

URTAC Recommendations

Gary L. Covatch

Project Manager, Natural Gas & Oil Project Management Division



URTAC 2009 Recommendation Areas

- **Policy**
- **Near Term Impacts**
- **Research Focus**
- **Technology Transfer**

URTAC 2009 Policy Recommendations

- **Most Policy and Programmatic Issues to be addressed by HQ**
- **Implementation item: Goal of 30% Addition to Reserves**
 - NETL developing comprehensive Benefits Assessment Program with the goals:
 - Develop best available estimate of technically recoverable resource base impacted by technology
 - Develop sound, transparent methodology to determine the benefits at Project and Program levels
- **Implementation item: Mechanisms to balance environmental responsibility and resource development concerns.**
 - Program supports HQ efforts with Environmental Projects and Environmental Advisory Groups
 - Environmental Program to be discussed under Research Focus

URTAC 2009 Recommendation Areas

- Policy
- **Near Term Impacts**
- Research Focus
- Technology Transfer

URTAC 2009 Near Term Impacts Recommendations

- **Balance long term research, some short term projects with potential for early application**
 - To be addressed under Research Focus
- **Documentation of “early success” and making researchers knowledgeable of prior and on-going research**
 - To be addressed under Technology Transfer

URTAC 2009 Recommendation Areas

- Policy
- Near Term Impacts
- **Research Focus**
- Technology Transfer

URTAC 2009 Research Focus Recommendations

- **Expand the Program to include the following:**
 - Geosciences as applied to exploration, drilling, stimulation and re-stimulation
 - Basin analysis and real-time resource exploitation
 - Stimulation and Completion
 - Water Management
 - Environmental
 - Other Petroleum Resources

Research Focus

From RPSEA 2010 Draft Annual Plan

- **Focus to support three short and longer term high level goals:**
 - An integrated program of key technologies to enable specific unconventional gas resource development in a particular geographic area
 - Conduct early-stage novel concepts research for unconventional gas resource development
 - Example: biological enhancement of gas production
 - Development and execution of innovative approaches to integrate research results into commercially available services

2010 Integrated Solicitation Strategy

- **Build on the existing portfolio of projects developed during the 2007-2009**
- **Ensure a coordinated program addressing the technology challenges of resource development in at least three specific unconventional gas resources**
- **Aim to fill program gaps remaining after the 2009 projects are chosen and build on the positive results of ongoing projects**

Existing Integrated Unconventional Gas Program

	CBM 10%	Gas Shales 45%	Tight Sands 45%
Integrated Basin Analysis		New Albany (GTI) \$3.4	Piceance (CSM) \$2.9
Drilling			
Stimulation and Completion	Microwave CBM (Penn) \$0.08	Cutters (Carter) \$0.09 Frac (UT Austin) \$0.69 Refrac (UT Austin) \$0.95 Frac Cond (TEES) \$1.6	Gel Damage (TEES) \$1.05 Frac Damage (Tulsa) \$0.22
Water Management	Integrated Treatment Framework (CSM) \$1.56	Barnett & Appalachian (GTI) \$2.5	Frac Water Reuse (GE) \$1.1
Environmental	*	Environmentally Friendly Drilling (HARC)* \$2.2	*
Reservoir Description & Management		Hi Res. Imag. (LBNL) \$1.1 Gas Isotope (Caltech) \$1.2 Marcellus Nat. Frac./Stress (BEG) \$1.0	Tight Gas Exp. System (LBNL) \$1.7 Strat. Controls on Perm. (CSM) \$0.1
Reservoir Engineering		Decision Model (TEES) \$0.31 Coupled Analysis (LBNL) \$2.9	Wamsutter (Tulsa) \$0.44 Forecasting (Utah) \$1.1 Condensate (Stanford) \$0.52
Resource Assessment		Alabama Shales (AL GS) \$0.5 Manning Shales (UT GS) \$0.43	Rockies Gas Comp. (CSM) \$0.67
Exploration Technologies	Coal & Bugs (CSM) \$0.86	Multi-Azimuth Seismic (BEG) \$1.1	

