


FINAL -- Nov 4-5, 2015 -- FINAL

 http://rrt6.org/	<u>Meeting Location:</u> US EPA Training Center <u>16650 Westgrove Drive, Addison, Texas</u>	<u>RRT Co-Chairs</u> Ronnie Crossland, EPA Michael Sams, USCG	<u>RRT Coordinators</u> Steve Mason, EPA Mason.Steve@epa.gov Todd Peterson, USCG Todd.M.Peterson@uscg.mil
---	---	--	---

Day 1 -- RRT-6 General Session -- Wednesday, Nov 4, 2015

Time	Topic	Presenter /Facilitator
8:30 – 9:00 AM	Introductions / Administrative Announcements / Opening Statements	Ronnie Crossland, EPA / Michael Sams, USCG
9:00 – 9:30 AM	Review of 2015 RRT Priorities / Status	Michael Sams, USCG
9:30 – 10:15 AM	State Reports (NM, TX, AR, OK & LA)	State Agencies Present
10:15 – 10:30 AM	Break	
10:30 – 11:15 AM	State Emergency Management Assistance Compact (EMAC) process & how it may apply to ESF-10 activities during a Stafford Act delegation	Steve Palladino, OEM
11:15 – 11:30 AM	RRT-6 Decision-Making Playbook for Alternative Response Technologies	Karolien Debusschere, LOSCO
11:30 AM – 1:00 PM	Lunch	
1:00 – 1:30 PM	EPA FOSC Reports CES Environmental Services, Houston, Removal Project Ector Drum, Inc., Odessa, Removal Project	EPA FOSCs
1:30 – 2:30 PM	USCG FOSC Reports	USCG FOSCs
2:30 – 2:45 PM	Break	
2:45 – 3:45 PM	U.S. Energy Information Administration (EIA) presentation	Grant Nülle
3:45 – 4:00 PM	Break	
4:00 – 4:30 PM	Bayou Sorrel Pipeline Spill / Swamp Fires	LCDR Rodriguez, MSU Baton Rouge
4:30 – 5:00 PM	M/V Glory Trader: Managing a Potentially Explosive Cargo	Paige Doelling, NOAA SSC
5:00 – 5:15 PM	Wrap-Up	Ronnie Crossland, EPA / Michael Sams, USCG
5:15 PM	Adjourn	
Networking Session – Location TBD		
Adobe Connect: https://epa.connectsolutions.com/region6rrt/ Conference Call: 866-299-3188 Pin: 214-665-2292#		

Day 2 -- RRT-6 General Session -- Thursday, Nov 5, 2015

Time	Topic	Presenter/Facilitator
8:30 – 9:00 AM	Public Health Role to OSC/FOSC	CAPT Pat Young, ATSDR
9:00 – 9:30 AM	Definition of U.S. Waters - How it has changed & effect on spills/reporting	Maria Martinez, Roberto Bernier, EPA
9:30 – 9:45 AM	Break	
9:45 – 10:45 AM	New Madrid Seismic Zone – Central U.S. Earthquake Consortium (CUSEC)	Jim Wilkinson, CUSEC or Brian Blake, CUSEC
10:45 – 11:15 AM	Alternative Dispersants	James Hanzalik, Clean Gulf Associates
11:15 – 12:30 PM	Lunch	
12:30 – 1:00 PM	Region 9 Refugio Oil Spill Response Discussion	CDR Keith Donohue, USCG PST
1:00 – 1:30 PM	Gold King Mine Release (CO, NM & UT)	EPA
1:30 – 2:00 PM	Texas General Land Office Toolkit	Steve Buschang, TGLO
2:00 – 2:45 PM	Herding Agents	Tim Nedwed, ExxonMobil
2:45 – 3:00 PM	Closing Remarks	Ronnie Crossland, EPA / Michael Sams, USCG
3:00 PM	Adjourn	
Adobe Connect: https://epa.connectsolutions.com/region6rrt/ Conference Call: 866-299-3188 Pin: 214-665-2292#		

Proposed Dates for next RRT Meetings

Spring

May 18-19, 2016

Fall

Nov 9-10

Calhoun County Crude Condensate Spill

Spill Date: September 24, 2015
Responsible Party: Sunline Global

Presenter: Renae DiGuardi
TCEQ Corpus Christi

Incident Details



Spill Site Location



Product Details

- Crude Oil Condensate – DOT 1267
- Color: Green
- API: 51
- Origin: Helena, Texas



Initial Response Actions

- Site Monitoring for Contaminants
- Ignition Prevention
- Roadway Cleared
- Initial Remediation



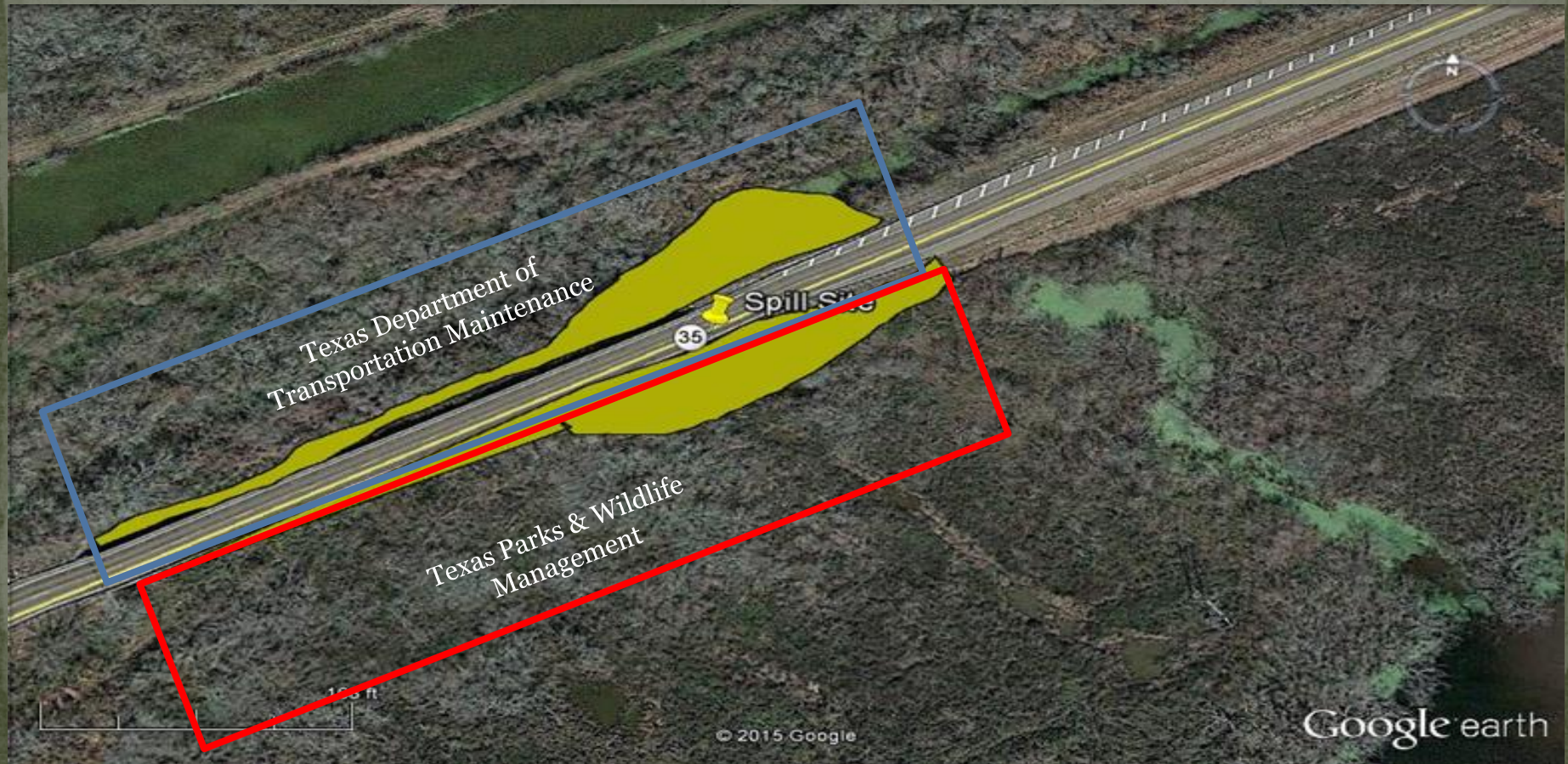
Initial Monitoring/ Sampling Data

- PID
 - Air and Soil
 - Twice Daily
- 4 Gas Meter
 - Safety
- Summa Canisters
 - Guadalupe River Residential Area
 - Hog Bayou Bridge



Jurisdictional Cooperation

- Spill Remediation Jurisdiction – TCEQ
 - TPWD Stewardship
 - TXDOT Stewardship



Mid-Phase Response Actions

- Excavation of Contaminated Soils
- Classification and Disposal of Wastes



Complications

- Contamination under State Highway 35



Roadway Soil Samples

- Three samples from roadway
- Three samples from skirt

Victoria SH 35 Spill Site	<u>TRRP PCLs</u>	Sample ID					
mg/Kg	TRRP Tier 1 Res PCL in Soil	1	2	3	4	5	6
benzene	0.026	0.024	8.1	1	2.5	0.12	0.047
ethylbenzene	7.6	0.2	11	2.6	4.5	0.22	2.8
toluene	8.2	0.428	58	10	20	1	4.6
xylene	120	3.1	147	35	60	2.9	44
TPH	TPH 1005 TRRP Screening Level						
C6-C12	65	126	4321	909	1991	<26	3973
C12-C35	200	577	7370	1948	3513	<26	12720
Samples collected by CTI on 10/5/15;					Source: Mark Norman TXDOT		

Spill Site Soil Samples

- 16 Confirmation Samples
- 1 Background Sample

Victoria SH 35 Spill Site		Sample ID								
mg/Kg	TRRP Tier 1 Res PCL in Soil	8	9	10	11	12	13	14	15	16
benzene	0.026	<.0053	<.0054	<.0054	<.0054	<.0054	<.0054	<.0054	<.0054	<.0053
ethylbenzene	7.6	<.0053	<.0054	<.0054	<.0054	<.0054	<.0054	<.0054	<.0054	<.0053
toluene	8.2	<.0053	<.0054	0.0057	<.0054	<.0054	<.0054	<.0054	<.0054	<.0053
xylene	120	<.0160	<.0160	0.025	<.0160	<.0160	<.0160	<.0160	<.0160	<.0160
TPH	TPH 1005 TRRP Screening Level									
C6-C12	65	<21	<22	<22	<22	<22	<21	<22	<21	<21
C12-C35	200	38	56	39	29	42	31	29	<21	39
Samples collected by CTI on 10/13/15								Source: Renae DiGuardi		

Projected End Phase

- Scheduling geo-probing event for delineation
- Removal of impacted areas
- Removal of select areas of highway and apron
- Confirmation Samples
- Site Restoration
- Highway Reconstruction



QUESTIONS???

“Ask me no **Questions**, I’ll tell you no **Lies!**”
– Ernest T. Bass

“Question Everything. Learn Something.
Answer Nothing!” – Euripides

“Sometimes Questions are more **Important**
than **Answers!**” – Nancy Willard

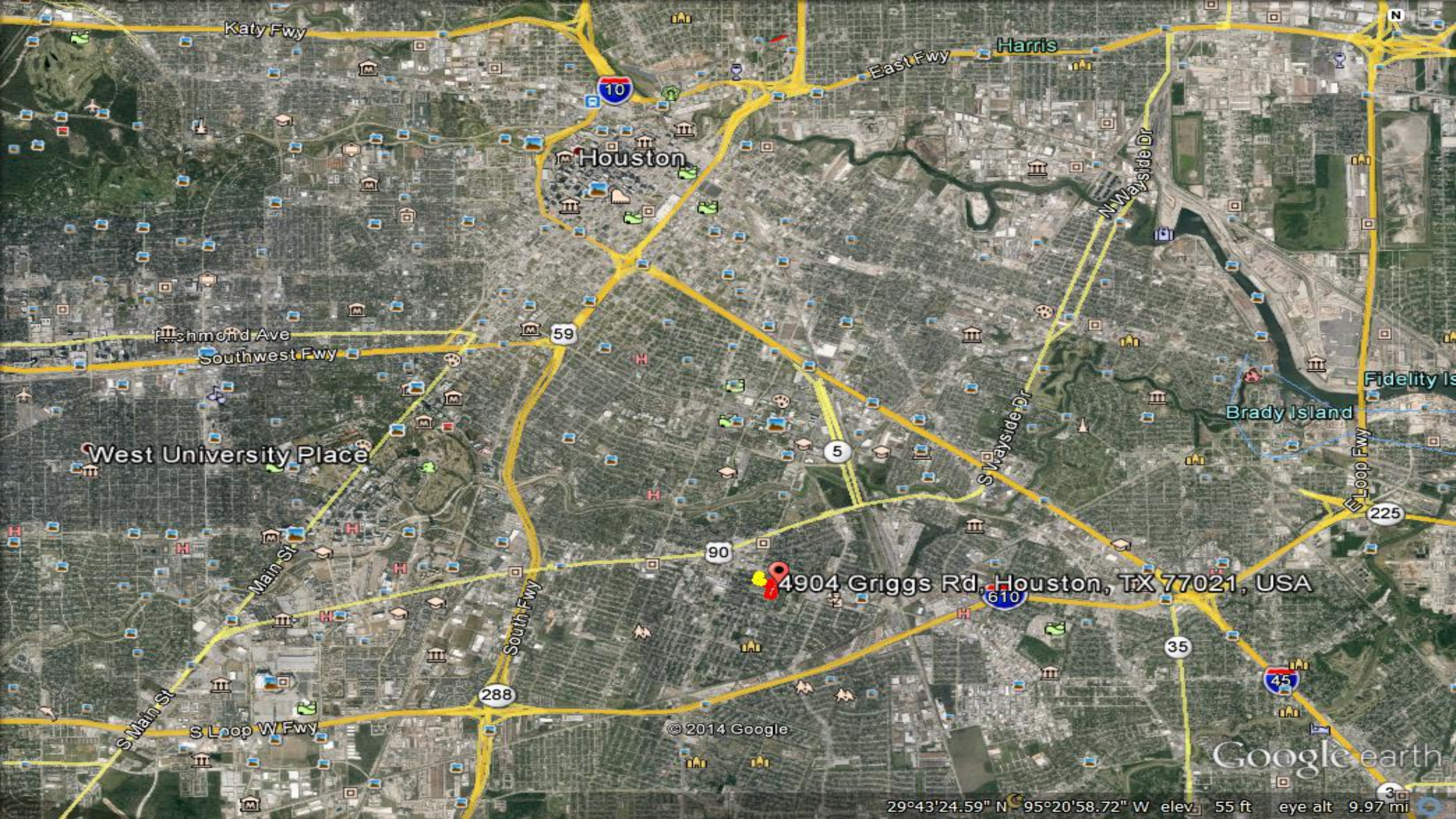
Contact Information

Email: Renaee.DiGuardi@tceq.texas.gov

Office: 361-825-3131 Cell: 361-537-7917

CES Environmental Services, Inc.

November 2015



Katy Fwy

Harris

East Fwy

Houston

N Wayside Dr

Fishmond Ave
Southwest Fwy

West University Place

Main St

South Fwy

S Wayside Dr

Loop Fwy

4904 Griggs Rd, Houston, TX 77021, USA

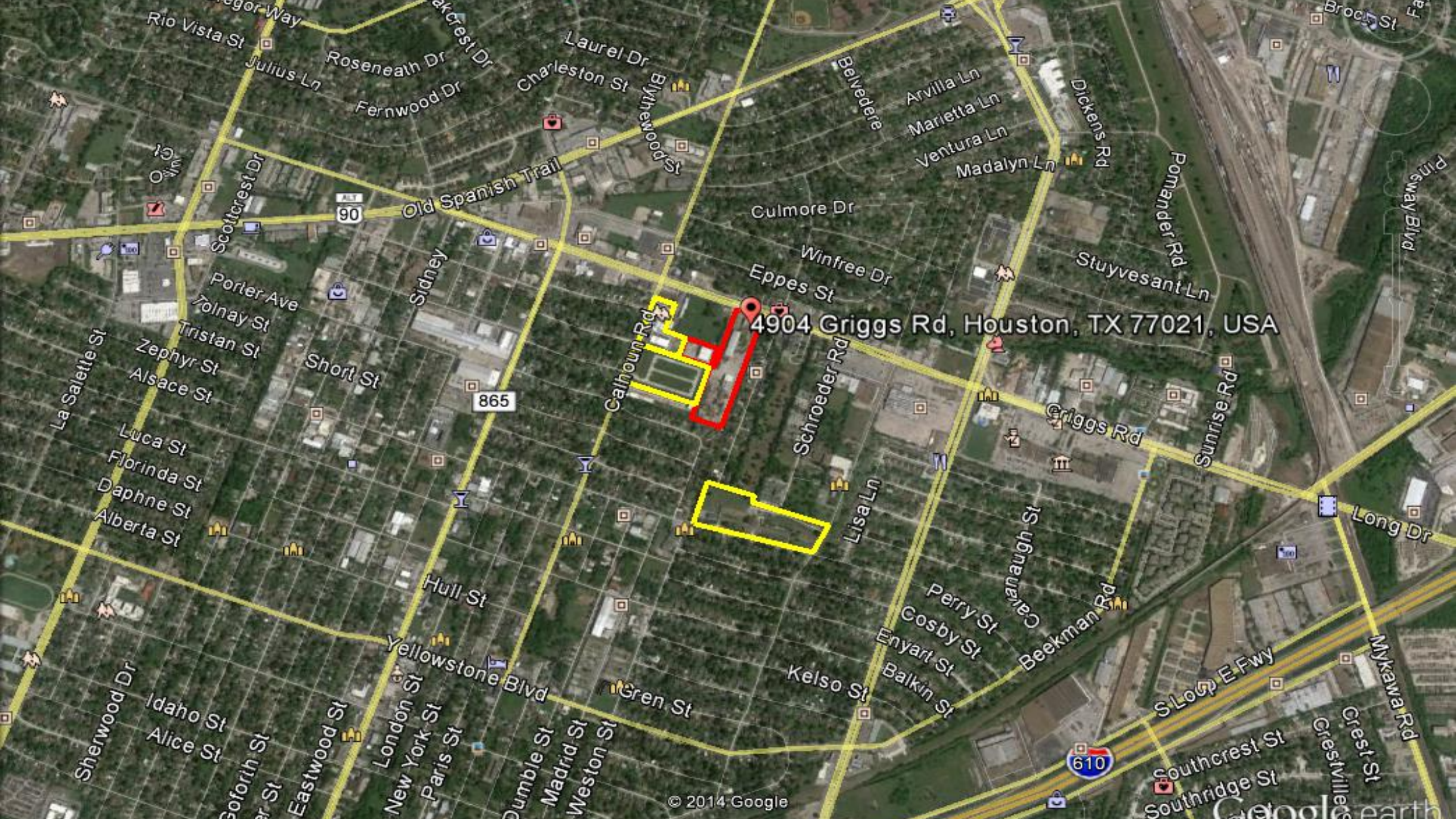
S Main St

S Loop W Fwy

© 2014 Google

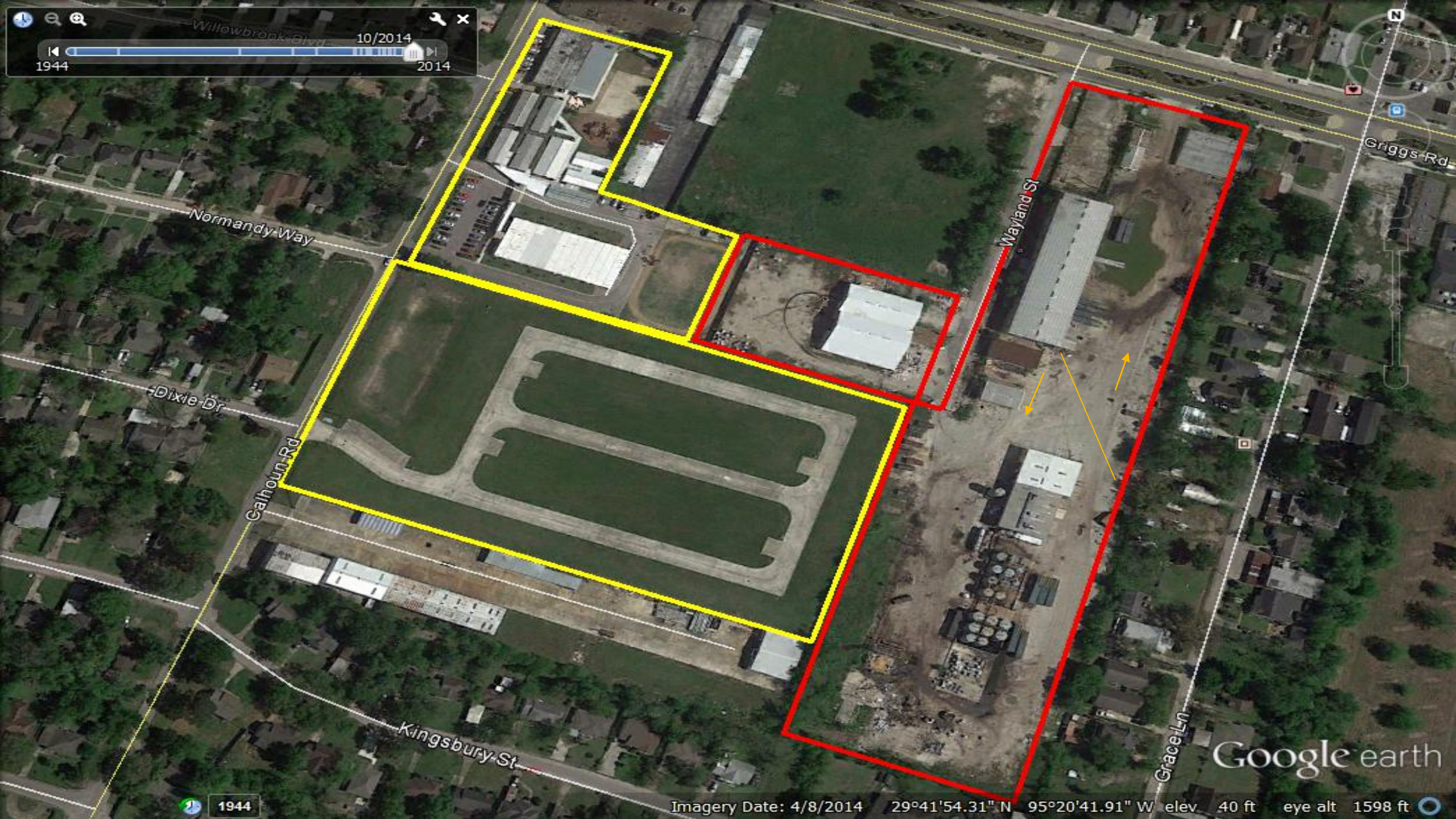
Google earth

29°43'24.59" N 95°20'58.72" W elev 55 ft eye alt 9.97 mi



4904 Griggs Rd, Houston, TX 77021, USA

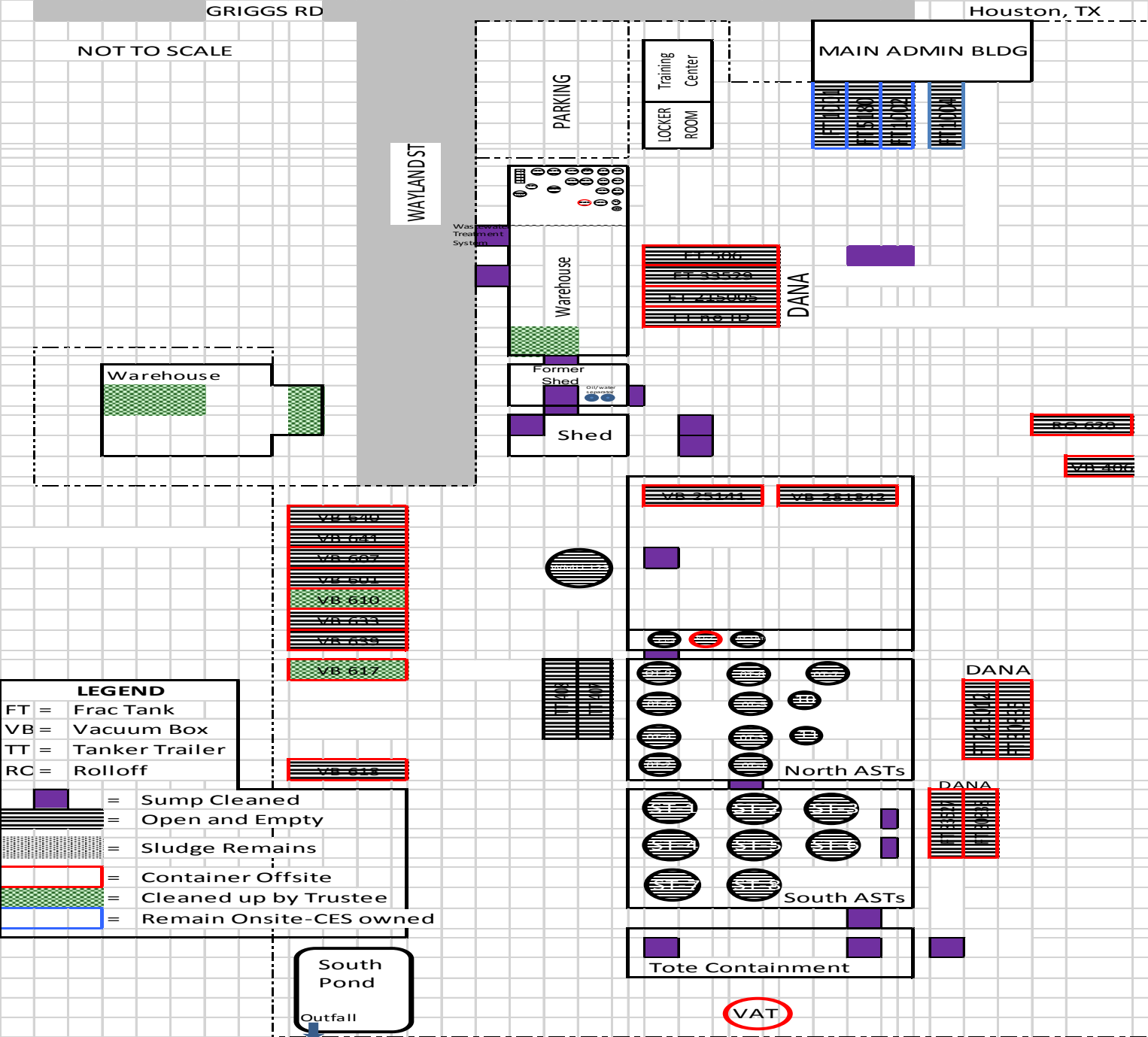
Willowbrook Dr 10/2014
1944 2014



Google earth

1944

Imagery Date: 4/8/2014 29°41'54.31" N 95°20'41.91" W elev 40 ft eye alt 1598 ft



LEGEND

FT = Frac Tank
VB = Vacuum Box
TT = Tanker Trailer
RC = Rolloff

= Sump Cleaned
 = Open and Empty
 = Sludge Remains
 = Container Offsite
 = Cleaned up by Trustee
 = Remain Onsite-CES owned















Original
Vacuum Boxes
(12VB and 1
RO) – All
Removed









Tank Trailers (2) – Material Removed



Frac Tanks (12) –
Material
removed/disposed.
8 returned to
rental companies.
4 CES left onsite.
to disposal.



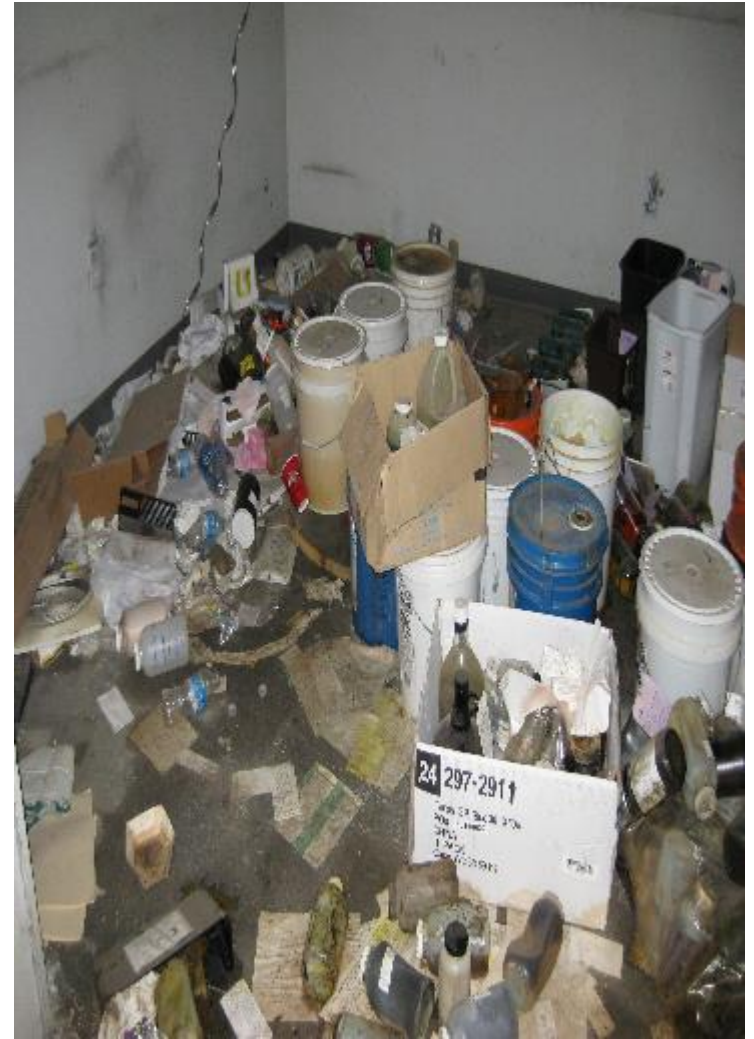
ASTs (23) –
Material
removed and
disposed.



Totes/Drums/Misc
Containers (324):
Empties (159);
Contents (165) - field
sampled, bulked,
disposed



Lab Pack
(completed by
Trustee/Estate
at EPA/TCEQ
request)



Vats (4) – 4
vats bulked
into existing
wastestreams



Asphalt/Concrete
Areas: Areas
cleaned and
waste disposed.



Wastewater
Treatment Tanks
(20): Materials
removed and
disposed.



Sumps/Trenches/Oil-Water Separator (22):
waste removed and disposed and cleaned







Coordination: Citizens NGOs Media

- 2 Public Meetings
- Personal Contacts with Citizens
- Personal Contacts with Schools (Hartsfield Elementary, Beatrice Mayes Academy)
- Texas Organizing Project
- Air Alliance Houston
- Texas Low Income Housing Information Service
- University of Houston Law Students
- Texas Southern University Environmental Policy Students
- Local Media (Ch 2, 11, 39)
- Houston Public Media (NPR)

Coordination
Elected Officials
City Offices
State Agencies
Federal Agencies

- City Council Member – Dwight Boykins
- U.S. Representative – Shelia Jackson Lee
- Houston Police and Fire Department
- Houston Health and Human Services
- Houston Public Works and Engineering
- Texas Department of State Health Services
- Texas Commission on Environmental Quality
- Agency for Toxic Substances and Disease Registry

Waste Disposal

	Haz Liquids (gal)	Haz Solids (#)	Haz Debris (yd3)	NH Liquids (gal)	NH Solids (#)	NH Debris (yd3)
EPA	120,563	226,910	90	71,596	9,780	120
TCEQ	18,960	371,340	50			
TOTALS	139,523	598,250	140	71,596	9,780	120

Estimated Costs (8/30/15)

- EPA: \$ 1,924,344
- TCEQ: \$ 423,848
- Additional Assessment/Cleanup being done by PRP Group under TCEQ Voluntary Cleanup Program

An aerial photograph of an industrial or waste management site. A large, dense pile of blue drums is the central focus, surrounded by various industrial buildings, some with corrugated metal roofs. A road runs horizontally across the middle of the image, with a semi-truck visible on the left. The background shows more industrial structures and some greenery.

Ector Drum Removal

The site conducted drum recycling operations with drums that were received “RCRA Empty,” from oilfield industrial sources that included primarily crude oil treatment fluids, corrosive chemicals, and lubrication oils.

Drums were washed with a mild caustic solution, triple-rinsed, dried, air pressure tested, and painted for eventual resale. The caustic rinsing solution was recycled until it became spent.









Drum Segregation



09/11/2015 12:40 PM

Hazcatting



09/19/2015 08:48 AM

Bulking



10/06/2015 08:46 AM

Disposal



Drum Shredder









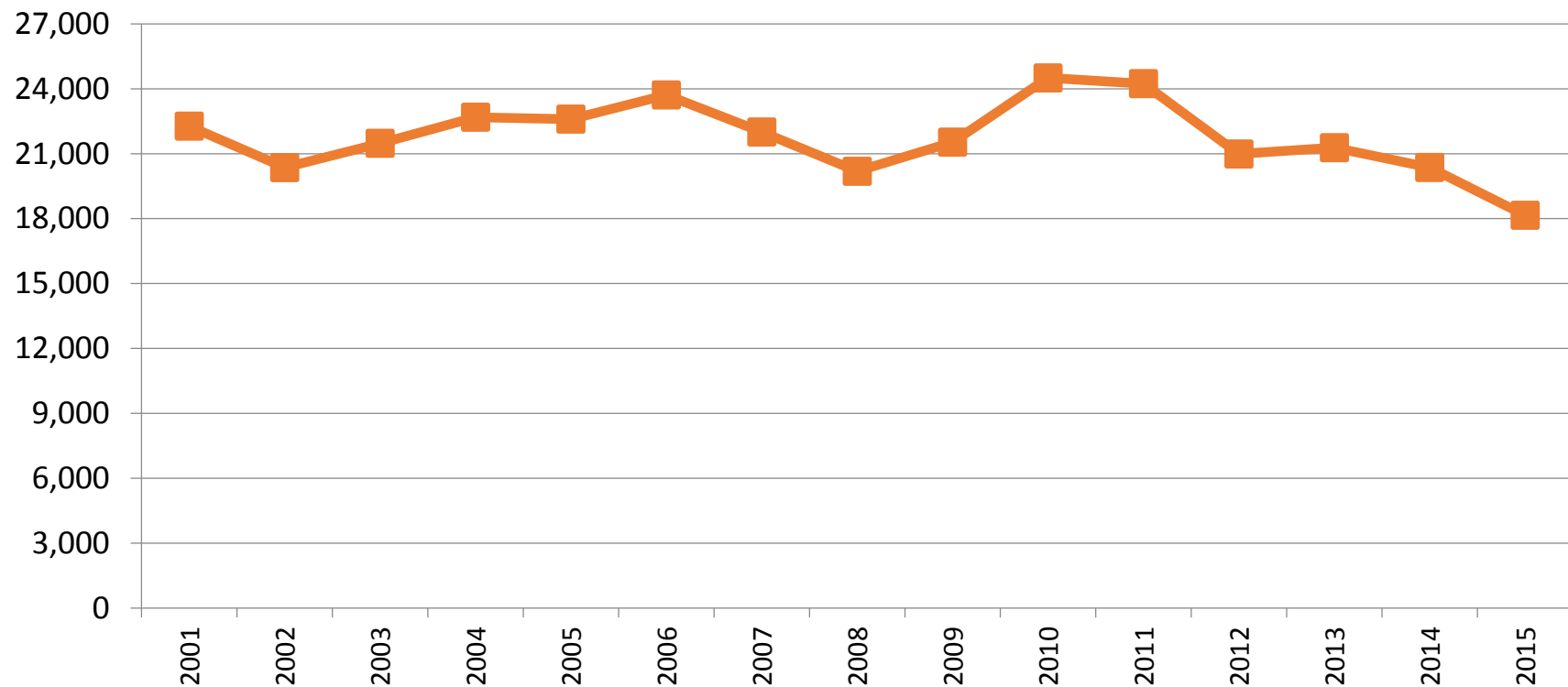


EPA National Accidental Release Information :

FY 2011 – 2015

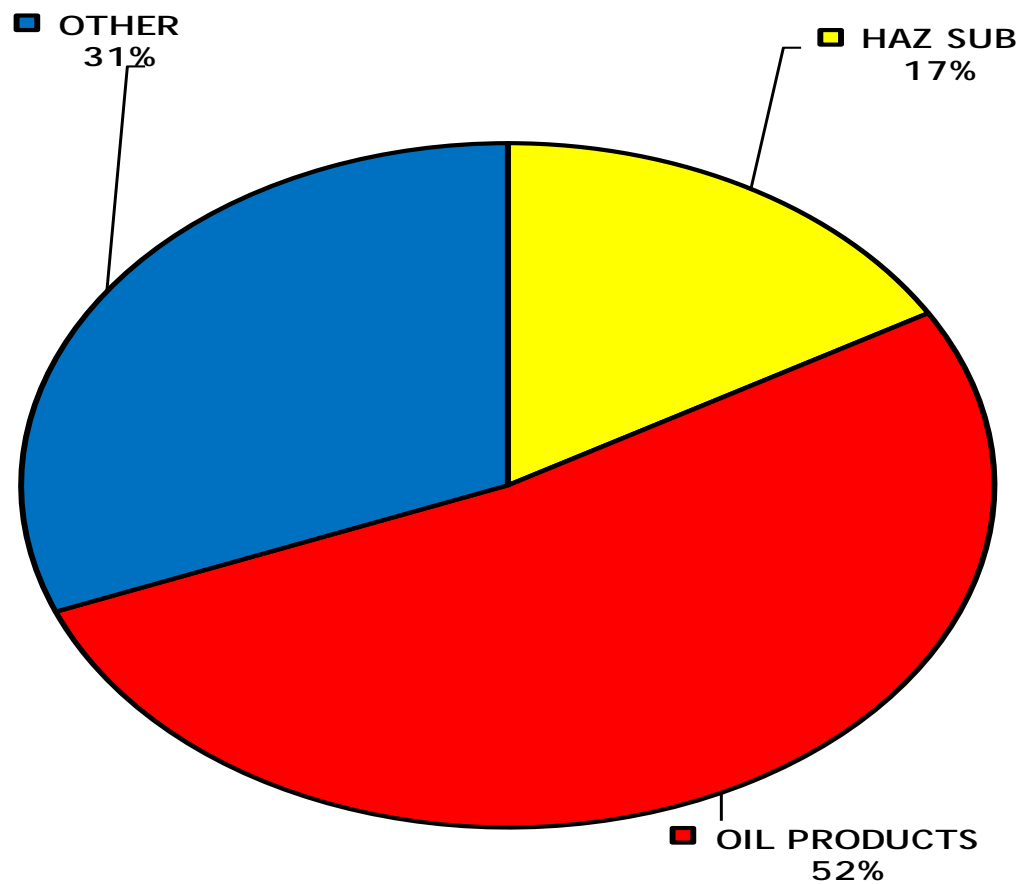
Over Thirty Years of Collecting Release / Spill Information

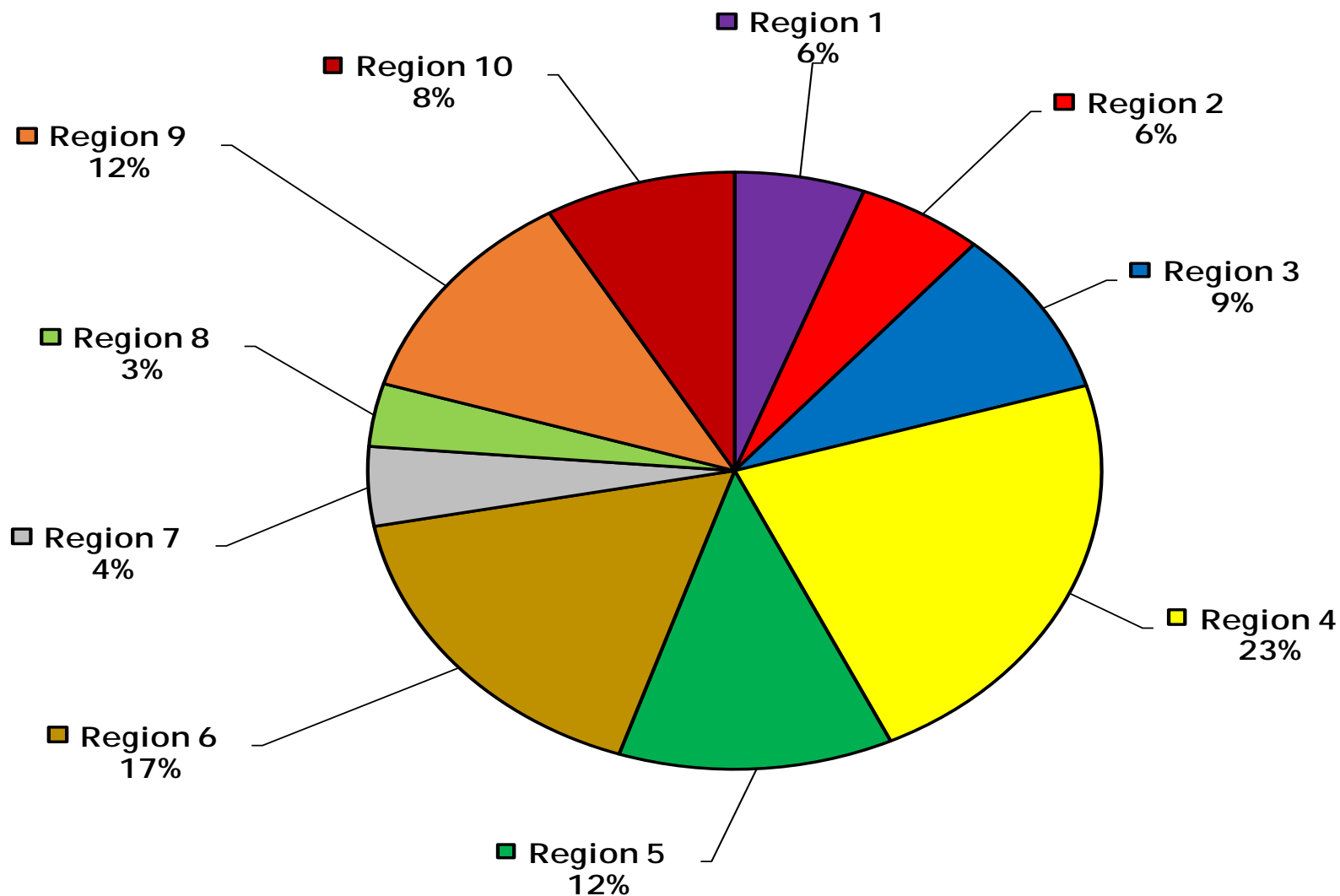
NRC Notifications to EPA (2011 -- 2015)

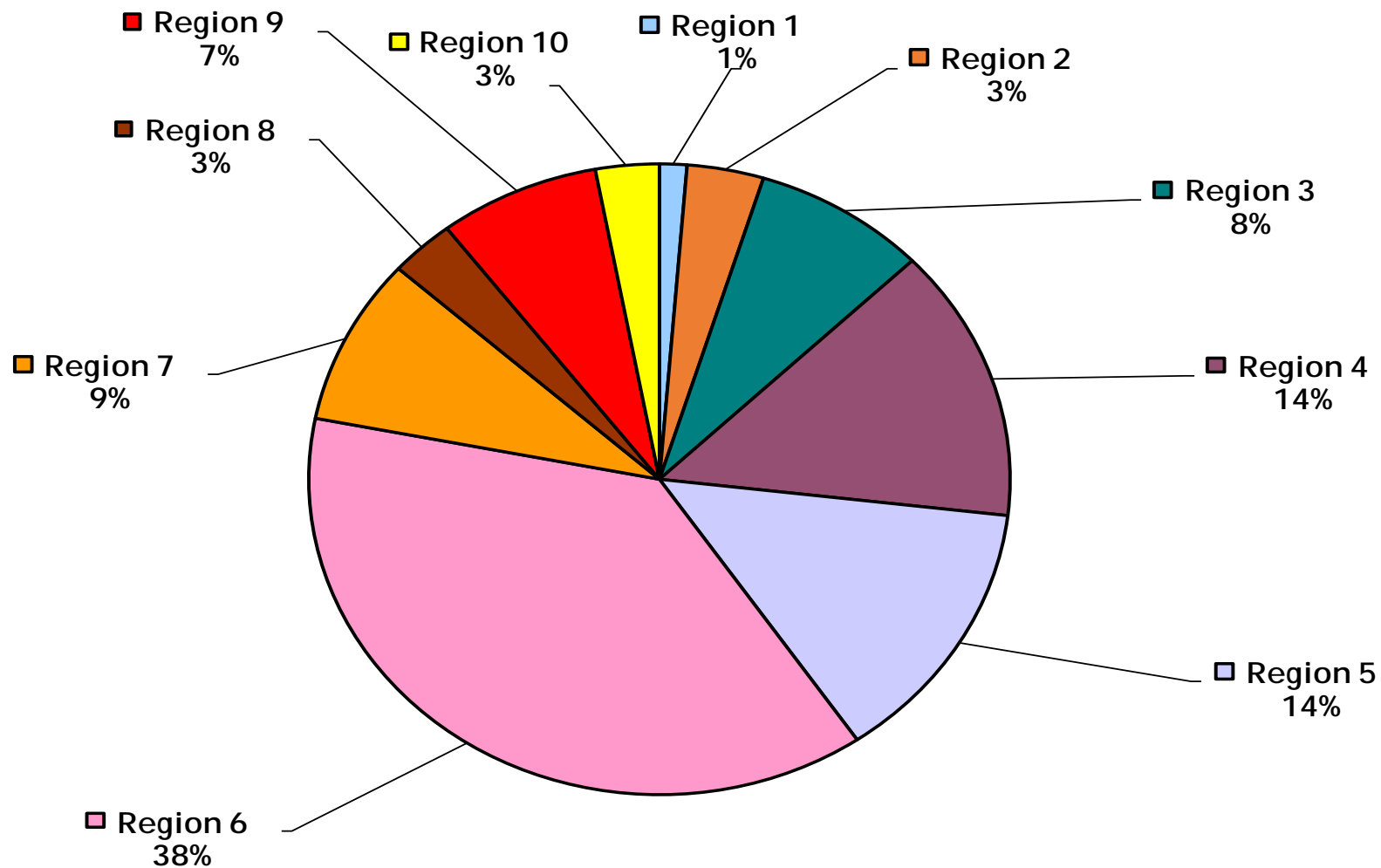


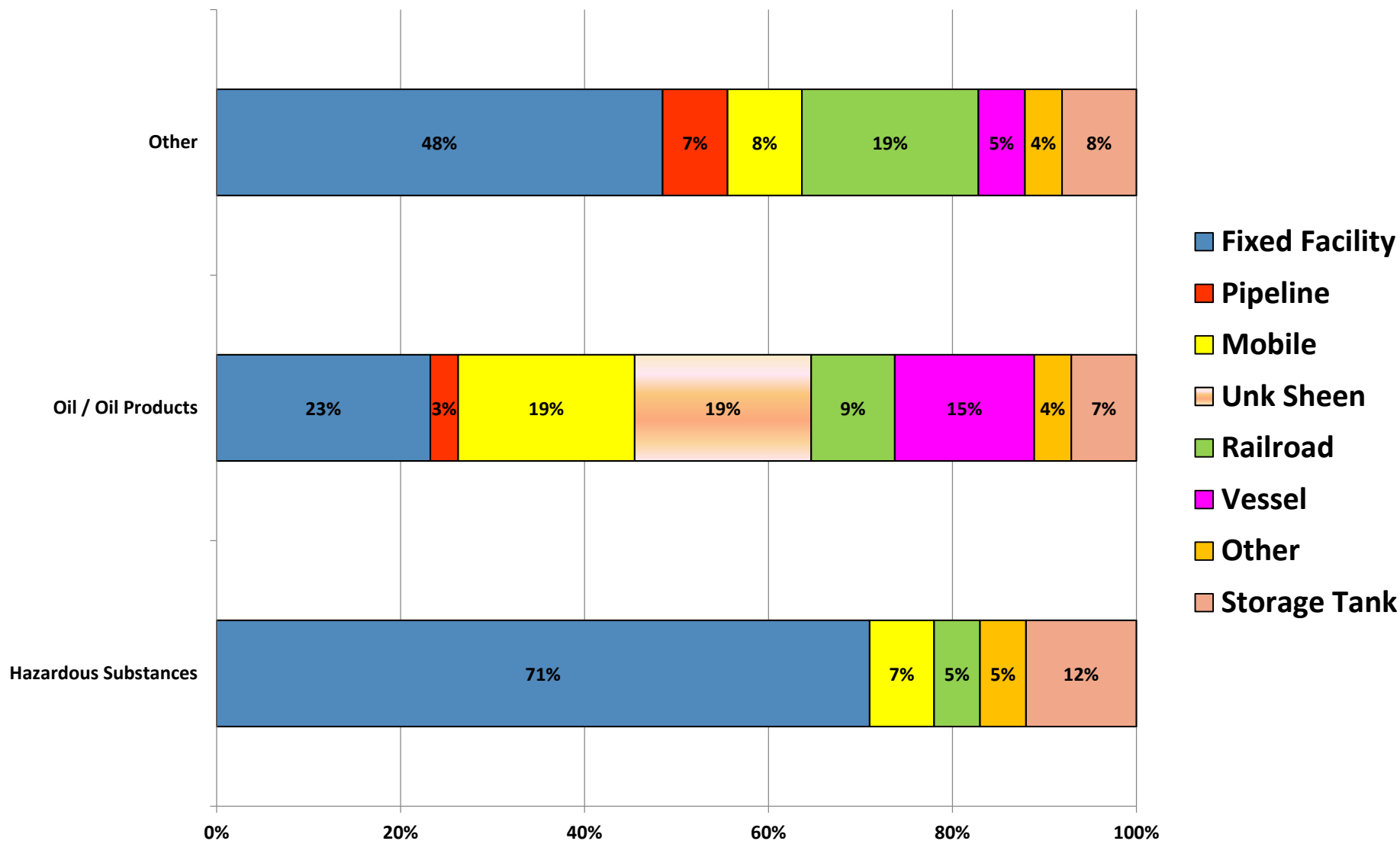
2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
22,271	20,357	21,478	22,686	22,596	23,716	22,003	20,190	21,532	24,503	24,235	20,988	21280	20361	18154

