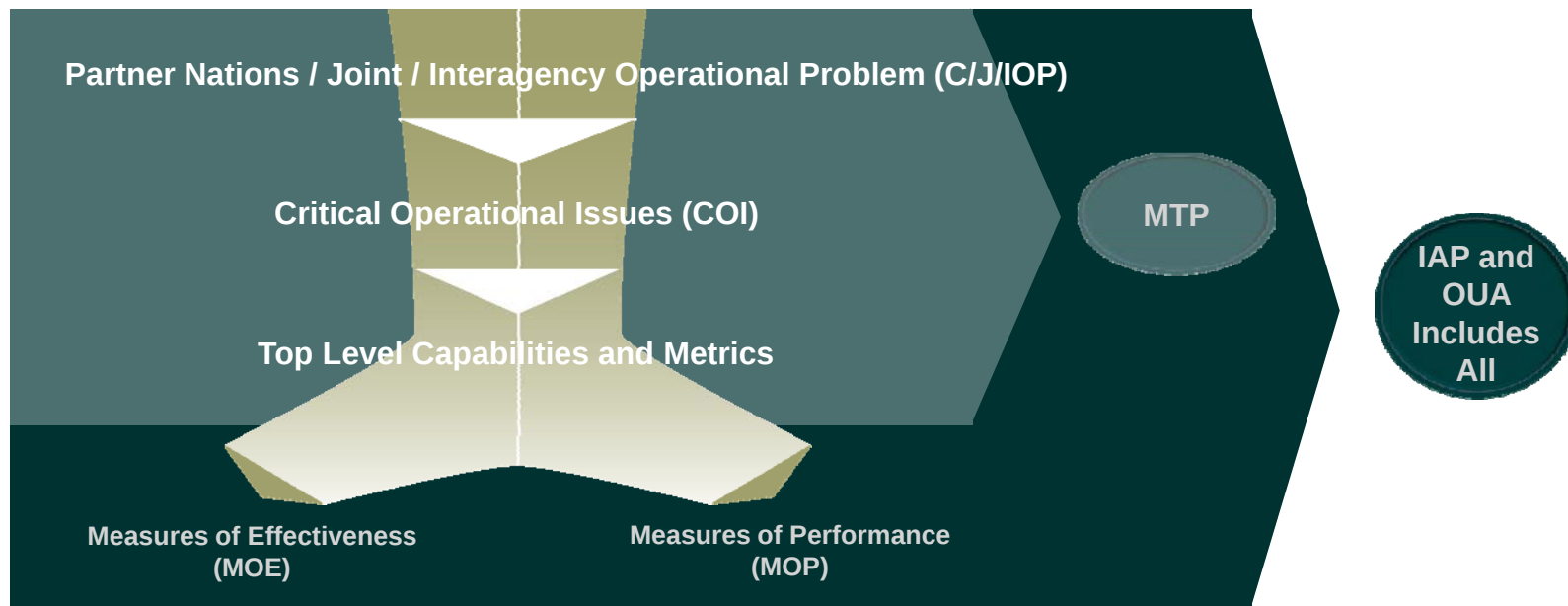


Regional Node Facility (Example)





Partner Nations / Joint / Interagency OUA Approach



KEY:

- Management and Transition Plan (MTP)
- Integrated Assessment Plan (IAP)
- Operational Utility Assessment (OUA)

**Qualitative and Quantitative Metrics Operationally
Demonstrated Through CONOPS / TTP**



Technical Demonstration and Programmatic Approach



[One “*Virtual*” Regional (1); National Nodes (2); Regional Node (1)]

- Identify and determine participating partners / users (Oct 09)
- Define technical and operational Functional Requirements (Nov 09 – Jan 10)
- Review and establish configuration management processes (Jan 10)
- Define operational scenarios (data & analysis requirements) (Jan 10)
- Define and establish operational and system architectures version 1.0 (Jan - Jun 10)
- Develop and establish software specification and documentation (Jan – Dec 10)
- Acquire and integrate data sets (Feb - Jun 10)
- Build and test software version 1.0 (Feb - Jul 10)
- Develop training package (Jun - Nov 10)
- Build and test software version 2.0 (Jul - Oct 10)
- Conduct site surveys (i.e., physical structure, connectivity, infrastructure access etc.) (Aug 10)
- Develop CONOP and TTP (Oct 10 – Feb 11)
- Conduct technical suitability users evaluations (Sep 10)
- Conduct TD at National Space Science and Technical Center (NSSTC) (Nov 10)
- Perform software fixes (Dec 10)
- Deliver training package (Dec 10)
- Establish software version 3.0 (Jan 11)
- Conduct training (Jan 11)
- Conduct OD (Feb 11)
- Develop and produce Quick-look and interim OUA reports (Mar – Apr 11)