2007 Projects

2008 Projects

NATIONAL ENERGY TECHNOLOGY LABORATORY

URTAC 2009 Research Focus Recommendations (NETL R&D)

- **Expand the Program to include the following:**
 - Environmental: NETL FOA: Closed June 5, 2009
 - Water resources & water management for shale gas development
 - Science to support regulatory streamlining and permitting associated with shale gas development
 - Alaskan water management solutions for issues arising from development of local oil and natural gas resources for use by remote communities.
 - Other Petroleum Resources (NETL In-house Research)
 - Enhanced and Unconventional Oil Recovery
 - Development of advanced technologies to move the status of known technically unrecoverable oil resources to technically and economically recoverable resources

URTAC 2009 Recommendation Areas

- Policy
- Near Term Impacts
- Research Focus
- **Technology Transfer**

URTAC 2009 Technology Transfer Recommendations

- **The plan should specifically outline the steps necessary to communicate the results of the research and technologies developed.**
- **The program should utilize organizations and conferences to promote the knowledge management system and technology transfer process. Include mention of RPSEA forums, etc.**
- **The knowledge management system of the Unconventional Resources and Small Producer Program should be linked to other knowledge management resources.**
- **Once a knowledge management system has been developed, metrics are necessary to evaluate and communicate successes.**

URTAC 2009 Technology Transfer Recommendations

- ***The plan should specifically outline the steps necessary to communicate the results of the research and technologies developed.***
 - NETL has developed and will implement a Technology Transfer plan that provides the internal process for integrating information from the following DOE Oil and Gas Programs for dissemination to a broad audience of stakeholders:
 - Methane Hydrates
 - Effective Environmental Protection
 - (Unconventional) Oil
 - EPLA 2005, Title IX, Subtitle J, Section 999
 - Congressionally Directed Projects

URTAC 2009 Technology Transfer Recommendations

The program should utilize organizations and conferences to promote the knowledge management system and technology transfer process.

- **NETL Technology Transfer Partners and Products:**
 - Partners:
 - PTTC
 - RPSEA
 - New Technology Transfer Agreement (Existing ends 8/30)
 - Solicitation closed May 15, 2009
 - Products:
 - E&P Focus Newsletter
 - RPSEA Workshops and Conferences
 - Active engagement of trade press for technology publications
 - Publications and workshops from the New Tech Transfer agent
 - NETL Website
 - **Knowledge Management Database/System**

NETL Technology Transfer Program

Information to
be Delivered

	RPSEA	NETL	Contractors	DOE-HQ
Project Reports		Complementary program	Interim and final reports	
Project Data Sets		Complementary program	Spreadsheets, GIS, other	
Project Software			Models and online tools	
Presentations/papers	Program and project level	Program and project level	Project level	High Level Program
Program Information	RFPs, deliverables, metrics, feedback	Program updates, benefit assessments		Program activity, FAC reports, mandated info.

Delivery Vehicle

Project websites			Selected projects have websites	
Program websites	RPSEA site with links	Portal on NETL site with links		Pages on DOE site
Publications	Newsletter, articles in trade press	Newsletter, Techlines, articles in trade press	Technical papers, articles	Press releases, Techlines
Forums/workshops	RPSEA forums and workshops	PTTC workshops		
Public meetings	SPE papers, other technical meetings	SPE papers, other technical meetings	SPE papers, other technical meetings	