HAZ SUB: CERCLA Hazardous Substances & EPCRA Extremely Hazardous Substances

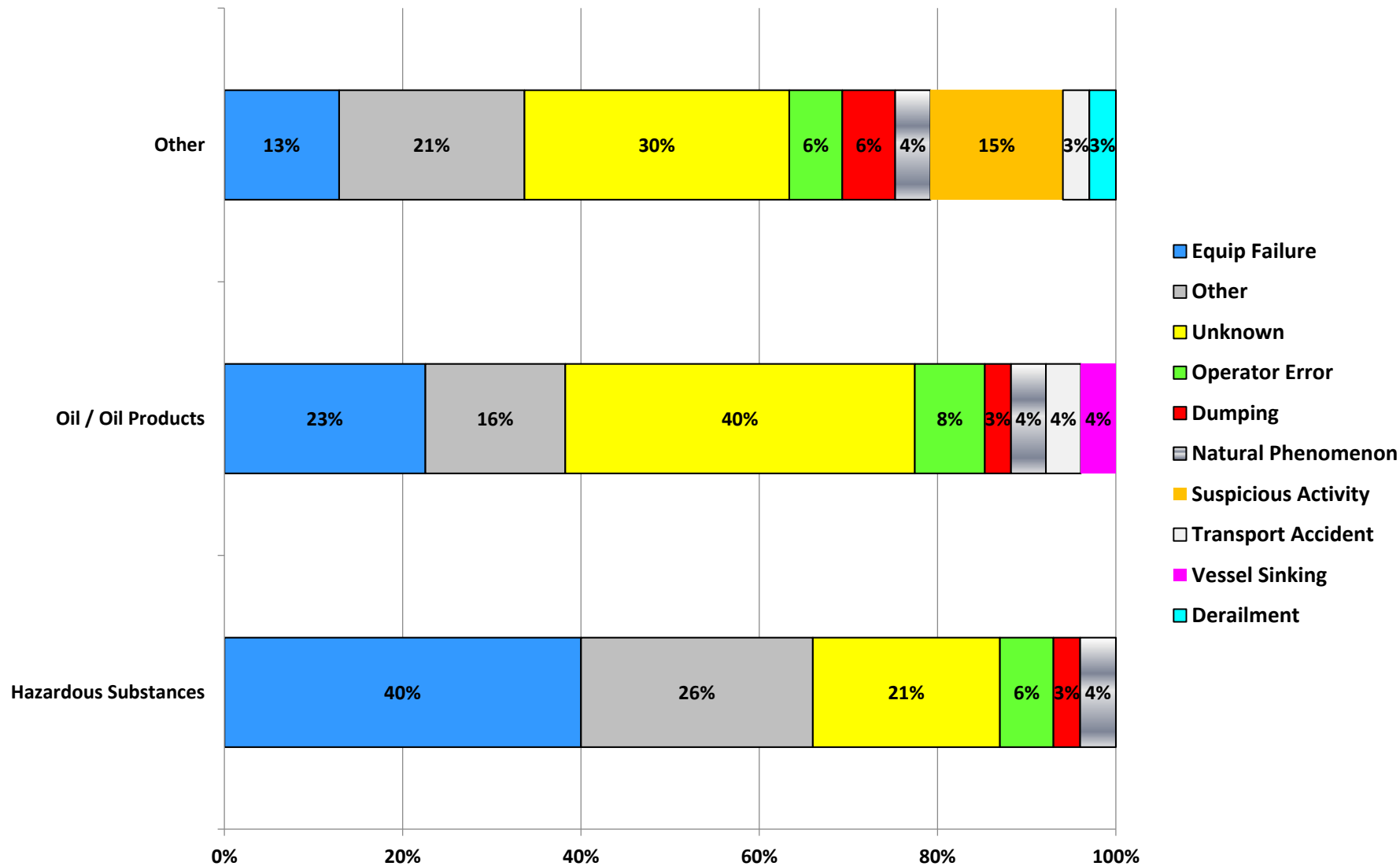








NRC Notifications to EPA -- Cause of Release (2011 - 2015)



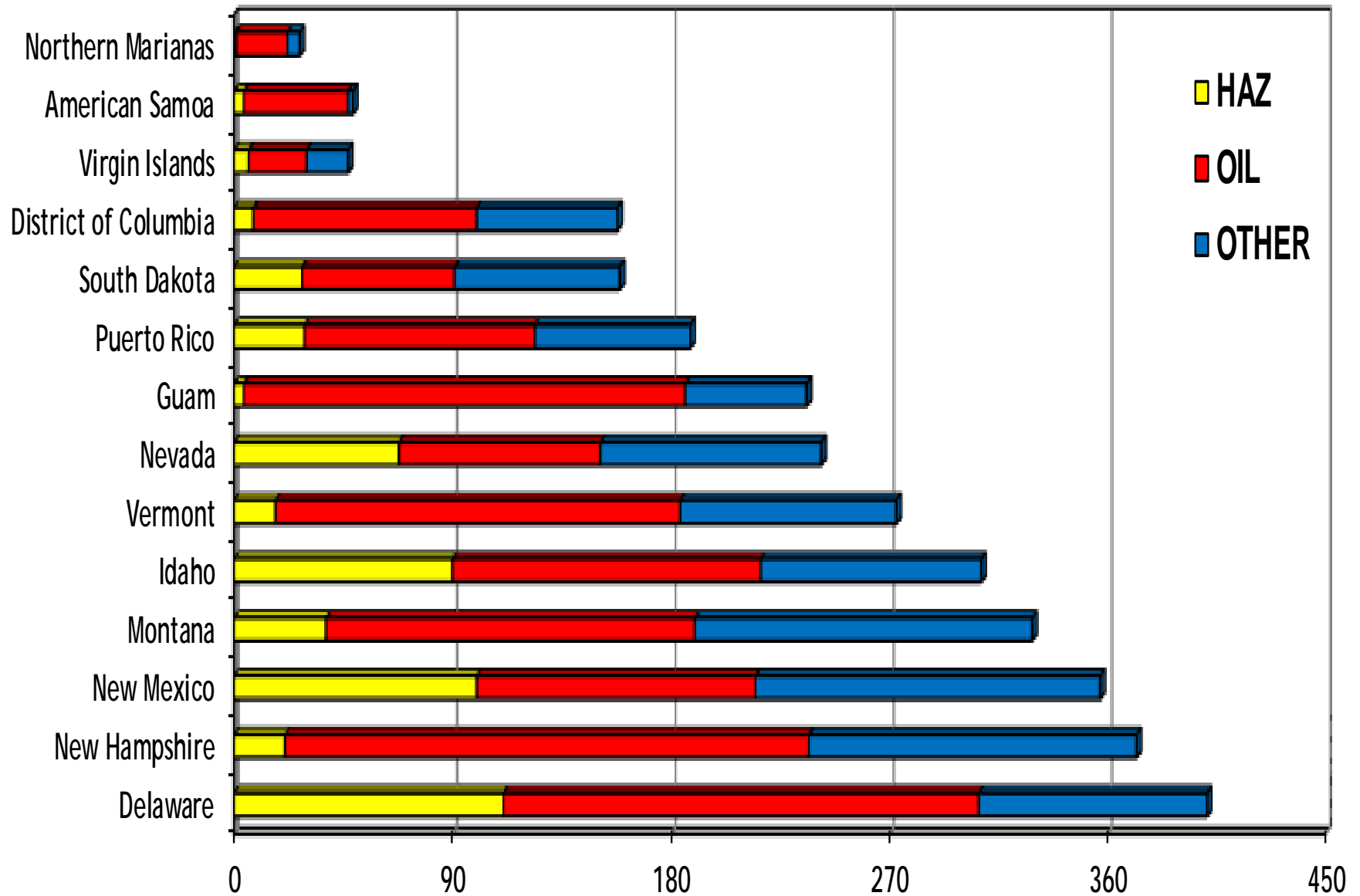
11/15/2015

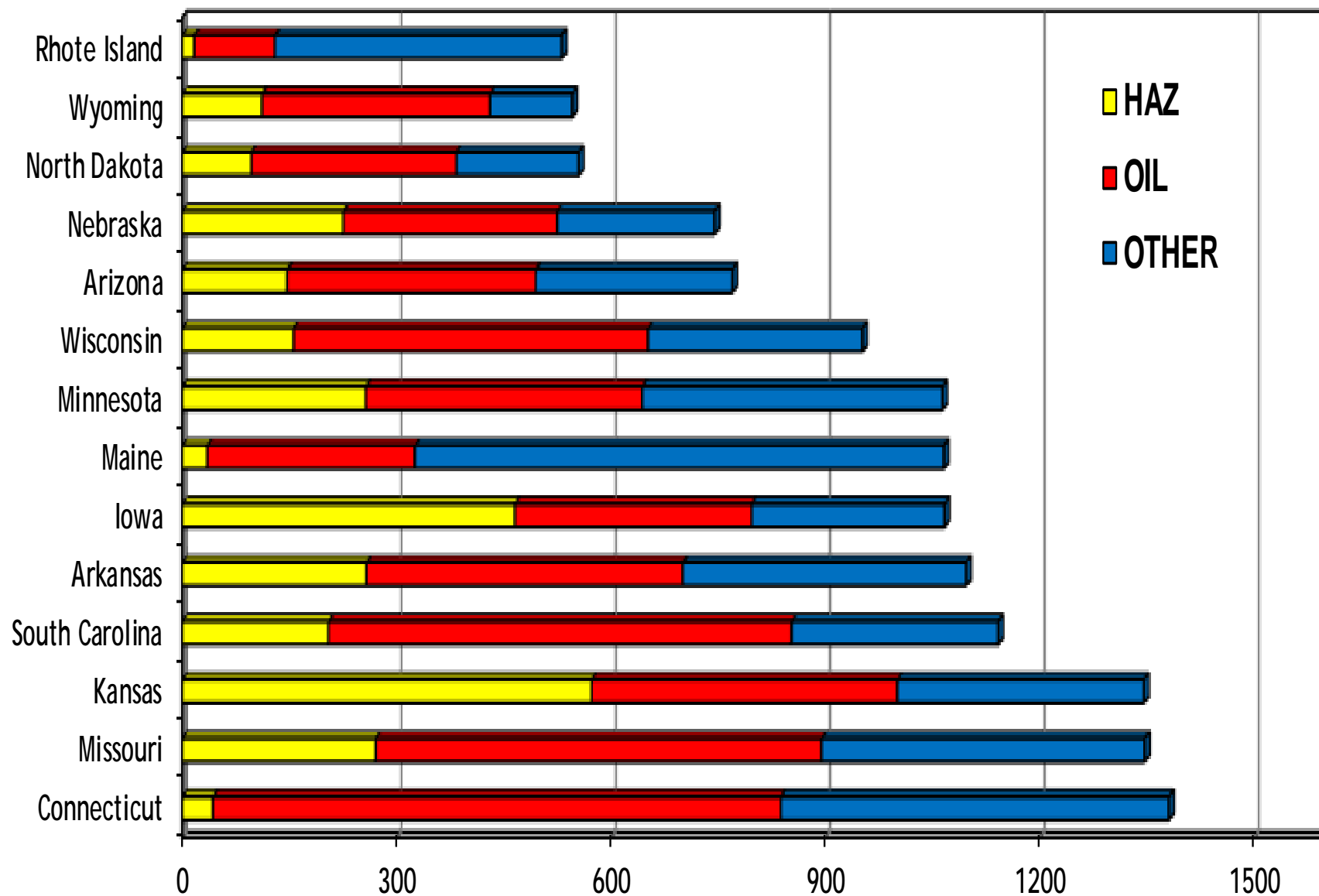
Other Causes may include: aircraft crash, continuous, terrorist

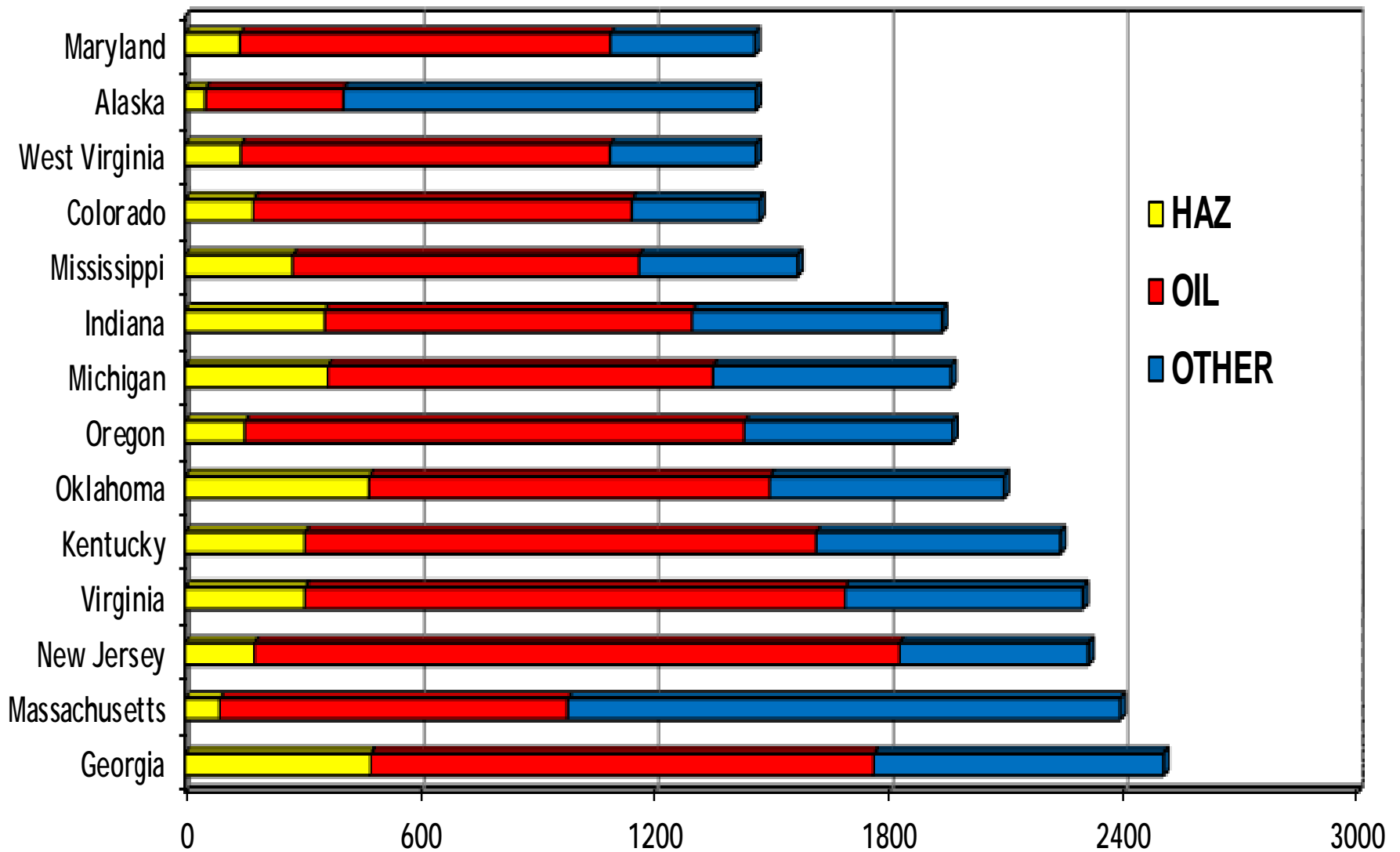
Since 2011, approximately 3.5% of all release reports involved a significant event (death, injury, community evacuation, evacuation of a facility, shelter-in-place)

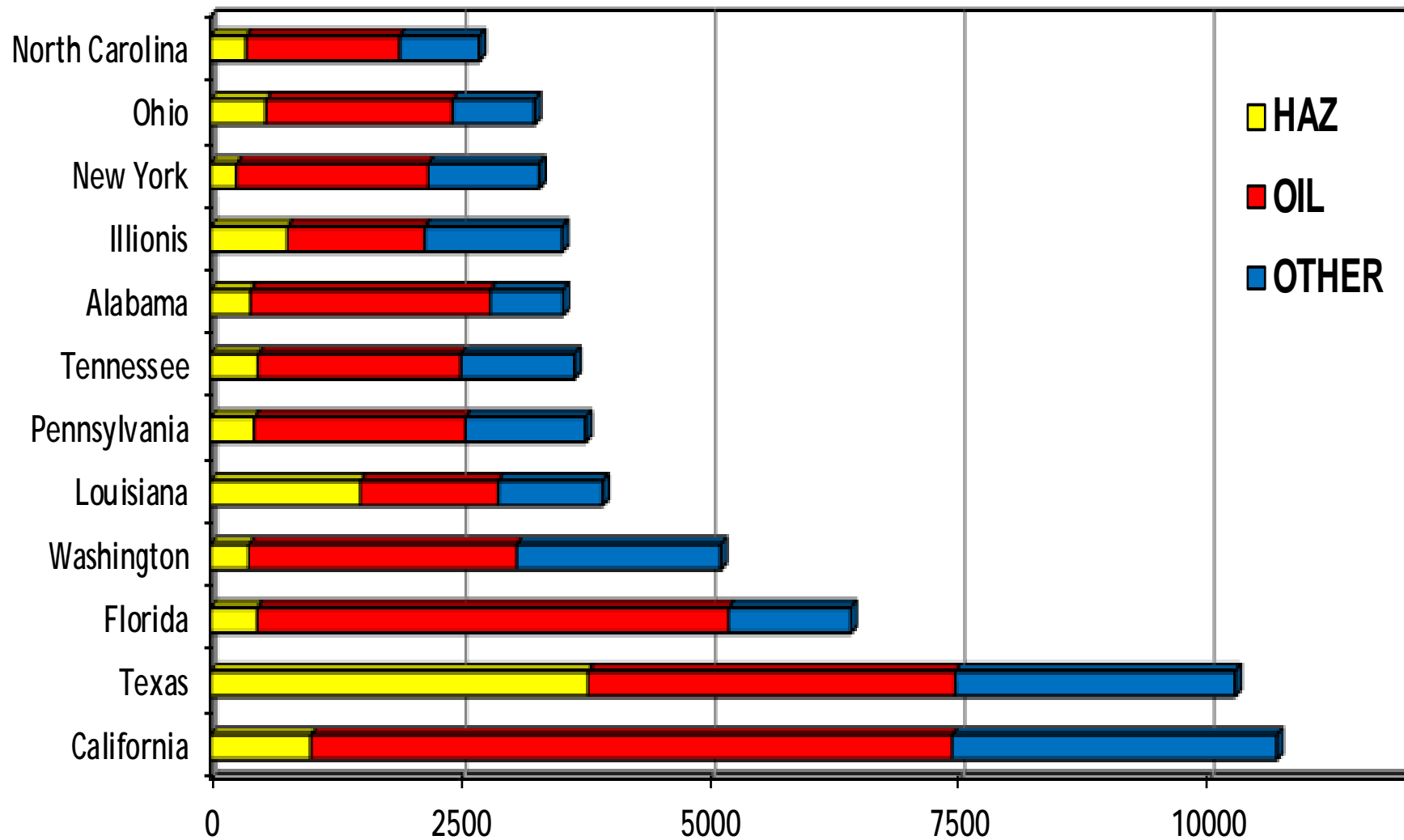
Deaths, injuries, and evacuations may not be directly due to exposure, but as a consequence of the accident resulting in the release

Since 2011, statistically there is approximately five (4-5) shelter-in-places or evacuations of a community (whole or part) or of a facility due to a hazardous substance, oil, or other material incident somewhere, on a weekly basis





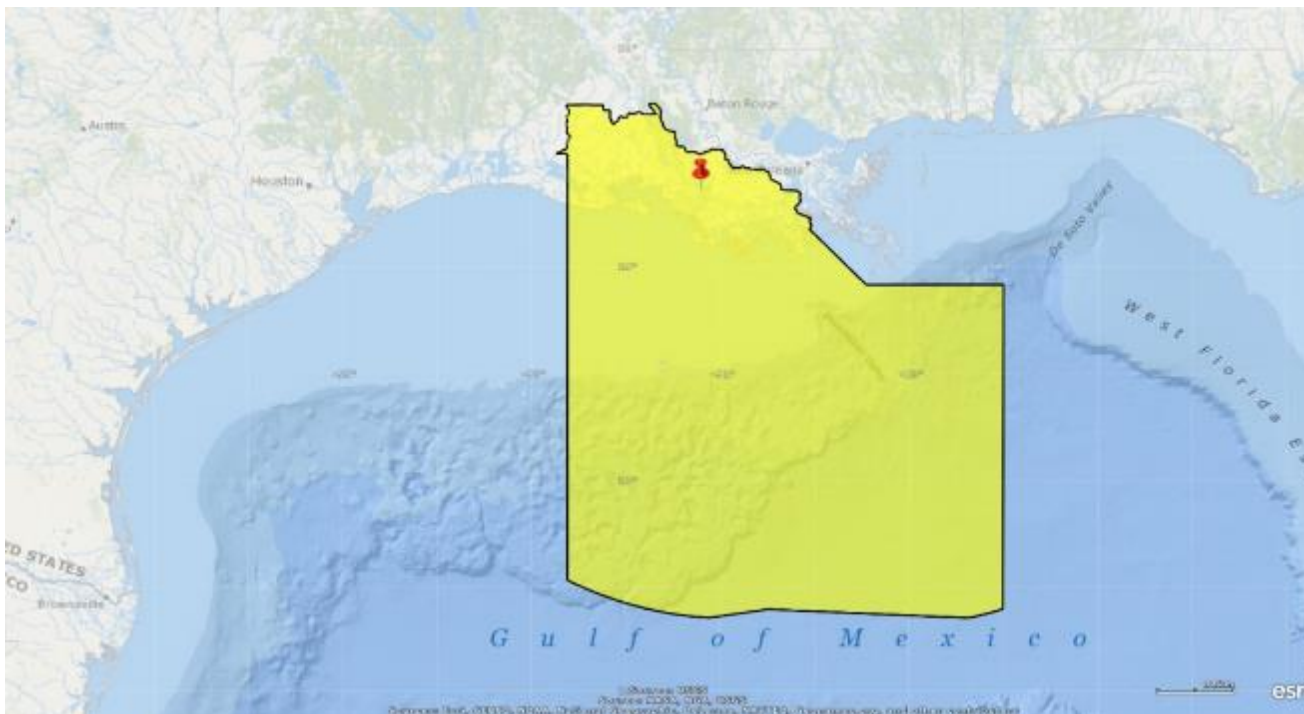






MSU Morgan City

Captain David McClellan
MSU Commanding Officer



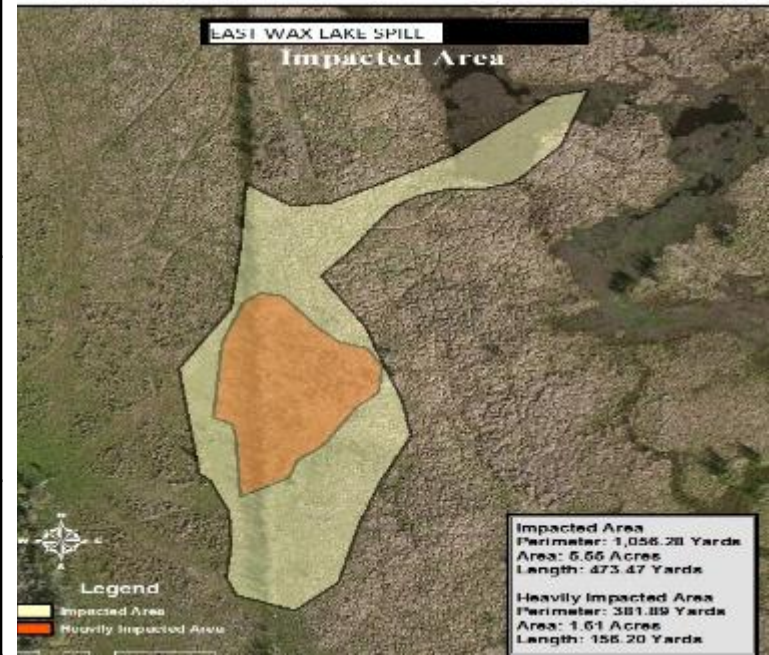
NRC Notifications	RRT Activations	Federal Projects	CERCLA Projects
574	0 Surface Washing Agents 1 In-situ Burn 0 Dispersants	3	0



Incident Name



RRT Activation:	Consultation
Type and amount of product spilled:	25BBLS Crude Oil Condensate 100BBLS Produced Water
Cause of spill:	Leak in crude oil condensate line.
Date of spill:	14 July 2015
Responsible Party:	Texas Petroleum Investment Company
Key operational activities:	Initial oil Recovery efforts. Establishment of Incident Command. RRT consultations. In-situ burn, with air monitoring. Remedial actions with continued monitoring.
Major lessons learned:	RRT consultation process for in-situ burns. Oil recovery methods when dealing with flotant.
Lead Coordinator Contact Information:	MSU Morgan City, FOSC





Incident Name



RRT Activation:	N/A
Type and amount of product spilled:	Diesel fuel discharged into water 1,500 gallons. Total 8,000 gallons of fuel and water recovered.
Cause of spill:	Vessel Sinking
Date of spill:	30 August 2015
Responsible Party:	F/V Capt Richie Rich
Key operational activities:	Opening the OSLTF. Monitoring contractor operations.
Major lessons learned:	Location of vessel made coordination and recovery efforts difficult.
Lead Coordinator Contact Information:	MSU Morgan City, FOSC





MSU Morgan City

Training

Description	Dates
FOSCR	24-4 AUG/SEPT
SCAT	20-22 OCT
Oil Spill Control	24-28 AUG
ICS	SEPT, MAY

Exercises/Workshops

Description	Dates
Joint GIUE w/EPA	19 MAY
EPA Workshop	10 JUN
BSEE GIUE	09 SEPT
BP WCD Drill	29 OCT

Federal, state, and local planning and coordination efforts

Description	Dates
Area Committee	05 OCT
Clean Gulf	10-12 NOV

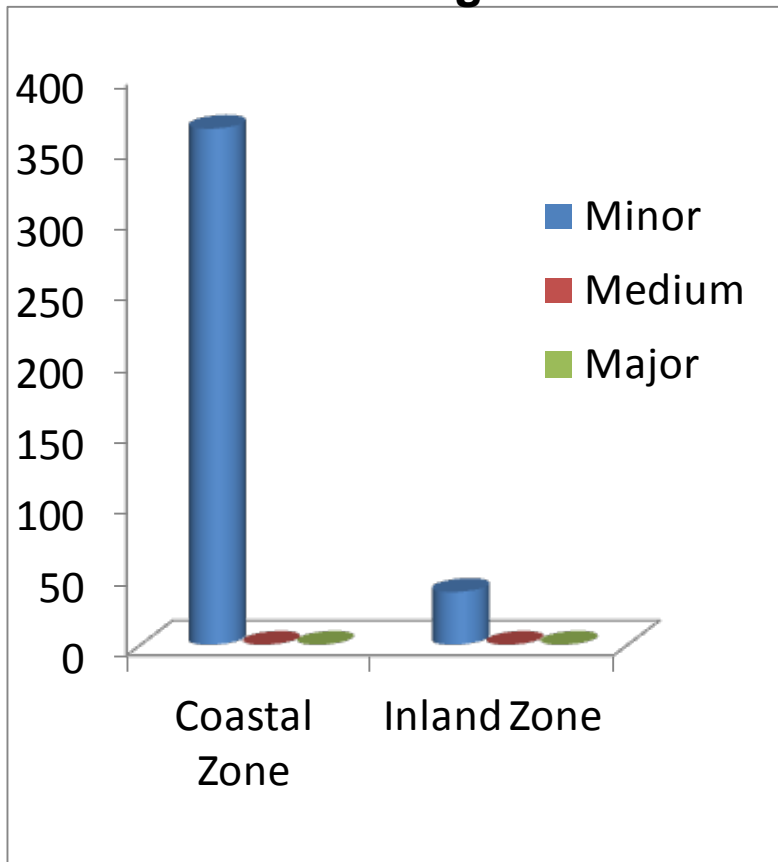


Optional

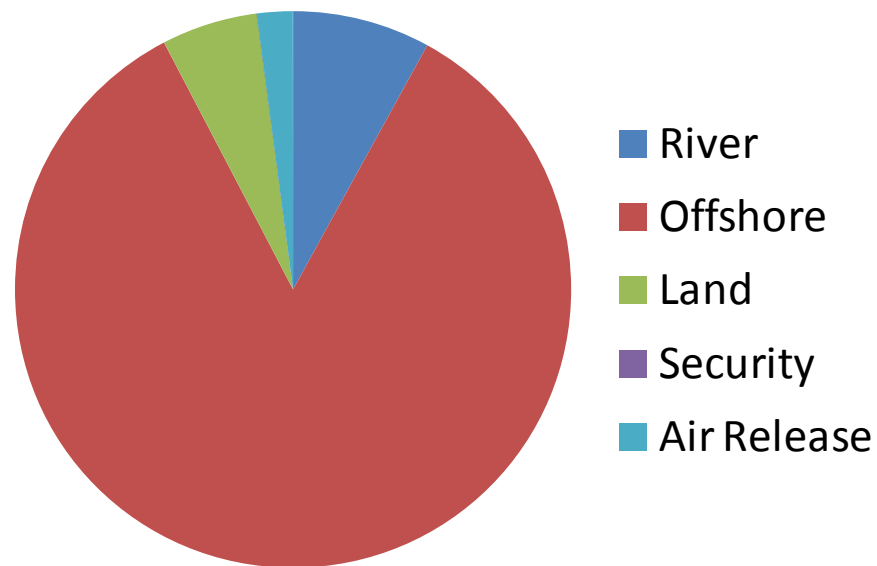


NRC Notifications

Oil Discharges



Breakdown of Reports





MSU Port Arthur & Lake Charles



Captain Randal Ogrydziak, CDR Monica Rochester



NRC Notifications	RRT Activations	Federal Projects	CERCLA Projects
208	00 Surface Washing Agents 00 In-situ Burns 00 Dispersants	02	00



M/V STEVEN L. BENNETT



RRT Activation:	RRT not activated
Type and amount of product spilled:	Approx. 10 gallon of HFO was discharged at the Port of Orange.
Cause of spill:	Fracture in fuel tank
Date of spill:	July 29 th , 2015
Responsible Party:	M/V Steven L. Bennett
Key operational activities:	Detailed tracing of path of discharge back to fracture in HFO tank. Cleaning of sewage tank and hulls. Decision to leave stain on Port's dock.
Major lessons learned:	Multi-faceted incident required the skill-sets of both pollution responders and vessel inspectors to provide a thorough investigation.
Lead Coordinator Contact Information:	MST2 Dane Grulkey





UTV LOUISE



RRT Activation:	RRT not activated
Type and amount of product spilled:	Approx. 15 gallons of bilge oil discharged into the Sabine Channel.
Cause of spill:	Capsizing and subsequent salvage
Date of spill:	August 21 st , 2015
Responsible Party:	Lydia-Ann Channel Fleet
Key operational activities:	Channel closure; prevented vessel from sinking in center of channel. Follow-up activities and salvage operation were monitored by both USCG and TGLO
Major lessons learned:	USCG Vessel Traffic Service proved to be invaluable, as they facilitated the safe transit of large vessel traffic while minimizing the disruption of salvage operations.
Lead Coordinator Contact Information:	MST2 Kira Dodson





Apollo Energy Discharge



RRT Activation:	RRT not activated
Type and amount of product spilled:	Approx. 1.5 barrels of crude oil discharged into Johnson's Bayou, LA.
Cause of spill:	Pin-hole in pump-jack product line.
Date of spill:	September 15 th , 2015
Responsible Party:	Apollo Energy
Key operational activities:	Booming strategies developed to protect wildlife refuge. Verifying reported discharge was actually point-source. Monitored potential well leak.
Major lessons learned:	Working relationships with our area stakeholders and trustees is paramount, given the proximity of the incident to protected state and federal land.
Lead Coordinator Contact Information:	MST2 Dane Grulkey. USCG and LA DNR monitored response and follow-up actions.





CG-Initiated Unannounced Equipment Deployment Exercises



RRT Activation:	RRT not activated
Date:	Various
Responsible Parties:	USCG, TGLO, LOSCO, and LADEQ
Key operational activities:	Conducted four successful unannounced equipment exercises to test local Facility Response Plans (FRPs).
Major lessons learned:	Personnel Safety and Safe Working Practices: One member supporting the drill suffered injury and major vehicle damage after leaving the exercise due to an un-attentive drive.
Lead Coordinator Contact Information:	LT Orion Bloom CWO Matt Tilimon MSTC Travis Hutton MST2 Kira Dodson





MSU Port Arthur



Training

Description	Dates
HAZWOPER	11/2015

Exercises/Workshops

Description	Dates
UCO Workshop	12/2015
Phillips 66 TTX	10/2015

Federal, state, and local planning and coordination efforts

Description	Dates
Area Committee	01/2016



100 Barrel Pipeline Discharge



RRT Activation:	RRT not activated
Type and amount of product spilled:	Approximately 100 barrels of oil were discharged into the environment
Cause of spill:	Pipeline rupture
Date of spill:	June 11 th , 2015
Responsible Party:	CITGO Oil, Carlyss, LA
Key operational activities:	Oil did not impact navigable waterway due to the facility's quick response. Five physical barriers were employed to prevent the migration of oil.
Major lessons learned:	Impact to the surrounding vegetation and habitat required LADEQ involvement for potential NRDA oversight and management. Underflow dams prevented spread of oil into small creek that feeds into the Calcasieu River
Lead Coordinator Contact Information:	MST3 Chelsea Speer/LT Orion Bloom





15 Barrel Discharge



RRT Activation:	RRT not activated
Date:	October 22 nd , 2015
Responsible Parties:	LeBeouf Bros. Towing
Key operational activities:	Containment and recovery of approximately 15 barrels of oil. Oil was wind-driven into a small cut with minimal access. Low-pressure flushing was required.
Major lessons learned:	Impending inclement weather necessitated a rapid yet thorough response to prevent spread of oil. Site was broken down into four divisions, each with its own endpoints. Mechanical and passive recovery were utilized within the impacted area.
Lead Coordinator Contact Information:	LT Orion Bloom/MSTC Travis Hutton





Sensitive Site Identification /GRP Development within AOR

RRT Activation:	RRT not activated
Date:	Workshops: Various over the next three months Field work: Ongoing
Responsible Parties:	USCG, LOSCO, U.S. Fish & Wildlife and LA Fish & Wildlife
Key operational activities:	Identify sensitive sites of particular interest and determine booming/response strategies at those sites.
Major lessons learned:	MSU Lake Charles AOR has been broken into six separate zones, centering around the areas Wildlife Refuges.
Lead Coordinator Contact Information:	Workshops : LT Orion Bloom Field work: MST1 Joseph Torcivia & MST2 George Fox





BSSE-Initiated Unannounced Exercises



RRT Activation:	RRT not activated
Dates:	July 9 th , 2015 and July 15 th , 2015
Responsible Parties:	Bureau of Safety and Environmental Enforcement (BSEE)
Key operational activities:	Assisted BSEE in conducting two unannounced exercises for off-shore operators in the Lake Charles AOR.
Major lessons learned:	Personnel safety issues identified early with some accompanying support personnel not being familiar with OSRV operations.
Lead Coordinator Contact Information:	MSTC Travis Hutton





MSU Lake Charles



Training

Description	Dates
ICS	01/2016
ICS	02/2016

Exercises/Workshops

Description	Dates
CITGO PREP	10/2015
Hackberry SPR	04/2016
Vigilant Guard	04/2016

Federal, state, and local planning and coordination efforts

Description	Dates
GRP Workshops	11/2015 12/2015 01/2016



U.S. Coast Guard District 8

Federal On-Scene Coordinator (FOSC) Reports







Sector Corpus Christi

Captain Tony Hahn
Sector Commander



NRC Notifications	RRT Activations	Federal Projects	CERCLA Projects
226	0 Surface Washing Agents 0 In-situ Burns 0 Dispersants	02	02



Tarmageddon



RRT Activation:	No
Type and amount of product spilled:	Tarballs (varied from fresh to weathered) 9900 gallons total
Cause of spill:	Believed to be natural seep, investigated all sources, nothing discovered
Date of spill:	May 20 – Jun 25 2015
Responsible Party:	Potential Natural Seep/unknown source
Key operational activities:	CG/GLO daily survey of beaches followed by priority spot cleanups
Major lessons learned:	This annual event was better managed by keeping the OSLTF open for extended durations. It was key to a more effective & responsive effort
Lead Coordinator Contact Information:	LCDR Patrick Marshall, USCG Mr. Jimmy Martinez, TGLO





Contrarian Rose



RRT Activation:	No
Type and amount of product spilled:	100 Gallons of diesel
Cause of spill:	Internal Tank to Tank Transfer
Date of spill:	August 10, 2015
Responsible Party:	Owner of Contrarian Rose
Key operational activities:	Federalized response, worked w/ Sector Houston-Galveston to obtain samples from VSL which transited to their AOR
Major lessons learned:	Work closely with other units & agencies
Lead Coordinator Contact Information:	MST1 Gordon Bellinger Gordon.h.bellinger@uscg.mil

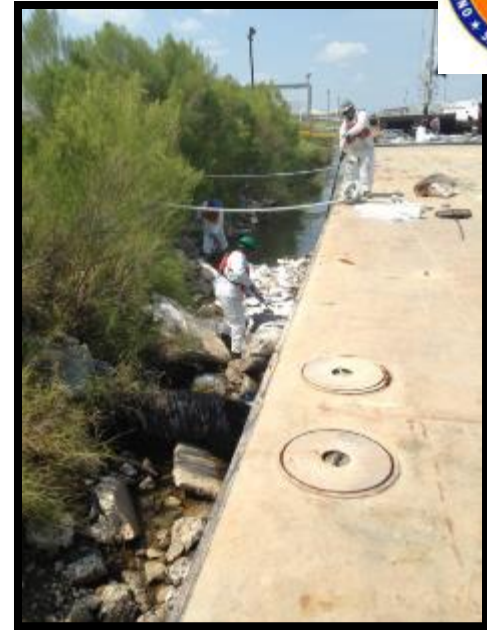




Buckeye/Gonsoulin Transfer



RRT Activation:	No
Type and amount of product spilled:	#6 Fuel Oil, 02 BBLs discharged in containment, 10 gallons in water
Cause of spill:	Poor communications between PIC & Tankerman lead to burst of transfer hose
Date of spill:	September 28, 2015
Responsible Party:	LeBeouf Brothers Towing Company
Key operational activities:	Barge PIC closed valve, didn't communicate to facility, resulted in burst hose. & immediate discharge
Major lessons learned:	Failure in communication continues to be the largest contributor to these types of discharges
Lead Coordinator Contact Information:	MST3 Kayla Butler Kayla.m.butler@uscg.mil





Sector Corpus Christi

Training

Description	Dates
NDOW Exercise	18-19 May 2015
PR College	20-21 May 2015
Facilities College	Ongoing

Exercises/Workshops

Reserve Hurrex	11-12 July 2015

Federal, state, and local planning and coordination efforts

Description	Dates
Area Committee	11 Aug 2015
Area Committee	17 Nov 2015

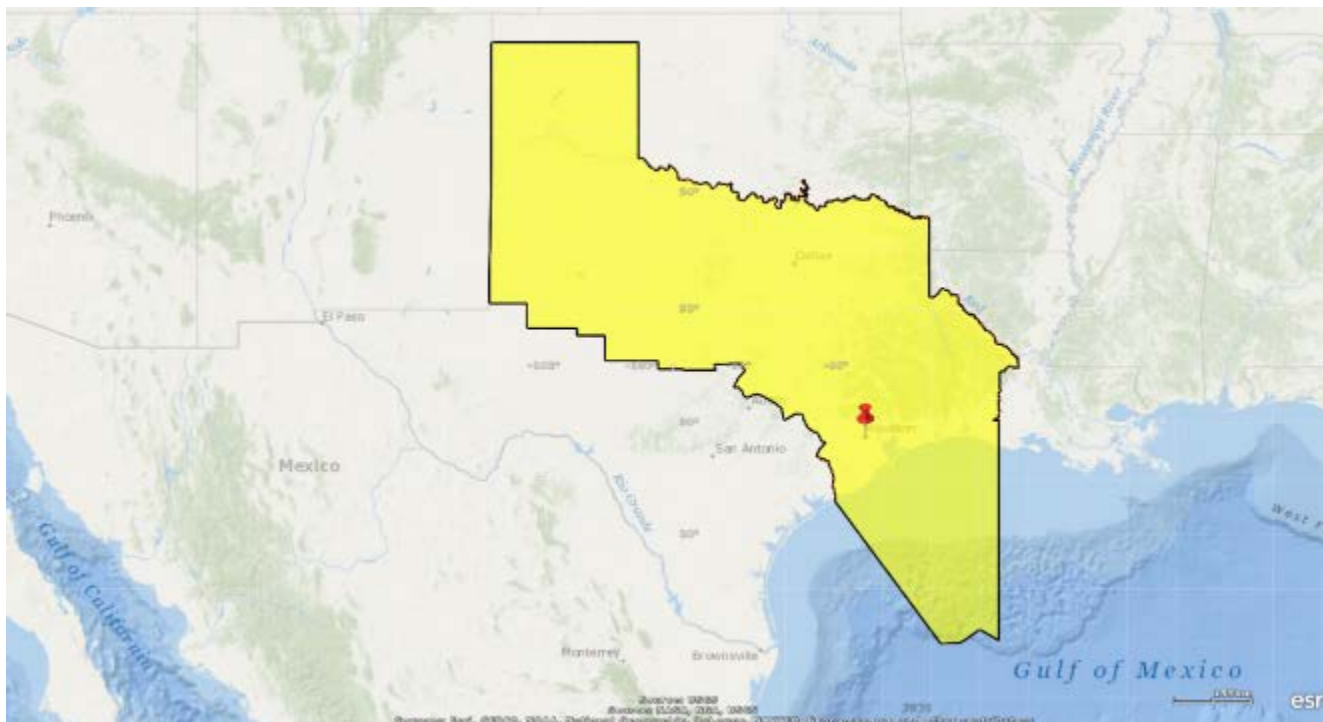




Sector Houston-Galveston



Captain Brian Penoyer
Sector Commander



NRC Notifications	RRT Activations	Federal Projects	CERCLA Projects
155 (Sec Office) 99 (MSU TXC)	01 Surface Washing Agents 00 In-situ Burns 00 Dispersants	04 (TXC)	01 (TXC)



Kirby Collision



RRT Activation:	None
Type and amount of product spilled:	22996 gallons of Naptha
Cause of spill:	Barge Collision
Date of spill:	10 JUN15 at 1130
Responsible Party:	Kirby Inland Marine
Key operational activities:	Multi agency response to ICP stand up in Kirby Channelview. Secured the source of the spill, salvaged the vessel, transferred the remaining product.
Major lessons learned:	Congestion in the HSC makes incidents like this an increasing risk for the future. Response times and cooperation from all involved parties are imperative to a successful evolution.
Lead Coordinator Contact Information:	Sector H-G lead Investigator MST1 Joel Blanchard (ret.)