Transition Affordability



- Utilize free DoD high resolution commercial data whenever possible.
- Employ business model that encourages data sharing
- Using COTS and GOTS equipment and software where ever possible
- Selection of data sets and models will be made based on a benefit to cost analysis
- Standardize equipment, maintenance and training where ever possible
- Use mature open source software where ever possible



Interoperability and Integration



- **Technical approach**
 - Services Oriented Architecture
 - Maximize COTS hardware and software
 - Minimize change to communications systems or networks
 - Custom database interfaces as required by data providers
 - Standard mapping and satellite data
 - Open Geospatial Information Systems Standards
- **CONOP and TTP integration**
- **Activity coordination required with Partner Nations**



Training



- **Approach for conducting training:**
 - CONOPS and TTP Define Training
 - Training Focused on Conducting OD
 - Will Address Both Technical, Operational and Sustainment
 - Regional and National Nodes [Existing site]
 - Analysts
 - System and network administration (web service, RDMS, ESRI, SSL Certificate)
 - Decision makers / Users
 - Training Plan Content:
 - User Manuals and interactive training
 - Curriculum and Instructional Materials
 - Trainers provided by Technical Team
 - Compatible with Transition Training needs
 - User Prerequisites
 - TM develops training plan and approach





Security and Information Assurance



- **Operates at the unclassified commercially secured security level**
- **Information Assurance (data is protected and uncompromised)**
 - User Authentication capability employed
 - Use data from trusted sources
 - Use of secure protocols
- **No Interim Authority to Operate (IATO) required**
- **TM develops security Management Plan**



Description of Products / Deliverables



Deliverable / Product	Quantity	TM	XM	OM	Type O	Type D
Datasets						
Satellite Data Suite (e.g. Landsat, MODIS (Aster and Terra) ,EO-1 ALI ,QuickBird, IKONOS, FORMOSAT, RADARSAT)	1	x			x	x
<i>In situ</i> Data Suite (e.g., stream gauge, surface temperature, surface winds, soil saturation, etc.)	1	x			x	x
Framework Data (e.g.; topographic, political, geologic, transportation, land cover, etc.)	1	x			x	x
Software / Hardware						
Processing and Servicing Software Bundle	1	x			x	x
Web service (HTTP / HTTPS) Application	1	x			x	x
Data base Management Software	1	x			x	x
Open source GIS	1	x			x	x
Geographic Information System (GIS) application	1	x			x	x
Image Processing Software Applications Bundle	1	x			x	x
API for SOA for one-way data-sharing with DoD C2 systems	1	x			x	x
Analysis Tools Bundle	1	x			x	x
Hardware Bundle	1	x			x	
Documentation						
CONOP and TTP	1			x	x	x
Training Plan	1	x			x	x
IOUA Report	1			x	x	x
Final OUA Report	1			x	x	x
Security Management Plan	1	x			x	x
Interface Control Document (ICD)	1	x				x
Software Specification	1	x				x
Functional Requirements	1			x		x
Management and Transition Plan	1	x	x	x		
Test Plan	1	x				x
Architectures Description	1	x				x
DOTMLPF and Policy Recommendations/Changes	1			x	x	x

Supporting narrative descriptions for each product / deliverable provided in MTP



Networks / Equipment / Facilities

(1 of 2)



Networks / Equipment / Facilities	Quantities	Date Required	POC
Networks			
Unclassified, commercially-secured Internet / intranet	1	Oct 09 - Sep 11	Partner Nations and Technical Mgr.
Regional Node HW/SW	1		
Hardware			
Workstations	3	Dec 10 - Sep 11	Technical Manager
Web/Map Servers	TBD		Technical Manager
Database Server	TBD		Technical Manager
Data Archive System	TBD		Technical Manager
Multiprocessor Cluster	TBD		Technical Manager
Ingest and Product Generation Server	TBD		Technical Manager
Large Screen Displays	3		Technical Manager
Network Equipment	TBD		Technical Manager
Universal Power Supply	TBD		Technical Manager
Cooling	TBD		Technical Manager
KVM, Switches, Cables, etc.	TBD		Technical Manager
Backup and Recovery System	TBD		Technical Manager
Printer/Scanner/Fax	TBD		Technical Manager
Software			
Oracle 11G	TBD	Dec 10 - Sep 11	Technical Manager
Oracle Spatial	TBD		Technical Manager
Backup System	TBD		Technical Manager
Linux Licenses	TBD		Technical Manager
ESRI ArcGIS Desktop 9.3.1	3		Technical Manager
ArcIMS	TBD		Technical Manager
IDL	3		Technical Manager
ERDAS Imagine	3		Technical Manager
Google Earth Pro	3		Technical Manager