Section 999 Tech Transfer Index

	A	B	C	D	K	L	M	N	O	P	Q	
	Area	Project	Performer	Contract Number	Performer Address	PI	Project Cost	Federal Cost	Cost Share	Start Date	End Date	RP Cor
1	Small Producer	Field Site Testing of Low Impact Oil Field Access Roads: Reducing the Environmental Footprint in Desert Ecosystems	TEES	07123-01	1470 William D Fitch Pkwy College Station, TX 77845		\$444,839	\$284,839	\$160,000	9/3/2008	9/2/2010	Ms Ca
2	Small Producer	Preformed Particle Gel for Conformance Control	University of Missouri, Rolla	07123-02	Missouri University of Science and Technology-OSP 202 University Center,300 W 12th St Rolla, MO 65409-1330		\$786,716	\$520,212	\$266,504	8/19/2008	7/31/2010	Ms Ca
3	Small Producer	New Miscible CO2 Application to Improve Oil Recovery for Small Producers	University of Kansas	07123-03	Youngberg Hall 2385 Irving Hill Road Lawrence, KS 66045	Jjun Syung Tsau	\$342,714	\$274,171	\$68,543	5/2/2008	9/20/2010	Kent
4	Small Producer	Enhancing Oil Recovery from Mature Reservoirs Using Radial-jetted	University of Kansas	07123-04	Youngberg Hall 2385 Irving Hill Road		\$519,441	\$248,385	\$271,056	8/21/2008	8/24/2009	Ms Ca
5	Small Producer	Cost-Effective Treatment Of Produced Water Using Co-Produced Energy Sources For Small Producers	New Mexico Tech (NMIMT)	07123-05	801 Leroy Place Socorro, NM 87801		\$1,164,888	\$457,253	\$707,635	8/9/2008	8/5/2010	Kent
6	Small Producer	Seismic Stimulation to Enhance Oil Recovery	Lawrence Berkeley National Laboratory	07123-06	One Cyclotron Road, MS90F200 Berkeley, CA 94720		\$1,373,373	\$723,373	\$650,000	8/15/2008	8/14/2010	Ms Ca
7	Small Producer	Reducing Impacts of New PIT Rules on Small Producers	New Mexico Tech (NMIMT)	07123-07	801 Leroy Place Socorro, NM 87801		\$763,396	\$509,191	\$254,211	8/19/2008	8/5/2011	Kent
8	Unconventional	Novel Concepts for Unconventional Gas Development in Shales, Tight Sands and Coalbeds	Carter Technology	07122-07	9702 Garden Flow Drive Sugar Land, Texas 77478	Ernest Carter	\$114,600	\$91,680	\$22,920	7/24/2008	2/19/2008	Kent
9	Unconventional	Application Of Natural Gas Composition To Modeling Communication Within And Filling Of Large Tight-Gas-Sand Reservoirs, Rocky Mountains	Colorado School of Mines	07122-09	1500 Illinois Street Golden, CO 80401	Hanis	\$1,016,417	\$670,417	\$346,000	8/25/2008	8/24/2010	Kent
10	Unconventional	An Integrated Framework for the Treatment and Management of Produced Water	Colorado School of Mines	07122-12	1500 Illinois Street Golden, CO 80401	Borg Drewes	\$4,017,085	\$1,560,393	\$2,456,692	9/12/2008	3/11/2011	Kent
11	Unconventional	Comprehensive Investigation of the Biogeochemical Factors Enhancing Microbially Generated Methane in Coal Beds	Colorado School of Mines	07122-14	1500 Illinois Street Golden, CO 80401	Junk Munakata-Marr	\$1,246,740	\$864,333	\$382,407	9/12/2008	9/11/2010	Kent
12	Unconventional	Reservoir Connectivity and Stimulated Gas Recovery	Colorado School of Mines	07122-15	1500 Illinois Street Golden, CO 80401	Dag	\$7,528,256	\$2,894,256	\$4,634,000	9/19/2008	9/18/2010	Kent