Lower San Jac



RRT Activation:	None
Type and amount of product spilled:	6426 gallons of crude oil
Cause of spill:	Overtured Tank Truck
Date of spill:	28JUN15 at 0425
Responsible Party:	Paison Logistics
Key operational activities:	Multi-agency response to include TGLO and TPW.
Major lessons learned:	Proper booming strategies mitigated more shoreline exposure.
Lead Coordinator Contact Information:	Sector H-G lead Investigator MST2 Justin Chartier





F/V RICH



RRT Activation:	No
Type and amount of product spilled:	None (Estimated 6K gal. of oil & 75 gal. of misc. HAZMAT onboard)
Cause of spill:	Vessel abandoned and washed ashore
Date of spill:	02 September 2014
Responsible Party:	Unknown
Key operational activities:	Opened Federal Project. Completed removal of approx. 2500 gals. of oily water & 75 gal of HAZMAT. Completed destruction of vessel.
Major lessons learned:	Require robust salvage plan, confirm vessel construction, and require sounding of tanks in writing*.
Lead Coordinator Contact Information:	MST3 Nazzario; MST1 White





Bolivar Seepage



RRT Activation:	No
Type and amount of product spilled:	Approx 100 BBLS of Crude Oil
Cause of spill:	Unknown
Date of spill:	19 Jun 2015
Responsible Party:	Unknown
Key operational activities:	Opened Federal Project, assessed scope of operations and requested assistance from federal and local gov't agencies. Contracted OMI Environmental Solutions (OMIES) to conduct clean up. Conducted excavation of beach and removal operations.
Major lessons learned:	
Lead Coordinator Contact Information:	MST2 Lilly; MST1 White





Bolivar 349 Collision



RRT Activation:	No
Type and amount of product spilled:	Potential of approx 50k BBLS of Naptha & 54K BBLS of Cumene
Cause of spill:	Collision
Date of spill:	20 July 2015
Responsible Party:	KIRBY/ENTERPRISE MARINE
Key operational activities:	Issued BNM, closed portions of ICW and Houston Ship Channel and enforced safety zone. Opened Federal Project for CG costs, monitored firefighting efforts, conducted investigation, cargo transfer and salvage operations
Major lessons learned:	
Lead Coordinator Contact Information:	MST3 Nazzario; MST1 White





Sector Houston-Galveston

Training

Description	Dates
FOSCR	03AUG15-14AUG15
CBRNE	13JUL15-14JUL15
NPFC/SILC	01SEP15
New Oil's Presentation	03JUN15

Exercises/Workshops

Chemical Defense Framework	28JUL15-29JUL15
American Salvage Association	18AUG15-20AUG1
GIUE Planning Workshop	09Sep15

Federal, state, and local planning and coordination efforts

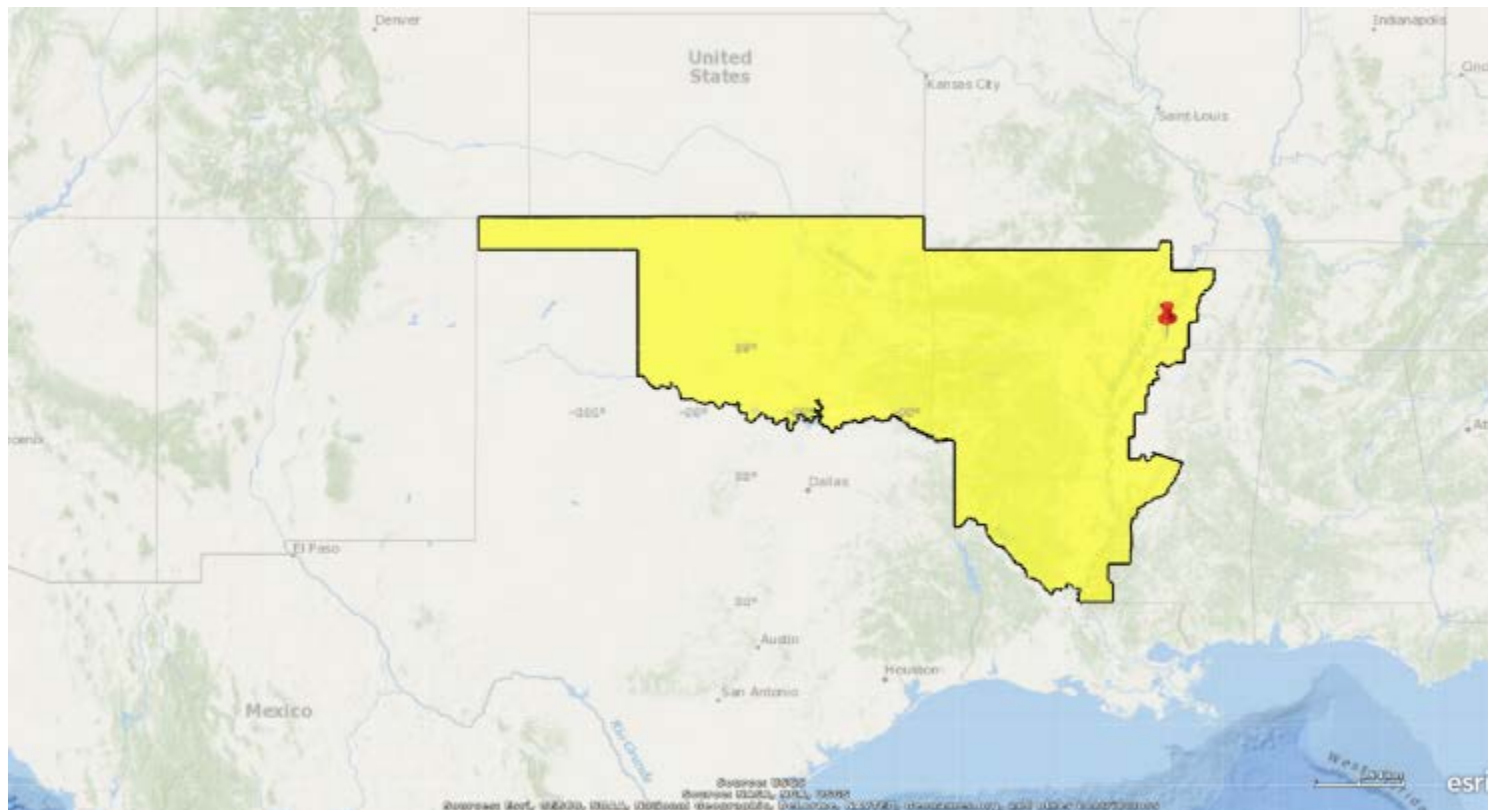
Description	Dates
CTCAC	04 Nov
HURREX	On-Going (Feb 16)



Sector Lower Mississippi River



Captain Timothy Wendt
Sector Commander



NRC Notifications	RRT Activations	Federal Projects	CERCLA Projects
43	0	1	0



UTV LAURA ELIZABETH



RRT Activation:	None
Type and amount of product spilled:	Urea Ammonium Nitrate (less than 2% ammonia)
Cause of spill:	Barge damaged during grounding/ Intentional release from damaged tank
Date of spill:	23-25 September
Responsible Party:	Southern Towing
Key operational activities:	Clean-up/removal of discharged chemical, salvage of barge.
Major lessons learned:	Investigation ongoing; Improve understanding of Clean Water Act
Lead Coordinator Contact Information:	LCDR Dwyer 901-521-4747





General Information



Training

Description	Dates
ICS 339/400	22-24 Sep
NPFC Training	29 Sep
IAP Software	03-04 Nov

Exercises/Workshops

Valero Ex.	August 2015
GST Visit	August 2015
LEPC Workshop	June 2015
3 GIUE's	June/July/Oct 15

Federal, state, and local planning and coordination efforts

Description	Dates
RRT 7 Meeting	07-08 Oct
RRT 4 Meeting	18-20 Aug
AMSC Meeting	Monthly

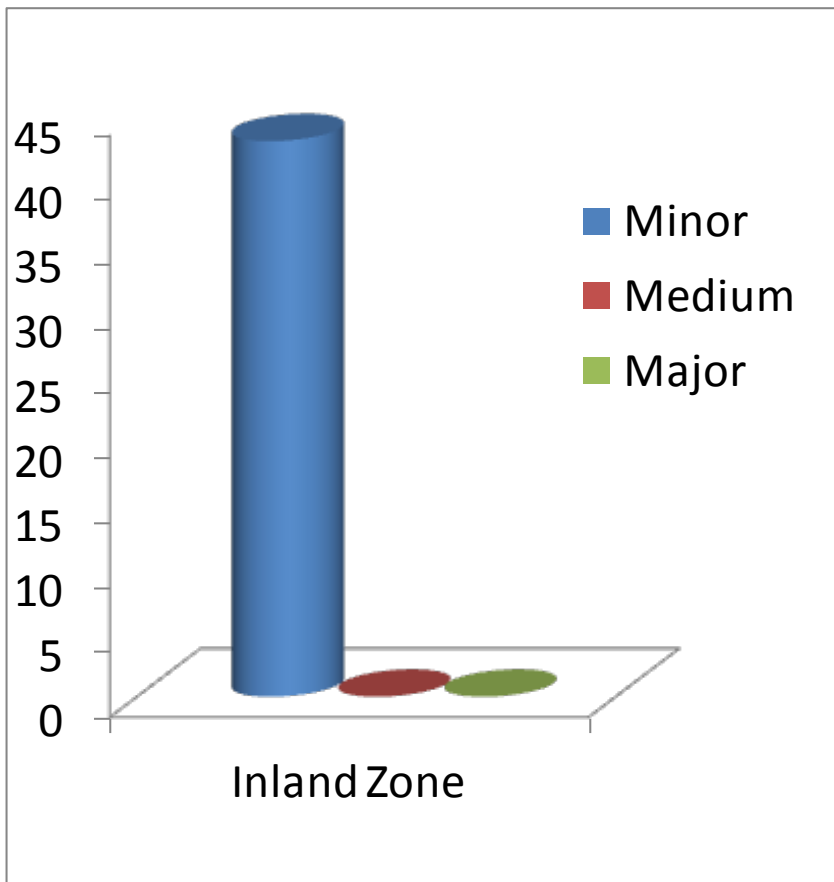


Optional

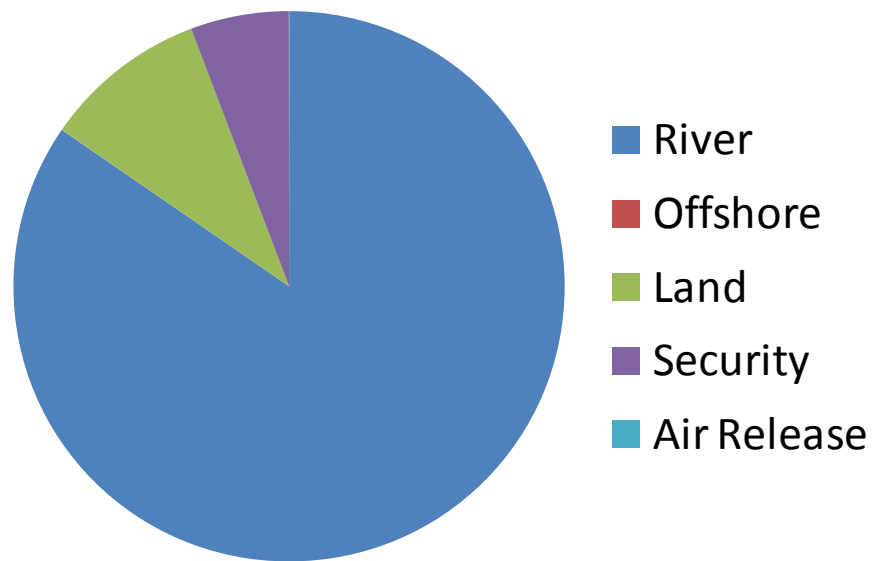
NRC Notifications



Oil Discharges



Breakdown of Reports

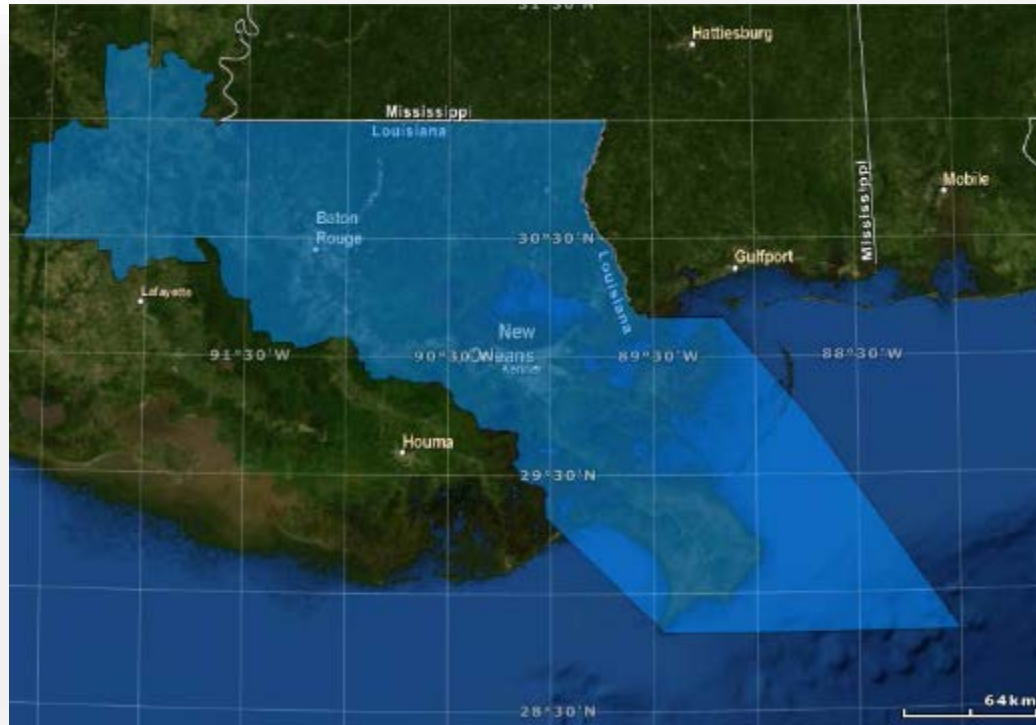


Sector New Orleans



Captain Philip Schifflin

Sector Commander



NRC Notifications	RRT Activations	Federal Projects	CERCLA Projects
483	0 Surface Washing Agents 0 In-situ Burns 0 Dispersants	01	0

Dune Energy



RRT Activation:	No
Type and amount of product spilled:	50- 60 bbls Crude Oil
Cause of spill:	Corrosion of a 4" flow line
Date of spill:	28Jun15
Responsible Party:	Dune Energy Garden Island Bay
Key operational activities:	USCG Sector New Orleans received initial report of a 150'x 4' silvery sheen in Garden Island Bay. USCG and LOSCO conducted a site visit and determined an estimated 50-60 barrels of crude oil in the marsh. Four leaks were discovered on the 1/2 mile long 4" flow line running from the booster station to the storage facility. The leaks were clamped and the line was flushed with bay water as part of a plan to abandon the line. Active clean up operations lasted approximately 1 month.
Major Lessons Learned:	Accurate initial reports of discharge volume are important to executing an effective response and mobilizing the appropriate amount of equipment.
Lead Coordinator Contact Information:	Sector New Orleans IMD, MST2 Kampsnyder



11/16/2015

Dune Energy



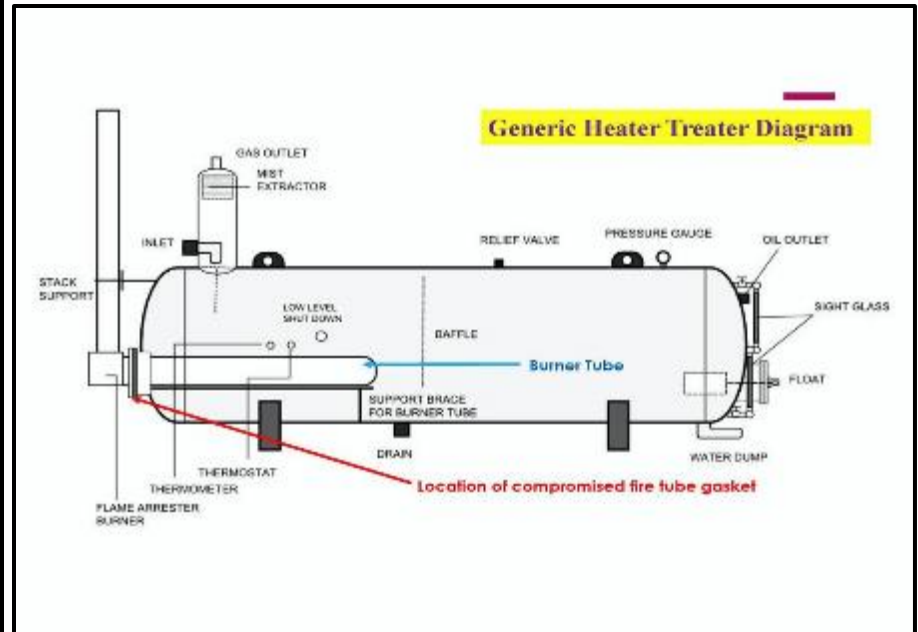
Breton Sound 21 Platform Fire



RRT Activation:	No
Type and amount of product spilled:	Crude oil and Diesel fuel Potential 130 bbls total
Cause of spill:	Heater Treater/Fire Tube Failure
Date of spill:	22May15
Responsible Party:	Texas Petroleum Investment Company (TPIC)
Key operational activities:	Breton Sound 21, Located approximately six nautical miles northeast of Breton Island. Unified Command established ICP in Belle Chasse. The source of the fire was a compromised fire tube gasket, on the facility Heater Treater. Initial firefighting vessels lacked the pumping capability to reach the fire. Firefighting foam was not readily available and needed to be shipped in. Significant containment & recovery assets mobilized to protect Breton Island.
Major Lessons Learned:	Emphasized need to improve SMFF training & readiness in SE Louisiana. Significant logistical challenges involved in responding to a fire on an offshore platform or vessel.
Lead Coordinator Contact Information:	Sector New Orleans IMD, MST2 Alleyne



Breton Sound 21 Platform Fire



Sector New Orleans



Training

Description	Dates
NOAA Science of Oil Spills Seattle, WA 4 Members	June 01-05, 2015
TRACEN FOSCR Course 2 Members	Aug 03-14, Aug 24- Sep 04, 2015
Marine Salvage Response Course 1 Member	Aug 18- 20, 2015
NOAA SCAT Course 7 Members	Oct 20-22, 2015
NOAA Oil Observatory Workshop 2 Members	Oct 20-22, 2015
TRACEN Pollution Response Course 1 Member	Nov 2- 13, 2015

Exercises/Workshops

Description	Dates
Chevron Full Scale WCD Exercise	May 11-15, 2015
SECNOLA/Shell PREP Govt- led Full-scale Exercise	June 23-25, 2015
GUIE-Clayton Williams Energy	Aug 25, 2015
Exxon GOM Exercise	Oct 12-13, 2015

Federal, state, and local planning and coordination efforts

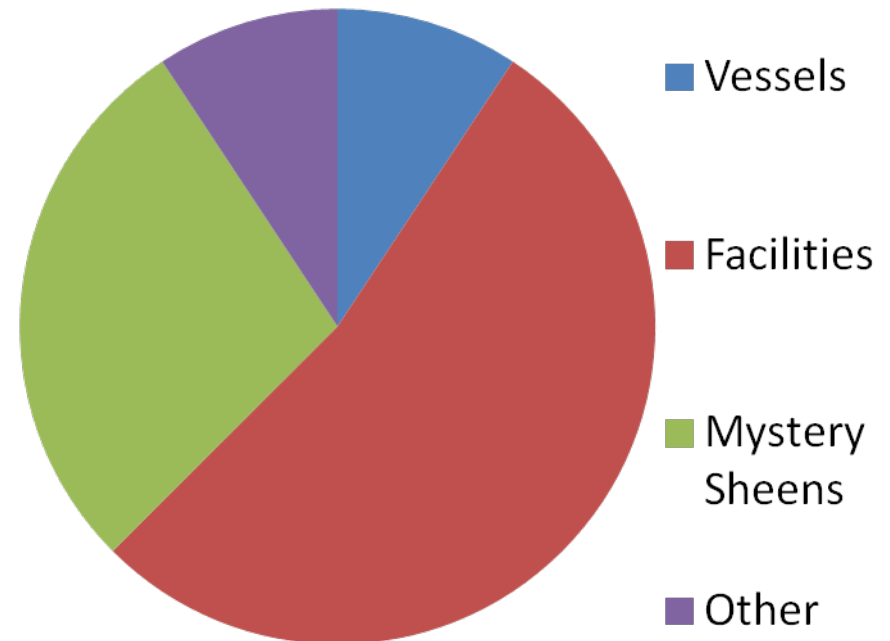
Description	Dates
Area Committee Meeting	Aug 02, 2015



NRC Notifications

- **Facility** reports up 55% since last RRT meeting (227)
- **Vessel** reports up 44% since last RRT meeting (39)
- **Mystery Sheen** reports up 147% since last RRT meeting (126)

Breakdown of Reports



U.S. Tight Oil in Context

Overview of U.S. Tight Oil Production and Trends



For

Region 6 Regional Response Teams Meeting

November 4, 2015/ Addison, Texas via video/teleconference

By

*Grant Nülle, Upstream Oil & Gas Economist, Exploration and Production
Analysis Team*

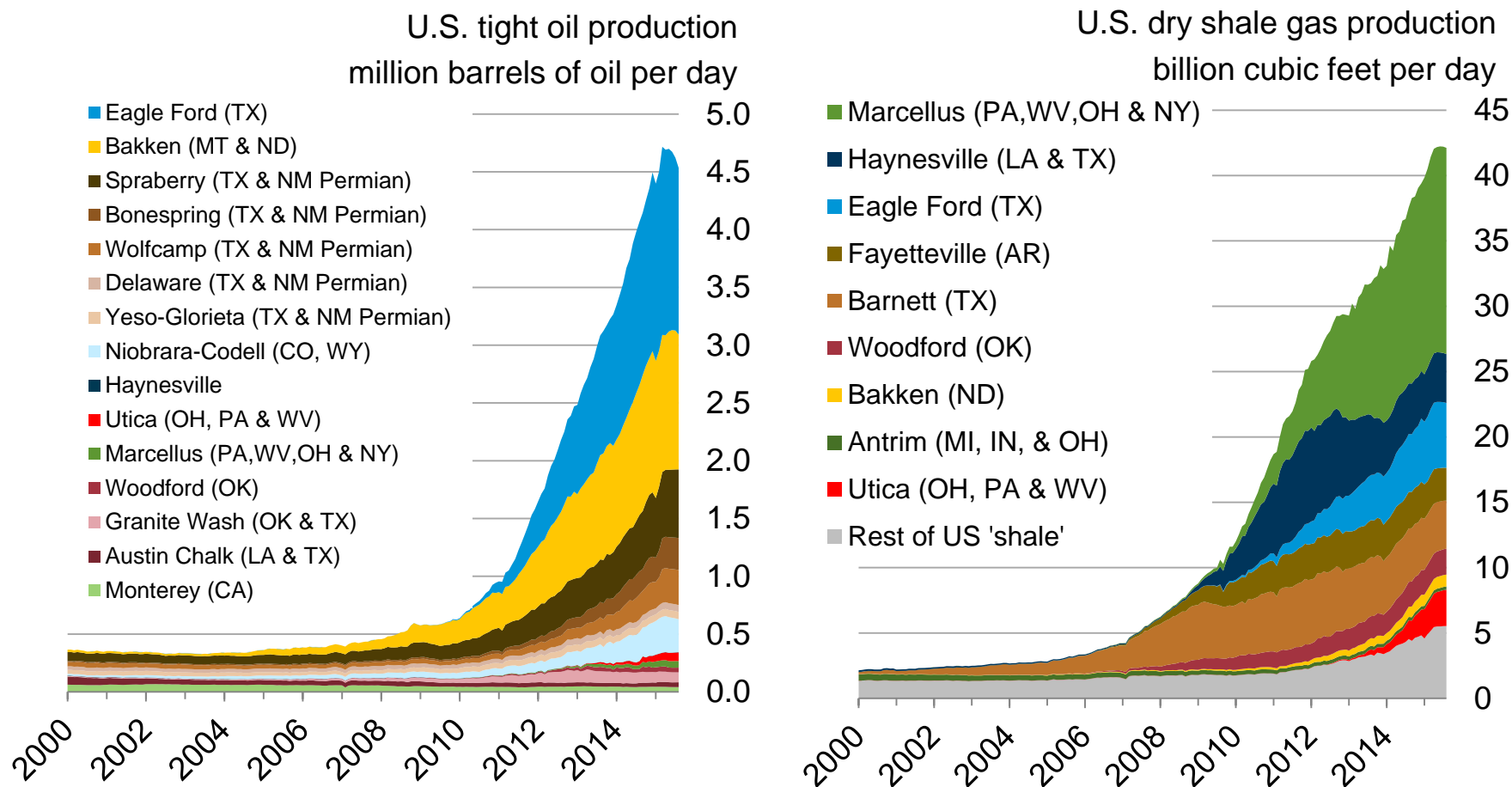
EIA mission: independent statistics and analysis

- EIA was created by the U.S. Congress in 1977
- EIA collects, analyzes, and disseminates independent and impartial energy information to promote sound policymaking, efficient markets, and public understanding of energy and its interaction with the economy and the environment
- EIA is the Nation's premier source of energy information and, by law, its data, analyses, and forecasts are independent of approval by any other officer or employee of the U.S. Government
- EIA does not propose or advocate any policy positions

EIA produces data series, analyses, and energy projections

- Weekly, monthly, and annual data
 - Displays U.S. and regional production, stocks, blender inputs, imports, and exports
- Real-time analyses
 - Digests important developments in **Today in Energy**, This Week in Petroleum, Issues & Trends, Country Analysis Briefs, **Drilling Productivity Report**
- Short-Term Energy Outlook (STEO)
 - Forecasts U.S. supplies, demands, imports, stocks, and prices of energy with a horizon of 12 to 24 months
- Annual Energy Outlook (AEO)
 - Presents 25- to 30-year projection and analysis of U.S. energy supply, demand, and prices
- International Energy Outlook (IEO)
 - Assesses international energy production and consumption

The U.S. has experienced a rapid increase in natural gas and oil production from shale and other tight resources

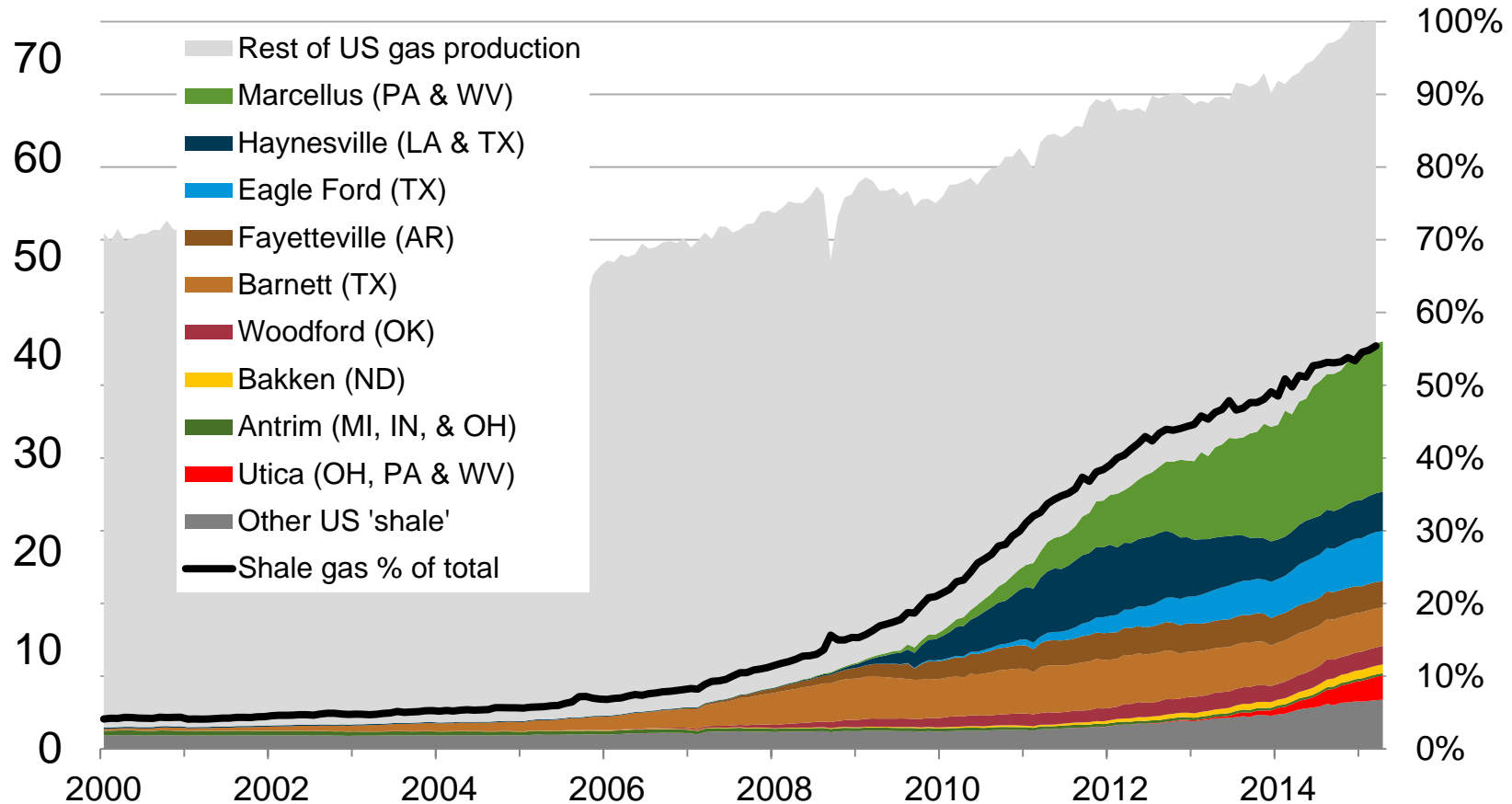


Sources: EIA derived from state administrative data collected by DrillingInfo Inc. Data are through August 2015 and represent EIA's official tight oil & shale gas estimates, but are not survey data. State abbreviations indicate primary state(s).

Estimated U.S. shale gas production was 41.4 Bcf/d in May 2015 about 55% of total U.S. dry production (74.6 Bcf/d)

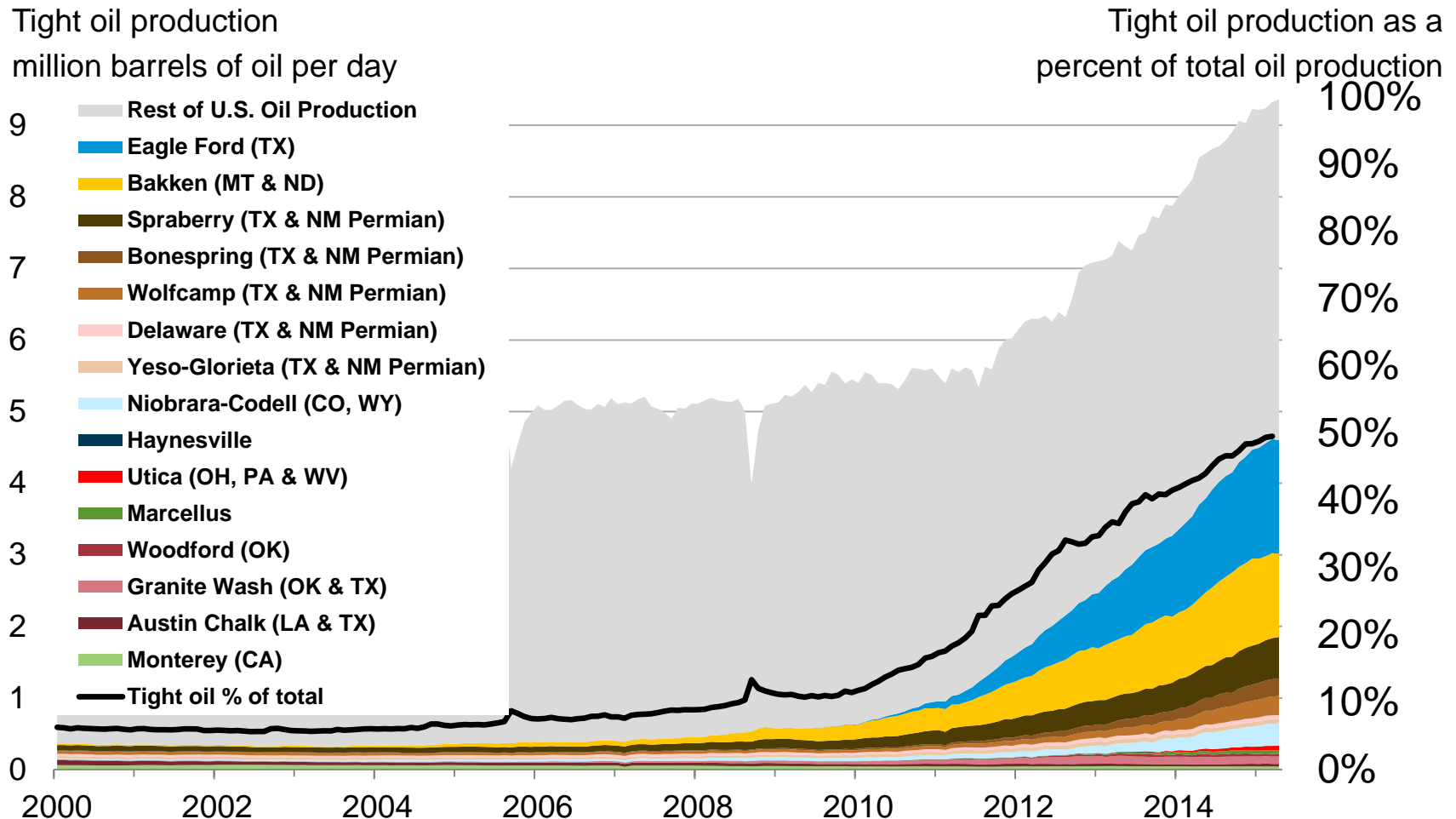
Natural gas production (dry)
billion cubic feet per day

Shale gas production as a
percent of total gas production



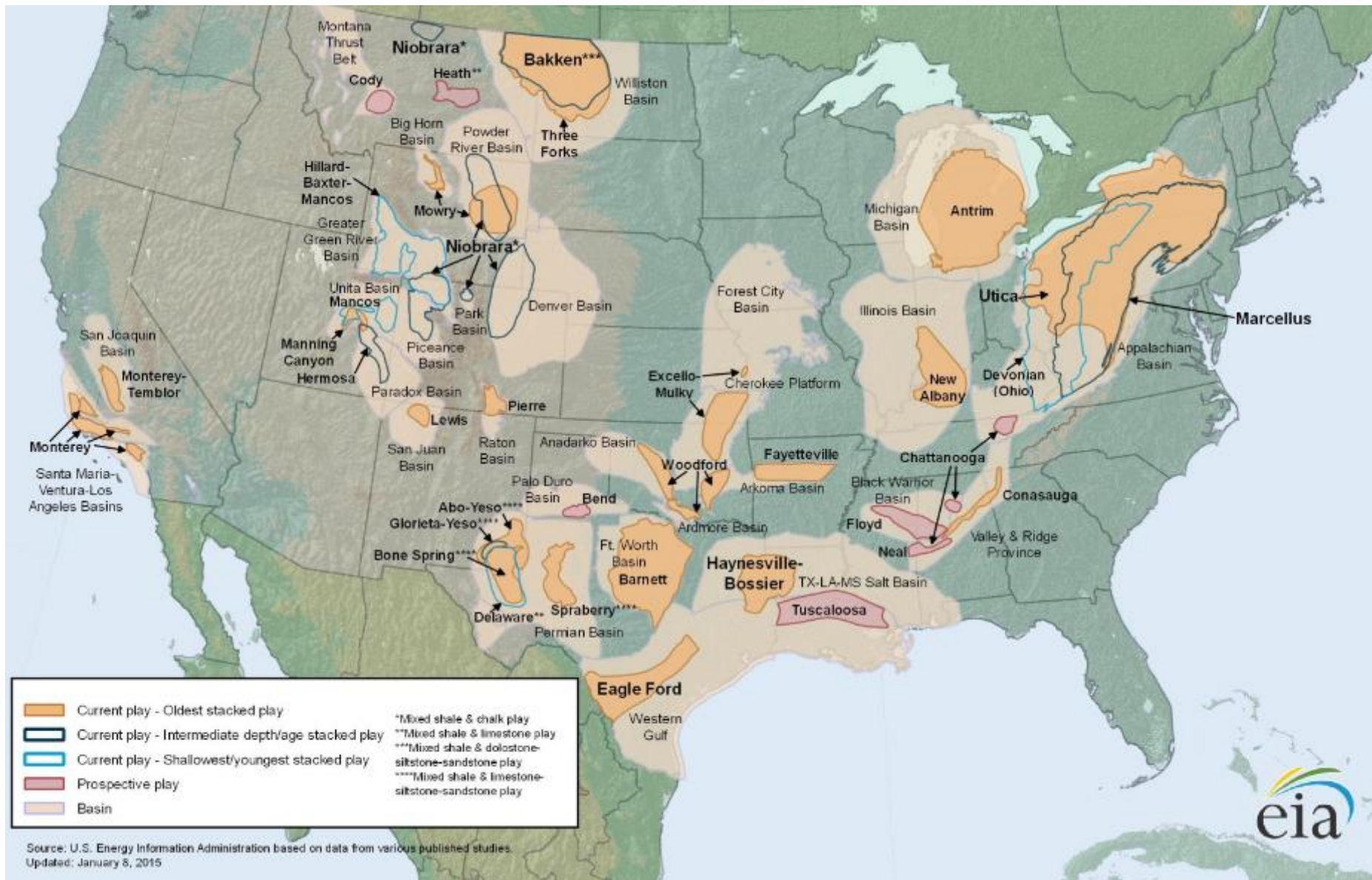
Sources: EIA Natural Gas Monthly data through December, STEO through April 2015 and Drilling Info.

Estimated U.S. tight oil production was 4.6 MMbbl/d in May 2015 about 49% of total U.S. oil production (9.4 MMbbl/d)



Sources: EIA derived from state administrative data collected by DrillingInfo Inc. Data are through April 2015 and represent EIA's official tight oil estimates, but are not survey data. State abbreviations indicate primary state(s).

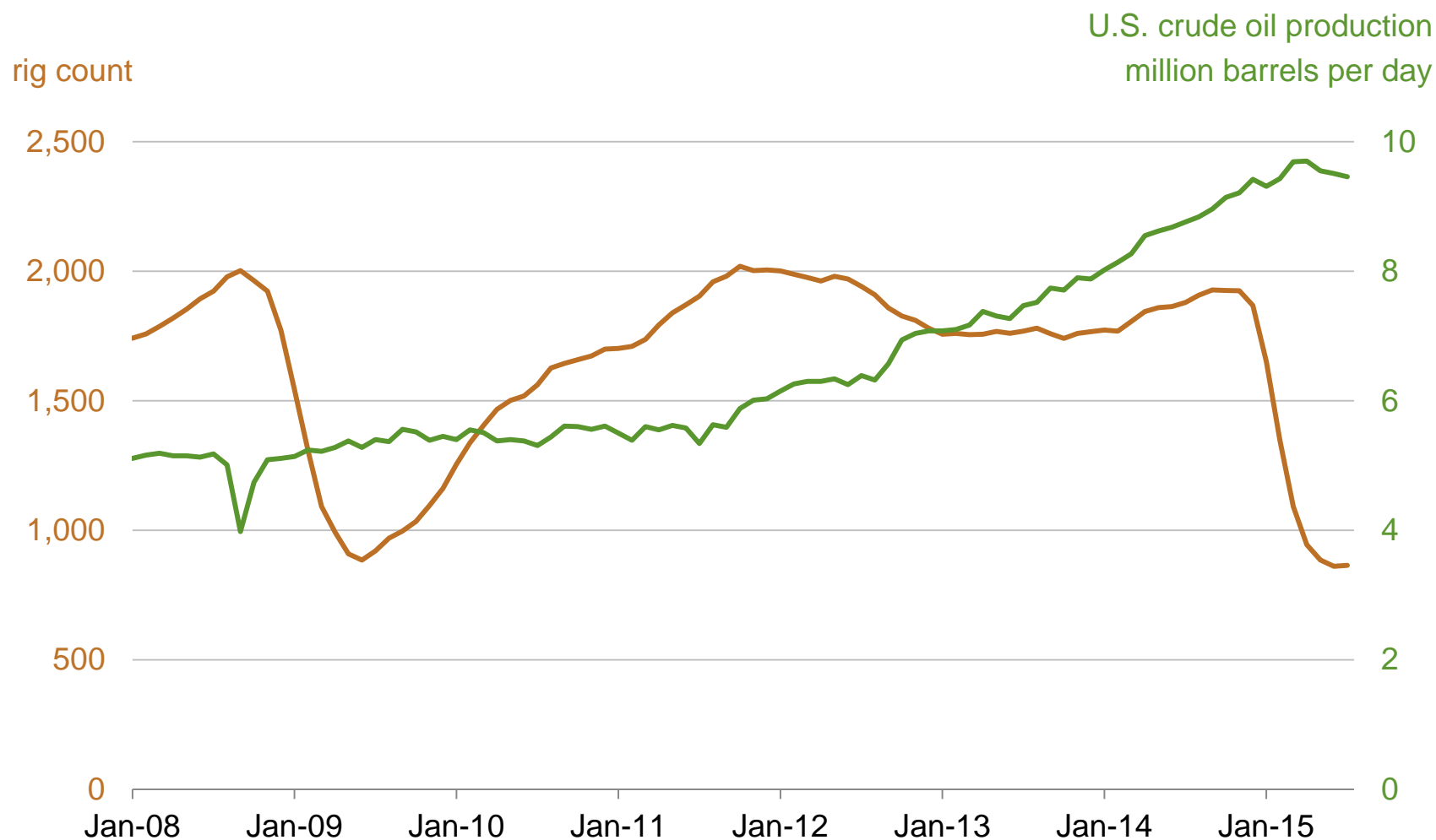
Shale gas and tight oil plays



Tight oil characteristics vary considerably

- Prior to the “shale development breakthrough”
 - Drillers targeted either oil or natural gas formations
 - Production was relatively stable over a long period from each well
 - Simple rig count was sufficient to monitor and forecast production
- Drilling in tight formations
 - New applications of technology: Horizontal drilling and hydraulic fracturing
 - Pad drilling: Multiple wells per rig from one surface location
 - High initial production rates driven by better technology
 - Steep production declines
 - Formations yielding both oil and natural gas
 - Regional differences contrast rig and well productivity
 - Higher costs to drill and complete a well

Rig counts alone an inadequate indicator for U.S. oil production that has continued to rise through the first quarter of 2015

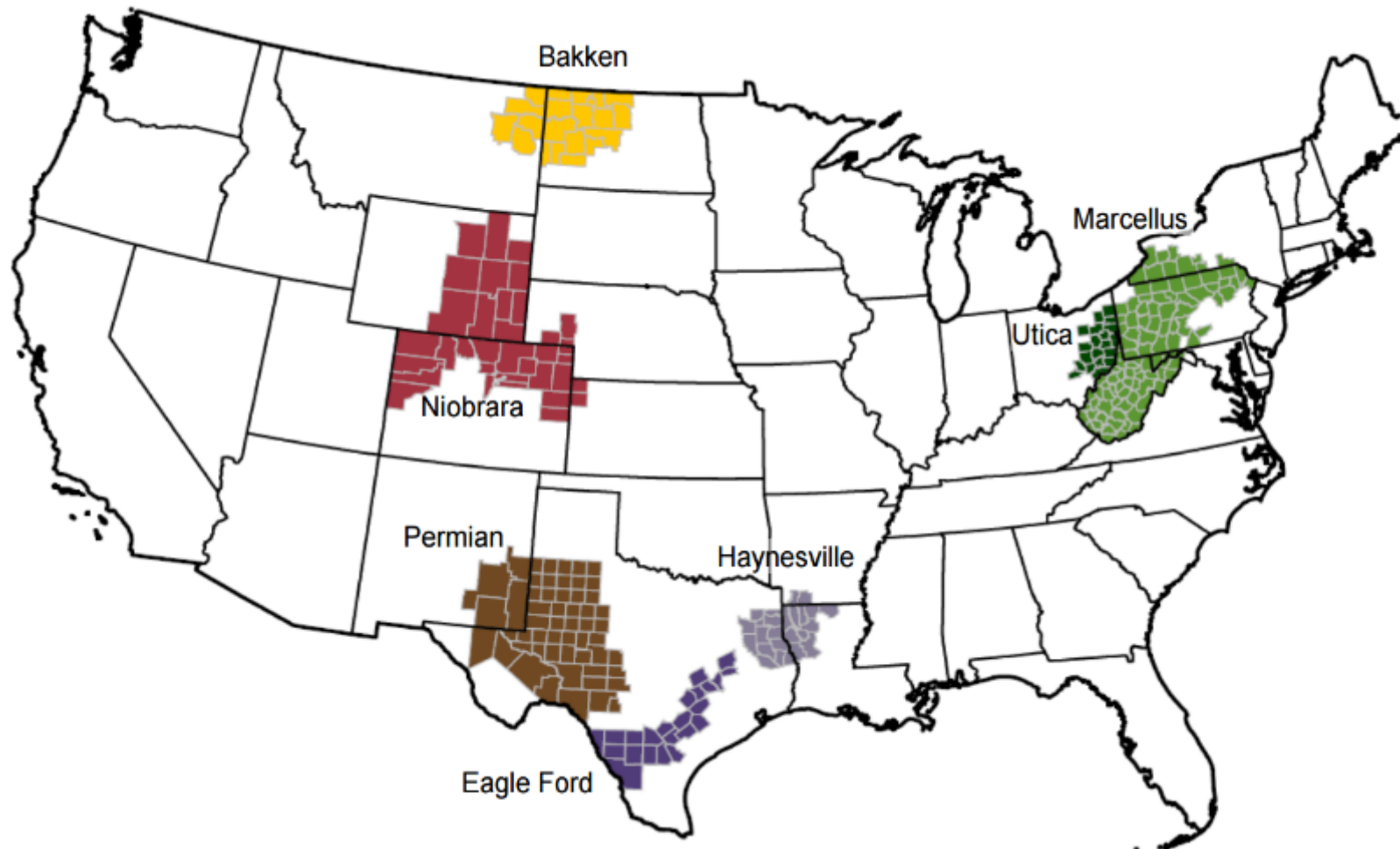


Source: Baker Hughes, Inc. Rig Count; EIA, Short-Term Energy Outlook, July 2015

Shale gas and tight oil trends: production by geography – the Drilling Productivity Report (DPR)

<http://www.eia.gov/petroleum/drilling/>

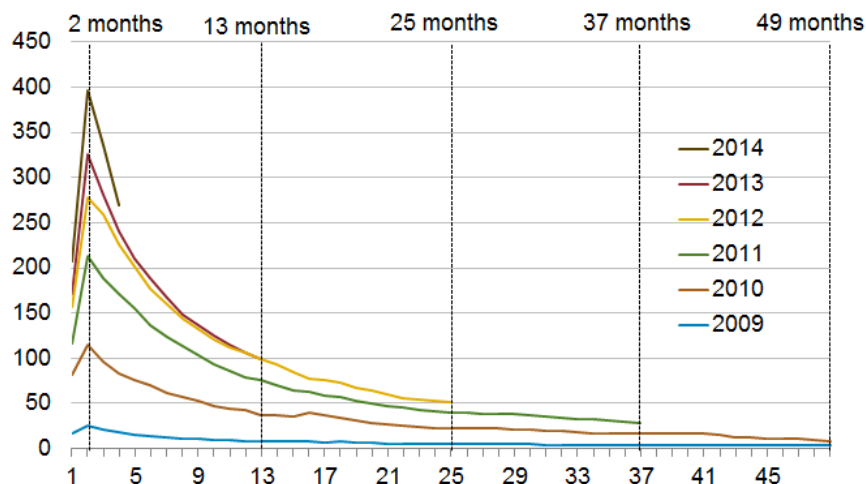
Seven key plays account for nearly all recent growth in U.S. oil and natural gas production



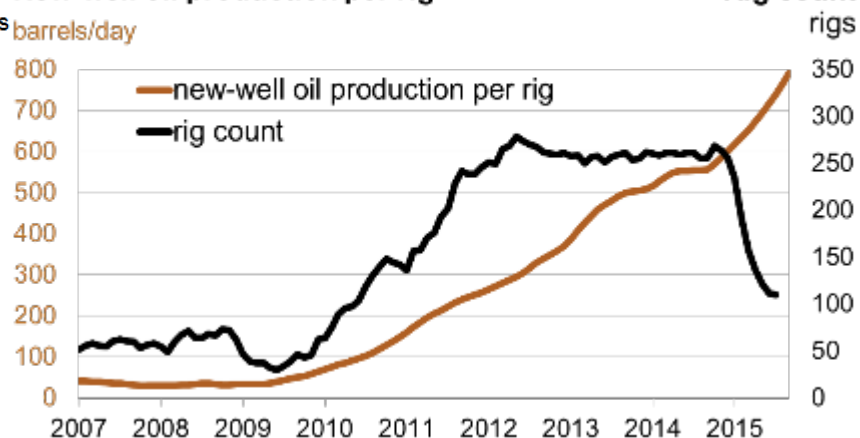
Source: EIA, Drilling Productivity Report, August 2015

DPR captures key elements of shale

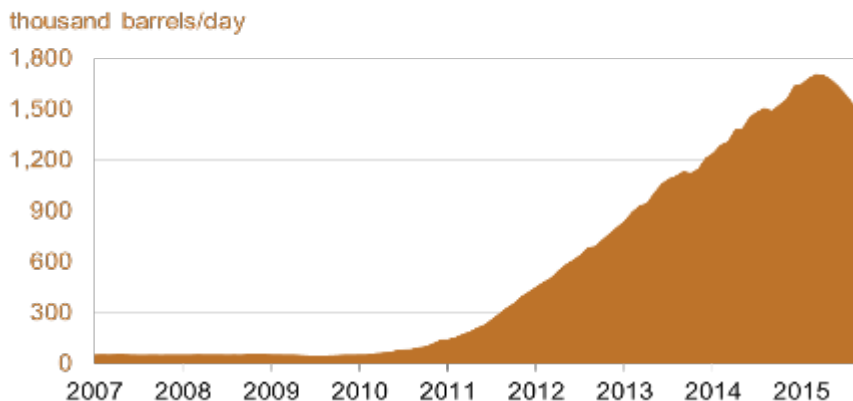
Eagle Ford average oil production per well by year
barrels per day



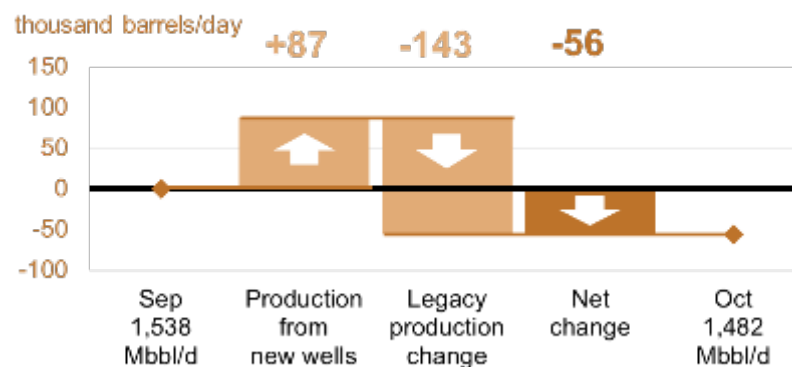
**Eagle Ford Region
New-well oil production per rig**



**Eagle Ford Region
Oil production**



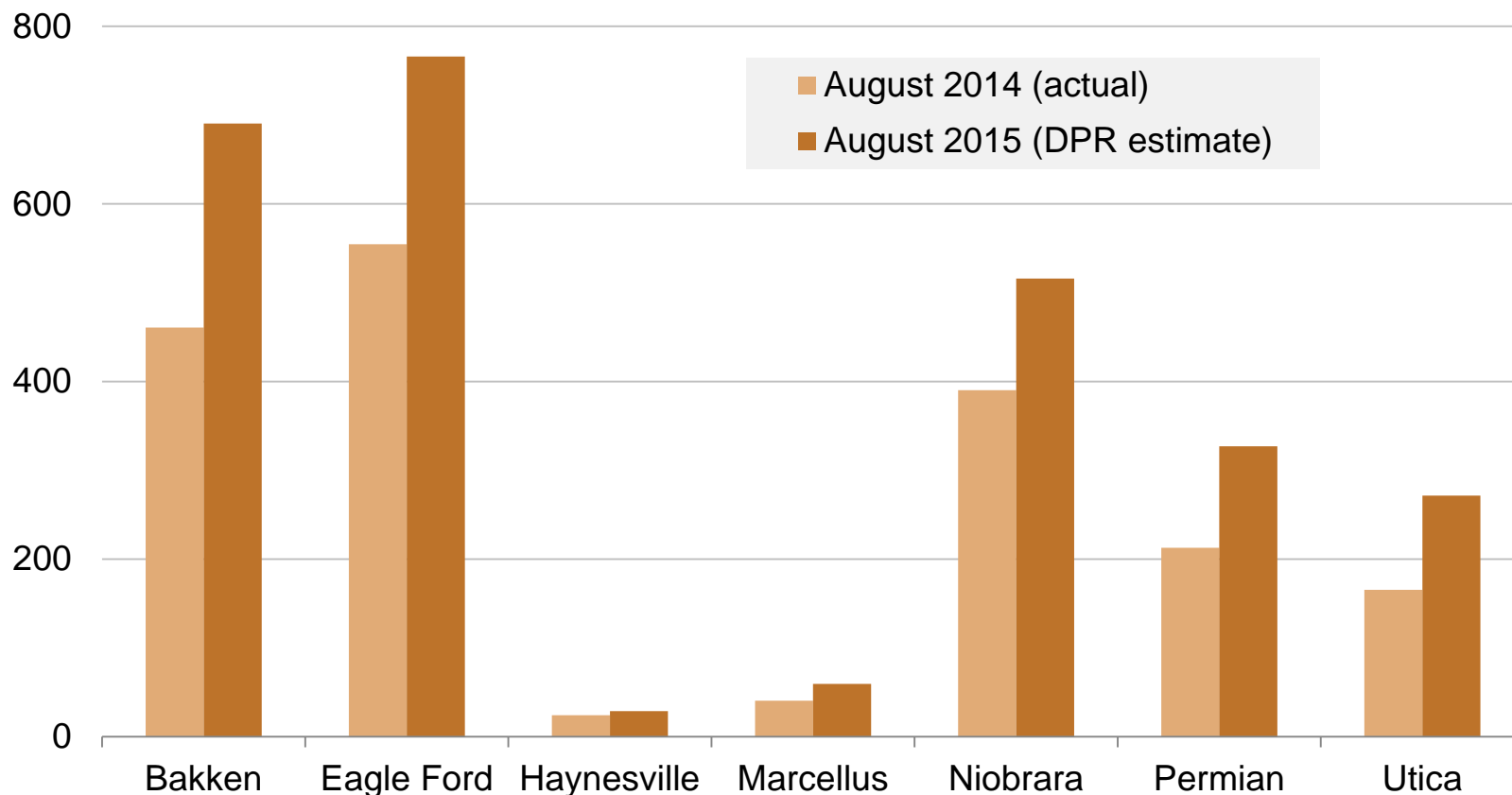
**Eagle Ford Region
Indicated change in oil production (Oct vs. Sep)**



Source: EIA Drilling Productivity Report, Aug. 2015, DrillingInfo Inc.