Networks / Equipment / Facilities (2 of 2)



Networks / Equipment / Facilities	Quantities	Date Required	POC
Virtual Regional Node HW/SW 1			
Hardware			
Workstations	3	Jan 11-Sep 11	Technical Manager
Large Screen Displays	2		Technical Manager
Network Equipment	TBD		Technical Manager
Software			
ESRI ArcGIS Desktop 9.3.1	3	Jan 11 - Sep 11	Technical Manager
IDL	3		Technical Manager
ERDAS Imagine	3		Technical Manager
Google Earth Pro	3		Technical Manager
National Node HW/SW 2			
Hardware			
Workstations	2	Jan 11 - Sep 11	Technical Manager
Large Screen Displays	1		Technical Manager
Software			
ESRI ArcGIS Desktop 9.3.1	2	Jan 11 - Sep 11	Technical Manager
IDL	2		Technical Manager
ERDAS Imagine	2		Technical Manager
Google Earth Pro	2		Technical Manager
Facilities			
Development Node - National Space Science and Technology Center, Huntsville, AL	1	Oct 09 - Nov 10	Danny Hardin
Virtual Regional Node - Stuttgart	1	Jan 11 - Sep 11	Partner Nation POC [TBD]



Top Level Regions & Scenarios

Region: Norway / Scandinavia (optional)

Scenarios	Tools / Providers	Models
Flooding Inundation	Norwegian Flood	Norwegian Flood Forecasting
	Dartmouth Flood	Dartmouth Flood
	Global Floods (GSFC)	LDAS (GSFC)
	DLR	SHIELDS (MSFC)

Potential Source Datasets
MODIS
AMSER-E
Landsat
ASTER
GRACE
SRTM
TRMM
GOES (NOAA)
AVHRR (NOAA)
RADARSAT (Canada)
Commerical (Ikonos/Quickbird)

Datasets Legend:

- **Blue:** NASA or NOAA
- **Red:** Non-US in Country
- **Green:** Commercial



Supporting Programs



Supporting Program	POC	Supporting Components / Systems	Date Required	DinK Funding (\$000)	
				FY10	FY11
SERVIR	Dan Irwin	Core Software (Central America and Africa)	1-Mar-10	500K	
Pacific Disaster Center	Bob Feden	Vietnam modeling tools	1-Mar-10	300K	
DLR, Germany	Mike Schmidt	Data and modeling tools	1-Mar-10	200K	
NASA GSFC Earth Science	Shahid Habib	Data and modeling tools	1-Mar-10	200K	



Acquisition and Contracting Strategy



- NASA ensures contracts set clear milestones and deliverables
 - Technical Manager ensures JCTD costs are met
- NASA disperses funding to government team members (EUCOM, AMRDEC, SMDC, and GSFC)
- NASA assigns Von Braun Center for Science & Innovation, 501 c 3, to be the JCTD lead for acquisition and contracting
 - VCSI has established a low cost acquisition structure and innovative procurement / contracting mechanisms
 - Lowers cost and expedites delivery of key hardware and software
 - Will also assess use of a university partner as acquisition lead pursuant to subcontract
- NASA transfers funding to VCSI via Cooperative Agreement with NASA MSFC
 - VCSI contracts with key organizations (i.e., DLR, UAHuntsville, and Partner Nations for Stuttgart operational demonstration)



Assumptions



- **No SOA interface unless deployed through to a DoD organization**
- **Unclassified facilities for the JCTD demonstration in Europe will be provided by EUCOM**
- **EUCOM will provide adequate power, cooling and internet bandwidth in the facilities to support hardware operations**
- **Project will obtain funding by January 2010**
 - Funds will be distributed to NASA and EUCOM after DOD investments are allocated



SERVIR & PEOPLE JCTD COMPARISION



	SERVIR	PEOPLE JCTD
Capabilities	SERVIR Architecture	Builds Upon SERVIR Architecture
		Broad Global / Cross CoCOM Architecture Approach
	Baseline Datasets for Central America & Africa	Enables Integration of at Least 14 Potential Datasets Supporting 4 Additional Regions
	Baseline Training Program	Expands & Enhances Training Program
	Enables Data Enhancement	Enables Data Enhancement
		New DOD / NASA Data Products
		Environmental & Disaster Management Products
		Food Security & Migration Products
		New Google Visualization Tool
Partnerships	NASA	NASA
	USAID	DoD
	Central American & African Partner Nations	European, Southeast Asian, African Partner Nations
	Private Sector	DLR
	NGO	VCSI
	Universities	UAHuntsville
	UAHuntsville	NOAA
	NOAA	PDC
		Commercial

Proposal Draft