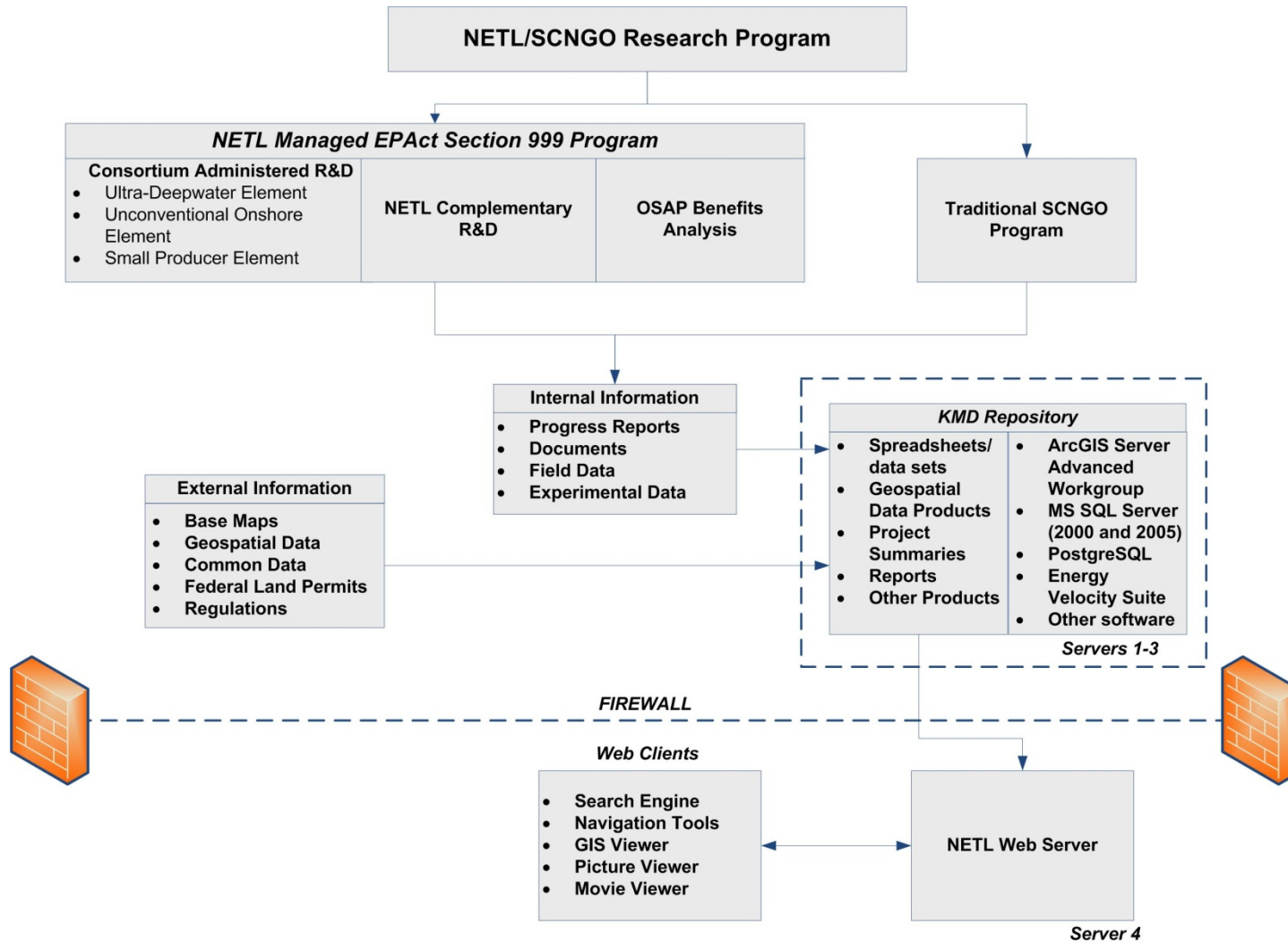
- Other work-sheets roll up tech transfer items by type, date and program area
- Each document is linked to its location on NETL, RPSEA, FE-HQ or PI website
- Additional worksheet provides future planned events - RPSEA forums, meetings, papers, presentations, etc.
- Spreadsheet will be updated regularly and can be easily e-mailed