Major tight oil producing regions show strong productivity gains

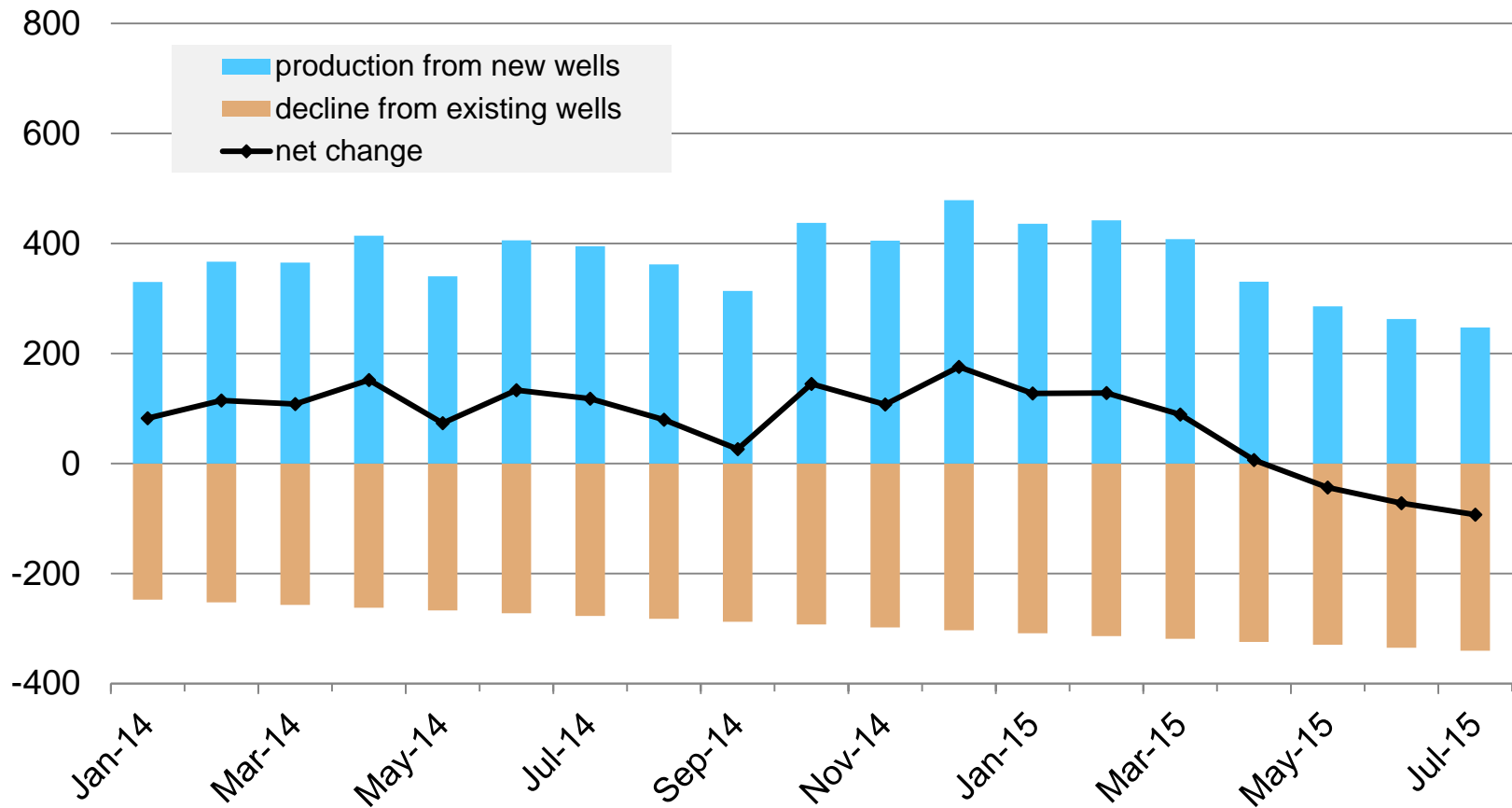
new-well oil production
barrels per day per rig



Source: EIA, Drilling Productivity Report, July 2015

Sum of DPR regions showed new oil well production being nearly offset by legacy declines in April 2015 anticipating turning point

total month-to-month change
thousand barrels per day

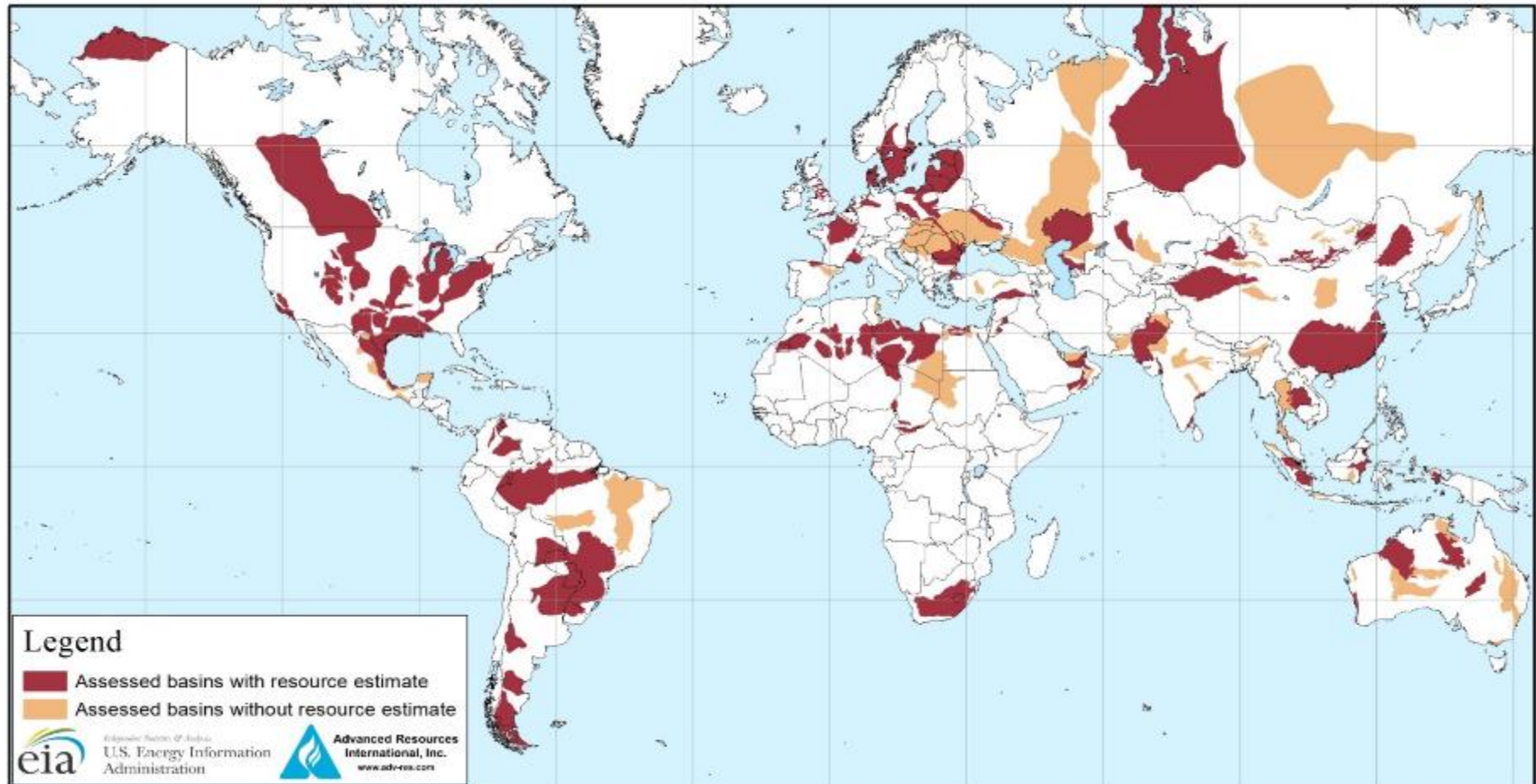


Source: EIA, Drilling Productivity Report, July 2015

Contributing Factors to U.S. Tight Oil Production

- Technical Expertise and Experience
- Extensive Transportation Capacity
- Price Responsiveness of producers
- Regulatory Stability & Government Support

Map of 106 basins assessed for shale oil and shale gas resources in 46 countries



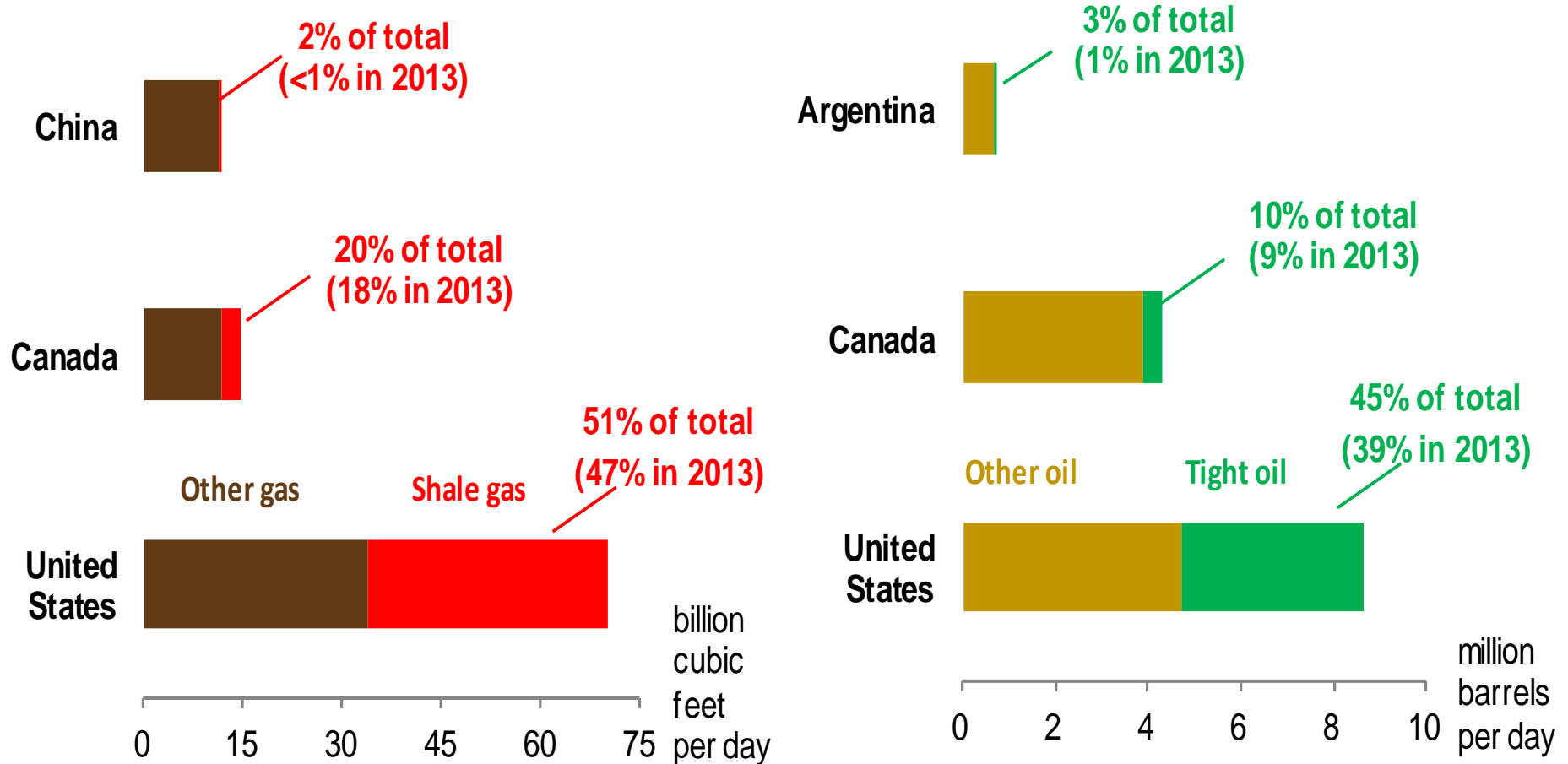
Source: EIA/ARI Supplement 2015 Preliminary Release

Top ten countries with technically recoverable shale resources

Shale gas			Shale oil		
Rank	Country	Trillion cubic feet	Rank	Country	Billion barrels
1	China	1,115	1	Russia	75.8
2	Argentina	802	2	United States	60.2
3	Algeria	707	3	China	32.2
4	Canada	573	4	Argentina	27.0
5	United States	555	5	Libya	26.1
6	Mexico	545	6	UAE	22.6
7	Australia	429	7	Chad	16.2
8	South Africa	390	8	Australia	15.6
9	Russia	287	9	Venezuela	13.4
10	Brazil	245	10	Mexico	13.1
	Total for 46 countries	7,509		Total for 46 countries	400.8

Source: EIA, USGS and ARI 2015 Preliminary Results

Countries producing shale gas and tight oil in 2014



Source: US EIA, Canada National Energy Board, Fact Global Energy, Chevron, Yacimientos Petroliferos Fiscales

Oil markets

Energy & Financial Markets

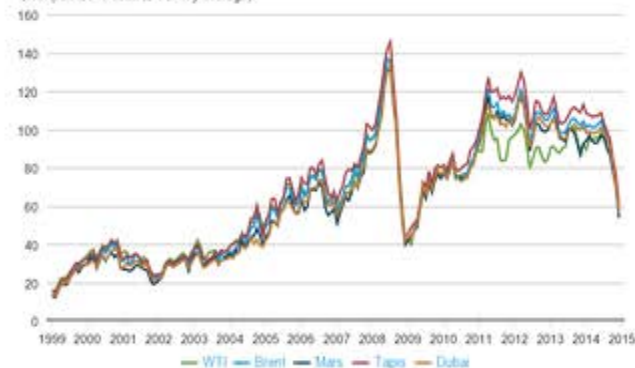
WHAT DRIVES CRUDE OIL PRICES?

An analysis of 7 factors that influence oil markets, with chart data updated monthly and quarterly

OVERVIEW



\$/bbl (real 2010 dollars, monthly average)



Overview - What Drives Crude Oil Prices?

Who's Who in Global Markets

Factors that Influence Prices

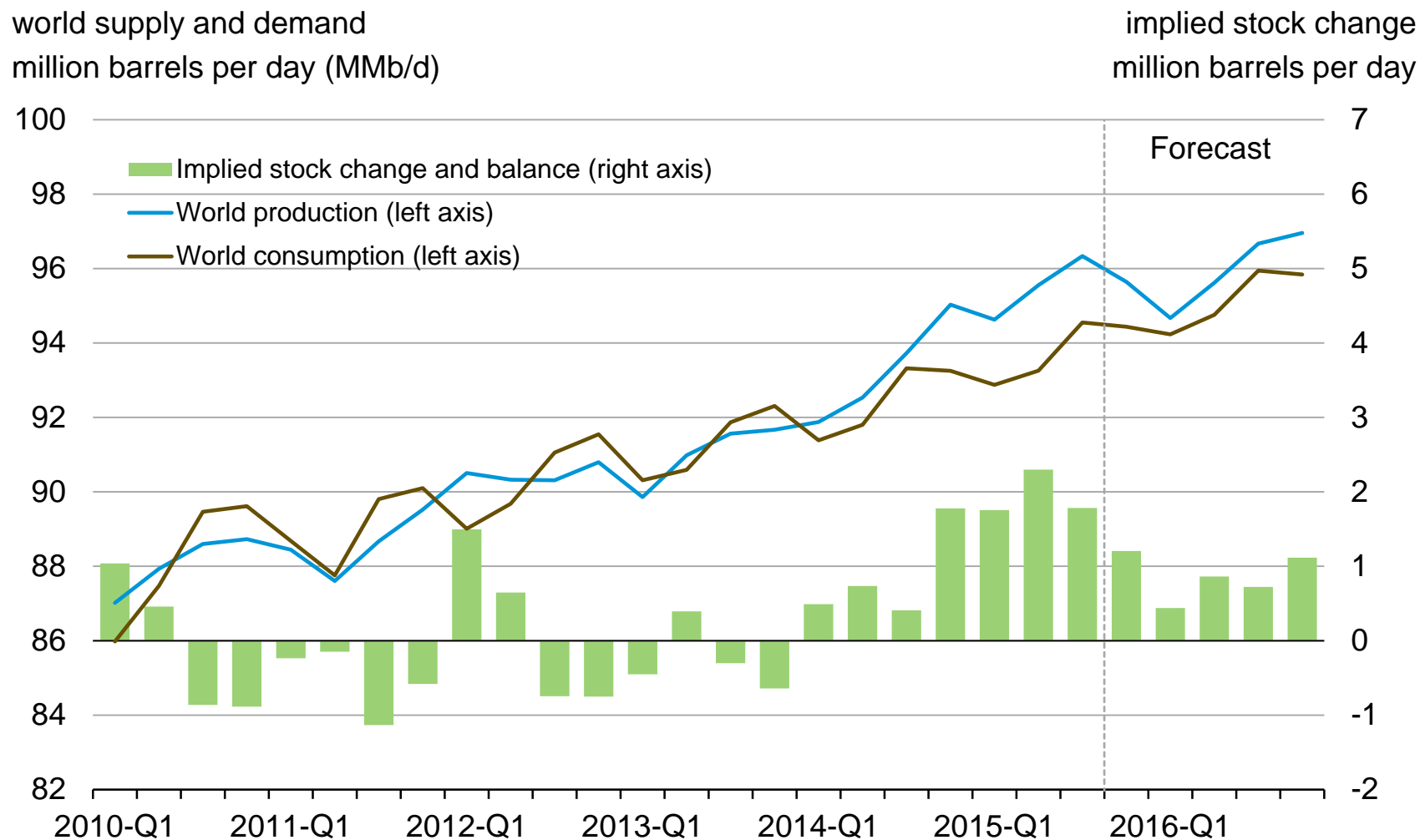
Various events could lead to changes in global supply or demand that could push future crude oil prices higher or lower than the STEO forecast

Increase Prices

Event	
Increase Prices	ISIL disrupts Iraqi exports
	Iranian sanctions are tightened
	Social unrest in oil-dependent countries leads to supply disruptions
	OPEC cuts output more than projected
<hr/>	
Decrease Prices	World economic growth is lower than projected (e.g., China)
	OPEC keeps production at 2015 levels in 2016
	Reduction in unplanned production outages
	Iranian sanctions are lifted

Decrease Prices

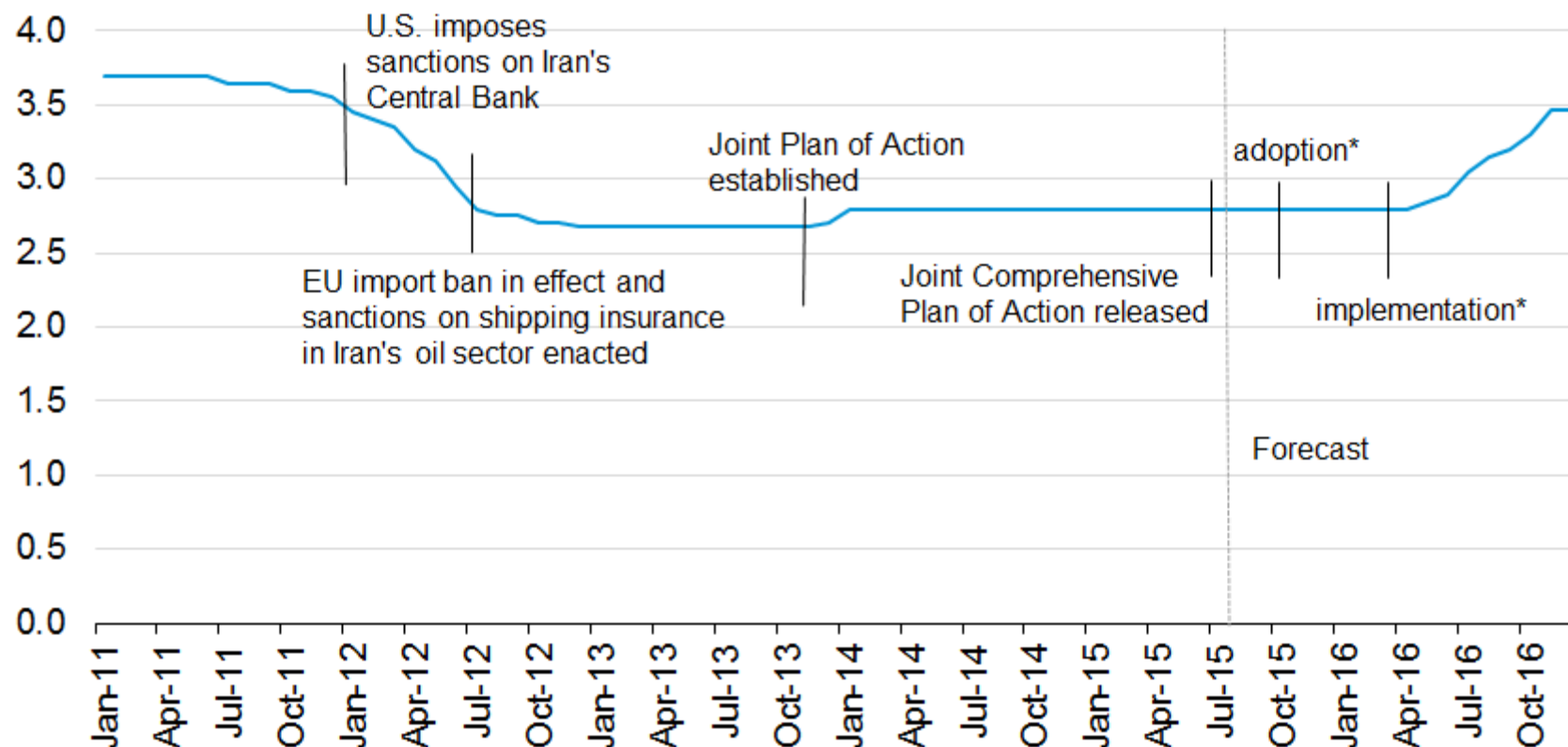
Oil supply and demand begin to rebalance in 2016



Source: EIA, Short-Term Energy Outlook (October 2015)

Iranian crude oil production is expected to begin increasing in the 2Q 2016, inventory sales could be sooner

Iranian crude oil production
million barrels per day

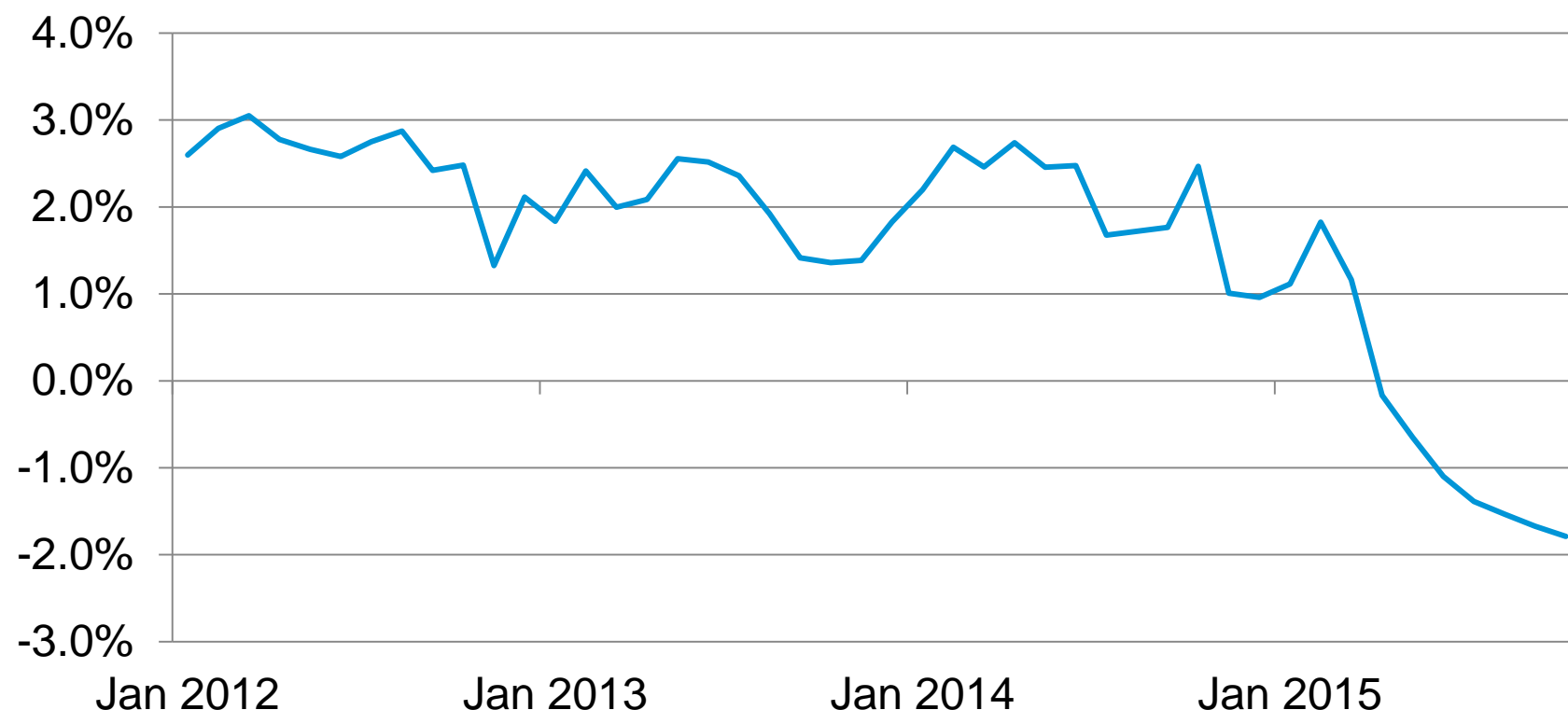


Source: Energy Information Administration

*EIA's assessment

Production growth in top U.S. crude producing regions (Permian, Bakken, Niobrara, and Eagle Ford) reversed in early 2015

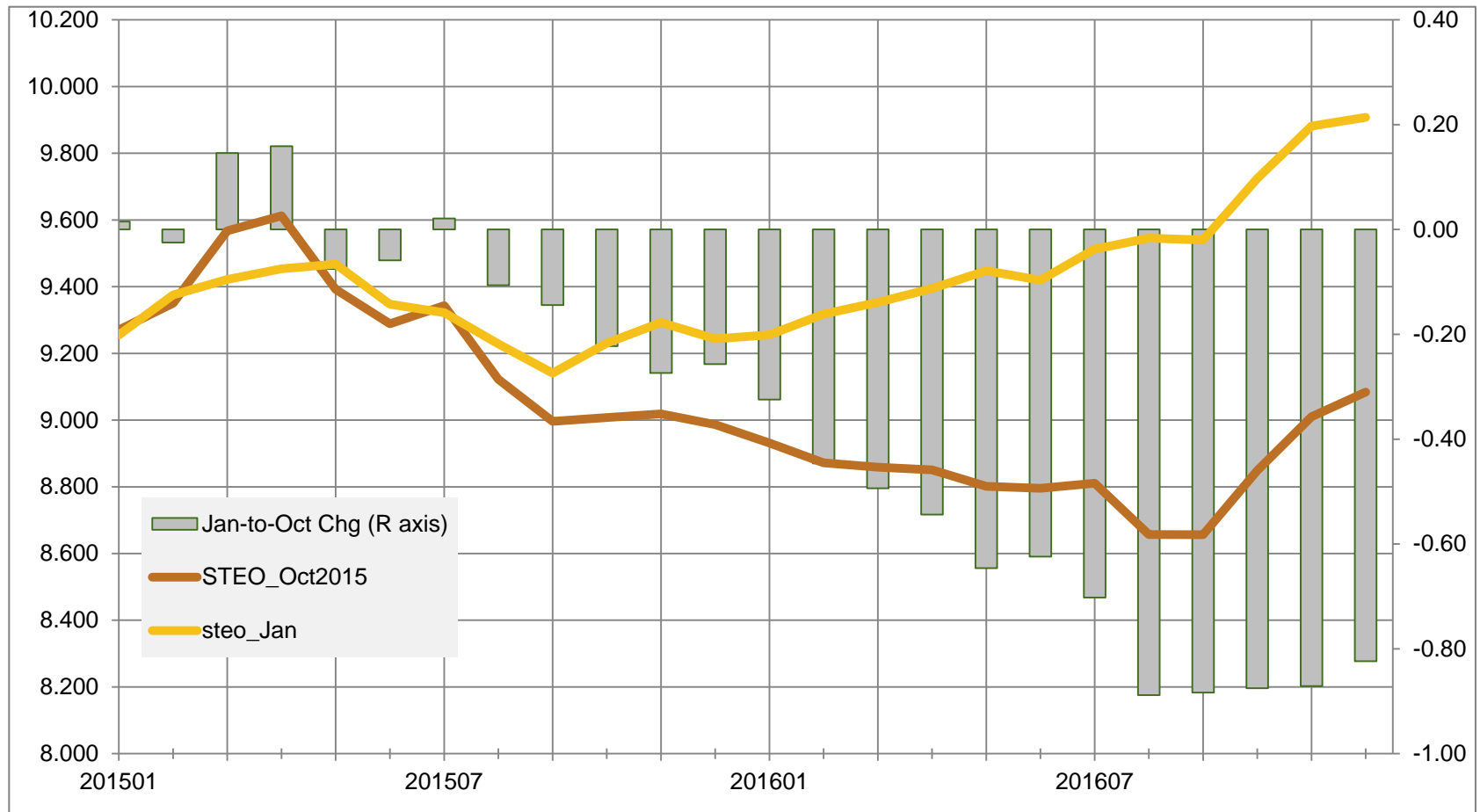
monthly percent change
three month rolling average



Source: Energy Information Administration, Drilling Productivity Report, October 2015 (chart extends to November 2015)

October 2015 U.S. oil supply forecast significantly down from outlook at the start of the year

Millions of barrels per day

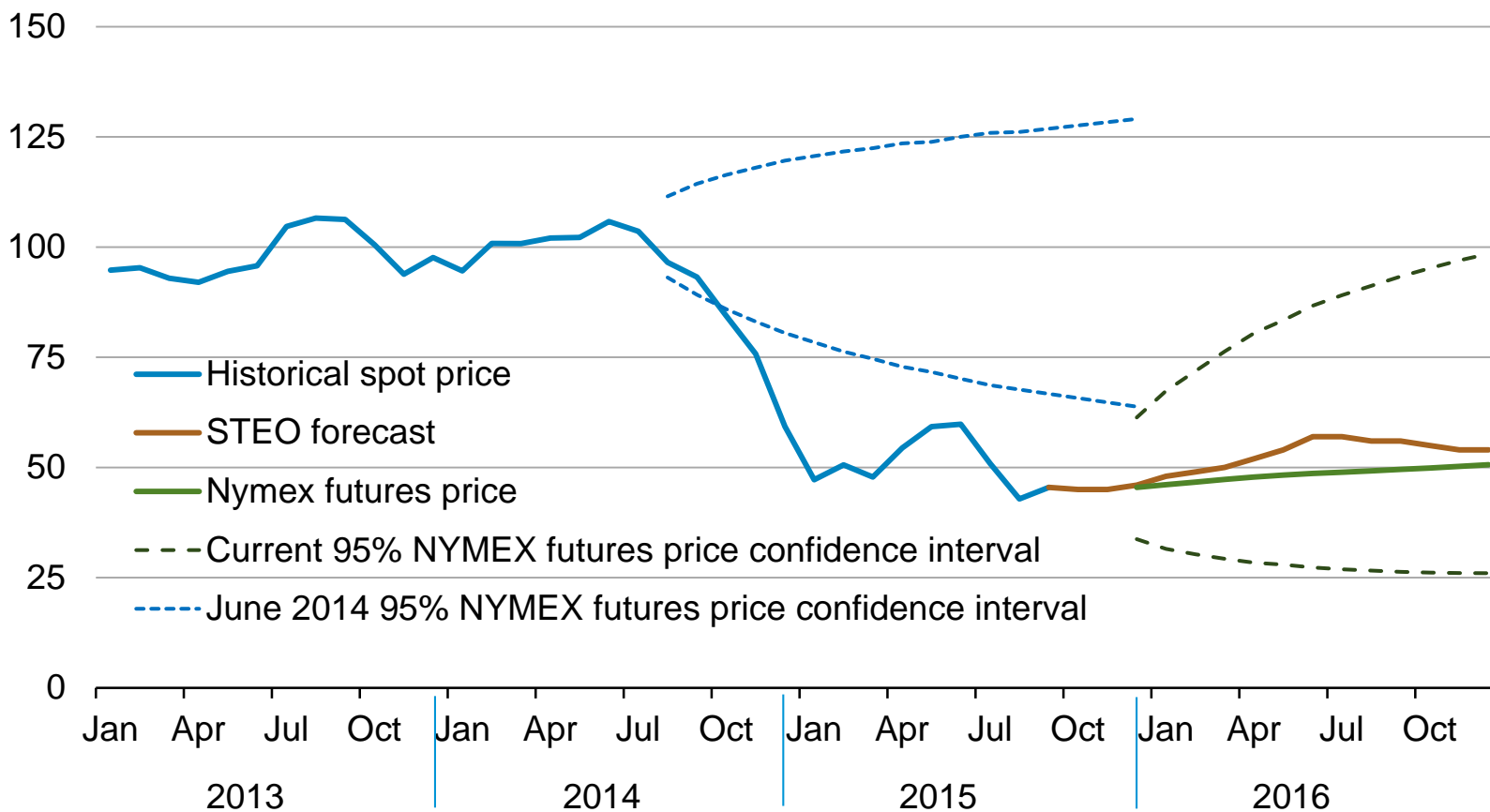


Source: October 2015 STEO

The market-implied confidence band for oil prices is very wide

WTI price

dollars per barrel



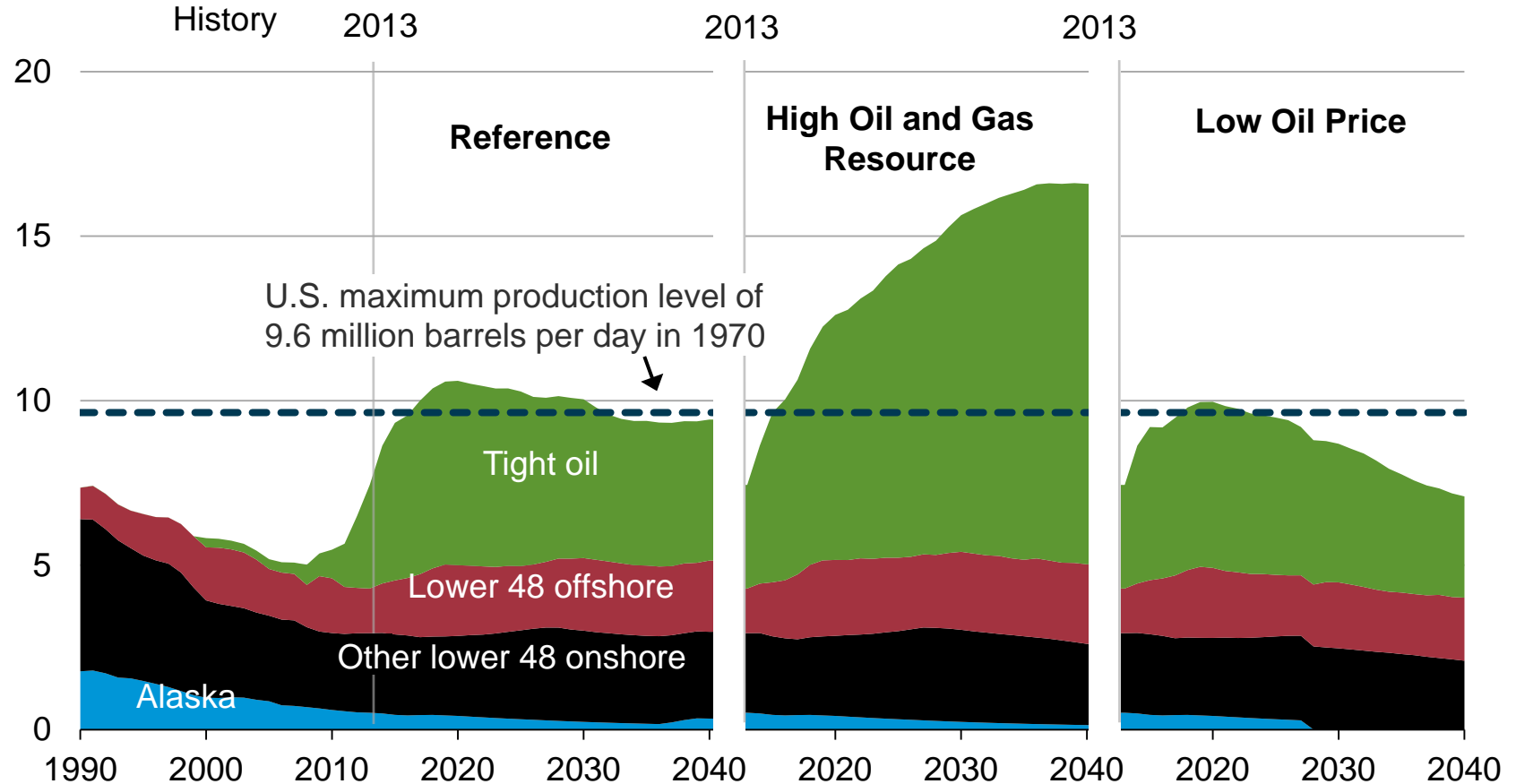
Source: EIA, Short-Term Energy Outlook (October 2015)

Annual Energy Outlook 2015: Petroleum and other liquid supply

<http://www.eia.gov/forecasts/aeo/>

U.S. crude oil production rises above previous historical highs before 2020 in all AEO2015 cases, with a range of longer-term outcomes

U.S. crude oil production
million barrels per day



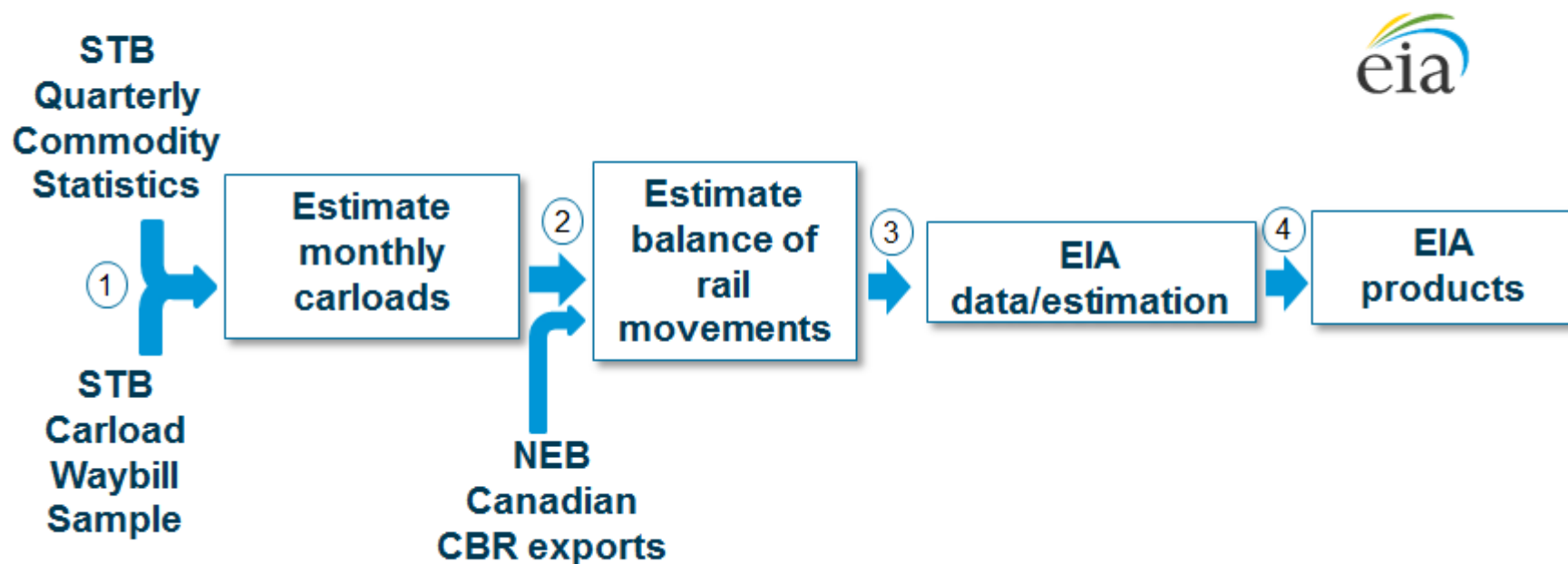
Source: EIA, Annual Energy Outlook 2015

Crude by Rail

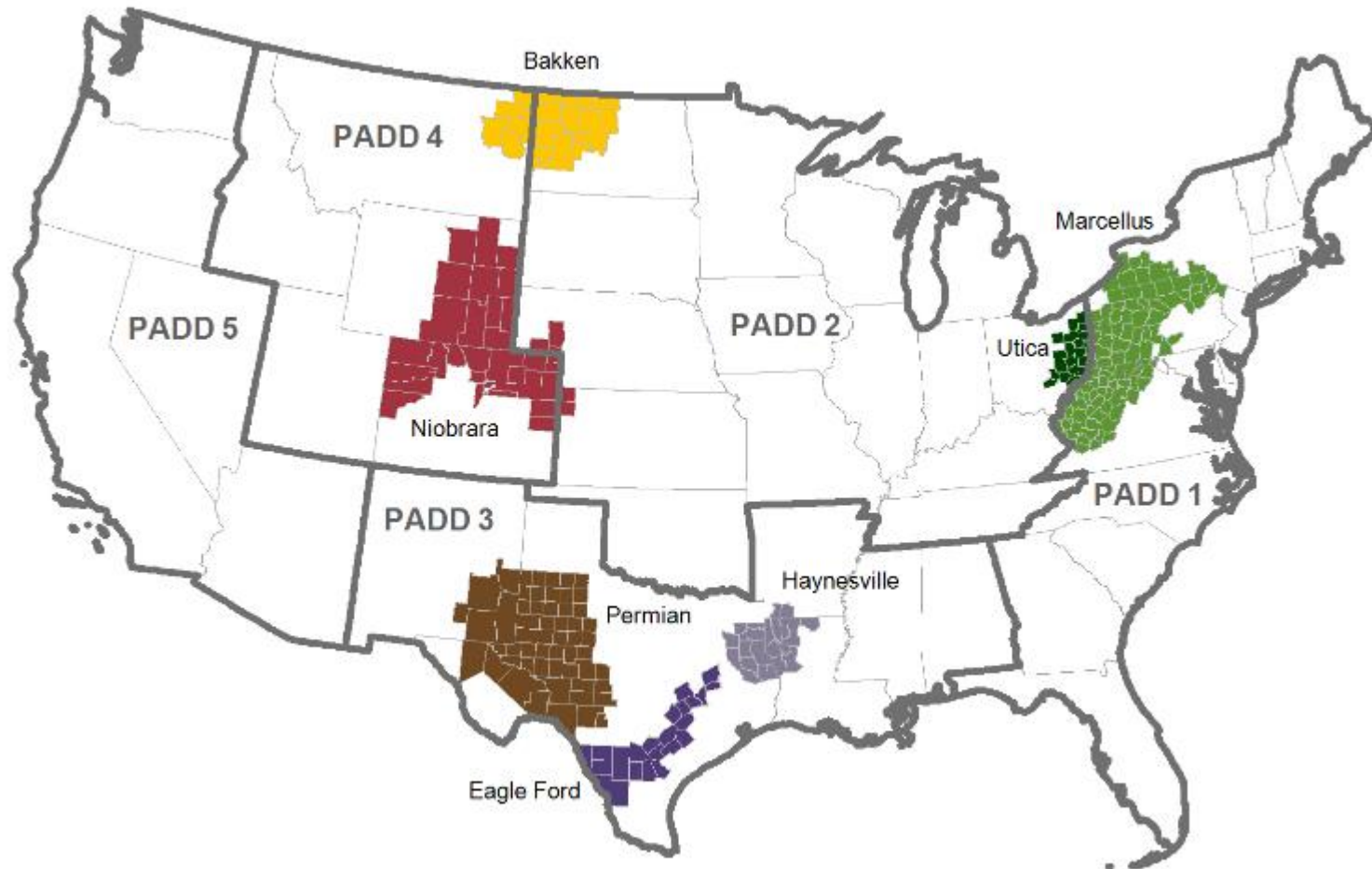
EIA crude-by-rail project overview

- EIA published monthly crude-by-rail (CBR) data at the end of March 2015 along with its monthly petroleum supply balances
- EIA's new data series provides historical monthly data starting in January 2010
- The data include inter-regional, intra-regional, and cross border CBR traffic between the U.S. and Canada
- Developed using data from the Surface Transportation Board (STB) and Canada's National Energy Board (NEB)
- EIA's most recent monthly data are estimated

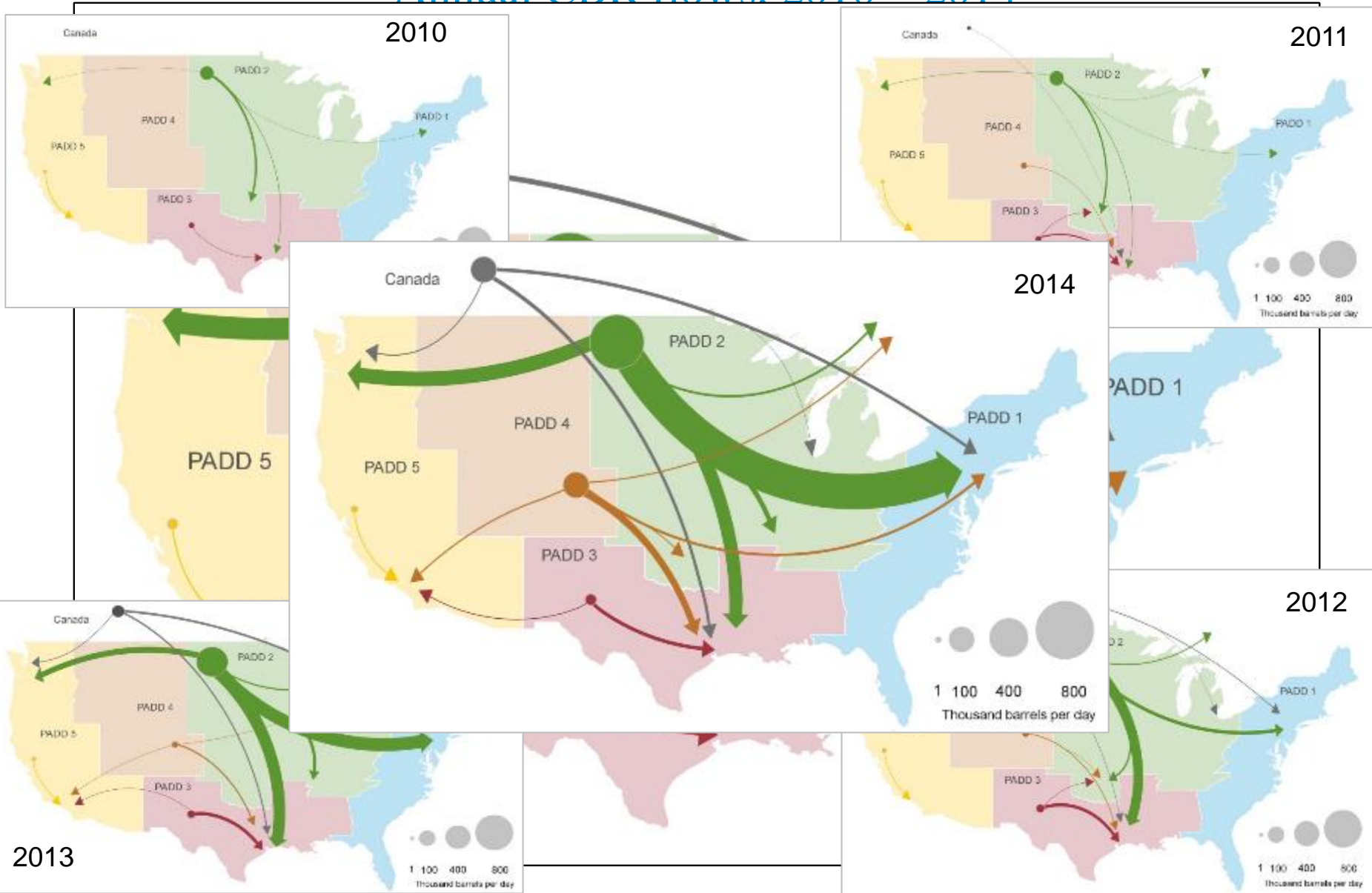
EIA's CBR data process integrates multiple data streams and models



Petroleum Administration for Defense Districts (PADDs) with major shale oil producing areas that indicate CBR originations



Annual CBR flows, 2010 – 2014



Unaccounted-for crude oil is minimized on a regional basis with the inclusion of rail data

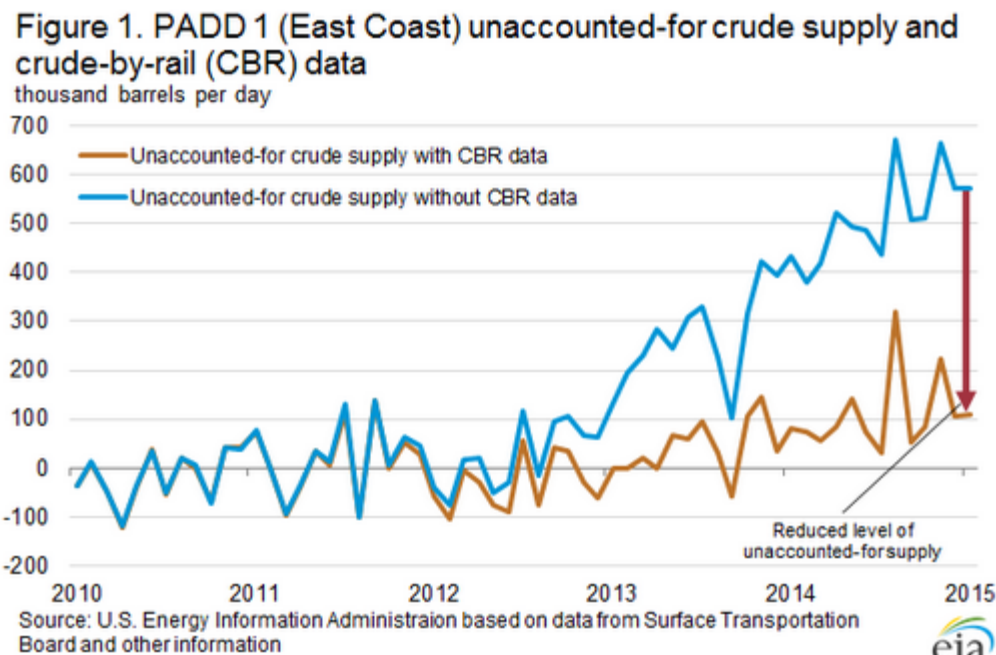
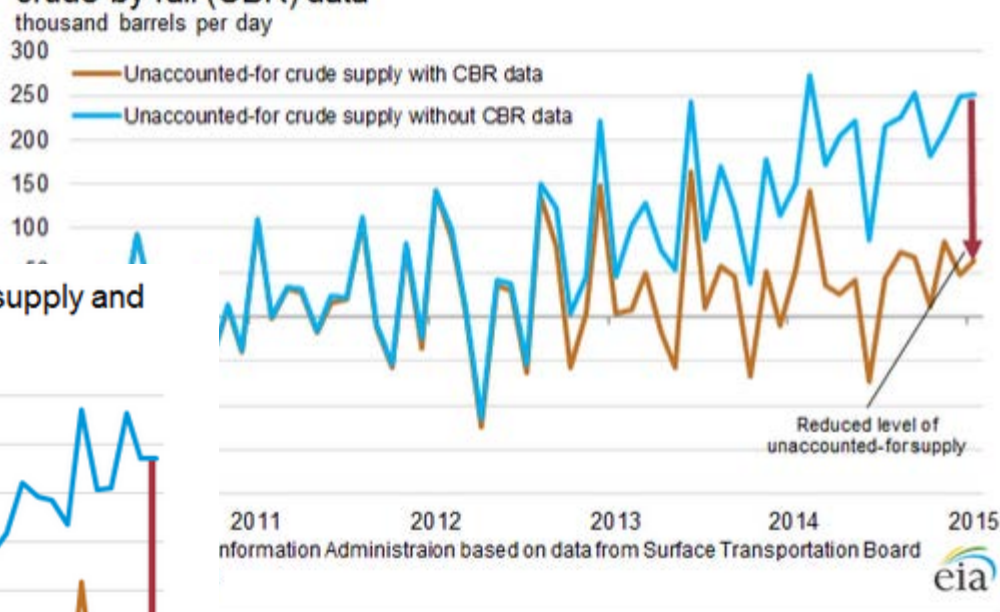


Figure 2. PADD 5 (West Coast) unaccounted-for crude supply and crude-by-rail (CBR) data



EIA's new webpage dedicated to crude-by-rail movements

U.S. Movements of Crude Oil By Rail


With Data through January 2015 | Release Date: March 30, 2015 | Next Release Date: April 29, 2015

Summary - mbbl/d	Summary - mbbl	Changes by PADD					
Crude oil movements by rail, January 2015 thousand barrels/day							
	Receipts						
Shipments	PADD 1	PADD 2	PADD 3	PADD 4	PADD 5	United States	Canada
PADD 1	0	0	0	0	0	0	0
PADD 2	437	40	57	0	171	704	28
PADD 3	0	0	40	0	7	47	0
PADD 4	26	15	107	0	9	157	15
PADD 5	0	0	0	0	6	6	0
United States	463	55	203	0	193	914	43
Canada	61	14	50	0	6	130	NA
Total	523	69	253	0	199	1,045	NA

NA = data not available
PADD = Petroleum Administration for Defense District
Note: Includes movements to and from Canada
Source: U.S. Energy Information Administration estimates based on analysis of data from the Surface Transportation Board and others.

<http://www.eia.gov/petroleum/transportation>

Data Tables (monthly, 2010-2015)

- Movements of crude oil by rail
- Movements by rail between PAD Districts
- Movements by pipeline, tanker, barge and rail between PAD Districts
- Net receipts by pipeline, tanker, barge and rail between PAD Districts
-  Movements of crude oil by pipeline, tanker, barge, and rail between PAD Districts (for current month)

Press Release

- [March 30, 2015](#)

Related Articles

- [New EIA monthly data tracks crude oil movements by rail - Today in Energy, 3/31/15](#)
- [Rail shipments of oil and petroleum products through October up 13% over year-ago period - Today in Energy, 11/13/14](#)
- [Crude delivered by rail continues to supply West Coast refineries - This Week in Petroleum, 10/1/14](#)
- [Rail deliveries of U.S. oil continue to increase in 2014 - Today in Energy,](#)

Summary table of CBR data include inter-PADD, intra-PADD, and U.S.-Canada movements

Movements of Crude Oil by Rail

Product: Period-Unit:

Download Series History Definitions, Sources & Notes								
Show Data By: <input type="radio"/> Product <input checked="" type="radio"/> Areas	<input type="button" value="Graph"/> <input type="button" value="Clear"/>	Aug-14	Sep-14	Oct-14	Nov-14	Dec-14	Jan-15	View History
Summary								
Total	<input type="checkbox"/>	31,628	32,298	33,338	32,947	34,862	33,706	2010-2015
Intra-U.S. Movements	<input type="checkbox"/>	26,096	28,465	28,398	26,192	30,309	28,340	2010-2015
U.S. Exports to Canada	<input type="checkbox"/>	1,868	1,061	1,423	2,221	816	1,326	2010-2015
U.S. Imports from Canada	<input type="checkbox"/>	3,663	2,772	3,517	4,535	3,737	4,040	2010-2015
From PADD 1 to								
Total	<input type="checkbox"/>	1	0	0	0	0	0	2010-2015
U.S.	<input type="checkbox"/>	1	0	0	0	0	0	2010-2015
PADD 1	<input type="checkbox"/>	1						2010-2014
PADD 2	<input type="checkbox"/>	0	0	0	0	0	0	2010-2015
PADD 3	<input type="checkbox"/>							2010-2011
PADD 4	<input type="checkbox"/>	0	0	0	0	0	0	2014-2015
PADD 5	<input type="checkbox"/>							2011-2011
Canada	<input type="checkbox"/>	0	0	0	0	0	0	2011-2015
From PADD 2 to								
Total	<input type="checkbox"/>	20,910	23,362	22,839	23,024	23,462	22,688	2010-2015
U.S.	<input type="checkbox"/>	20,035	22,706	21,801	20,996	22,839	21,833	2010-2015
PADD 1	<input type="checkbox"/>	10,456	12,608	12,438	12,714	13,224	13,538	2010-2015
PADD 2	<input type="checkbox"/>	1,226	964	519	860	1,004	1,243	2010-2015
PADD 3	<input type="checkbox"/>	4,249	4,014	4,401	4,221	3,499	1,756	2010-2015
PADD 4	<input type="checkbox"/>	0	0	0	0	0	0	2012-2015
PADD 5	<input type="checkbox"/>	4,103	5,120	4,443	3,201	5,112	5,296	2010-2015
Canada	<input type="checkbox"/>	874	656	1,037	2,028	622	855	2011-2015

http://www.eia.gov/dnav/pet/PET_MOVE_RAILNA_A_EPC0_RAIL_MBBL_M.htm

Inter-PADD rail movements are comparable to pipeline and waterborne movements of crude oil

Movements of Crude Oil by Rail between PAD Districts

Product: Period-Unit:

Download Series History Definitions, Sources & Notes								
Show Data By:	Graph	Aug-14	Sep-14	Oct-14	Nov-14	Dec-14	Jan-15	View History
<input type="radio"/> Product <input checked="" type="radio"/> Areas	Clear							
From PADD 1 to								
PADD 2	<input type="checkbox"/>	0	0	0	0	0	0	2010-2015
PADD 3	<input type="checkbox"/>							2010-2011
PADD 4	<input type="checkbox"/>	0	0	0	0	0	0	2014-2015
PADD 5	<input type="checkbox"/>							2011-2011
From PADD 2 to								
PADD 1	<input type="checkbox"/>	10,456	12,608	12,438	12,714	13,224	13,538	2010-2015
PADD 3	<input type="checkbox"/>	4,249	4,014	4,401	4,221	3,499	1,756	2010-2015
PADD 4	<input type="checkbox"/>	0	0	0	0	0	0	2012-2015
PADD 5	<input type="checkbox"/>	4,103	5,120	4,443	3,201	5,112	5,296	2010-2015
From PADD 3 to								
PADD 1	<input type="checkbox"/>							2010-2011
PADD 2	<input type="checkbox"/>	69	0	0	0	43	0	2010-2015
PADD 4	<input type="checkbox"/>	0	0	0	0	0	0	2010-2015
PADD 5	<input type="checkbox"/>	269	140	131	345	289	214	2011-2015
From PADD 4 to								
PADD 1	<input type="checkbox"/>	417	1,035	708	525	1,218	809	2014-2015
PADD 2	<input type="checkbox"/>	253	125	502	384	512	463	2012-2015
PADD 3	<input type="checkbox"/>	2,721	2,372	3,162	2,512	3,381	3,305	2010-2015
PADD 5	<input type="checkbox"/>	400	310	694	175	840	293	2012-2015

http://www.eia.gov/dnav/pet/PET_MOVE_RAIL_A_EPC0_RAIL_MBBL_M.htm

Crude oil movements by mode data table now includes rail

Movements by Tanker, Pipeline, Barge and Rail between PAD Districts

Product: Period-Unit:

[Download Series History](#) [Definitions, Sources & Notes](#)

Show Data By:	Graph	Aug-14	Sep-14	Oct-14	Nov-14	Dec-14	Jan-15	View History
<input type="radio"/> Product <input checked="" type="radio"/> Areas	Clear							
From PADD 1 to								
PADD 2	<input type="checkbox"/>	333	318	296	374	365	333	1986-2015
PADD 3	<input type="checkbox"/>	1,139	999	1,487	727	871	590	1986-2015
PADD 4	<input type="checkbox"/>	0	0	0	0	0	0	2014-2015
PADD 5	<input type="checkbox"/>							2011-2011
From PADD 2 to								
PADD 1	<input type="checkbox"/>	11,053	13,099	12,934	13,180	13,699	14,113	1986-2015
PADD 3	<input type="checkbox"/>	24,503	23,820	27,352	25,275	26,274	26,208	1986-2015
PADD 4	<input type="checkbox"/>	3,626	3,527	3,773	4,254	4,587	4,969	1986-2015
PADD 5	<input type="checkbox"/>	4,103	5,120	4,443	3,201	5,112	5,296	2010-2015
From PADD 3 to								
PADD 1	<input type="checkbox"/>	636	526	835	789	1,505	789	1986-2015
PADD 2	<input type="checkbox"/>	28,141	28,175	22,704	24,060	24,555	24,219	1986-2015
PADD 4	<input type="checkbox"/>	0	0	0	0	0	0	2004-2015
PADD 5	<input type="checkbox"/>	269	140	131	345	289	350	1986-2015
From PADD 4 to								
PADD 1	<input type="checkbox"/>	417	1,035	708	525	1,218	809	2013-2015
PADD 2	<input type="checkbox"/>	7,767	8,187	8,461	8,376	9,431	9,891	1986-2015
PADD 3	<input type="checkbox"/>	3,145	2,757	3,571	2,883	3,779	3,726	1986-2015
PADD 5	<input type="checkbox"/>	400	310	694	175	840	293	2011-2015

http://www.eia.gov/dnav/pet/PET_MOVE_PTBA_EPC0_TNR_MBBL_M.htm

For more information

U.S. Energy Information Administration home page | www.eia.gov

Annual Energy Outlook | www.eia.gov/forecasts/aeo

Short-Term Energy Outlook | www.eia.gov/forecasts/steo

International Energy Outlook | www.eia.gov/forecasts/ieo

Today In Energy | www.eia.gov/todayinenergy

Monthly Energy Review | www.eia.gov/totalenergy/data/monthly

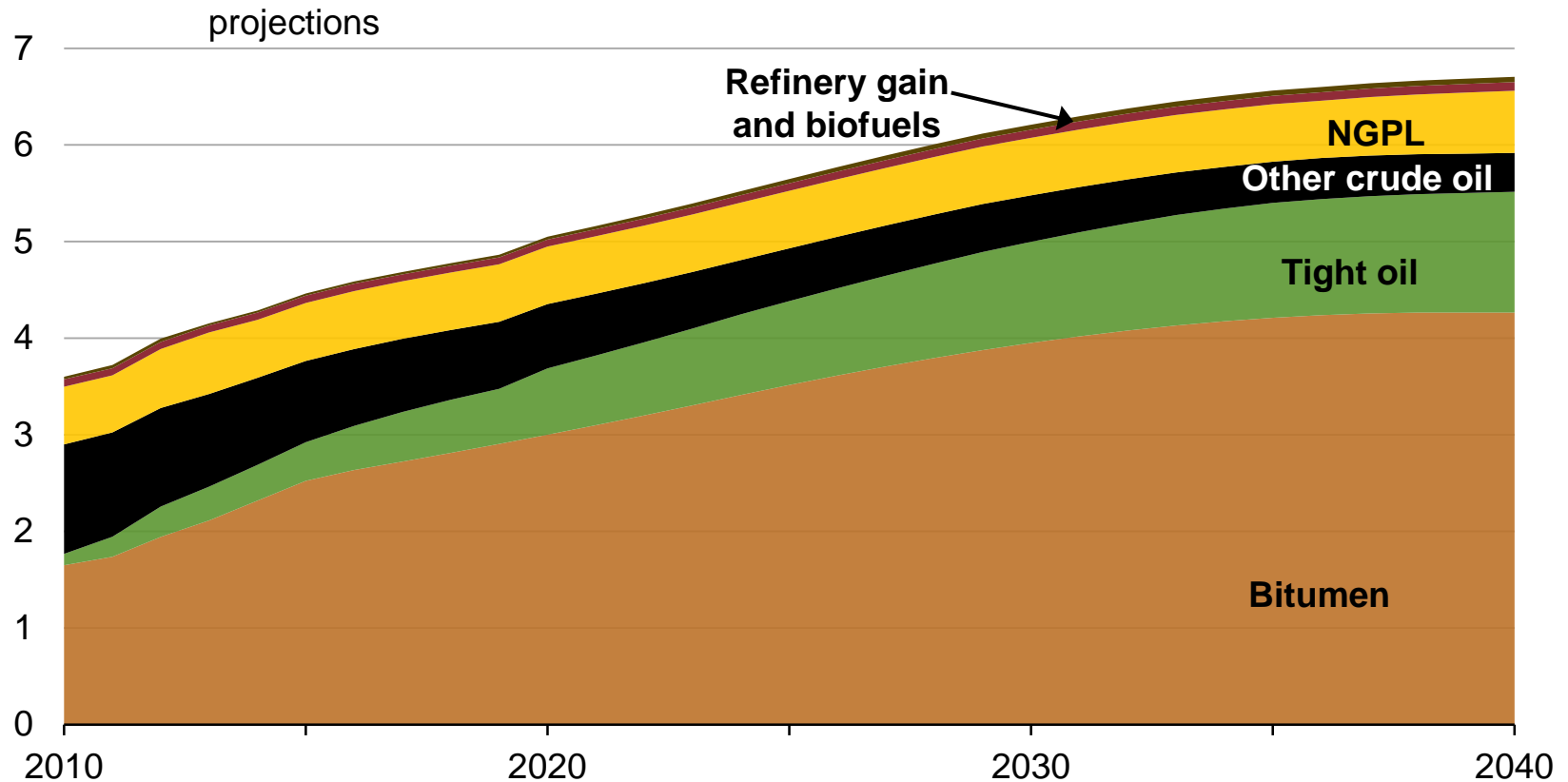
State Energy Portal | www.eia.gov/state

Drilling Productivity Report | www.eia.gov/petroleum/drilling

Canada

Canadian liquids production is projected to reach 5 million bbl/d by 2020, of which bitumen is 3 million bbl/d

Canadian liquid fuels production, Reference case
million barrels per day

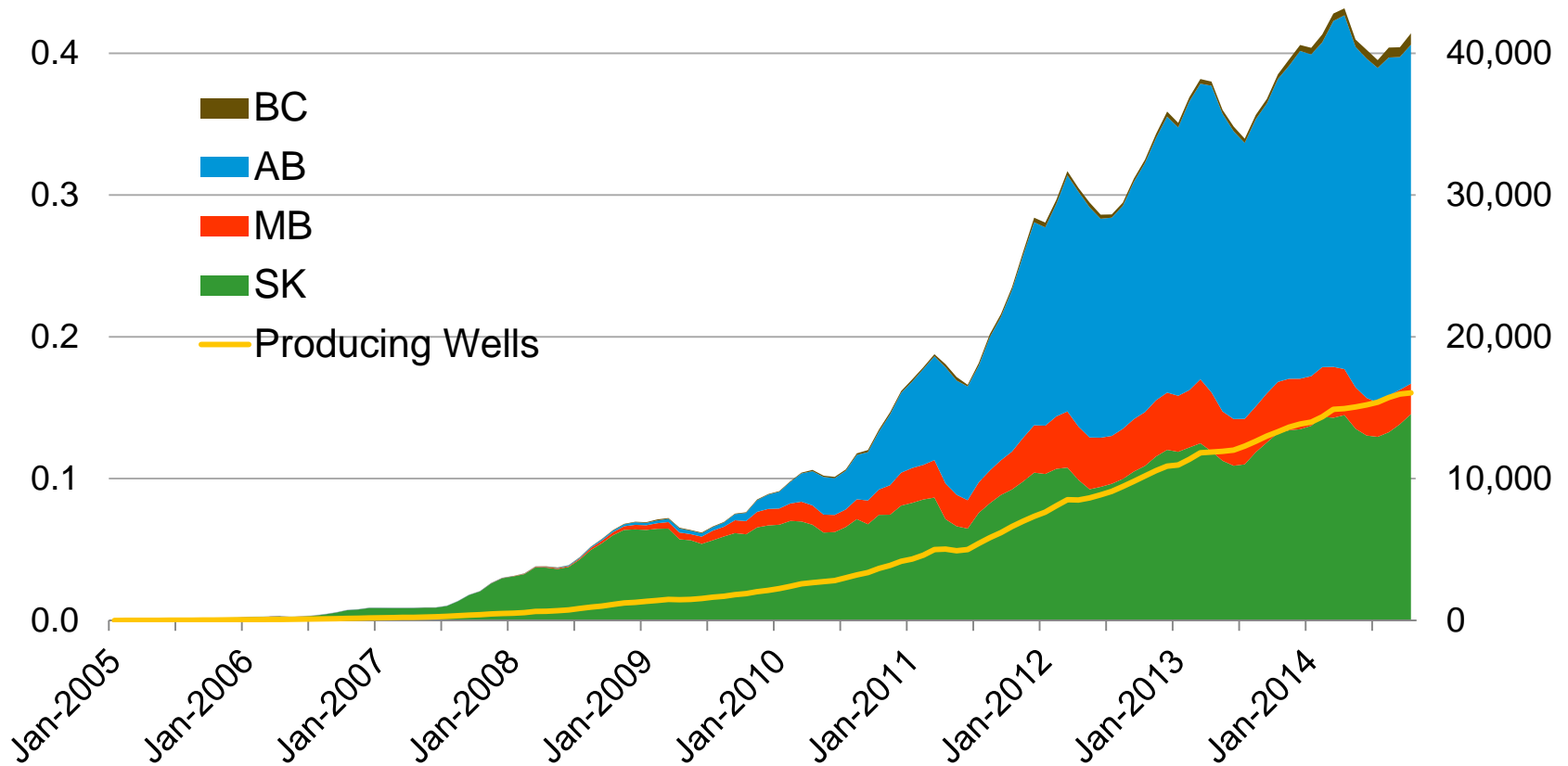


Source: EIA, International Energy Outlook 2014

Canadian tight oil production surpassed 0.4 million barrels per day in 2014 mainly from Saskatchewan and Alberta

Canadian tight oil production
million barrels per day

Producing well count

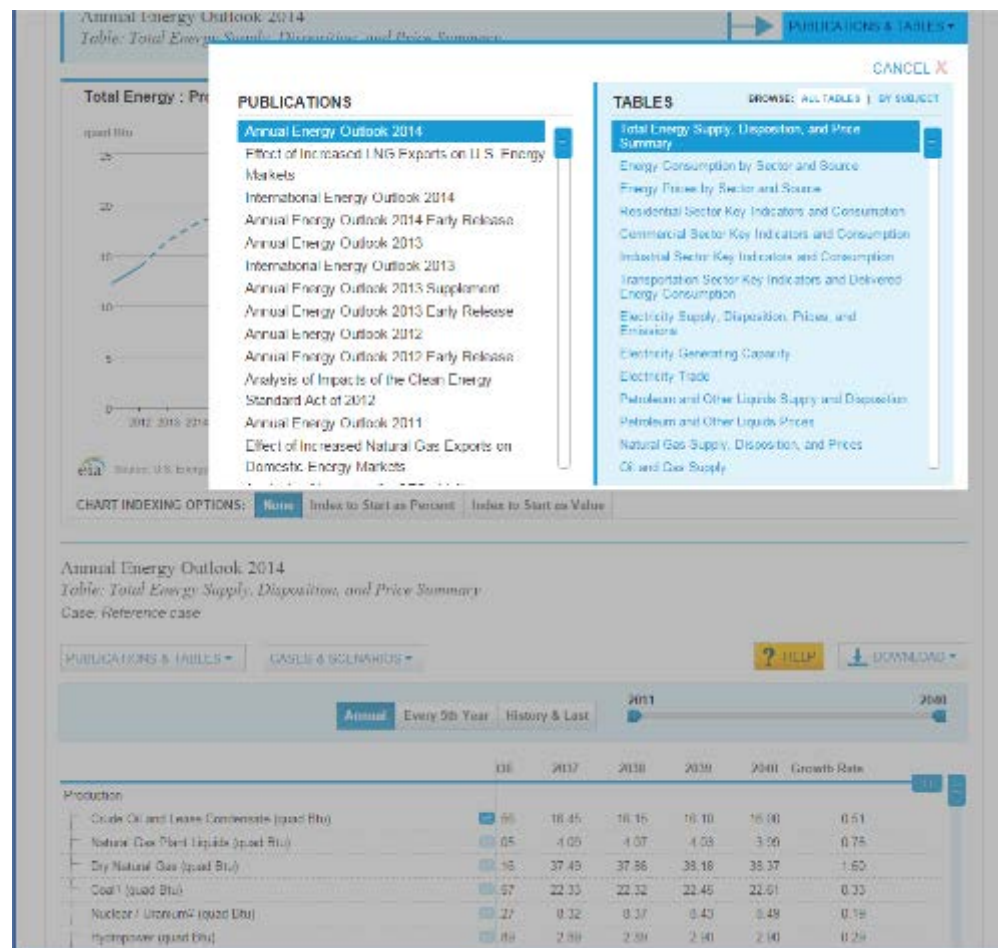


Source: Canada NEB 2014

Supplemental Slides

New AEO table browser

- Signature product redeveloped for EIA's state-of-the-art table browser experience
- Compares up to 6 cases from AEO

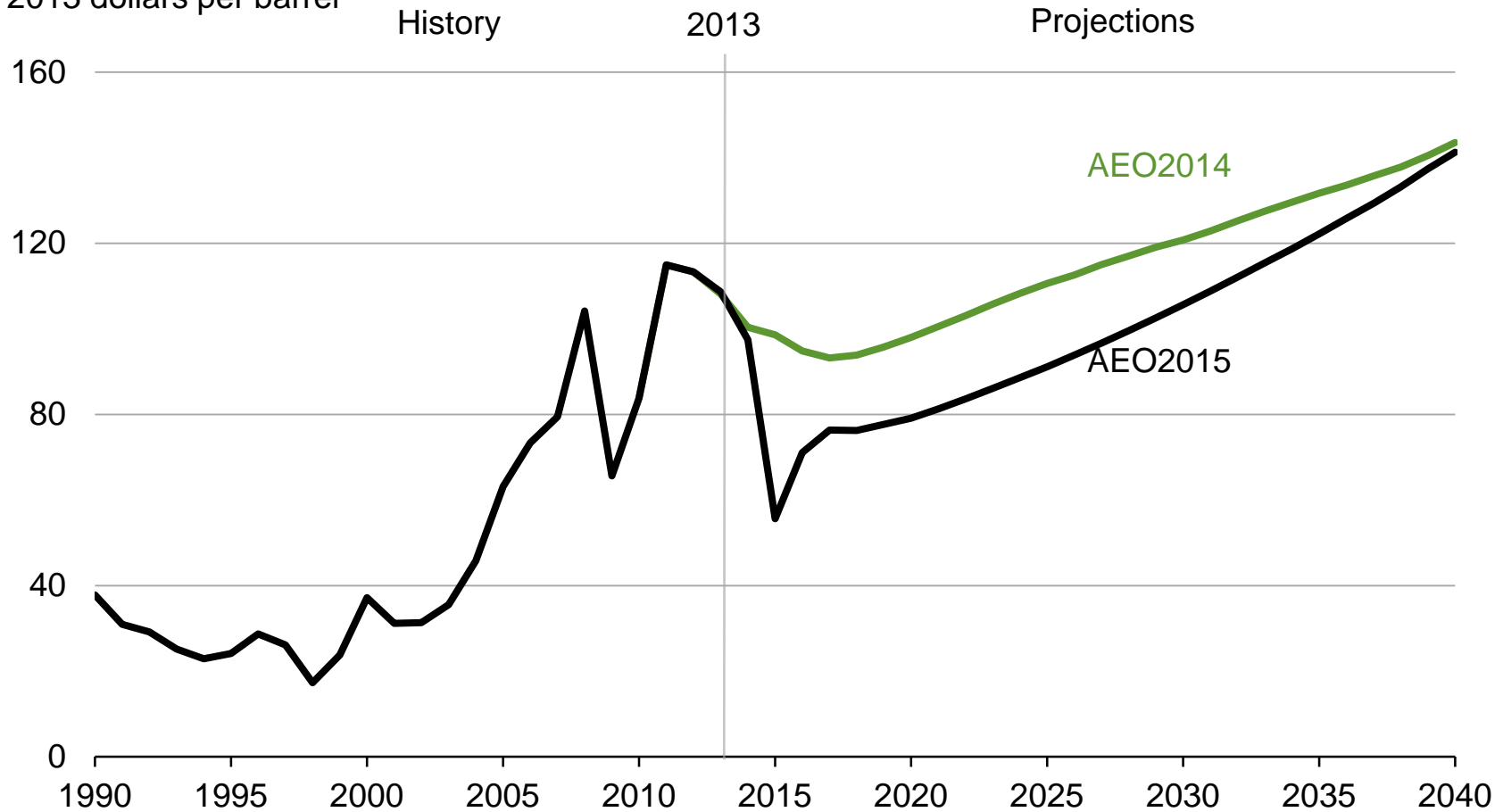


Annual Energy Outlook 2015: Petroleum and other liquid supply

<http://www.eia.gov/forecasts/aeo/>

Crude oil price projection is lower in the AEO2015 Reference case than in AEO2014, particularly in the near term

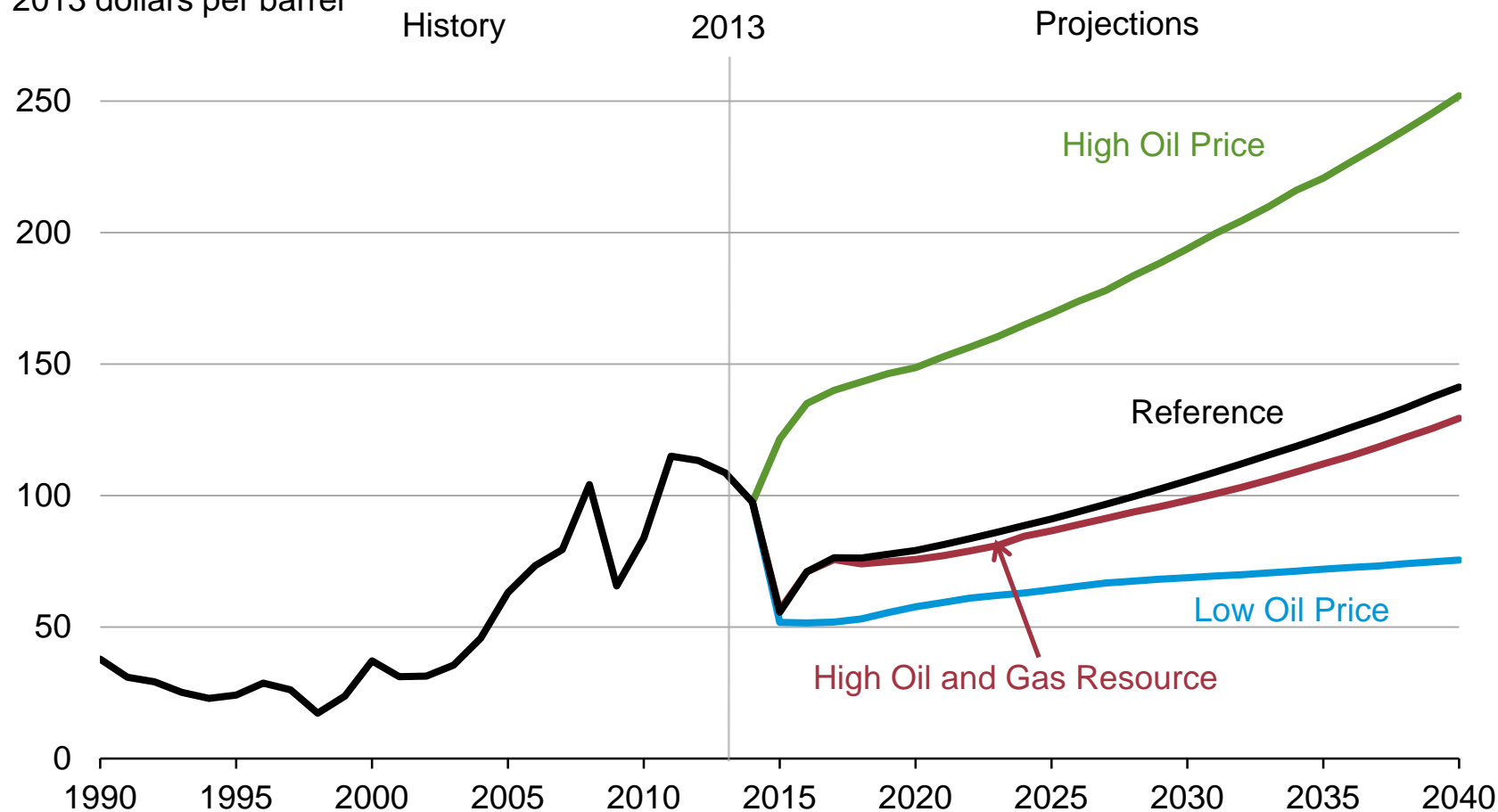
Brent crude oil spot price
2013 dollars per barrel



Source: EIA, Annual Energy Outlook 2015 Reference case and Annual Energy Outlook 2014 Reference case

AEO2015 explores scenarios that encompass a wide range of future crude oil price paths

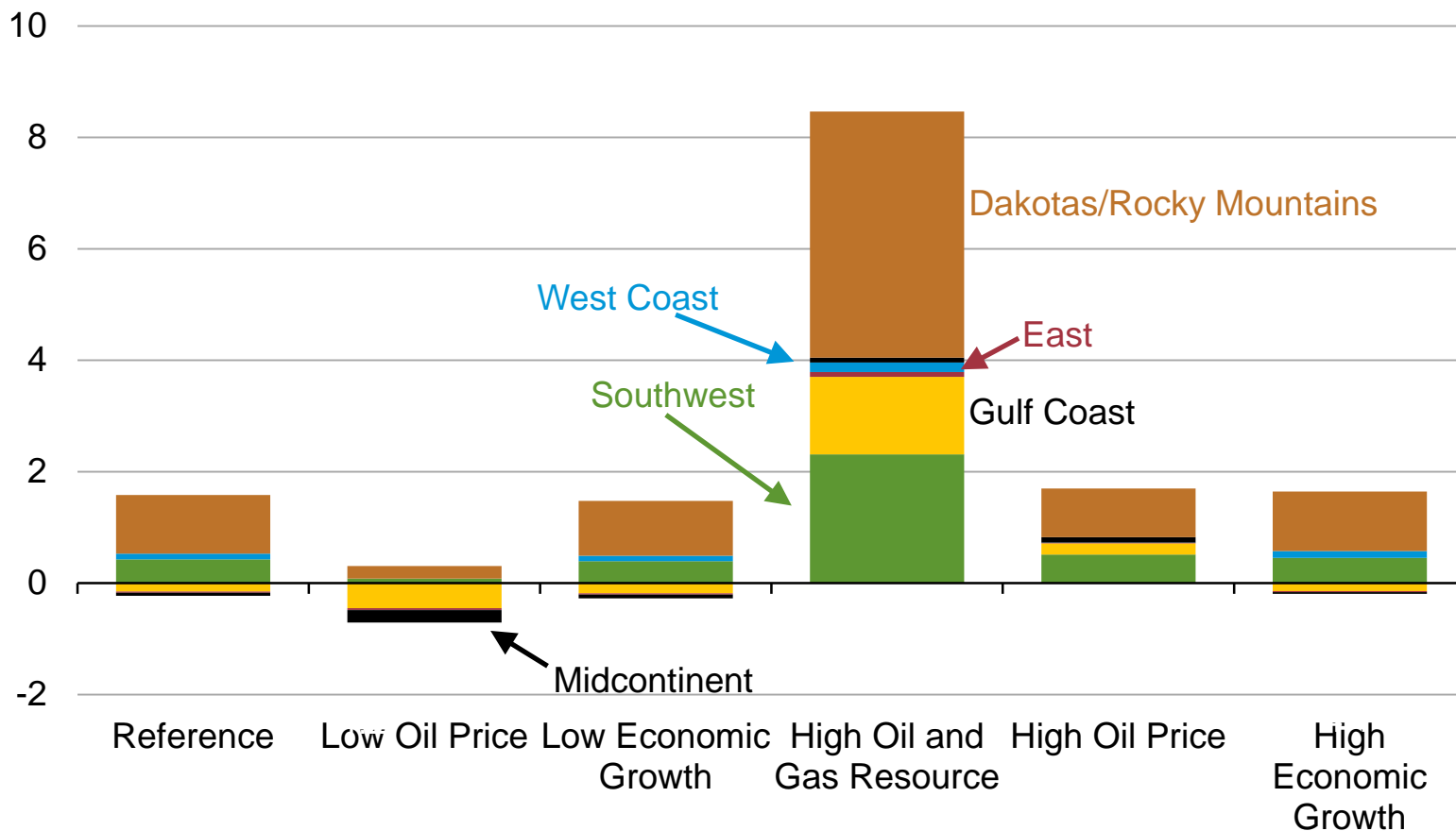
Brent crude oil spot price
2013 dollars per barrel



Source: EIA, Annual Energy Outlook 2015

Growth of onshore crude oil production varies across supply regions, affecting pipeline and midstream infrastructure needs

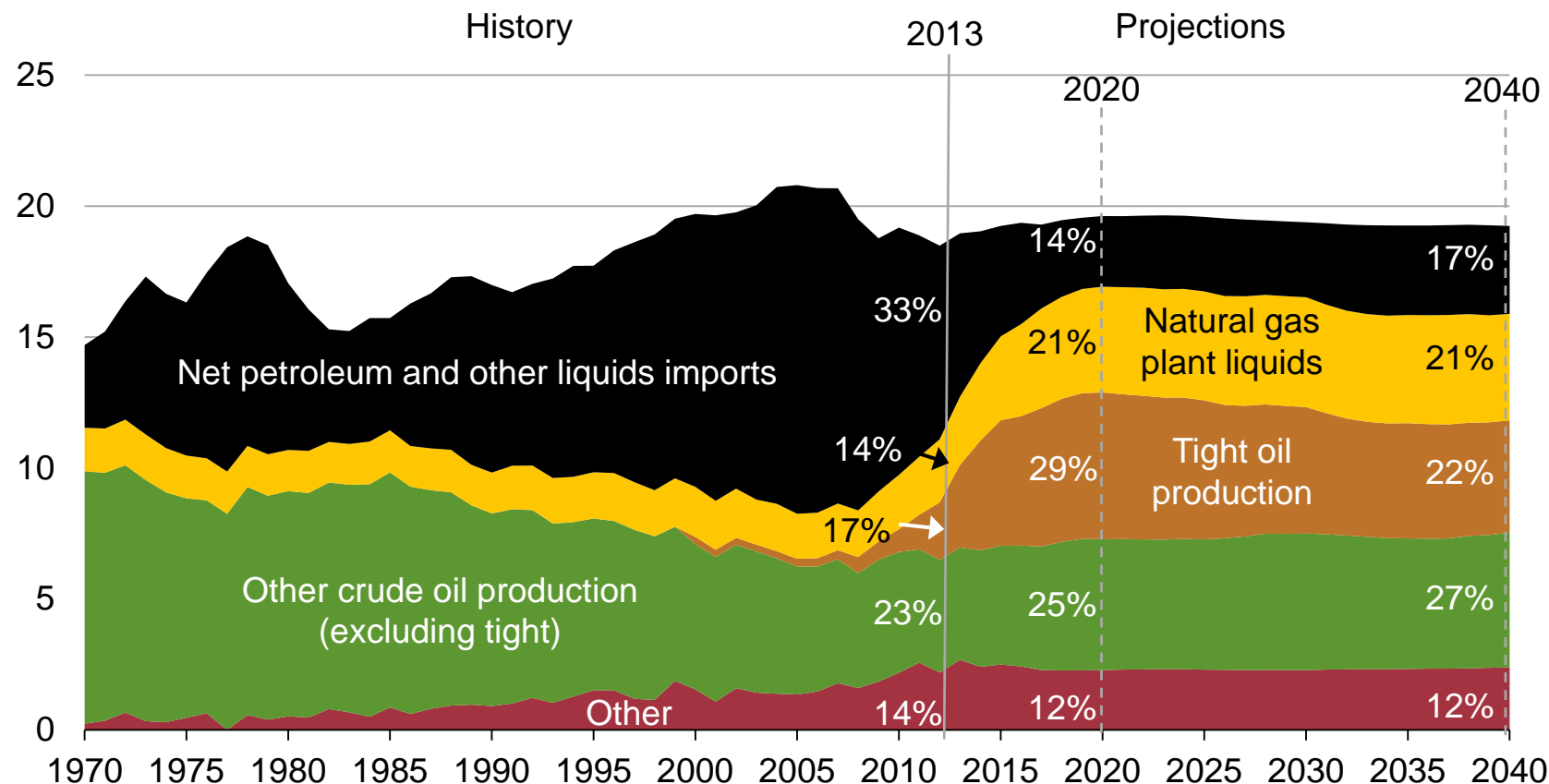
change between 2013 and 2040 in U.S. lower 48 onshore crude oil production by region
million barrels per day



Source: EIA, Annual Energy Outlook 2015

Combination of increased tight oil production and higher fuel efficiency drive projected decline in oil imports