- 2 Primary Worksheets: Unc. Resources/Small Producers and UDW ... list all basic project information: Who, What, Where, When, How Much, as well as all tech transfer products/delivery dates

Technology Transfer: NETL KMD Deployment Timeline

ID	Task Name	Jun 2009				Jul 2009				Aug 2009				Sep 2009				Oct 2009					
		5/31	6/7	6/14	6/21	6/28	7/5	7/12	7/19	7/26	8/2	8/9	8/16	8/23	8/30	9/6	9/13	9/20	9/27	10/4	10/11	10/18	10/25
1	Prototype KMD Online at NETL INTERNET																						
2	Fully Searchable Document Repository (50GB) ONLINE																						
3	Interactive Dashboards ONLINE																						
4	Interactive GIS (Map) Applications ONLINE																						

Technology Transfer: NETL KMD Organization of Information Flow



KMD Planned Key Products/Capabilities

- **CD/DVD Library** online containing previous oil and gas research at NETL
 - Compiles historical research
 - Converts the NETL publications page to a dynamic library for retrieving documents
 - Maintains the CD/DVD tree structure for searching
 - Contains 45 CDs and DVDs with 9,000+ PDFs, 186 Word DOCs, 61 spreadsheets, and 217 databases
- **Document Database** to allow searching of historical oil and gas research that will contain
 - DOE/NETL Project technical/topical reports
 - Key publications from the CD/DVD library
 - Key publications from the OSTI database
 - Reference for copyright-protected documents and documents that are not available in electronic format
 - Additional documents from the NETL Morgantown library: 397 final reports in PDF format and references to 5,000+ additional hard-copy reports

KMD Planned Key Products/Capabilities

- **Xcelsius Models** to provide a dashboard visualization of detailed oil and gas, and environmental data
 - Outer Continental Shelf (OCS) Model
 - Details information for the OCS Regions and Planning Areas
 - Provides undiscovered technically recoverable resources (UTRR) for gas and oil
 - Allows user control to select region or planning area display of resources
 - Indicates resources by water depth
 - Allegheny National Forest Model
 - Display environmental data related to drilling in the Allegheny National Forest including well density and watershed boundaries
 - Future enhancements may include relationship of data to the Marcellus Shale, along with trends of data for roads and chemical analysis within the National Forest