U.S. liquid fuels supply
million barrels per day

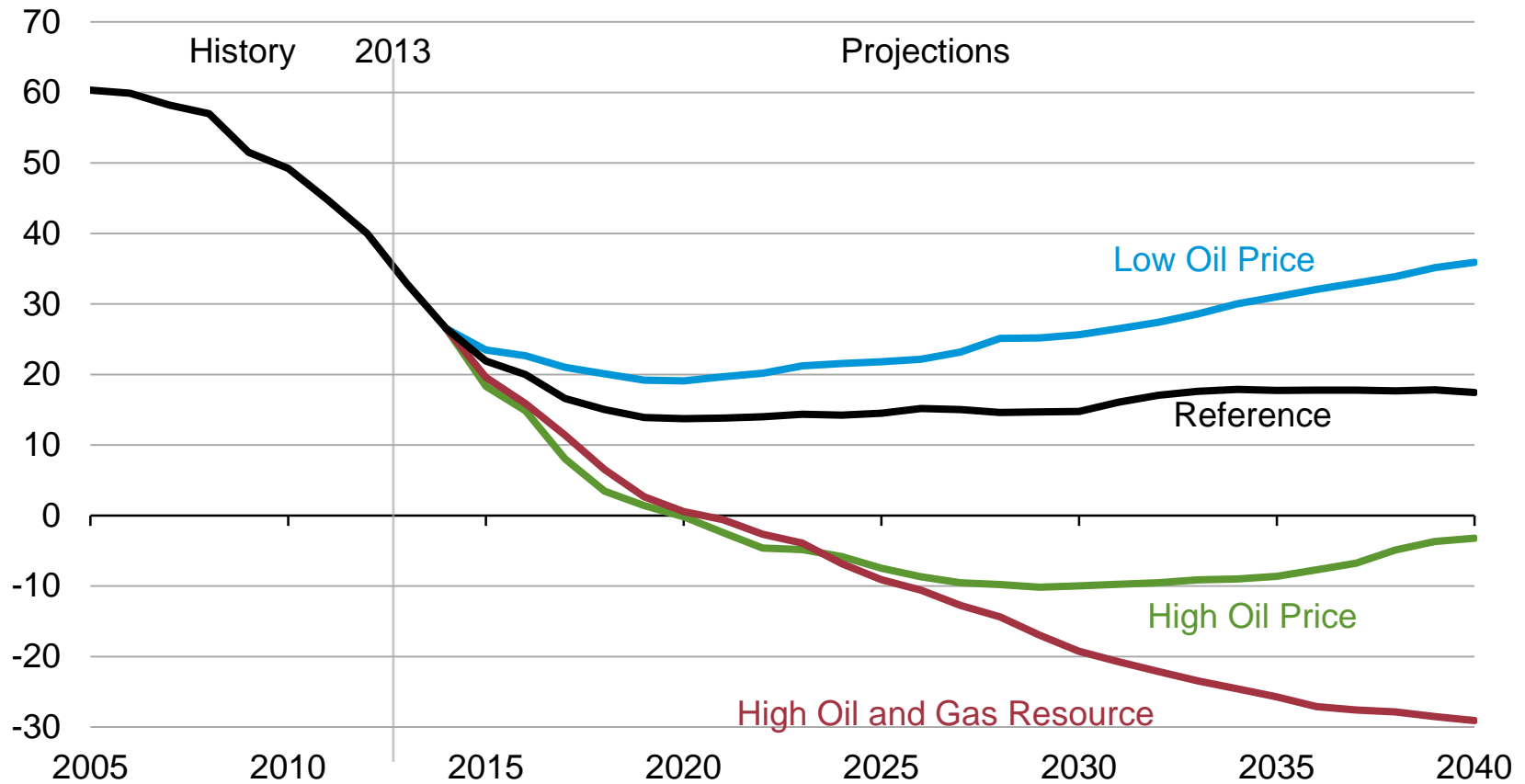


Note: "Other" includes refinery gain, biofuels production, all stock withdrawals, and other domestic sources of liquid fuels

Source: EIA, Annual Energy Outlook 2015 Reference case

Net imports provide a declining share of U.S. liquid fuels supply in most AEO2015 cases; in two cases the nation becomes a net exporter

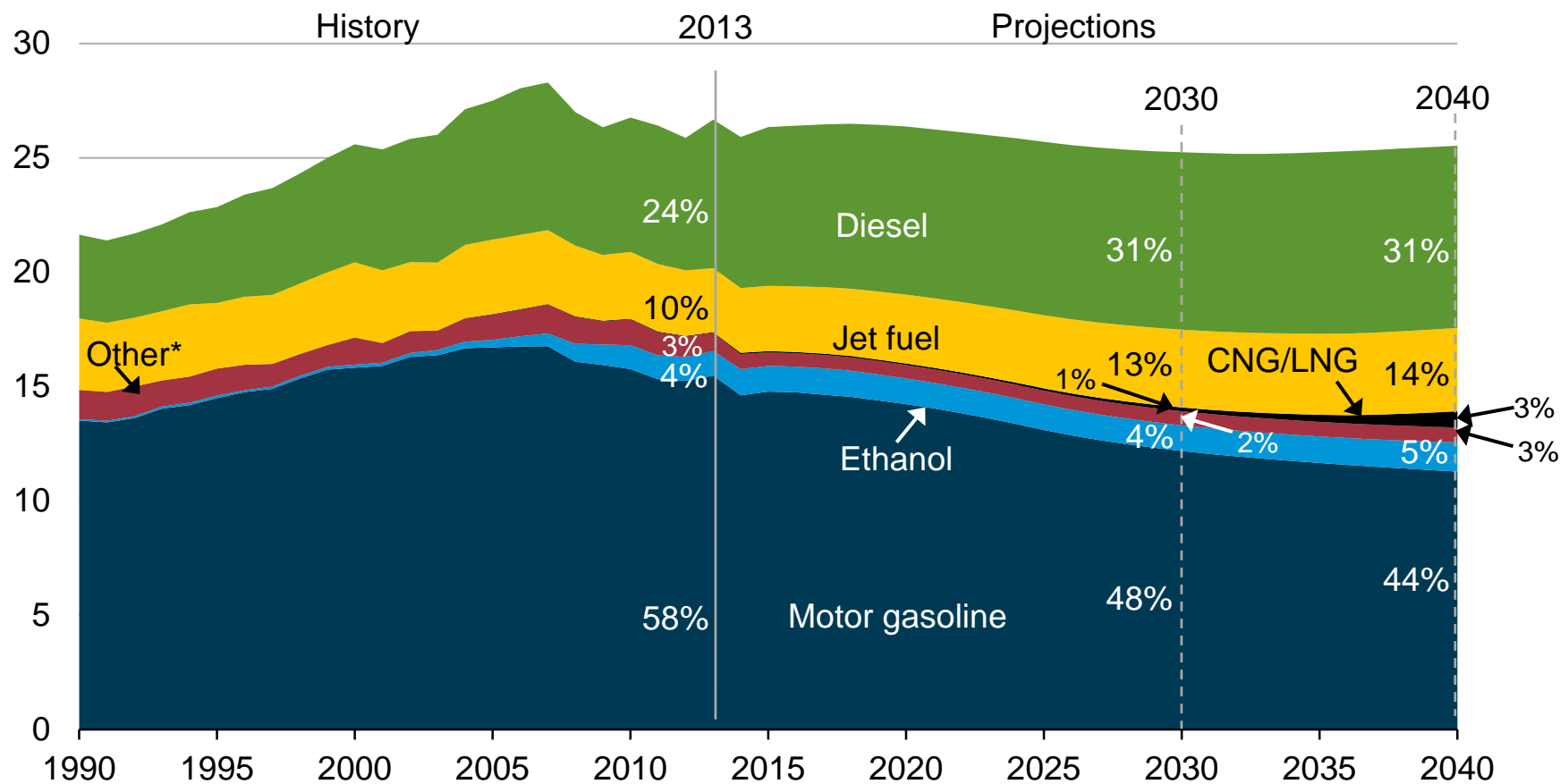
net crude oil and petroleum product imports as a percentage of total U.S. supply
percent



Source: EIA, Annual Energy Outlook 2015

In the transportation sector, motor gasoline use declines; diesel fuel, jet fuel, and natural gas use all grow

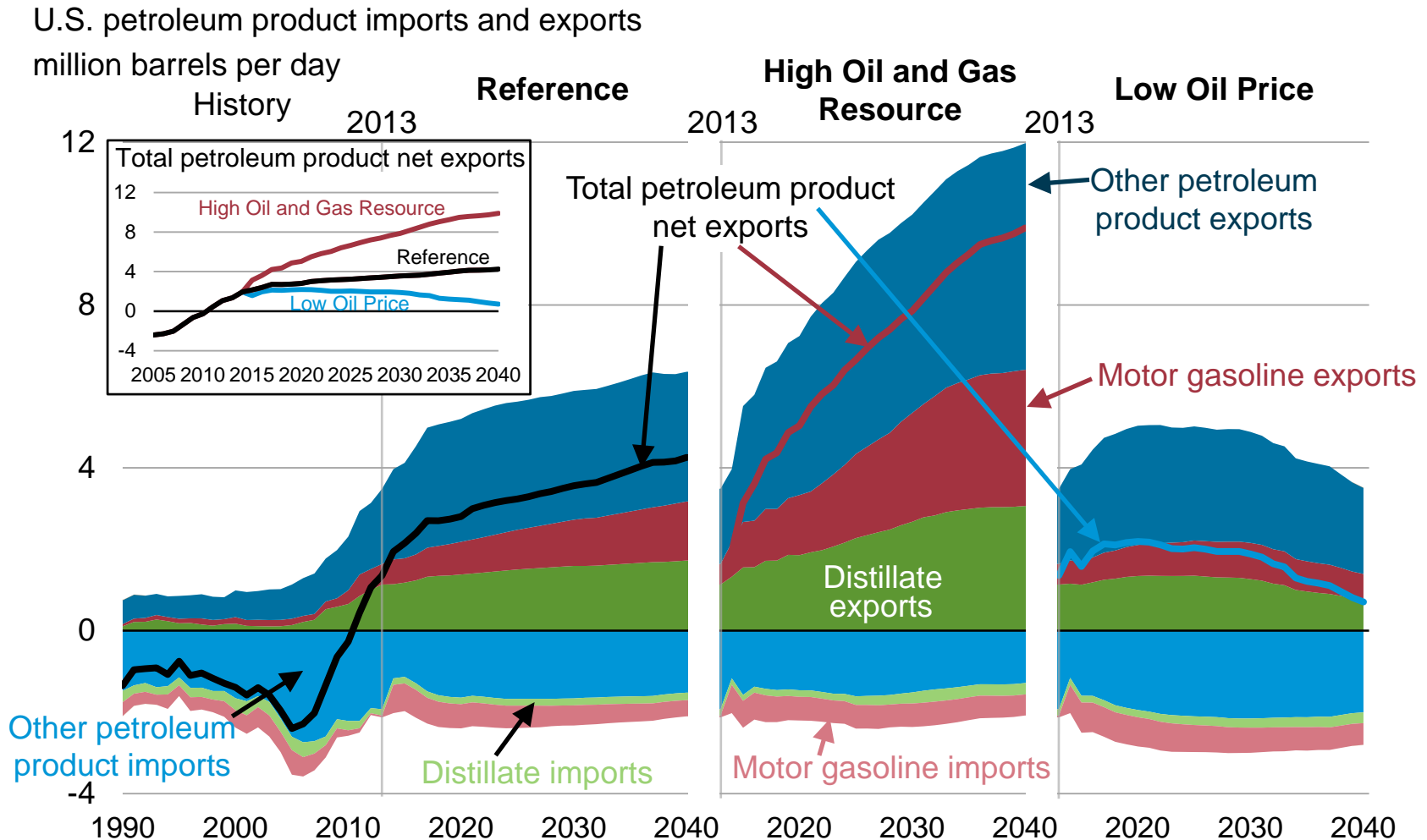
transportation energy consumption by fuel
quadrillion Btu



Source: EIA, Annual Energy Outlook 2015 Reference case

*Includes aviation gasoline, propane, residual fuel oil, lubricants, electricity, and liquid hydrogen

U.S. net exports of petroleum products vary with the level of domestic oil production given current limits on U.S. crude oil exports

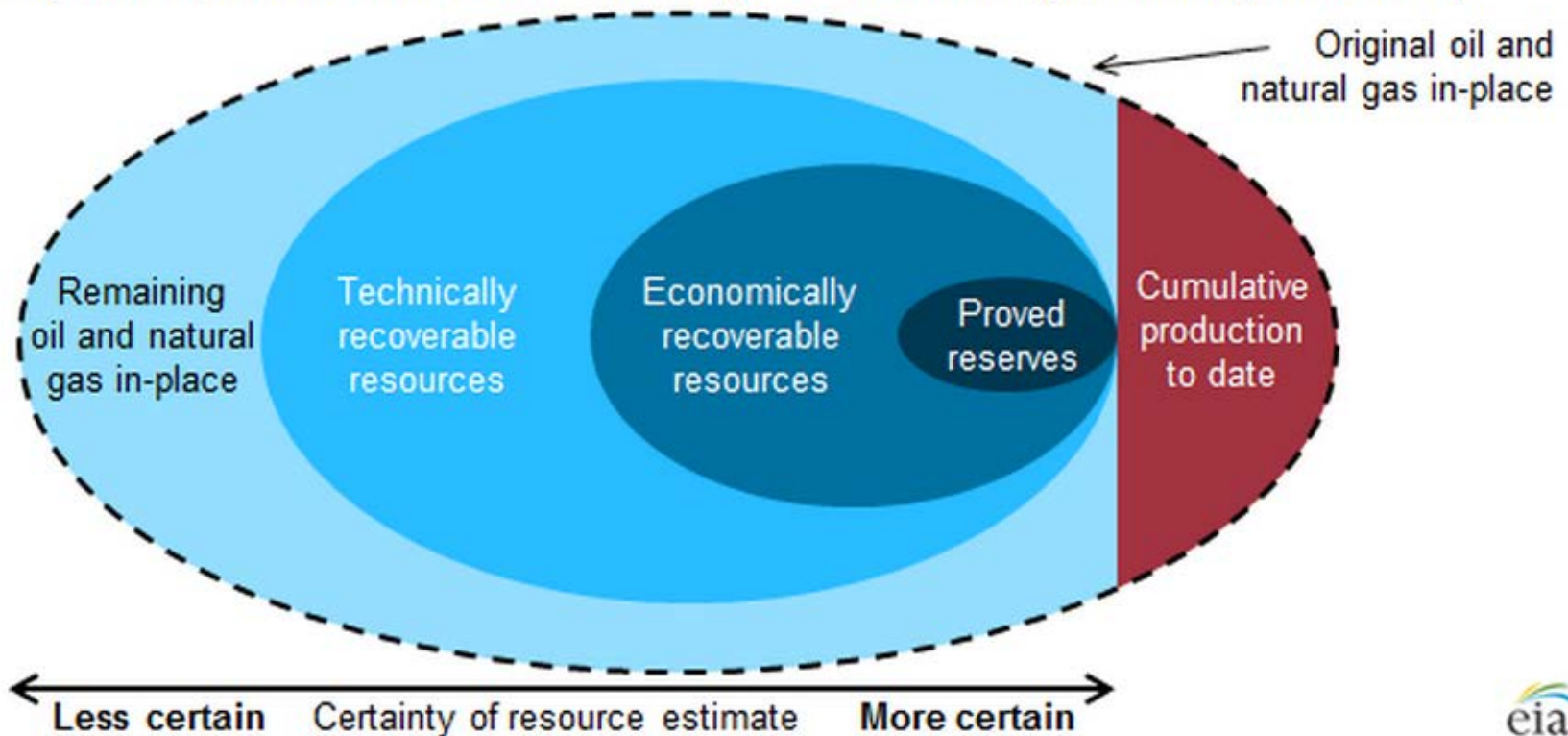


Source: EIA, Annual Energy Outlook 2015

Tight Oil Abroad

Oil and natural gas resource categories reflect varying degrees of certainty

Stylized representation of oil and natural gas resource categorizations (not to scale)



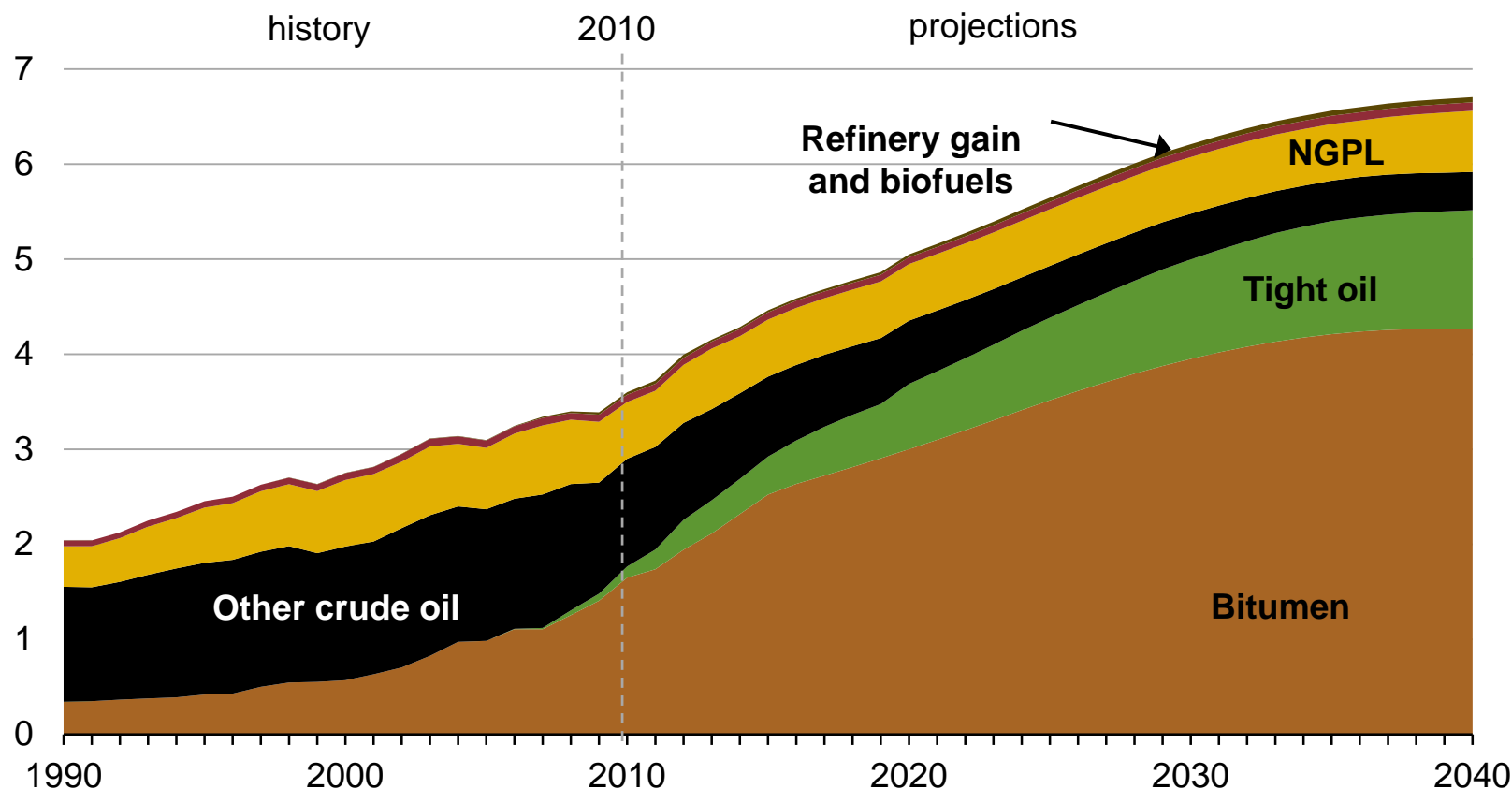
Source: U.S. Energy Information Administration

Note: Resource categories are not drawn to scale relative to the actual size of each resource category. The graphic shown above is applicable only to oil and natural gas resources.

<http://www.eia.gov/todayinenergy/detail.cfm?id=17151>

Canadian liquids production

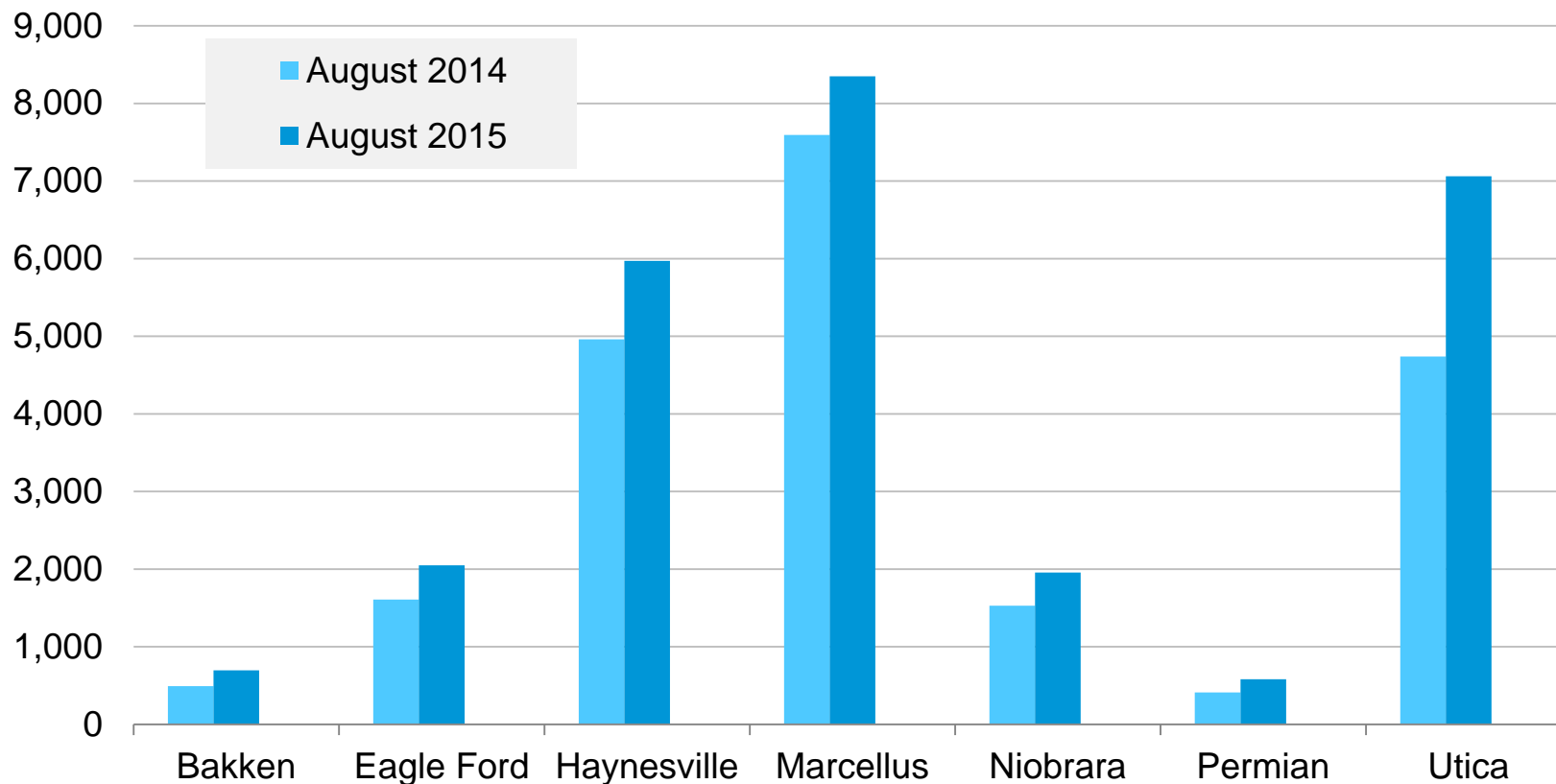
Canadian liquid fuels production, Reference case
million barrels per day



Source: EIA, International Energy Outlook 2014

Rig productivity underpins natural gas production gains

new-well gas production per rig
thousand cubic feet per day



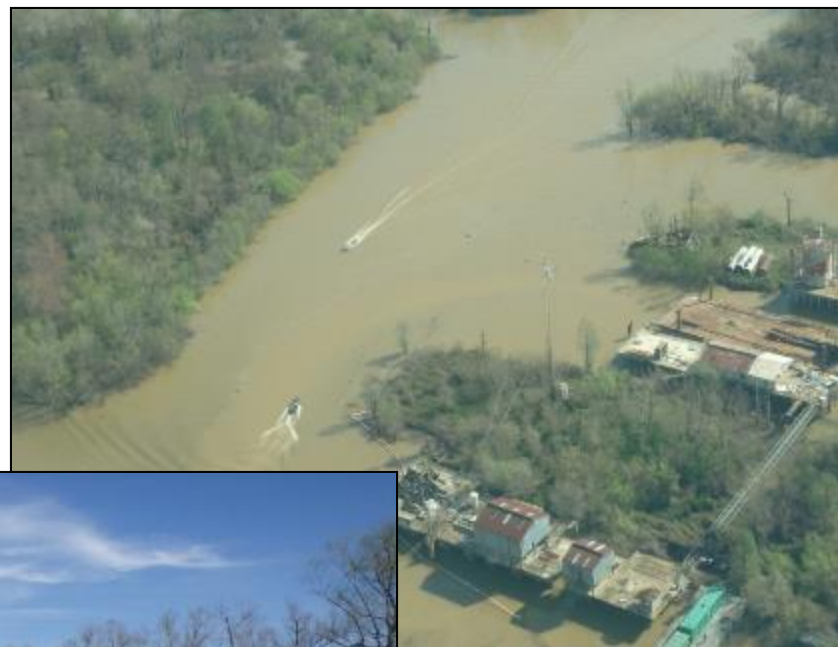
Source: EIA, Drilling Productivity Report, July 2015

Oil demand: Prices and economic growth are important, but policy, preferences, and technology may have a bigger long-term impact

- What types of consumption and pricing policies will be enacted across the world?
 - Fuel subsidies
 - Environmental policies
 - Domestic security policies
- What will light-duty vehicle trends look like?
 - Ownership rates
 - Efficiency and emissions standards
 - Technology/alternative fuels
- Where will goods be produced and how will they be moved?
- Will there be major industrial sector efficiency improvements or fuel switching?



Pipeline Spill Bayou Sorrel, LA 14MAR15



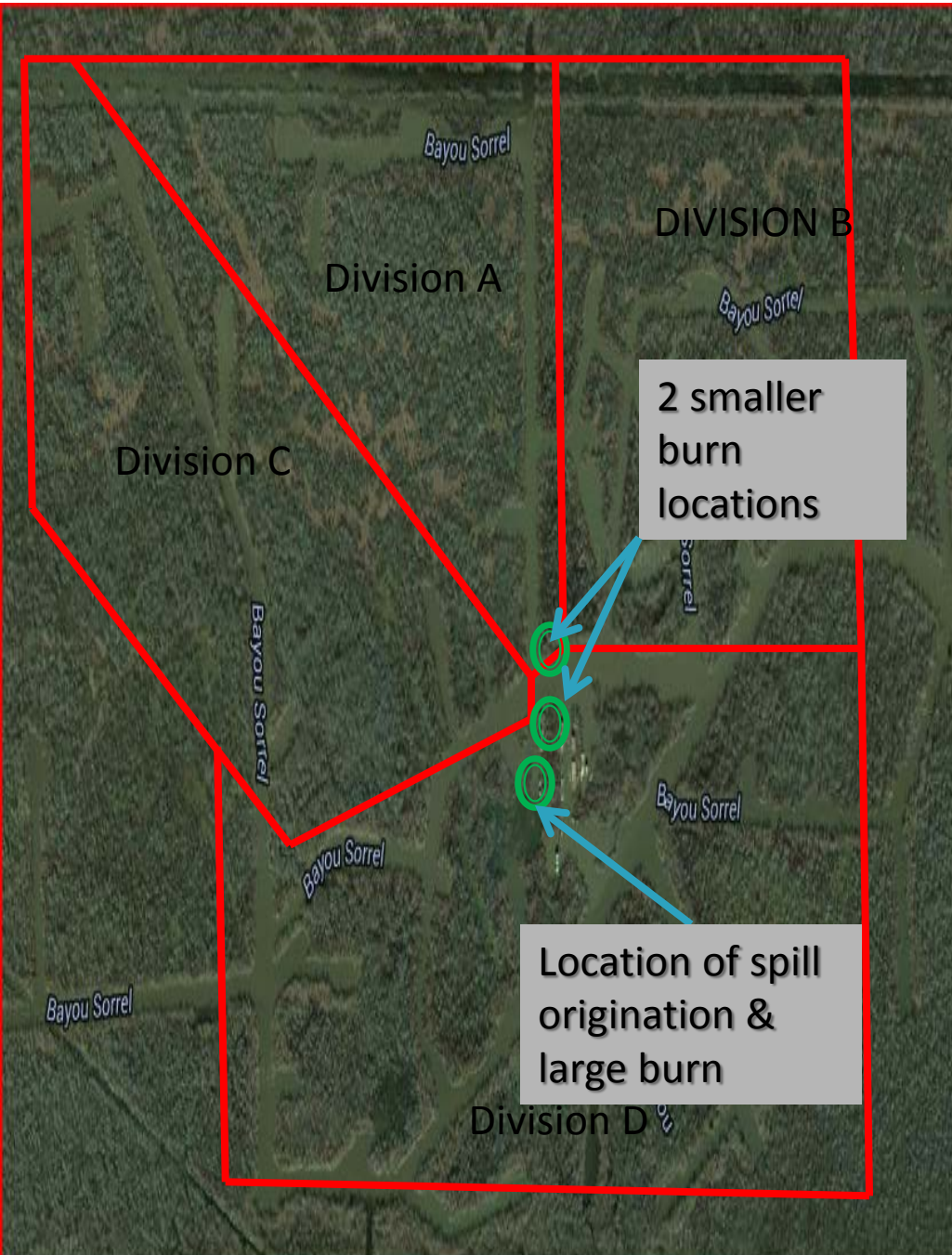


Involved Parties

- **LA DNR**- Considered land & platform an orphaned oil field & facility
- **Pharaoh Oil & Gas** – Responsible for P&A wells and dismantle oil platform at spill site
- **Interstate Exploration** - Responsible for pressure testing pipeline from Hilcorp to Pharaoh Oil & Gas
- **Amphibious Marine** - Hired by Interstate Exploration to assist with pipeline test. Operated by Martin Beldin
- **Hilcorp Energy** - Location of pumping/pushing end of pipeline
- **Shell** – Original operator of platform and wells

INITIATION OF ACTION

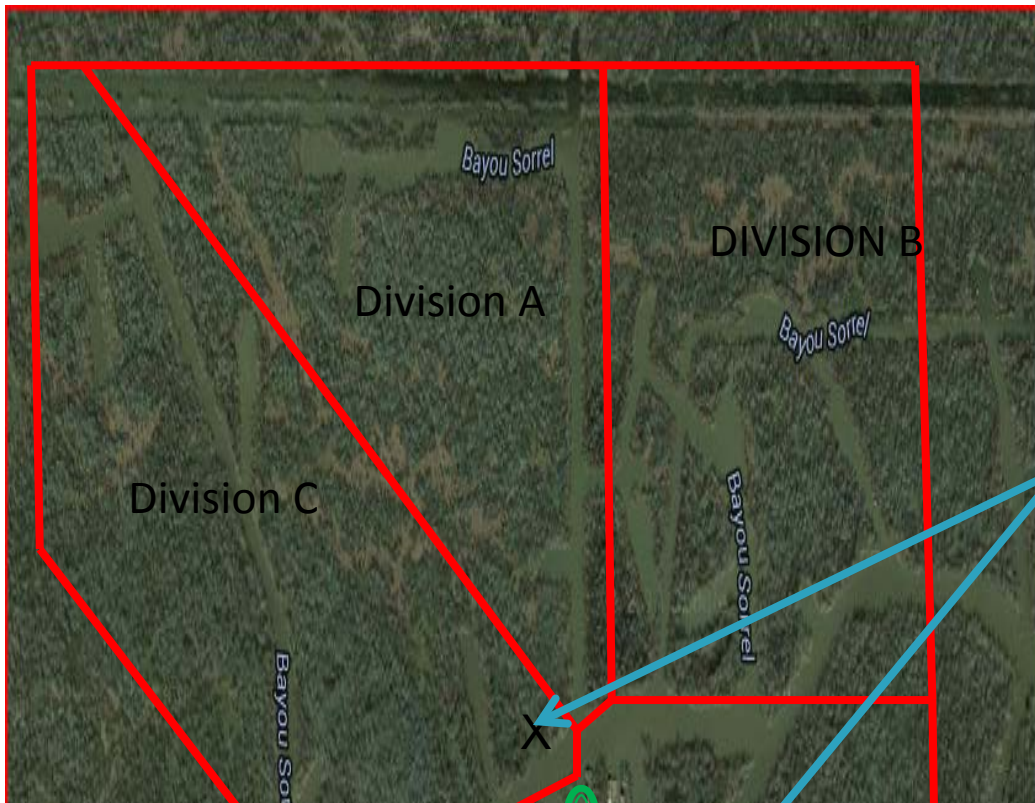
- On Sunday 15MAR15, at approximately 1800, MSU BR Pollution Responders arrived on scene and begin investigation.
- MSU BR begin taking samples of discharged product and begin conducting assessment to determine severity of spill but lost daylight and returned to base with plan to continue following day. Responders also observed burn site with oil discharging into the waterway and made plans for cleanup contractor arrival on Monday 16MAR15.





Main Burn Site at Platform Location





•On Monday & Tuesday (16-17MAR15), MSU BR Pollution Responders arrived on scene to continue assessment and determination of impacted areas. Oil is observed at spill location and in areas of division A, B & C.

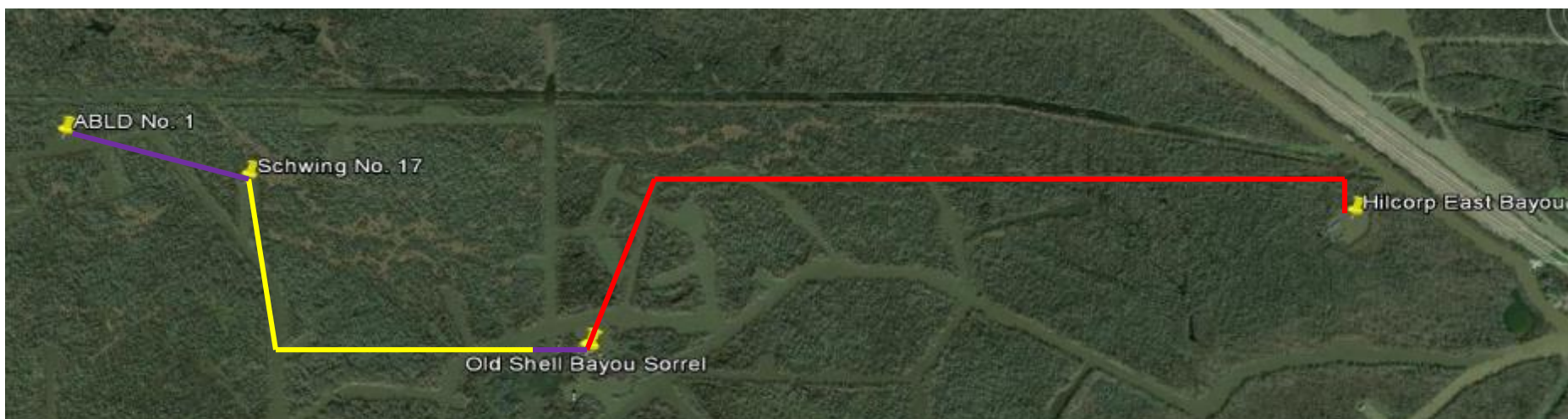
•At this time the oil within the canals appears to be different oil than black oil located at mark X in Division C and oil around the burn site.





Interstate Pipeline Test

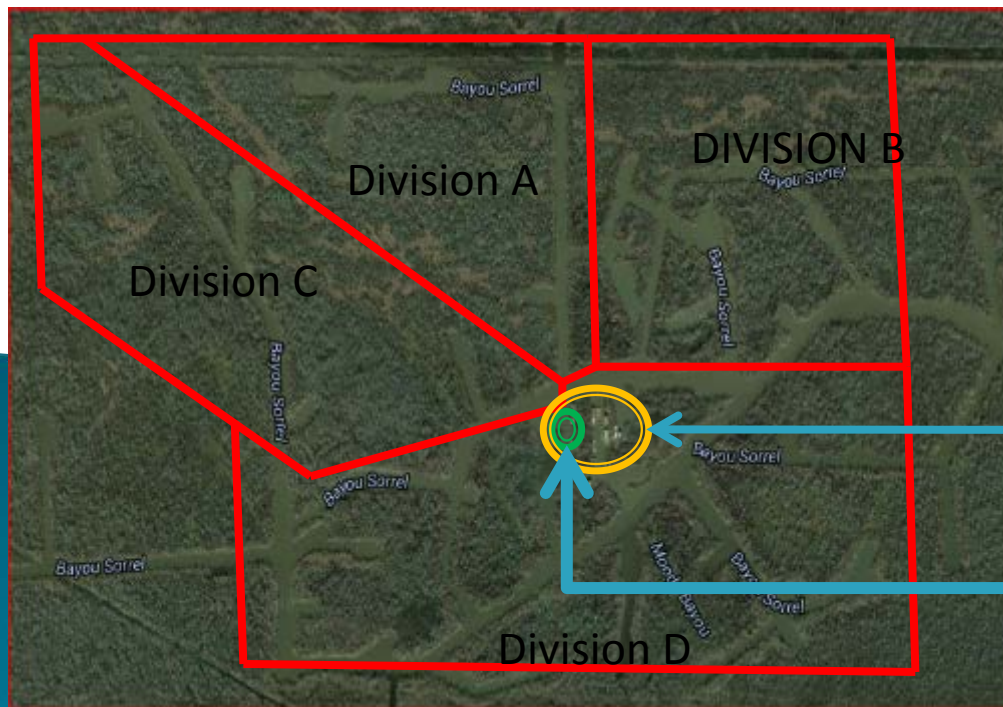
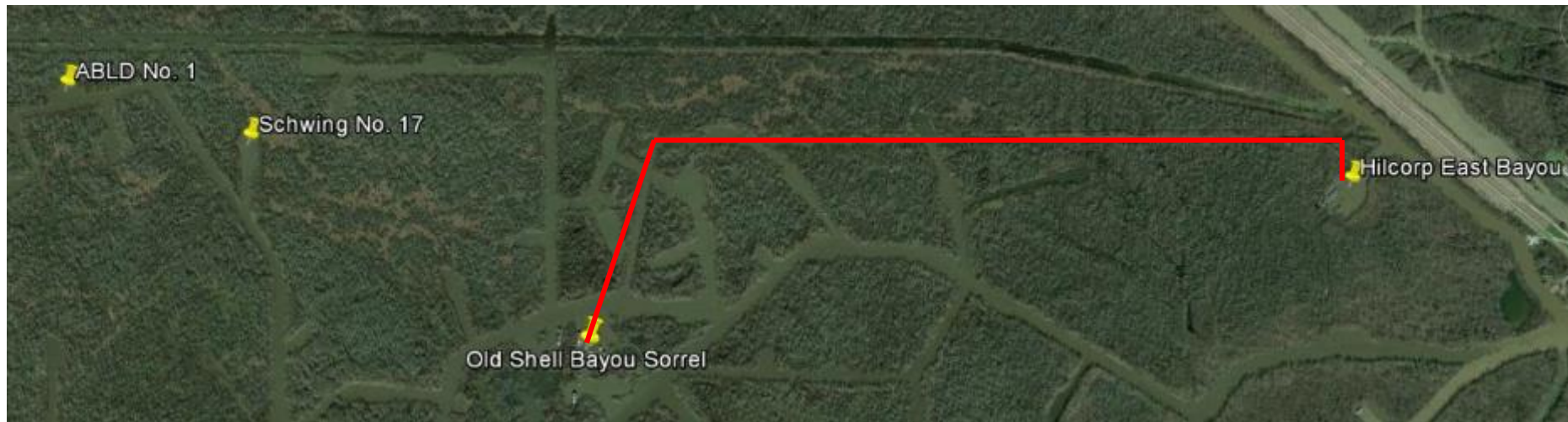
- On 14Mar15 @ approx 1500 Interstate Exploration & Amphibious Marine initiated a Pigging and Hydro test operation on the pipeline between Hilcorp and Pharaoh Oil
- The Pigging process started at Hilcorp and the waste was being received at Pharaoh
- After the pigging was initiated the receiving end radioed that no product was coming through
- Operations were suspended and search commenced. A discharge point was found, which was different from what the Pipe Survey had originally identified.



Key:

- : Pipeline from Hilcorp to Pharaoh/Old Shell facility, this is the pipeline that Interstate was testing during the discharge.
- : Pipeline Interstate wished to connect to running from Schwing No. 17 to an area near Pharaoh
- : Proposed New Pipeline to connect all existing pipeline

Pipeline Path and Spill Site Overview



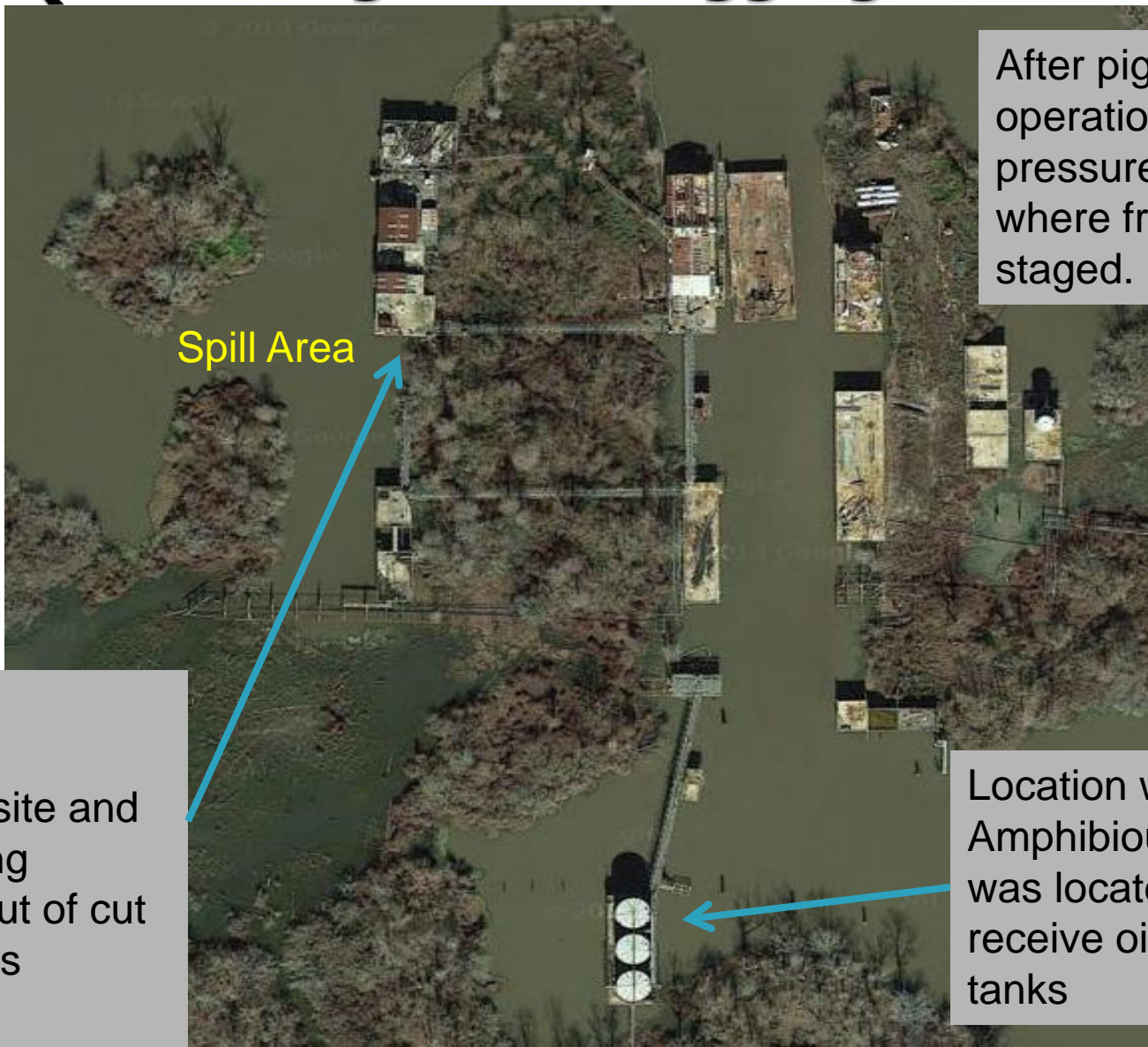
Potential discharge amount for pipeline:
approximately 10,000 feet of 4"
pipeline could contain **1865**
barrels of oil

Pharaoh Oil and Gas

Location of
Spill
Origination



Pharaoh Oil and Gas Site (Receiving end of Pigging Process)



After pigging operations started no pressure was noted where frac tanks were staged.

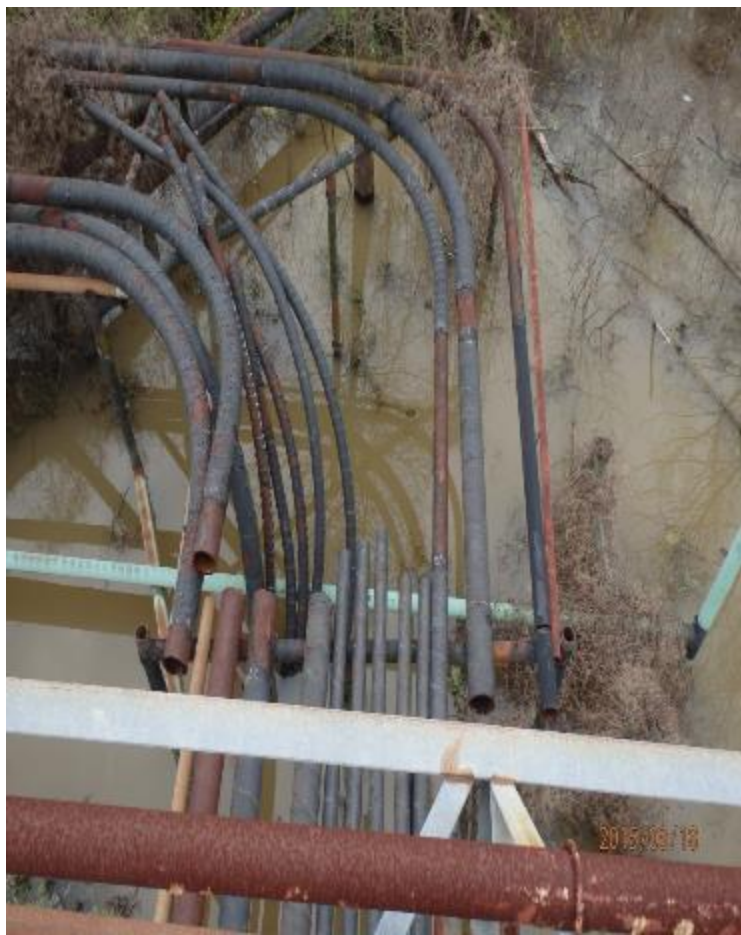
Spill Area

Interstate & Amphibious investigated site and found oil being discharged out of cut pipeline in this location.

Location where Amphibious Marine was located to receive oil into frac tanks



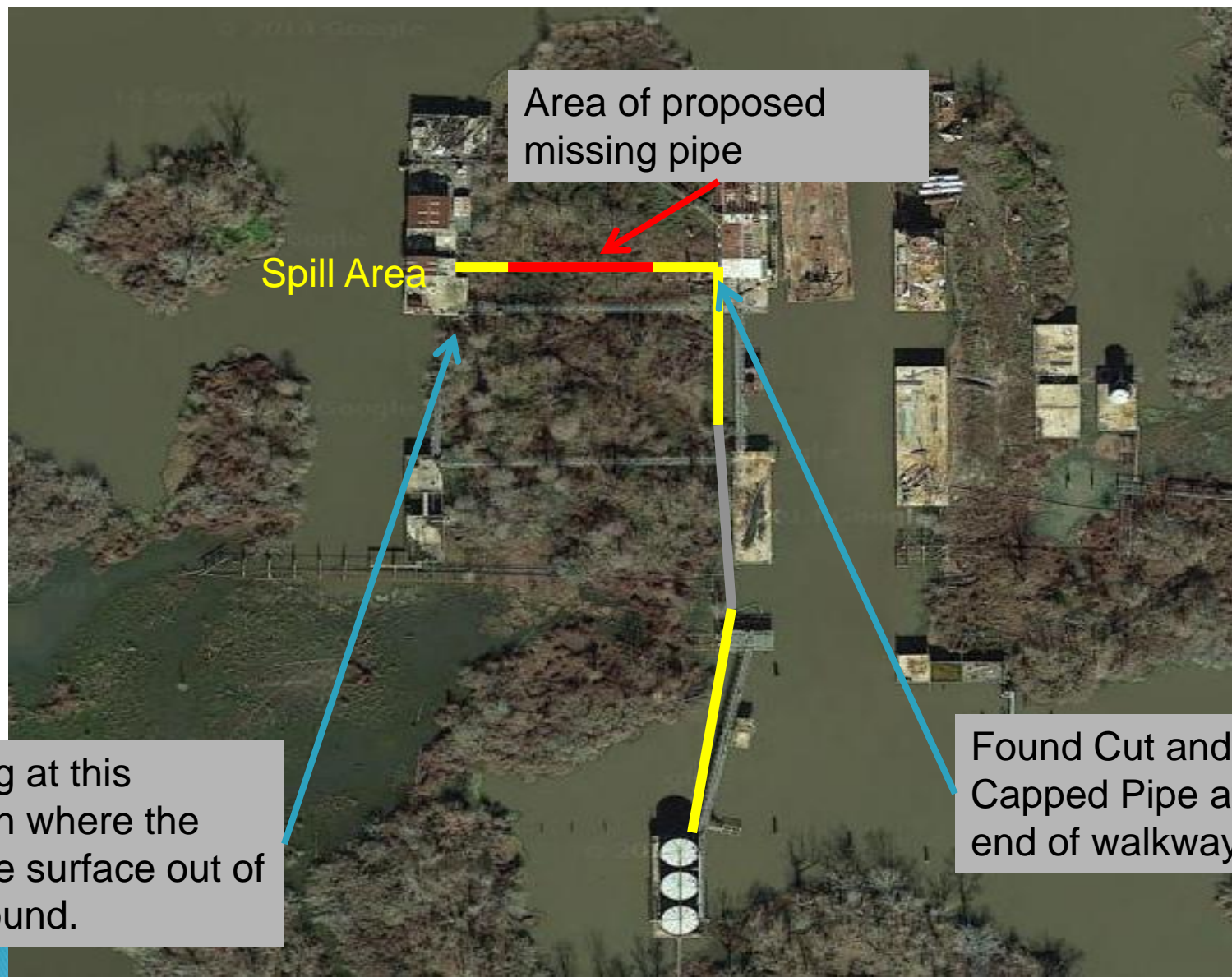
Overview of Pharaoh Oil and Gas Site



Platform area is a rat's nest of cut & uncapped piping, tanks, HAZMAT.
No known layout of flowlines



Tracing the Pipeline to find where the disconnect occurred



Area of proposed missing pipe

Spill Area

Starting at this location where the pipeline surface out of the ground.

Found Cut and Capped Pipe at other end of walkway

There was originally a pipeline here where the oil was discharging from. It was cut by Amphibious Marine.



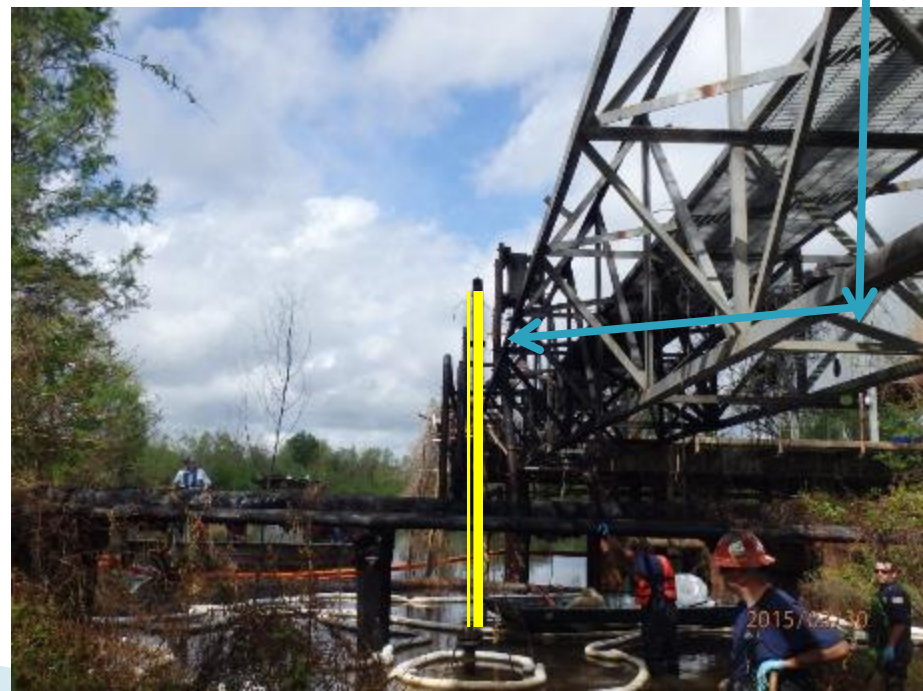
2015/03/30



Fires in the Night



- Amphibious Marine claims that after investigation the site at approximately 1600 he cut the pipeline in order to place a temporary fitting so that they could receive the oil from the pigging operation.
- During the welding operation Amphibious Marine 'accidently' caught the oiled area on fire with a welding torch. The oil around the cut pipeline was burned up.
- NRC witness said it occurred around 2330 on 14Mar.
- 3 separate burn locations discovered along with weathered, yet freshly burned boom





Notice of Federal Assumption



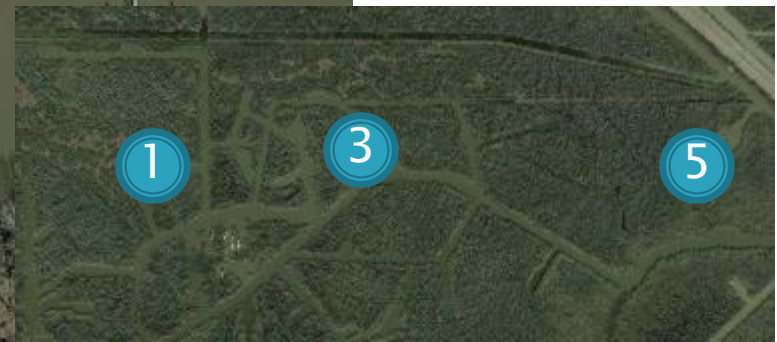
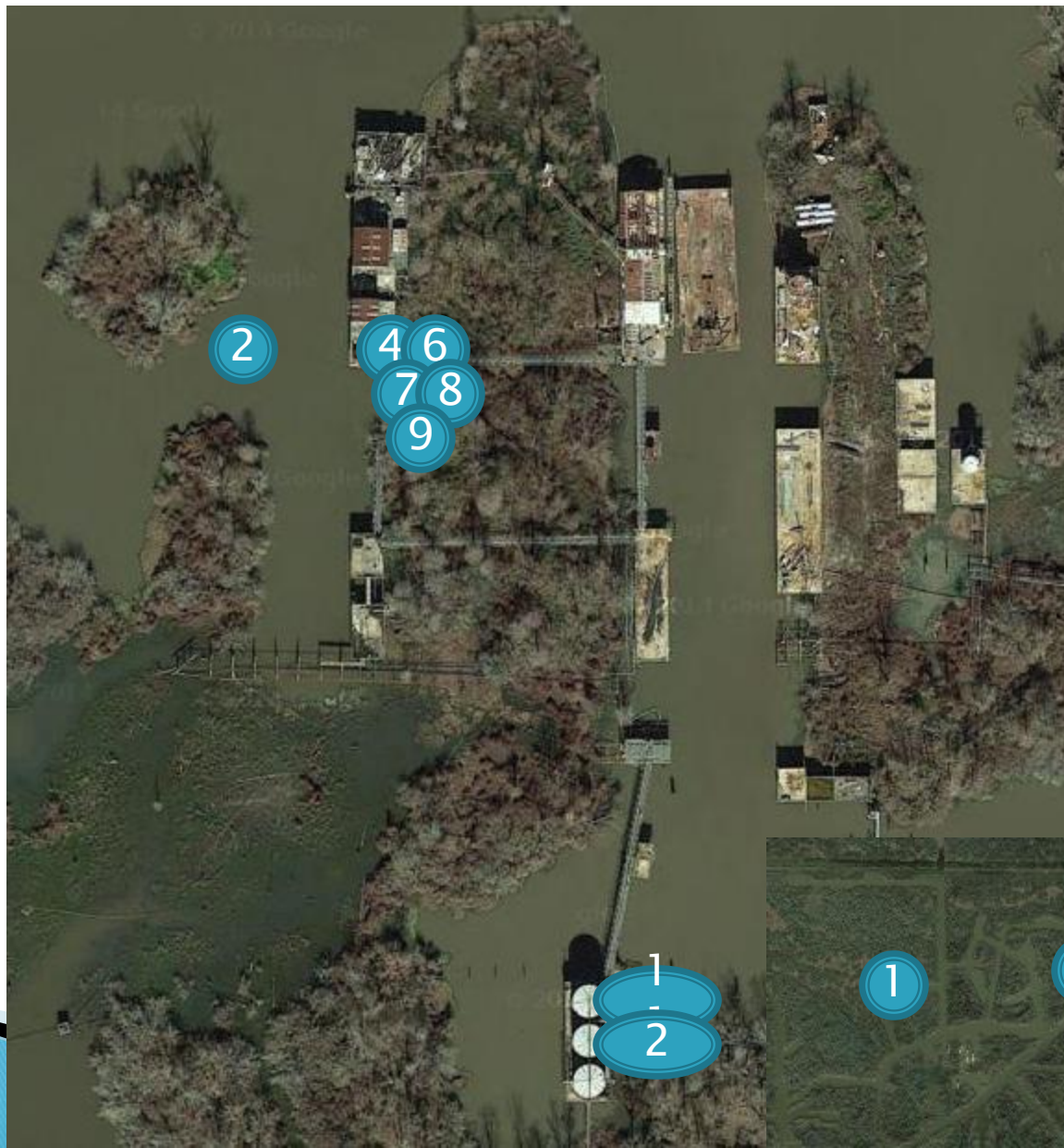
18MAR15

- At this point, Interstate Exploration does not believe the oil around the site has occurred from their initial discharge and Pharaoh Oil & Gas does not believe the discharged oil is a result of the cut pipelines that Amphibious Marine left uncapped while previously working for Pharaoh.
- MSU BR Issues Pharaoh Oil & Gas a Notice of Federal Assumption and began conducting removal activities to remove all substantial threats around the site.
- Federal Contractor Hired & GST brought in for assistance





MSL & NOAA (LSU Lab) Sampling





MSL & NOAA Sample Results



- Analysis of the Bayou Sorrel source samples are positive matches.
- These oils originate from the same South Louisiana crude source.
- Results also indicate spilled oil samples were positive oil fingerprint matches to the source samples.
- These spilled oil samples were lightly weathered and were likely to have been released < 2 weeks from the sample date (23 March 2015)
- The last spilled oil sample was moderately weathered (<2-3 weeks) and was a positive match to the source oils.
- Oil is not weathered, but instead highly pollinated



NOAA Analysis of effect of Weather and tide on Oil Spreading



Release conditions assumed:

Start time/date- 14 March 2015 @ 1400

Source location- 3 inch pipe cut near water surface

Release rate- near instantaneous with slow bleed from immediate shoreline to east

Winds- from Berwick near Morgan City, Station TESL1

Current- constant net movement to the SW (simulate runoff) at a speed of about 0.015 knots

Initial Movement: Time of release to 0500 15 Mar



From time of release (1400) until approximately 0500 on 15 March (~15 hrs) winds are mostly out of the WSW and light (5-10). Oil movement is to the east keeping most of the oil against the facility and shoreline. Some oil may get into the channel and move quickly east

Secondary Movement: 0500 15 Mar to 1200



From approximately 0500 on 15 March to 0900 (4 hrs) winds begin to turn around from the north and then steady from the east for the next 3 to 4 hours before picking up a slight southerly component around noon. Oil movement is initially very slight to the south keeping a good bit of the oil against the facility. There is a slight pause before oil changes direction and moves to the west. Any oil in the main channel moves quickly west and is now positioned for its next move up the north-south oriented channel as winds pick up from the southeast around 1200.

Final Movement: 1200 15 Mar to 2200



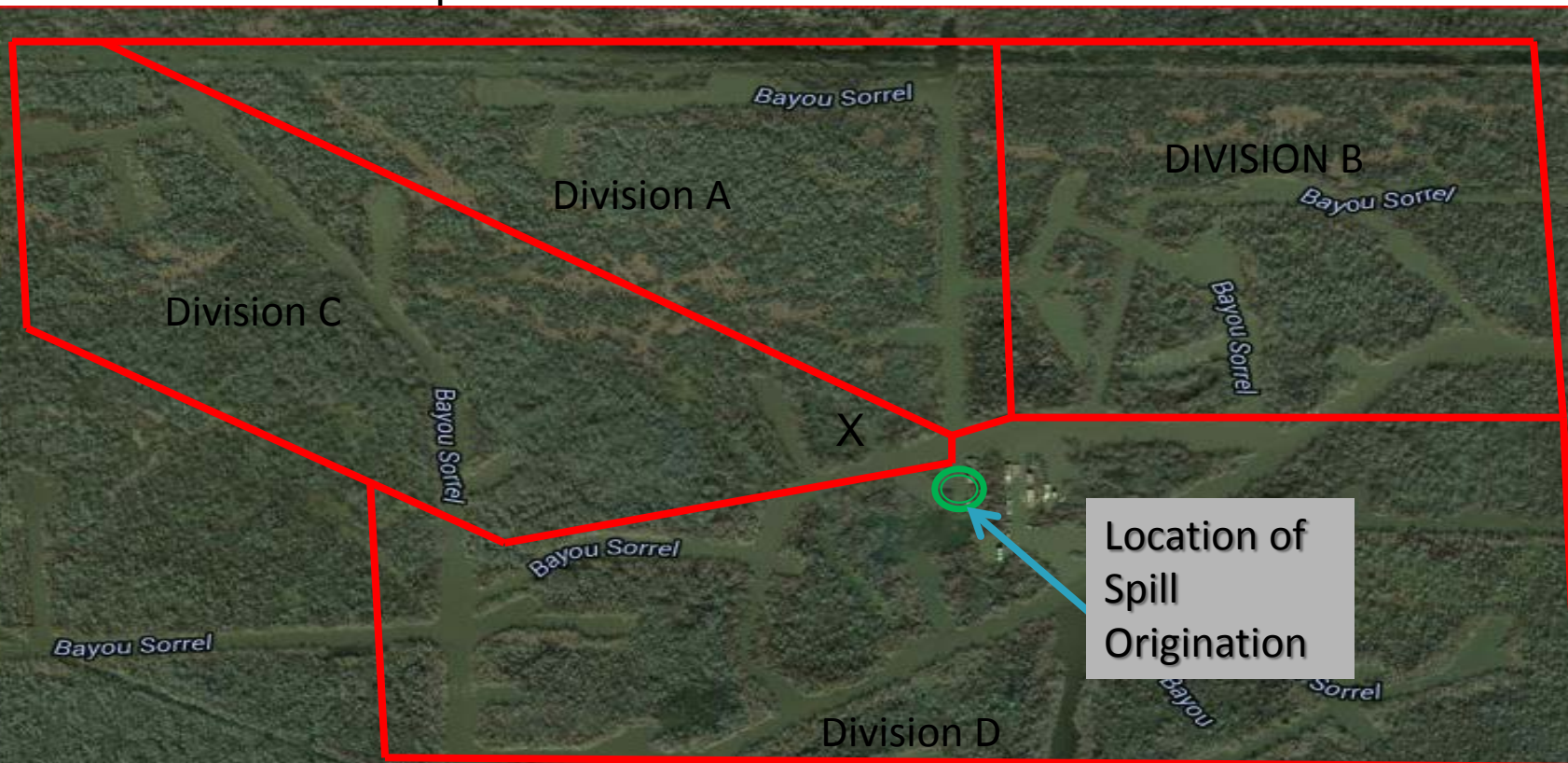
From approximately 1200 on 15 March to 1600 (4 hrs) winds are from the southeast, then turn and blow steady out of the south for the next 6 hours. Oil movement is initially very slight to the northwest pushing some oil away from the facility and into the main channel. Any oil positioned near the north-south oriented channel moves quickly north in the channel once the winds pick up out of the south.



Conclusion:

All oil originated from Interstate Pigging Operation

- Results from samples taken by NOAA and CG MSL Analysis reveal that the black oil is the same oil as the brown oil located throughout the canals in division A, B & C.
- NOAA weather analysis also correlates this finding.
- The oil throughout the canals is the same oil which originated from the pipeline Interstate accidentally pigged.
- Correlates with attempts to burn oil





Challenges

- ▶ Numerous potential Responsible Parties (RPs)
- ▶ Lack of reporting
- ▶ 3 Separate Burn sites
- ▶ Interference between potential RPs and sabotage of site during clean up
- ▶ Inter-relationship and personality conflicts between potential RPs
- ▶ Knowledge of previous history of site led to wrong assumptions at beginning
- ▶ Discovery of HAZMAT drums on platform that required additional GST assistance
- ▶ Untangling platform violations by Pharaoh with spill and burn sites by Interstate- both part of Federal response
- ▶ Criminal history of persons involved and criminal activity at site.



Questions?



Chemical Safety and Security Executive Order 13650



Standard Operating
Procedures (SOPs)
were completed
and signed off by
the Regional
Administrators of all
3 agencies (EPA,
OSHA, DHS) on
August 3, 2015



Administration of the Workgroup

This SOP establishes the administration of the workgroup, including reports, working with the Region 6 RRT, and implementation of the SOPs developed by the workgroup. If implementation or development of an SOP would include the RRT, the workgroup will submit the proposal to the RRT, to follow the established RRT process.

Incident Commander Standard for Senior Fire Department Personnel

/ HAZMAT Training for First Responders

This SOP develops efforts to coordinate with State Training Officers, as well as State training academies (TEEX, LSU, OSU, etc) to help in ensuring local response officials have the appropriate ICS/NIMS training (ICS 100, 200 and NIMS 700, 800), as well as advanced ICS training programs. Additionally, the SOP will describe efforts to coordinate with federal and state partners to work toward ensuring responders have the appropriate level of HAZMAT training for the position and duties they occupy. This will include ensuring responders understand the OSHA 29 CFR 1910.120 and EPA 40 CFR 311 requirements.

Participation on the Region 6 Regional Response Team (RRT)

This SOP describes efforts of the RRT to ensure agencies, at the federal and state level, which have chemical safety and security responsibilities, are appropriately represented on the Region 6 RRT. This would include State health agencies, emergency management agencies, and Poison Control Centers.

Improving Coordination with Federal and State Agencies on Programs, Roles, and Contacts

This SOP develops coordination with the RRT to have each agency on the RRT (state and federal) develop a one page summary of their regulatory programs for chemical safety and security. The compilation of these summaries will be shared with local/state/federal officials to assist officials in knowing which agency to refer to potential violations to, as well as information each agency may maintain on chemical safety and security.

EPCRA Outreach / Enforcement for State/Local Official

This SOP develops outreach to regulated facilities under EPCRA on the appropriate selection of emergency contacts on the Tier II form submitted to local and state officials (should be a local contact). Additionally, provide guidance to facilities on the importance of providing proper contact information during a release report. Through the Region 6 LEPC Update, encourage local officials to verify contacts, during drills, exercises or other events.

Guide to Provide First Responders with Access to Single Point of Contact for Facility Chemical Information

This SOP develops an outreach card for fire fighters and responders to identify people and agencies that they can reach back to and get the interpretations and chemical specific information they need. Card will be provided to States and LEPCs electronically to distribute to local responders. Card will identify Subject Matter Experts so responders can reach back for expertise on databases and interpretation of fixed chemical facility data.

LEPC Outreach

This SOP develops new, and continues existing, practices to support LEPCs, including those who need assistance to continue or increase their activity. This will include established practices (HOTZONE, LEPC Update, workshops, LEPC website), but will also encourage use of local exercises for participation by those facilities covered by EPCRA/RMP/PSM/CFATS. LEPCs which have developed or implemented an innovative process or material will be encouraged to share with other LEPCs through the LEPC Update or other means.

Inter-Agency Inspections and Enforcement Procedures

This SOP identifies procedures for all agencies, federal and state, which have chemical safety and security responsibilities, for sharing information, as appropriate. This would include providing Points of Contact within each agency for data sharing on inspection/enforcement results; procedures for referring facilities to other agencies; determine the appropriateness of joint inspections; and encourage the participation of local officials on certain types of inspections. Reinforce to local and state officials on the appropriate procedures for referring potential enforcement cases to EPA, DHS, or OSHA through outreach; train enforcement inspectors for RMP, SPCC/FRP, PSM, and CFATS programs on chemical safety/security compliance, so they can provide outreach to facilities during inspections. Conduct interagency training on chemical safety / security enforcement programs for inspectors focusing on RMP, PSM, CFATS, EPCRA, and SPCC/FRP programs.

**Incident Commander Standard for Senior Fire
Department Personnel / HAZMAT Training for
First Responders**

Region 6 LEPC Update

Steve Mason, EPA Region 6
mason.steve@epa.gov
Hilary Gafford, Weston Solutions
hilary.gafford@westonsolutions.com



Implementation of the Hazardous Waste Operations and Emergency Response Program at the State and Local Levels

Introduction. The Chemical Safety and Security Executive Order (E.O. 13650) – U.S. EPA-OSHA-DHS

Responding to recent catastrophic chemical facility incidents in the United States, including the tragic events in West Texas in April, 2013, President Obama issued Executive Order (EO) 13650 "Improving Chemical Facility Safety and Security" on August 1, 2013. The focus of the EO is to reduce risks associated with hazardous chemical incidents to owners and operators, workers, and communities by enhancing the safety and security of chemical facilities.

Regional Working Groups (RWGs) have been established in the Federal Regions under the leadership of regional tri-chairs from the Department of Homeland Security (DHS), the Environmental Protection Agency (EPA), and the Occupational Safety and Health Administration (OSHA). The RWGs were tasked with developing Standard Operating Procedures (SOPs), many of which serve as initiatives to assist local communities with emergency planning and preparedness. The Region 6 RWG has established eight (8) such SOPs, which includes SOP # 2, which is the focus of this publication.

Historically, lack of training has been identified as a contributing factor in injuries sustained by First Responders when responding to an emergency. The primary objective of SOP #2 is to ensure that response and planning organizations understand the requirements under the OSHA HAZWOPER Standard, and the accompanying EPA regulations.

Additionally, the RWG will coordinate with State Training Officers, State LEPC/HAZMAT Coordinators, as well as State Training Academies to determine what assistance federal agencies can provide in training of local responders, including Incident Command System / National Incident Management System (ICS/NIMS) training programs.

Accordingly, the RWG will coordinate with federal and state partners to ensure that responders have the appropriate level of HAZMAT training for the position and duties they occupy. Efforts in this regard will include outreach, including Region 6 HAZWOPER Awareness training and other effective Chemical Safety training. The goal is to ensure that First Responders understand the OSHA 29 CFR 1910.120 and EPA 40 CFR 311 requirements.

Section 1. Overview of EPA and OSHA Worker Protection Authority

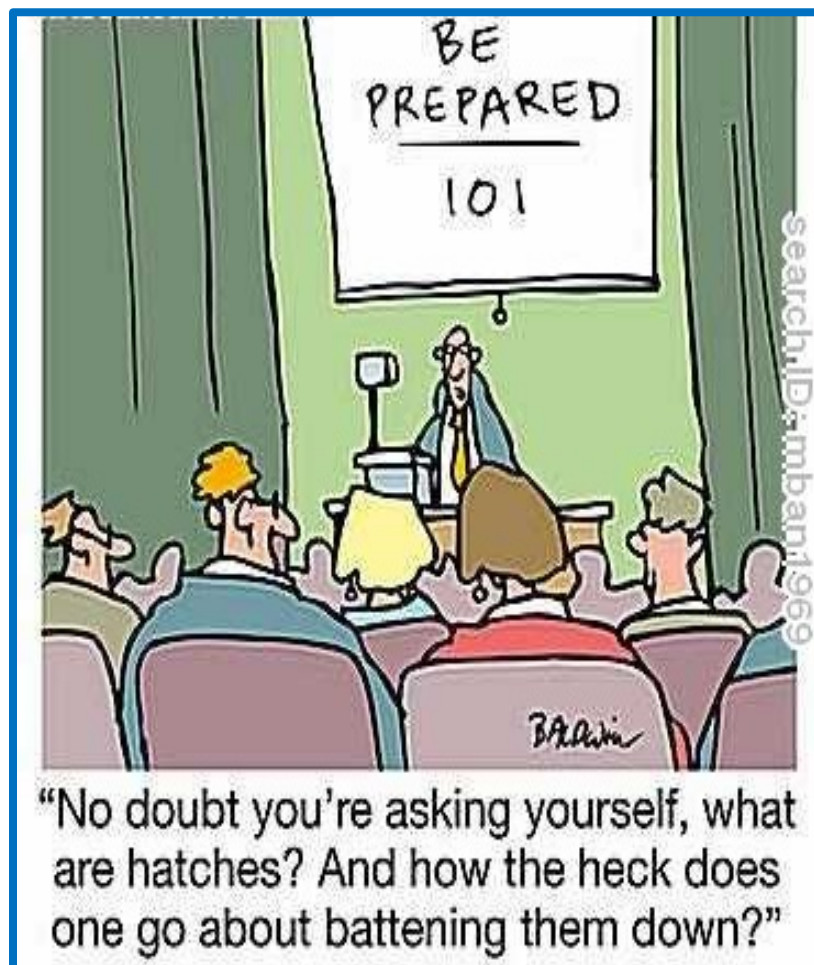
The Occupational Safety and Health Act of 1970, as amended, (OSH Act) established health and safety standards for the American workplace.

Section 6 of the OSH Act established Federal authority to issue general health and safety standards for private industry. Section 19 addresses standards for Federal government employees. Under the authority of Section 6 of the OSH Act, OSHA promulgated standards that are codified at 29 CFR and set forth the minimum health and safety requirements necessary to ensure protection for all private sector employees in the United States.

In 1986, Congress passed the Superfund Amendments and Reauthorization Act (SARA) section 126(a). SARA section 126(a) requires the Secretary of Labor to issue health and safety standards under Section 6 of the OSH Act for the benefit of private sector employees and Federal employees that are engaged in hazardous waste operations and emergency response.

Section 126(a) required the Assistant Secretary of OSHA, pursuant to section 6 of the Occupational Safety and Health Act of 1970, to promulgate standards ("regulations") for the health and safety of employees engaged in hazardous waste operations.

On March 6, 1989, OSHA issued the final Standard (29 CFR 1910.120) to fulfill the requirements of Section 126. This Standard is known as the Hazardous Waste Operations and Emergency Response (HAZWOPER). However, federal OSHA has no authority to enforce regulations protecting state and local government employees.



"No doubt you're asking yourself, what are hatches? And how the heck does one go about battening them down?"



First Responder Awareness Level Training

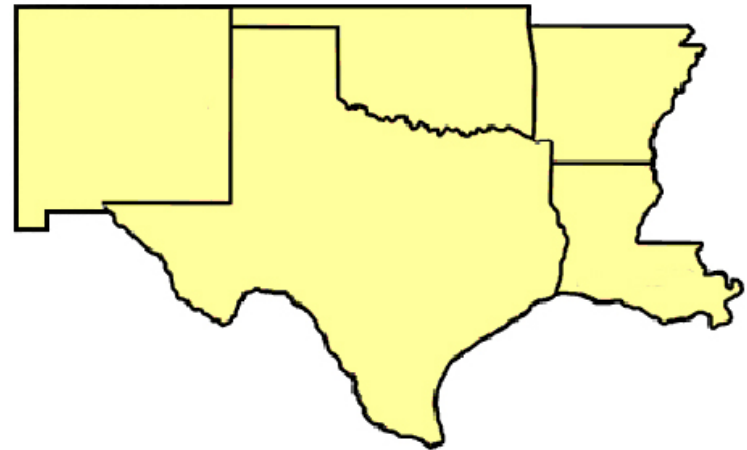
EPA Region 6
Superfund Division, Prevention & Response
Branch

Steve Mason
EPA Region 6
mason.steve@epa.gov

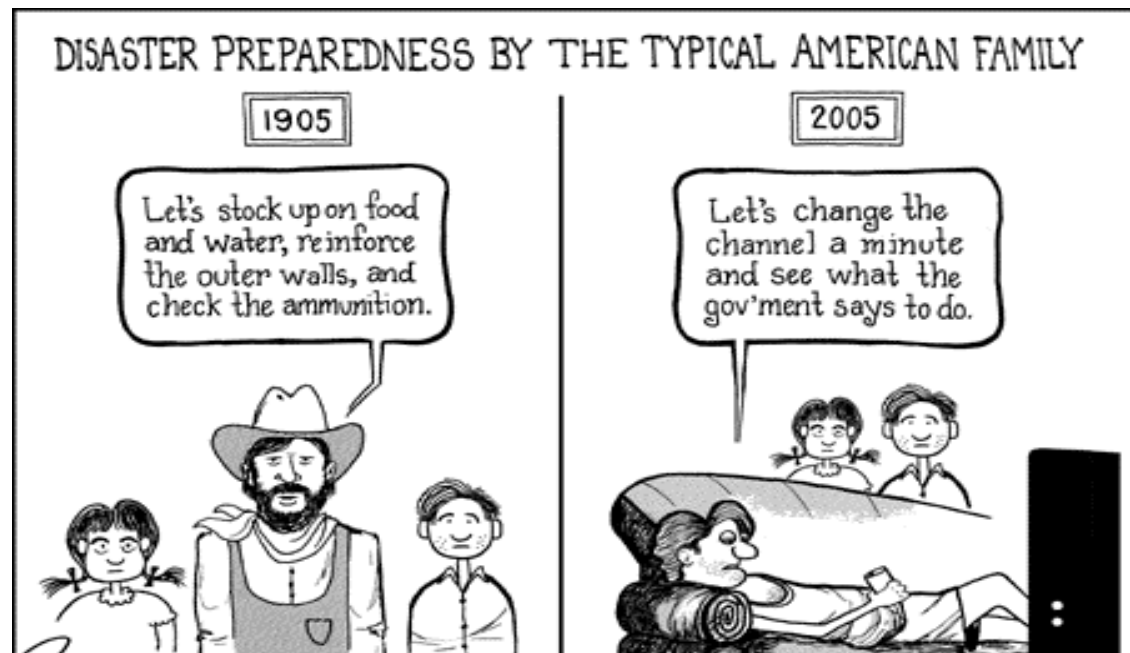
<http://rrt6.org>

LEPC Outreach

2015 REGION 6 LOCAL EMERGENCY PLANNING COMMITTEE (LEPC) WORKSHOPS



Total Attendance			
	Workshops	Attendees	LEPCs represented
Arkansas	4	54	17/75
Louisiana	4	132	37/64
New Mexico	4	116	20/33
Oklahoma	6	303	40/77
Texas	13	762	108/270
Totals	31	1,367	222/519 (43%)



AGENDA

Introductions / Purpose of the Workshop	
EPCRA Reporting Requirements CERCLA 103 and EPCRA 304 Reporting Requirements	EPA / State
Chemical Safety and Security Executive Order (13650)	DHS/OSHA/EPA
Safety and Health Programs at Facilities in Your Community	OSHA
Dealing with the Media in an Emergency	EPA
Chemical Security Programs at Facilities in Your Community	DHS
Dissemination of Information to the Public (what does EPCRA say)	EPA
Preparing for Unconventional Oil Shipments through Your Community	EPA
How an LEPC and Facilities can use the CAMEO Suite	START
State Issues	State Rep
More ideas on Keeping an LEPC Active (getting small business more involved)	EPA

Region 6 LEPC Update

Steve Mason, EPA Region 6

mason.steve@epa.gov

Hilary Gafford, Weston Solutions

hilary.gafford@westonsolutions.com



The Chemical Safety and Security Executive Order (E.O. 13650) -- U.S. EPA-OSHA-DHS

See Page 13 for a list of Acronyms used in this Update



In follow up to the tragedy that struck West, Texas, in April 2013, the President issued Executive Order 13650 - Improving Chemical Facility Safety and Security (EO) on August 1, 2013 to improve chemical facility safety and security in coordination with owners and operators. (See

page 3 for complete text of the Order).

The EO directs DHS, EPA, DOL, DOJ, USDA, and DOT to identify ways to improve operational coordination with State and local partners; enhance Federal agency coordination and information sharing; modernize policies, regulations and standards in order to enhance safety and security in chemical facilities; and work with stakeholders to identify best practices to reduce safety and security risks in the production and storage of potentially harmful chemicals.

The EO also established a Chemical Facility Safety and Security Working Group, which includes each of these agencies.

Since the EO was issued, the Working Group has taken important steps towards substantial improvements in practices, operations, protocols, and policies to improve chemical facility safety and security.

This fact sheet provides a brief update on Working Group progress and is intended to supplement ongoing public engagement. Agencies will continue to work on improving chemical facility safety and security as outlined within the EO.

Stakeholder Input

Engaging and partnering with State regulators, State, local, and tribal emergency responders, chemical facility owners and operators, and local and tribal communities is critical to improving chemical facility safety and security.

The Working Group conducted listening sessions across the country as well as conducted two webinars in order to

solicit comments, best practices and suggestions from stakeholders on issues pertaining to improving chemical facility safety and security. Nearly two hundred individuals attended the first four sessions, which were held in Texas City, TX, Washington, DC, Springfield, IL, and Orlando, FL.

Coordination with State and Local Partners

Federal, State, local, and tribal governments have different responsibilities in addressing risks associated with chemical facilities, including response planning for potential emergencies. To improve the effectiveness and efficiency of risk management and response measures, the Working Group has made progress in coordinating operations and sharing information among Federal agencies and State, local, and tribal partners with jurisdiction over chemical facility safety or security.

The Working Group is drawing on input provided by these partners through listening sessions, a pilot program in New York and New Jersey, State and local responder participation with Federal agencies on RRTs, as well as other mechanisms.



Using this input, the Working Group has identified needs and developed a matrix of programs that could address these needs and support communities in their safety and security efforts. The matrix includes programs to better engage facilities in the local planning process, additional training for first responders, technical support to SERCs and LEPCs, and improving data management and sharing.

A plan to support and further enable Federal, State, and local entities and industry in their efforts to work together to improve chemical safety and security was issued in June 2014 (see page 6). Subsequently, the Working Group will seek further input with all stakeholders, via listening sessions and stakeholder meetings, with the goal of bringing local entities

POTENTIAL SOURCES OF SUPPORT DURING A HAZMAT INCIDENT/EMERGENCY

Version: October 19, 2015

Emergency Spill Notifications			
Arkansas Department of Emergency Management			800-322-4012
Louisiana State Police			877-925-6595
New Mexico State Police			505-827-9126
Oklahoma Department of Environmental Quality			800-522-0206
Texas Environmental Hotline			800-832-8224
National Response Center			800-424-8802
CHEMTREC			800-424-9300
State EPCRA / LEPC Coordinators and SERC contacts			
Arkansas	Kenny Harmon	501-683-6700	kenny.harmon@adem.arkansas.gov
Louisiana	Gene Dunean	225-925-6113	gene.dunean@dps.la.gov
New Mexico	Hank Jolly	505-476-9640	hank.jolly@state.nm.us
Oklahoma	Tom Bergman	405-702-1013	tom.bergman@dep.ok.gov
Oklahoma	Bonnie McCalvey	405-521-2481	bonnie.mccalvey@dep.ok.gov
Texas	Bernardine Zimmerman	800-452-2791	Bernardine.zimmerman@tceq.texas.gov
Texas	Gabby Sternolle	512-424-5989	Gabriela.Sternolle@dps.texas.gov
State Assistance Numbers			
Arkansas	Emergency Management	800-322-4012	
Louisiana	Emergency Management	225-925-7500	
New Mexico	Emergency Management	505-476-9635	
Oklahoma	Emergency Management	800-800-2481	
Texas	Emergency Management	512-424-2208	
Arkansas	Health Departments	800-633-1735	
Louisiana	Health Departments	225-342-9500	
New Mexico	Health Departments	505-827-0006	
Oklahoma	Health Departments	405-271-0900	
Texas	Health Departments	512-458-7111	
Arkansas	Utility One Call	800-482-8998	
Louisiana	Utility One Call	800-272-3020	
New Mexico	Utility One Call	800-321-2537	
Oklahoma	Utility One Call	800-654-8249	
Texas	Utility One Call	800-245-4545	
Arkansas	Natural Resources	501-682-3986	
Louisiana	Natural Resources	225-342-8955	
New Mexico	Natural Resources	505-476-3200	
Oklahoma	Natural Resources	405-521-3851	
Texas	Natural Resources	800-424-9300	
State Assistance Numbers			
Arkansas	Environmental Compliance	888-233-0326	
Louisiana	Environmental Compliance	888-763-5424	
New Mexico	Environmental Compliance	866-428-6535	
Oklahoma	Environmental Compliance	800-522-0206	
Texas	Environmental Compliance	888-777-3186	
Arkansas	Agriculture Department	501-683-4851	
Louisiana	Agriculture Department	855-452-5323	
New Mexico	Agriculture Department	575-646-3007	
Oklahoma	Agriculture Department	405-521-3864	
Texas	Agriculture Department	512-463-7476	
Arkansas	State Fish & Wildlife	800-440-1477	
Louisiana	State Fish & Wildlife	800-256-2749	
New Mexico	State Fish & Wildlife	888-248-6866	
Oklahoma	State Fish & Wildlife	405-521-3851	
Texas	State Fish & Wildlife	800-792-1112	
Arkansas	Oil and Gas Incidents	479-646-6611/870-862-4965	
Louisiana	Oil and Gas Incidents	225-342-5515	
New Mexico	Oil and Gas Incidents	505-476-3441	
Oklahoma	Oil and Gas Incidents	405-521-2271	
Texas	Oil and Gas Incidents	844-773-0305	
Federal Agencies Emergency 24-Hour Numbers			
US Fish & Wildlife Service	505-766-2914	Fed. Highway Adm.-Motor Carrier	817-978-3225
DOT/Fed. Railroad Administration	800-724-5993	Federal Bureau of Investigations	855-835-5324
DOT/Pipeline & HazMat Safety	713-272-2820	OSHA - Emergencies	800-321-6742
Nuclear Regulatory Commission	301-816-5100	USCG District 8	504-589-6225
Homeland Security National Infrastructure Coordinating Center	202-282-9201	EPA Region 6	866-372-7745
Center for Disease Control (CDC)	254-741-9900	FEMA Region 6	940-898-5280
National / State Poison Control Centers	800-222-1222	DOI / Fish and Wildlife Service	505-766-2914
Alcohol, Tobacco, and Firearms (ATF)	202-648-6410		
Railroad Emergencies			
Burlington Northern Santa Fe (BNSF)	800-832-5432	Canadian Pacific Railway	800-716-9132
Union Pacific (UP)	888-877-7267	Norfolk Southern	800-453-2330
Kansas City Southern Railway	877-527-9464	CSX Railroad	800-232-0144
Texas Mexican Railway	877-527-9464	CN Railroad	800-463-9239

Region 6 Chemical Safety and Executive Order (13650) Regional Working Group
U.S. Environmental Protection Agency (EPA) / U.S. Department of Homeland Security (DHS) /
U.S. Department of Labor - Occupational Safety and Health Administration (DOL/OSHA)

Potential Sources of Support During HAZMAT Incident



Release Reporting Requirements under CERCLA 103 and EPCRA 304



Region 6 Chemical Safety and Executive Order (13650) Regional Working Group
U.S. Environmental Protection Agency (EPA) / U.S. Department of Homeland Security (DHS) /
U.S. Department of Labor - Occupational Safety and Health Administration (DOL/OSHA)

VERSION 1.0

Chemical Emergency Preparedness and Prevention Documents Compilation Documents Created by EPA HQ CEPPO, OEM and others September, 2015

Since the inception of the Chemical Emergency Preparedness and Prevention (CEPP) Program in 1985, as well as the passage of the Emergency Planning and Community Right-to-Know Act in 1986, and the Clean Air Act – Risk Management Program in 1990, the CEPP Office / Office of Emergency Management has developed and distributed over one hundred documents useful for LEPCs, regulated industries, and other stakeholders. Additional LEPC-related documents from the National Association of SARA Title III Program Officials, as well as EPA Regions, have been included.

This document contains the text only files of most of the documents. This document can be useful to officials searching for historical documents, or determining what guidance may have been developed on a specific topic.

For More Information

EPCRA: www2.epa.gov/epcra
Chemical Safety Executive Order 13650: www2.epa.gov/chemicalsafetyexecutiveorder/index.html
EPCRA Requirements: http://www2.epa.gov/sites/production/files/2013-08/documents/epcra_fact_sheet.pdf
CAMEO: www2.epa.gov/cameo
EPA EPCRA Regional Contacts: www2.epa.gov/epcra/epa-regional-epcra-rmp-contacts
EPA Superfund, TRI, EPCRA, RMP & Oil Information: www2.epa.gov/epcra/superfund-tri-epcra-rmp-oil-information-center
800-424-9346

Table of Contents

The link in the PDF column will take the user to the original document in the EPA National Publication Archive or other website where the original resides... The Document Name link will take the user to the text only file for that document in this compilation. If there is no link for the Document name, the file is too large or not appropriate to include as a text-only file. The user can still retrieve the original file from the PDF link.

To return to the Table of Contents, click on the HOME button at the beginning of any document.

Original	Document Name	Date Published
General EPCRA / LEPC / RMP Documents		
1. PDF	Chemicals in Your Community -- EPA 330 K-99-001	December, 1999
2. PDF	Chemicals in Your Community -- EPA 330 K-99-003	September, 1988
3. PDF	How to Better Prepare Your Community for a Chemical Emergency: A Guide for State, Tribal and Local Agencies -- 330-F-12-002	June, 2015
4. PDF	The Emergency Planning and Community Right-to-Know Act Fact Sheet -- EPA 330-F-12-002	September, 2012
5. PDF	The Emergency Planning and Community Right-to-Know Act Fact Sheet -- EPA 330-F-00-004	March, 2000
6. PDF	SARA Title III Fact Sheet -- Emergency Planning and Community Right-to-Know Act -- EPA 330-F-93-002	January, 1993
7. PDF	When it Falls: Enforcement of the EPCRA -- A Self-Help Manual for LEPCs -- EPA 305-0002	July, 1990
8. PDF	It's Not Over in October: Implementing EPCRA -- OSWER 90-004	1990
9. PDF	Revisions to the OSHA Hazard Communication Standard (HCS) -- EPA 330-F-12-001	August, 2012
10. PDF	Making it Work: Secrets of Successful SERCs -- EPA 330-F-93-007	January, 1993
11. PDF	Making it Work: Title III Compliance -- The Public's Right-to-Know -- OSWER-94-009-1	September, 1994
12. PDF	Chemicals, the Press, and the Public: A Journalist's Guide to Reporting on Chemicals in the Community -- EPA 330-R-00-003	March, 2000
13. PDF	Mansing Chemical Safety: Putting it All Together -- EPA 330-K-92-001	March, 1992
14. PDF	EPA's Role in Counter-Terrorism Activities -- EPA 330-F-98-014	February, 1998
15. PDF	National Response System BROCHURE	March, 2011
16. PDF	EPCRA: Guidance on Reporting Options for Sections 311 and 312 and Some Interpretations -- EPA 300-F-10-001	June, 2010

Region 6 Local Emergency Planning Committee (LEPC) Updates Compilation -- October, 2015

Since 1988 (over 27 years !!!), EPA Region 6 has issued LEPC Updates to provide valuable information on EPCRA and chemical emergency preparedness and planning for our federal, state, local, and community partners.

This document contains the text only files of most of the documents. This document can be useful to officials searching for historical documents, or determining what guidance may have been developed on a specific topic.

The authors, acknowledgements, and other article information is contained in the original files.

The articles herein are provided for general purposes only. EPA does not accept responsibility for any errors or omissions or results of any actions based upon this information. Please consult the applicable regulations when determining compliance. Mention of trade names, products, or services does not convey, and should not be interpreted as conveying official EPA approval, endorsement, or recommendation.

For More Information

Region 6 LEPC Website: www.epa.gov/region6/lepc
EPCRA: www2.epa.gov/epcra
Chemical Safety Executive Order 13650: www2.epa.gov/chemicalsafetyexecutiveorder/index.html
EPCRA Requirements: www2.epa.gov/sites/production/files/2013-08/documents/epcra_fact_sheet.pdf
CAMEO: www2.epa.gov/cameo
Superfund, TRI, EPCRA, RMP & Oil Information: www2.epa.gov/epcra/superfund-tri-epcra-rmp-oil-information-center
800-424-9346

Links to Previous Region 6 LEPC Updates

		Feb, 2014	Mar, 2012	Dec, 2010	Jul, 2009	Mar, 2008	Apr, 2006
		Dec, 2013	Feb, 2012	Mar, 2010	Jun, 2009	Jan, 2008	Sep, 2005
	Aug, 2015	Oct, 2013	Dec, 2011	Feb, 2010	Apr, 2009	Nov, 2007	Jul, 2005
	May, 2015	Aug, 2013	Nov, 2011	Jan, 2010	Mar, 2009	Aug, 2007	Apr, 2005
	Feb, 2015	Jun, 2013	Sep, 2011	Dec, 2009	Feb, 2009	Jun, 2007	Dec, 2004
	Jan, 2015	Apr, 2013	Jul, 2011	Nov, 2009	Jan, 2009	May, 2007	Sep, 2004
	Oct, 2014	Sep, 2012	May, 2011	Oct, 2009	Nov, 2008	Dec, 2006	Jun, 2004
	Aug, 2014	Jul, 2012	Dec, 2010	Sep, 2009	Jul, 2008	Aug, 2006	Apr, 2004
	Jun, 2014	Apr, 2012	Sep, 2010	Aug, 2009	Jun, 2008	Jun, 2006	Feb, 2004

Improving Coordination
with Federal and State
Agencies on Programs,
Roles

Regulatory Description & Contact Information

US DOT Pipeline and Hazardous Material Safety Administration / Office of Hazardous Materials Safety

PHMSA's Field Operations division serves to ensure transportation safety and security by conducting compliance, incident and accident response and investigations, performing safety, performance and regulatory adequacy and fitness determinations; executing outreach, education and training activities; and providing feedback, information and intelligence through its nationwide operations. Inspecting entities that offer hazardous materials for transportation; and that manufacture, requalify, rebuild, repair, recondition, or retest packaging (other cargo tanks and tank cars) used to transport hazardous materials.

It is the task of PHMSA's inspection and enforcement staff to determine compliance with the safety and training standards by: Inspecting entities that offer hazardous materials for transportation; and that manufacture, re-qualify, rebuild, repair, recondition, or retest packaging (other than cargo tanks and tank cars) used to transport hazardous materials.

PHMSA Hazardous Materials Enforcement assures compliance through:

Independent and joint modal field inspections and partnerships of:
 Shipper and carrier transportation facilities
 Packaging manufacturing, requalification, repair and reconditioning facilities
 Cargo vessel ports, rail freight yards, motor carrier and air cargo terminals
 Chemical and explosive manufacturing plants
 Programmatic inspections of hazardous material transportation systems, procedures, and processes
 Civil and criminal enforcement investigations
 Accident and incident investigation and failure analysis
 Outreach and education elements with other agencies, industry and stakeholders
 Emergency response

Internet Link(s) to Your Agency/Office's Regulatory Program(s):

<http://hazmat.dot.gov>

Internet Link(s) to Your Agency/Office's Public Access Database:

<https://hazmatonline.phmsa.dot.gov/Services/companylookup.aspx>

Primary Contact Person (provide Alternate Contact Person if necessary):

Anthony H. Murray (anthony.murray@dot.gov)
 Hazardous Materials Safety Assistance Team - Eastern Region
 Office Of Hazardous Materials Safety, Field Operations
 Pipeline and Hazardous Materials Safety Administration
 United States Department of Transportation
 620 Best Tavern Road, Suite 306
 West Trenton, NJ 08628
 Phone: (609) 980-2181 anthony.murray@dot.gov

Regulatory Description & Contact Information

Name of Agency/Office:

Department of Homeland Security – National Protection and Programs Directorate – Infrastructure Protection-Infrastructure Security Compliance Division – (DHS-NPPD-IP-ISCD)

Agency/Office Description:

Section 160 of the DHS Appropriations Act of 2007 grants the Department the authority to regulate chemical facilities that "present high levels of security risk." Under this authority, in April 2007, the Department of Homeland Security promulgated the Chemical Facilities Anti-Terrorism Standards (CFATS) regulation.