KMD Planned Key Products/Capabilities

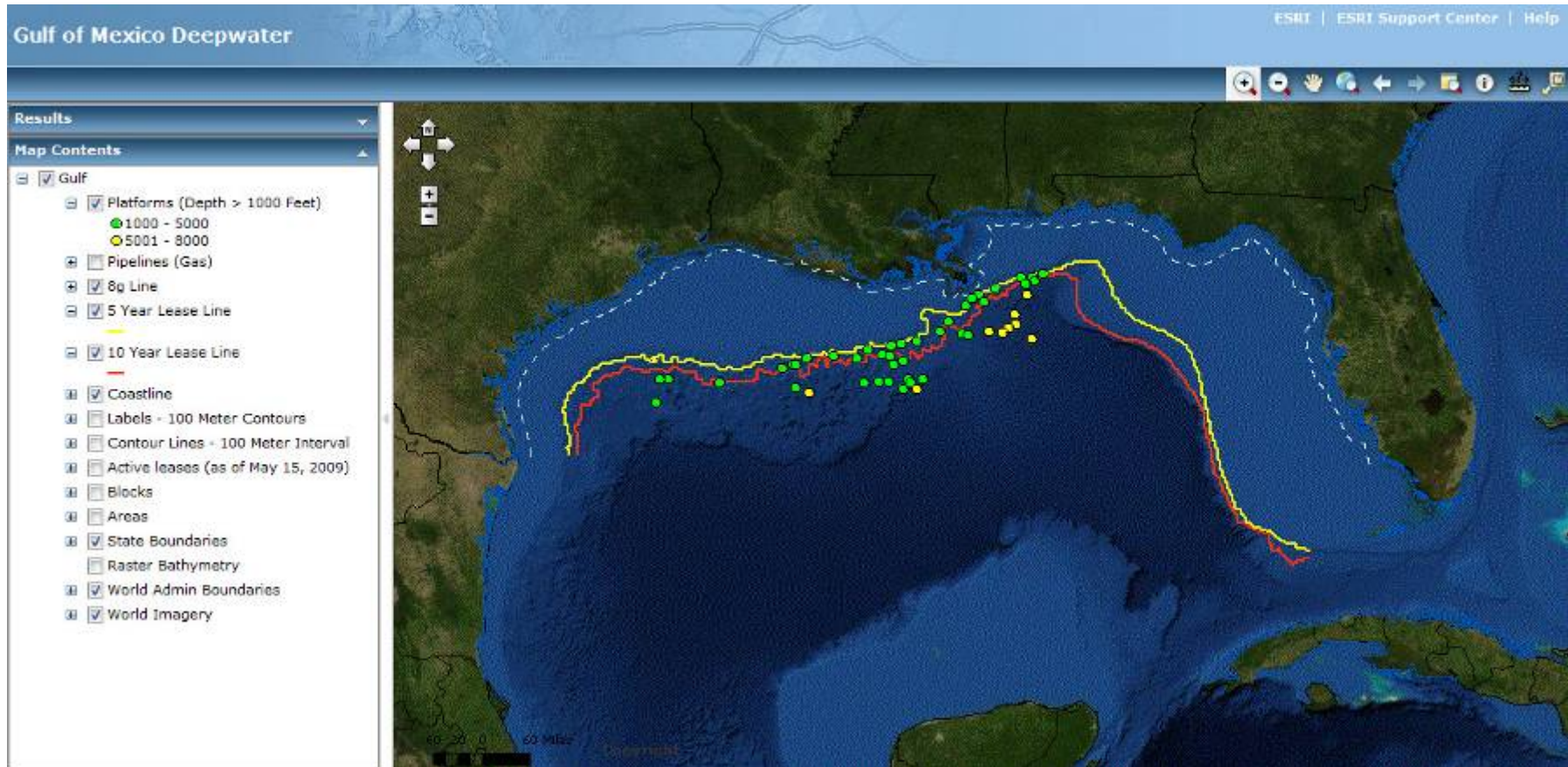
ArcGIS Web Map Services

allows visualization of data related to oil and gas research

- Gulf of Mexico (GOM) Deepwater
 - Data from the Minerals Management Service related to leases (i.e. 5- and 10-year lease lines, active leases, 8g line, coastline, state boundaries, and leases by water depth greater than 1,000 ft)
 - Infrastructure including platforms in water depth greater than 1,000 ft and gas pipelines
 - Location (area and block) and detailed bathymetry data for the GOM
- KMD – Oil and Gas Resources of the United States
 - Data from the Energy Policy and Conservation Act (EPCA) Phase III assessment for onshore oil and gas resources and restrictions/impediments to their development
 - Study area boundaries, land status, and land access categorization
 - Total oil density and total gas density per study area
 - Boundary data including Federal Lands, county/state boundaries, lakes/rivers, highways, railroads, and major cities
 - Data from the Energy Information Administration
 - Boundary data for U.S. oil and gas field maps
 - Coalbed methane cumulative production, reserves and resources, and gassy coal mines
 - Shale gas basins and plays

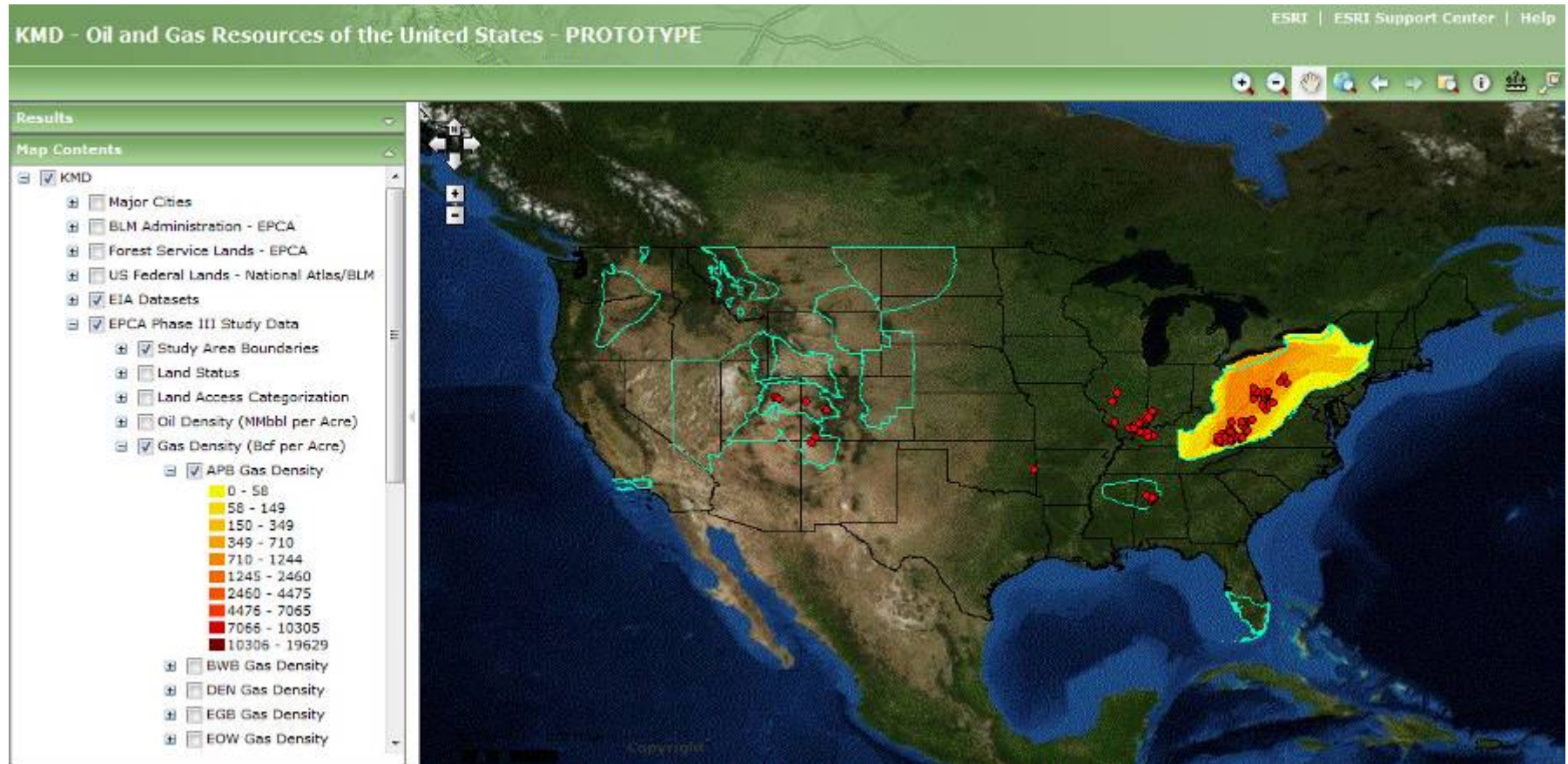
KMD Planned Key Products/Capabilities

Gulf of Mexico Deepwater ArcGIS Prototype



KMD Planned Key Products/Capabilities

Onshore Oil and Gas Resources of the U.S. Prototype



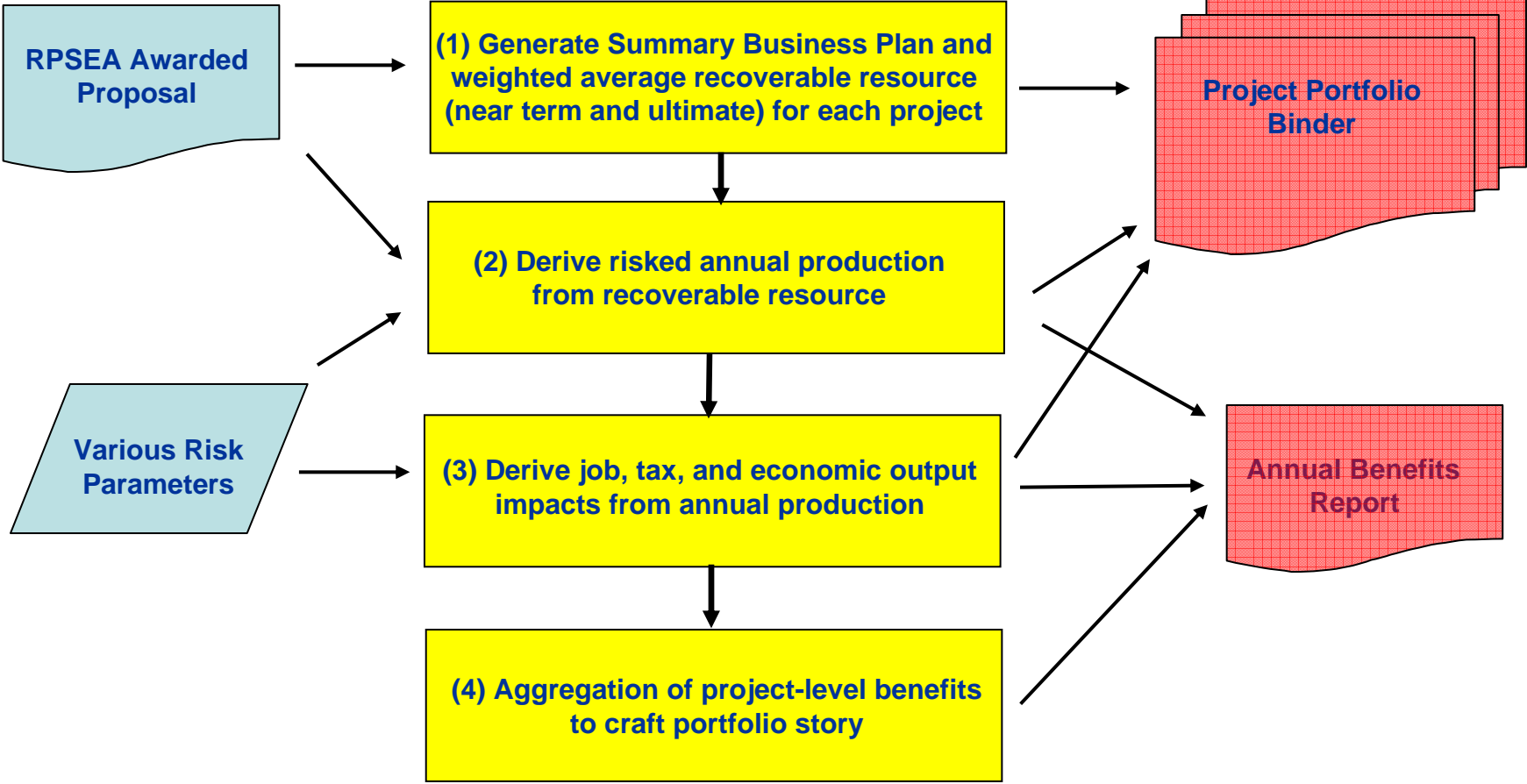
URTAC 2009 Technology Transfer Recommendations

Once a knowledge management system has been developed, metrics are necessary to evaluate and communicate successes.

- **NETL is currently developing peer reviewed models for development of benefits from the Program**

EPAct 999 Benefits Process

Methodology for RPSEA UNG&SP Projects



Questions