Facilities that may be required to comply with at least some provisions of the CFATS regulation will largely fall into the following categories:

- chemical manufacturing, storage and distribution;
- energy and utilities;
- agriculture and food;
- paints and coatings;
- explosives;
- mining;
- electronics;
- plastics; and
- healthcare.

To determine which chemical facilities meet the CFATS criteria for high-risk chemical facilities, the Department developed the Chemical Security Assessment Tool (CSAT) Top-Screen, an easy-to-use on-line questionnaire that must be completed by facilities that possessed any chemical on the CFATS [Appendix A: DHS Chemicals of Interest List \(PDF, 16 pages - 8 MB\)](#) or at or above the listed Screening Threshold Quantity (STQ) for each chemical on the day Appendix A was published (November 20, 2007).

In addition, any facility that comes into possession of any listed chemical of interest at or above the applicable Screening Threshold Quantity after November 20, 2007 must complete and submit a CSAT Top-Screen.

The Department may also notify facilities – either directly or through a *Federal Register* notice – that they need to complete and submit a CSAT Top-Screen.

Facility Exemptions:

- Facilities regulated pursuant to the Maritime Transportation Safety Act (MTSA): The Department will apply the MTSA exemption to facilities regulated under 33 CFR Part 104, Maritime Facility Security regulations. Part 104 of Title 33 of the Code of Federal Regulations is the only regulation that imposes the security plan requirements of 46 U.S.C. 76103 on maritime facilities. If the facility site includes both a facility regulated pursuant to the Maritime Transportation Security Act of 2005, Public Law 107-296, as amended, and a facility not regulated pursuant to the Maritime Transportation Security Act, the facility shall select

Regulatory Description & Contact Information

Name of Agency/Office: EPA Risk Management Program (EPA Region 2/ERRDRPB/PS)

Agency/Office Description: The EPA's Risk Management Program, under the Clean Air Act, requires facilities to prevent accidental releases of substances that can cause serious harm to the public and the environment from short-term exposures, and to mitigate the severity of such releases. The Risk Management Program requirements can be found at 40 CFR Part 68.

Generally, the Risk Management Program Rule regulates processes at stationary sources (facilities) that store or process regulated substances above a threshold quantity. Facilities are required to demonstrate compliance with Risk Management Program requirements through documentation and management and maintenance practices and coordinating emergency response plans with the Local Emergency Planning Committee. Regulated facilities are also required to summarize their Risk Management Program into a Risk Management Plan that is submitted and updated to the EPA at least every five years.

Based on applicability requirements, processes at regulated facilities are assigned one of the following prevention program levels: Program Level 1 (no off-site impacts), Program Level 2, or Program Level 3. Most processes at facilities in Region 2 are regulated as prevention Program Level 3 (because 1) a worst case release can impact public receptors and 2) they are also subject to Occupational Safety & Health Administration's Process Safety Management Standard.

The EPA's Risk Management Program regulates a wide variety of facilities in Region 2, ranging from water treatment, ammonia refrigeration, propane and LPG wholesalers, to chemical warehouses. The EPA's Risk Management Program does not regulate substances attached to their motive power, ammonia used as a fertilizer when held by farmers, flammable substances used as fuels, and flammable substances held for sale as a fuel (more than one-half of income obtained from direct sales to end users). The Risk Management Program also does not apply to transportation, including storage incident to transportation. The EPA's Risk Management Program also does not regulate flammable substances in a mixture with a NFPA rating of 3 and less. Additional exemptions and exclusions can be found at 40 CFR 68.115(b).

EPA's Risk Management Program has been delegated to the New Jersey Department of Environmental Protection and is implemented under the NJ Toxic Catastrophe Prevention Act.

Internet Link(s) to Your Agency/Office's Regulatory Program(s):

<http://www.epa.gov/oeem/content.html> (EPA Headquarters Website)

Internet Link(s) to Your Agency/Office's Public Access Database:

<http://echo.epa.gov/?redirect=echo> (inspection database only)

Primary Contact Person (provide Alternate Contact Person if necessary):

Ellen Banner: Banner.Ellen@epa.gov, 732-321-4348

Francesco Maimone: Maimone.Francesco@epa.gov, 732-321-4483

John Higgins: Higgins.John@epa.gov, 732-006-6194

Department of Labor/Occupational Safety and Health Administration (OSHA)

OSHA is responsible for assuring safe and healthful workplace conditions for all private and federal employees, by setting and enforcing standards and by providing training, outreach, and education and compliance assistance.

The OSHA Act and Coverage:

In general, coverage of the OSHA Act extends to all employers and their employees in the 50 states, the District of Columbia, Puerto Rico, and all other territories under Federal Government jurisdiction. The OSHA Act applies to employers and employees in such varied fields as manufacturing, construction, longshoring, agriculture, law and medicine, charity and disaster relief, organized labor and private education.

The following are not covered under the Act:

- Self-employed persons;
- Farms in which only immediate members of the farm employer's family are employed; and
- Working conditions regulated by other federal agencies under other federal statutes.

OSHA Standards

In carrying out its duties, OSHA is responsible for promulgating legally enforceable standards. OSHA standards may require conditions, or the adoption or use of one or more practices, means, methods or processes reasonably necessary and appropriate to protect workers on the job. Employers must comply with all rules and regulations which are applicable to their own actions and conduct.

Where OSHA has not promulgated specific standards, employers are responsible for following the Act's general duty clause. The general duty clause of the Act states that each employer "shall furnish a place of employment which is free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees."

States with OSHA-approved occupational safety and health programs must set standards that are at least as effective as the federal standards. Many state plan states adopt standards identical to the federal.

Authority to Inspect

OSHA is authorized under the Act to conduct workplace inspections. Every establishment covered by the Act is subject to inspection by OSHA compliance safety and health officers.

Inspection Priorities

Obviously, not all workplaces covered by the OSHA Act can be inspected immediately. Therefore, OSHA has established a system of inspection priorities.

- **Imminent Danger** – A condition that may cause death or serious physical harm immediately, or before the danger can be eliminated through normal enforcement procedures.
- **Catastrophes and Fatal Accidents** – Events resulting in hospitalization of three or more employees.
- **Employee Complaints** – Reports by an employee of alleged violation of standards or of unsafe or unhealthful working conditions.
- **Programmed High-Hazard Inspections** – Inspection activity aimed at specific high-hazard industries, occupations or health substances.
- **Follow-up Inspections** – Inspection activity that determines whether previously cited violations have been corrected.

2015 Regional Response Team (RRT) 6 Fall Meeting

Presentation by:

Jim Wilkinson, CUSEC Executive Director

November 5, 2015



Presentation Overview

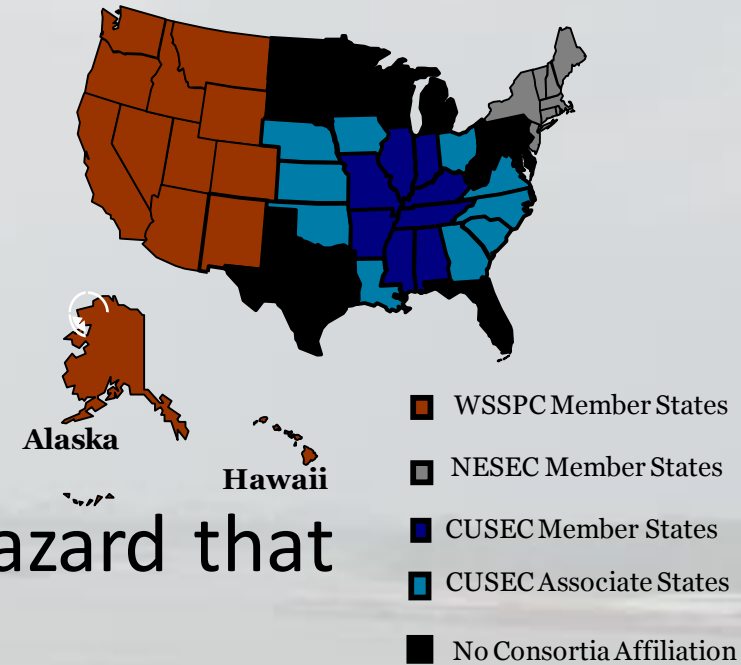
- CUSEC
- Earthquake Basics
- Seismic Risk –
 - Response Challenges
 - Long Term Recover
- Modeled Risk Assessment
- Upcoming Events

History behind CUSEC

- Scientific Community Outlined the Seismic Hazard for the Central U.S. during the 70's – unlike other areas of the country that have over a 100 years of understanding of their seismic hazard and corresponding plans
- Scientific data showed a regional impact unlike any other place in the United States –
- 1977 NEHRP Created -Earthquake Funding was now available
- FEMA / and Seven States most at risk by this hazard looked at the “regional” threat starting in 1981.
- CUSEC Formed in 1983

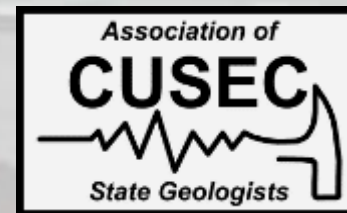
CUSEC

- One of three EM Consortia
- Only consortia with a single hazard that
Impacts all its states
- Purpose was different from the beginning
- Structured like an Emergency
Management Agency



CUSEC Structure

- Board of Directors - State EMA Directors
- Staff of 5 – Executive Director, Earthquake Program Manager, Grants Manager, Accounting Clerk, Administrative Assistant
- 2 temporary staffing positions
- Eight Member States –AL, AR, KY, IL, IN, MO, MS, & TN
- Ten Associates - began to join in late 1980's, Kansas being the latest
- Working Groups: State EMA -PIO's, Ops Chiefs, State Hazard Mitigation Officers, Donations/Volunteer planners, Exercise Officers, Technology Working Group
- Organizational Associations
 - Association of CUSEC State Geologists
 - CUSEC State Transportation Task Force
- Cover Four FEMA Regions – IV, V, VI, & VII
- Contracting is handled through FEMA HQ



CUSEC Goals

- To raise the level of **public awareness** of the earthquake hazard in the central U.S.
- To promote the adoption of **mitigation programs, tools, and techniques** to reduce vulnerability
- To foster **multi-state planning for response and recovery** to a damaging earthquake
- To promote the **application of research and lessons learned** to improve the level of preparedness

**Same goal areas adopted by the CUSEC Board for state Eq. programs*

Earthquake Program in the Central U.S.



Works at the state and local level

Work plan built around 4 goal areas in meeting:

- 1) State Program Expectations
- 2) Needs of the at risk communities

EMPG
EQPG

Works at the regional level

in support of:

- 1) Regional issues pertaining to the four goal areas
- 2) State Eq. Program

Corp
Agreement

FEMA
Funding and Program Support
HQ & Regions

Earthquake Basics

- New Madrid Seismic Zone – Most active region east of the Rockies
 - Wabash Valley Seismic Zone
 - East TN Seismic Zone
 - Oklahoma, Kansas, Texas, - induced earthquakes
 - 2,130 earthquakes in the past year in OK
 - 88 earthquakes in the past year in Dallas, TX area
- NMSZ – starts about 35 miles north west of Memphis and extends into southern IL. – Is comprised of 3 segments
- NMSZ averages 150 – 200 earthquakes a year
- Largest area of *Liquefaction* in the world

RESEARCH:

**Large earthquakes
in 1450 and 900 A.D.**

**The average time
between the large
earthquakes is about
500 years**

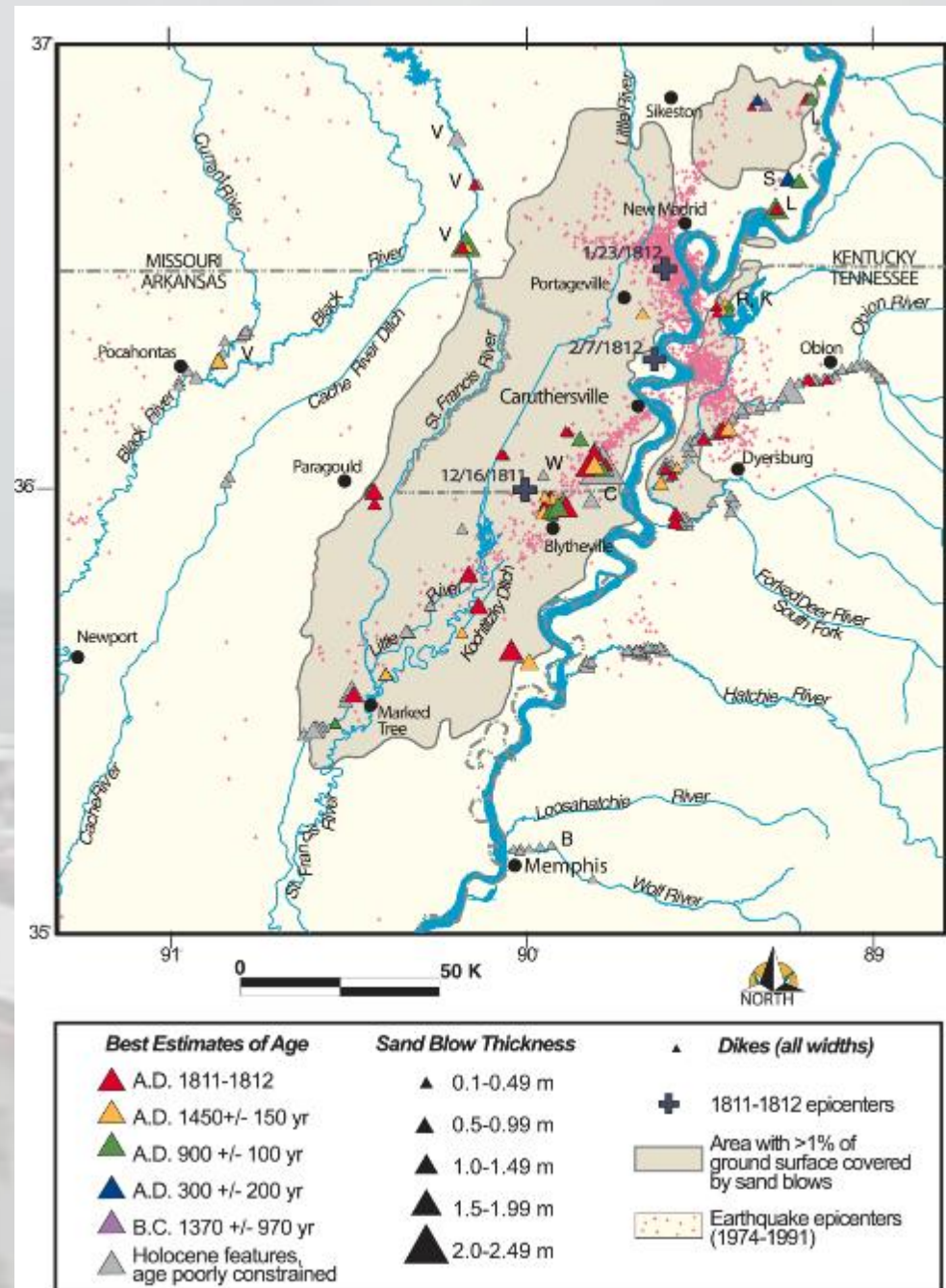
**The prehistoric
earthquakes were
approximately the
same size as the
1811-1812
earthquakes**

**Each may actually
represent sequences
of large earthquakes,
as in 1811-1812**

Dec 16, 1811

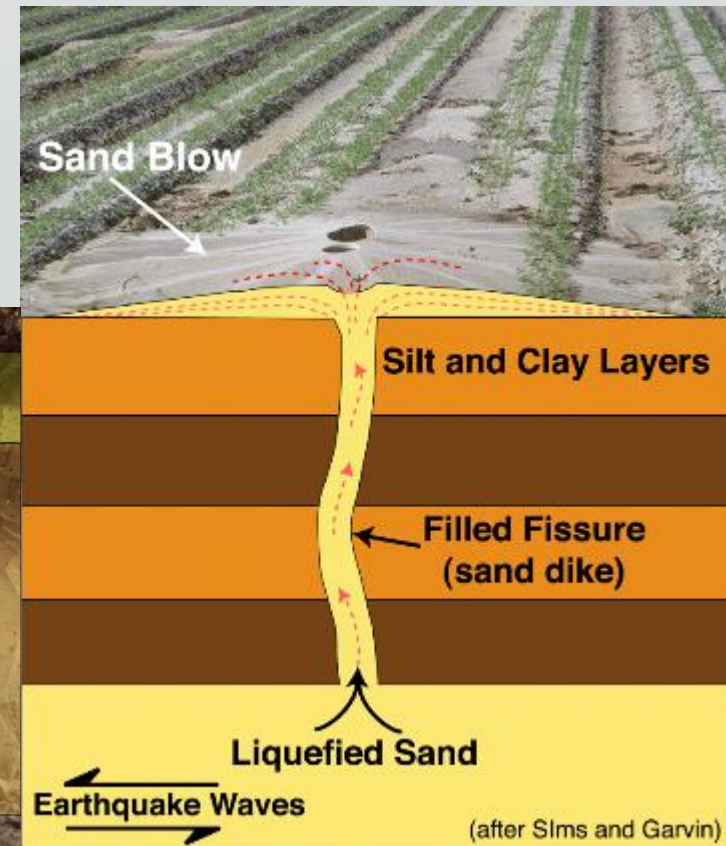
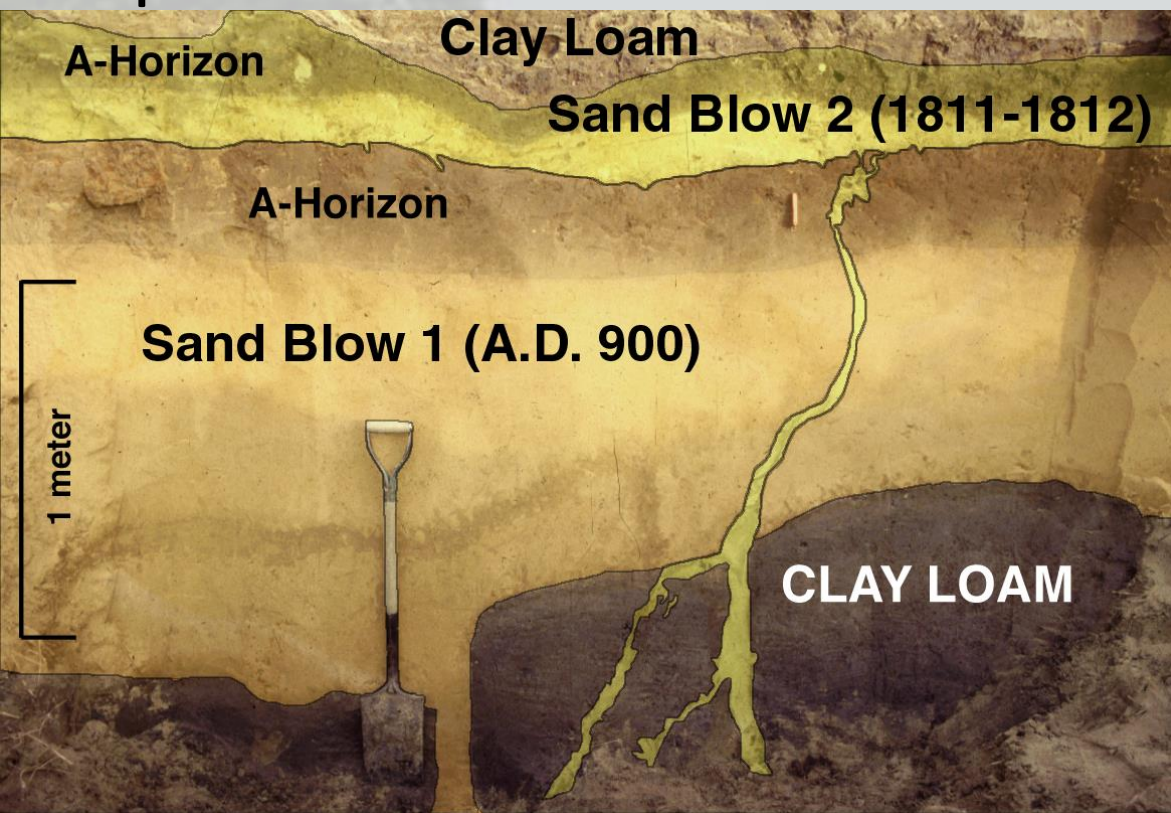
Jan 23, 1812

Feb 7, 1812



So How Do Researchers Determine Past Events?

Liquefaction



Large area susceptible to liquefaction



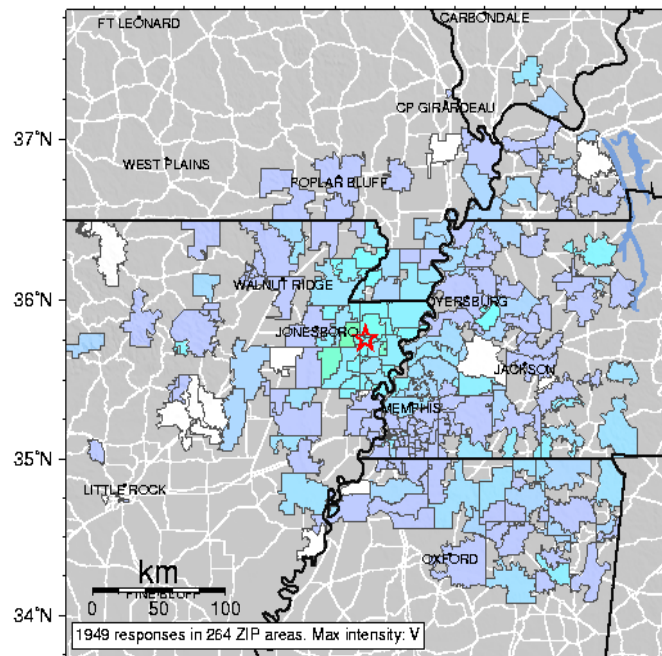
Liquefaction Caused Damage



Smaller More Recent Events

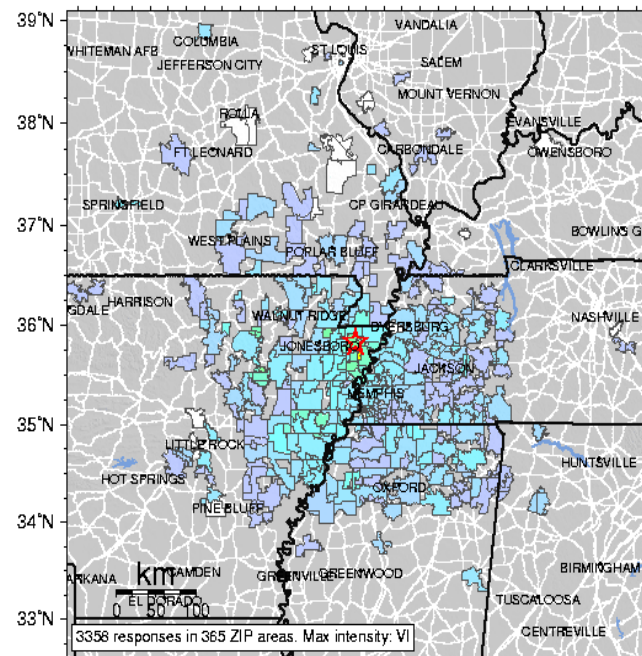
Validate Regional Hazard

USGS Community Internet Intensity Map (22 miles WSW of Blytheville, Arkansas)
ID:722_05 08:04:54 CST FEB 10 2005 Mag=4.1 Latitude=N35.76 Longitude=W90.25



February 10, 2005 - 4.1, 22 miles WSW of Blytheville, AR
Total reports: 2086
Reported in 6 states

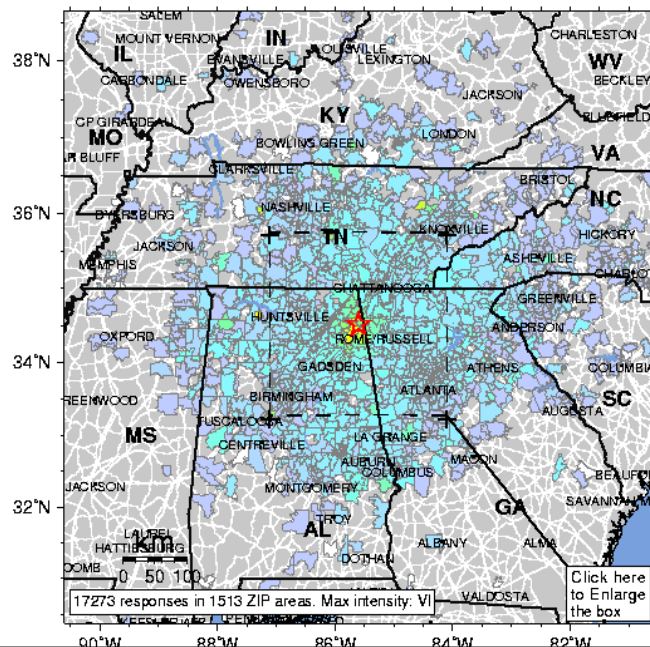
USGS Community Internet Intensity Map (15 miles WSW of Blytheville, Arkansas)
ID:hwb0501a 07:37:32 CDT MAY 1 2005 Mag=4.1 Latitude=N35.63 Longitude=W90.15



May 1, 2005 - 4.1, 15 miles WSW of Blytheville, AR
Total reports: 3501
Reported in 7 states

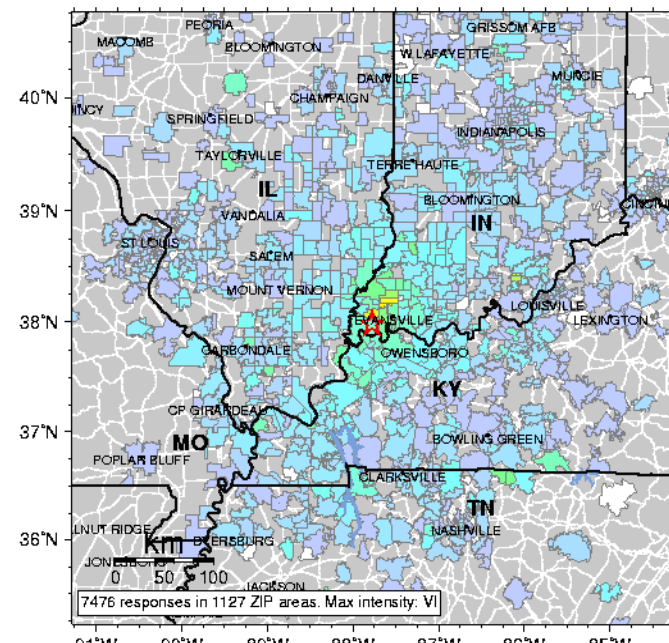
Regional Threat Is not Exclusive to New Madrid Seismic Zone

Community Internet Intensity Map (8 miles ENE of Fort Payne, Alabama)
ID:teak 03:59:37 CDT APR 29 2003 Mag=4.6 Latitude=N34.51 Longitude=W85.60



April 29, 2003 – 4.6
Earthquake - Fort Payne
Alabama
Total reports: 17298
Reports from 11 states and
D.C.

USGS Community Internet Intensity Map (12 miles W of Evansville, Indiana)
ID:fnbk 12:37:15 CDT JUN 18 2002 Mag=4.6 Latitude=N37.98 Longitude=W87.78



June 18, 2002 – 4.6
12 miles W of Evansville,
Indiana Total reports: 7476
Reports from 6 states

What Makes the Central US Unique Geologically?

- Low reoccurrence interval but high impact
- Large area of unconsolidated soils
- Felt/impacted area 20 times larger than similar events in the western U.S.
- Large earthquakes occur in clusters
- Large area susceptible to liquefaction

Secondary Hazards

- Landslides
- Liquefaction
- Disruption of ground water supplies
- Changes to river channels
- Hazardous Materials Release
- Localized flooding
- Fire
- Ground displacement – lateral spreading

So what does all this mean in terms of earthquake probabilities?

- Magnitude $\sim 7.5 - 8.0$
(similar to 1811-1812)
Approximately 7-10%
Low probability, high consequence
- Magnitude 6.0 or greater
(similar to 1843 Marked Tree, AR and 1895 Charleston, MO)
Approximately 25-40%
Higher probability, still significant impacts

Broad agreement in earth science community that NMSZ continues to pose significant and ongoing hazard

The Seismic Risk in the Central US

What makes this risk potentially
“Catastrophic”?

Problems on a Good Day – *What if...*



Lance Murphy – Commercial Appeal Photographer



J. Wilkinson CUSEC



J. Wilkinson CUSEC



Wikipedia

The Stage is Set for a Catastrophic Event

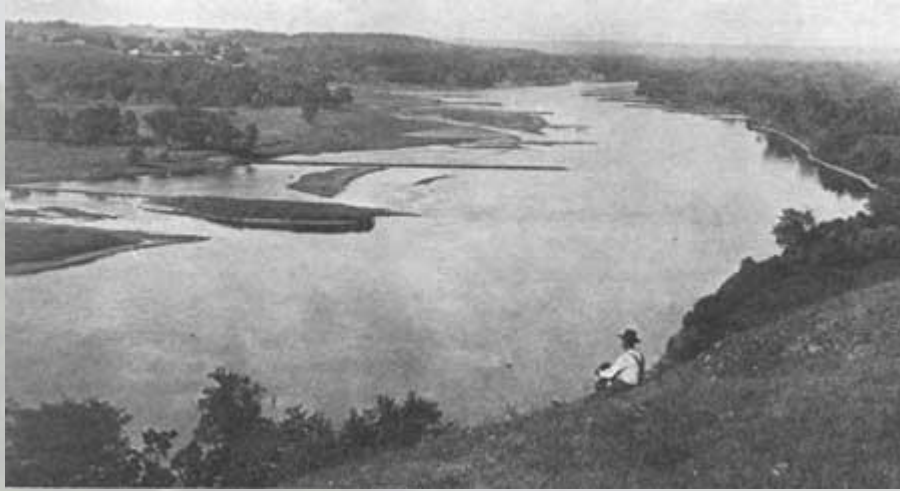
- High percentage of structures built without seismic considerations
 - Building codes have only recently addressed the seismic hazard
- Last significant earthquake 1895 - 6.8
- High percentage of URM's
- Central US Serves as the Crossroads Of America
- Low level of understanding / belief

Impact to the River Systems



The Red Deer River is seen in an aerial photo taken after a pipeline carrying crude started spilling oil into a tributary creek near Sundre, Alberta on June 8, 2012. (Photo courtesy of Global Calgary)

River Systems of 1811 are vastly different from today



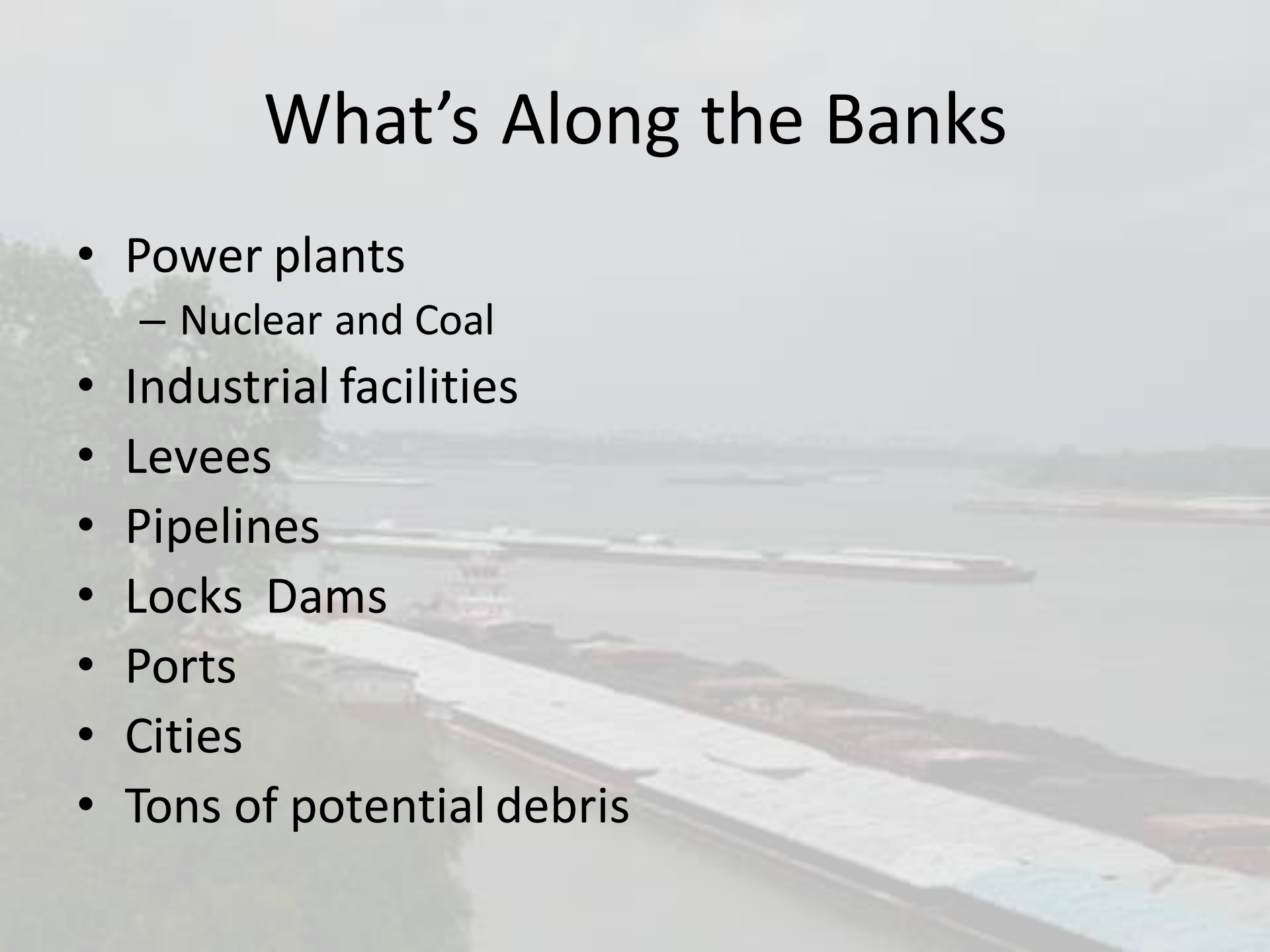
H. Bosse, draughtsman with the Corps of Engineers, 1883-1891. (*U. S. Army Corps of Engineers, St. Paul District*)

- Still a major transportation corridor
- Navigational and control systems are now critical elements
- Industrial / commercial / community developments increase associated risk



What's Along the Banks

- Power plants
 - Nuclear and Coal
- Industrial facilities
- Levees
- Pipelines
- Locks Dams
- Ports
- Cities
- Tons of potential debris



Damage to Ports



USGS/EERI Haiti EQ Damage report



FEMA photo



Rivers are going to be choked with debris



Man made debris - I-35 bridge



Photo credit: Mark Moran
Noxen, Pennsylvania



North Shore Emergency Management

Up and Down Stream of the Impact zone will become a parking lot



Downstream Considerations

- Management of river traffic
 - Vessels that would have been going up stream
 - Vessels operating in area
 - Response vessels
- Contaminates in the river
 - Hazardous materials
 - Debris
 - Large volumes of soil/silt – i.e. sandbars, islands, landslides,
- River channel conditions may be altered
 - River channel upstream could shift

Response Challenges

- Differing priorities / mandates
- Damage over a large geographical area
 - Multiple jurisdictions requesting aid
 - Differing needs / level of response needed
- Disruption to the infrastructure
 - Slows response
 - Restricts access
- Hazardous conditions
- Adjudication of resources
 - Tents
 - Generators
 - Food/Water

Long Term Recovery Issues

- Legal Issues
 - Debris from I-35 remained 3 years after the collapse
- Design/Code Modifications
 - Flood control
 - Land use
- Volume of Repairs / Reconstruction Projects
 - Limited resources
 - Limited labor
 - Lose of River Channels
 - Prioritization challenges
 - Bridges, levees, drainage/irrigation canals, locks

Modeled Risk

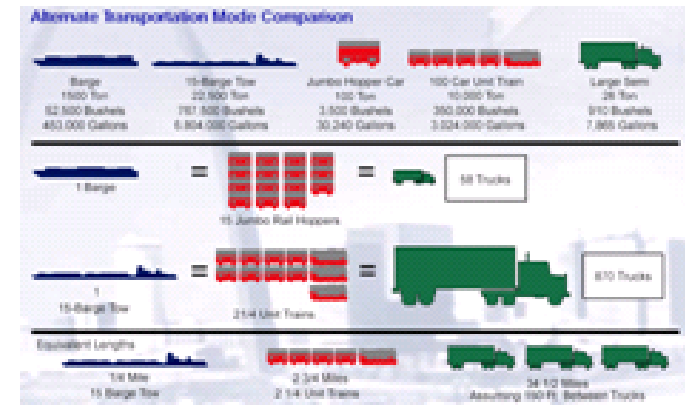
- Public Sector Modeling
 - HAZUS
 - FEMA
 - Mid America Earthquake Center
 - Sandia National Labs
 - Argonne National Labs
 - State EMA's
- Private Sector Modeling
 - RMS
 - EQECAT Catastrophe Models
 - others



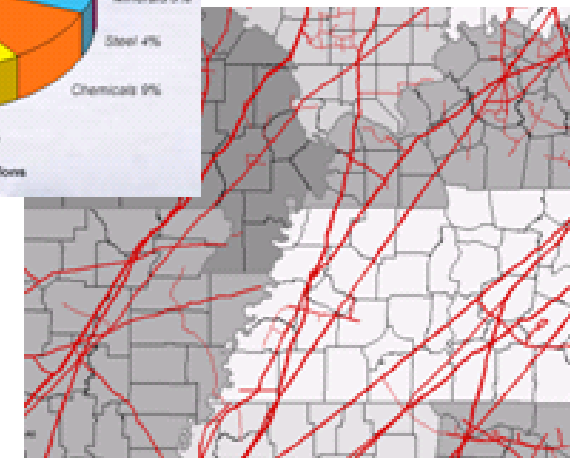
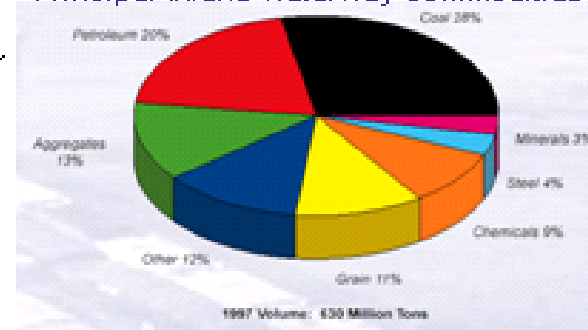
Consequences: Earthquake on New Madrid Fault

National Commodity Flow and Economic Consequences

- Effects of a significant quake in the NMSZ would have wide-ranging impact on the Nation's economy
 - A mere 10-day disruption to the local economies of those areas structurally damaged by the 1895 quake (e.g., due to fallen power lines) would have a \$50B impact (2/3 of this outside the affected region)
 - Commodity flows (pipeline, rail, highway, barge) through the impacted area likely disrupted for a much longer period
 - Infrastructure for alternative modes likely damaged as well
 - Alternative modes, even if available, are resource constrained
 - Products/services impacted include
 - Fuel (NG, Oil) for the upper Midwest (seasonally dependent)
 - Coal supplies to generation plants in the Southeast and Midwest
 - Food exports (seasonally dependent)
 - Availability of critical transportation facilities (e.g., Memphis FedEx SuperHub)
 - Availability of routes for insertion of emergency services personnel

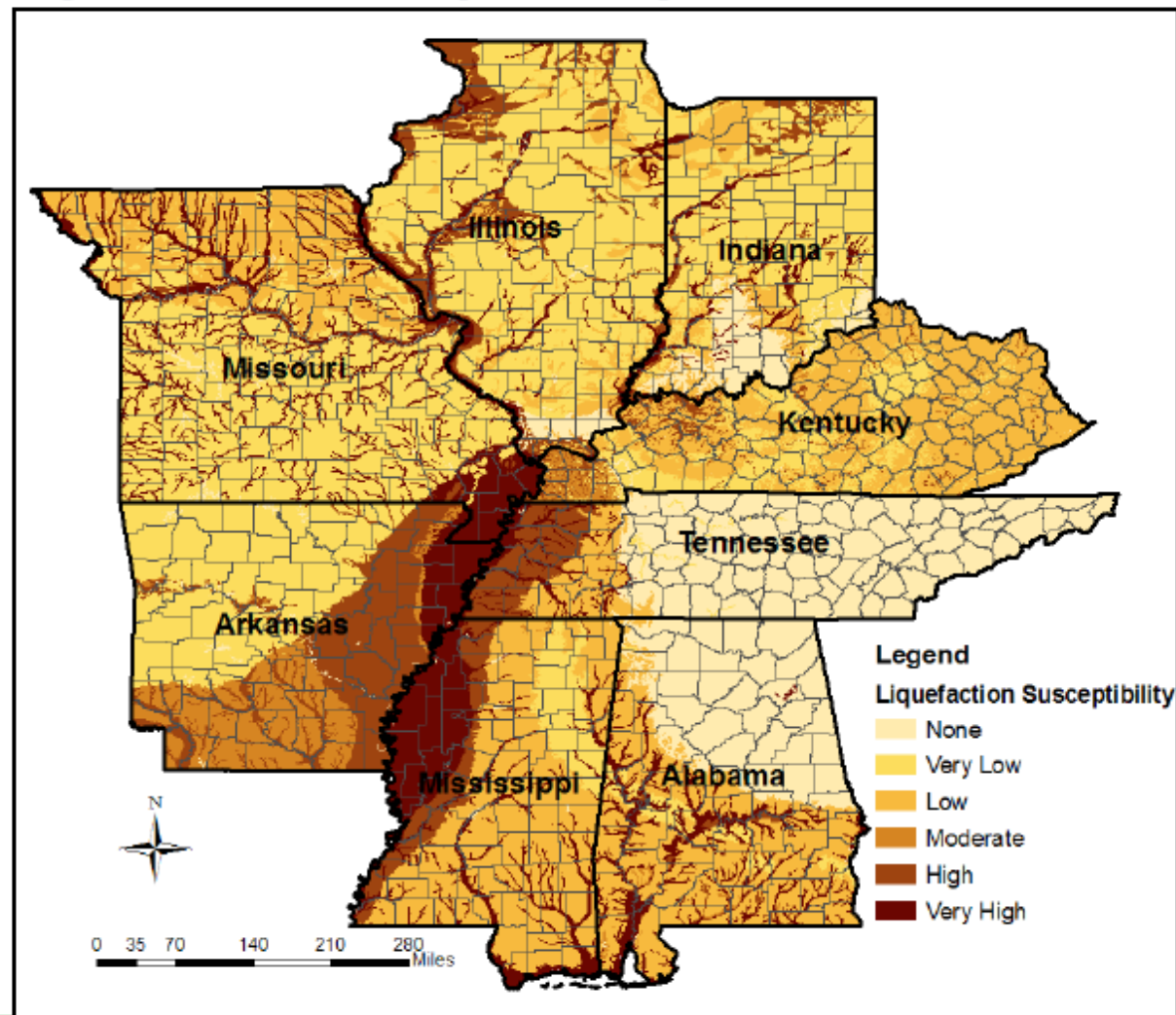


Principal Inland Waterway Commodities



Natural Gas Pipelines in Seismic Zone (Platts)

Regional Liquefaction Susceptibility



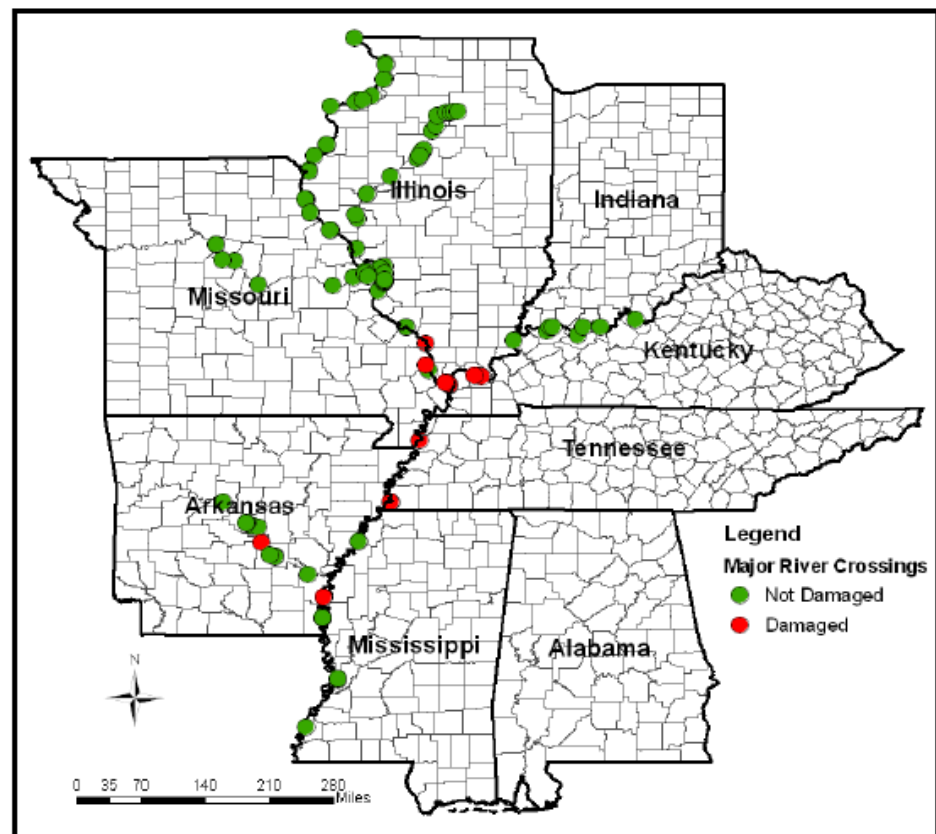
It is not recommended that staging areas or response activities are placed in areas specified as 'High' or 'Very High' liquefaction susceptibility. Areas with 'None', 'Very Low', or 'Low' are better suited for these types of activities.

Transportation Lifelines

Several major river crossing along the Mississippi, Ohio, and Arkansas Rivers are damaged, including:

- Harahan, Frisco and Memphis/Arkansas Bridges in Memphis, TN
- Caruthersville Bridge in Dyersburg, TN
- Charles W. Dean Bridge from Arkansas City, AR
- Mississippi and Ohio River bridges at Cairo, IL
- I-24 Bridge from Metropolis, IL
- Irvin S. Cobb Bridge in Paducah, KY
- I-57 Bridge at Cairo, IL
- Bill Emerson Memorial Bridge at Cape Girardeau, MO

Additionally, many bridges along major interstates in the region are damaged, such as I-55, I-57, I-24, I-40, I-155 and several US Routes



Highway Bridges		
	Total	Damaged
Alabama	17,491	0
Arkansas	14,060	1,083
Illinois	29,967	157
Indiana	20,387	0
Kentucky	15,418	262
Mississippi	18,293	6
Missouri	27,258	1,004
Tennessee	22,897	1,035
TOTAL	165,771	3,547

Airports		
	Total	Damaged
Alabama	469	0
Arkansas	335	37
Illinois	935	20
Indiana	675	0
Kentucky	222	13
Mississippi	257	0
Missouri	562	28
Tennessee	318	45
TOTAL	3,773	143

Ports		
	Total	Damaged
Alabama	327	0
Arkansas	103	17
Illinois	517	20
Indiana	100	0
Kentucky	301	61
Mississippi	222	0
Missouri	232	52
Tennessee	202	82
TOTAL	2,004	232

Railway Bridges		
	Total	Damaged
Alabama	118	0
Arkansas	68	11
Illinois	1,030	11
Indiana	92	0
Kentucky	166	3
Mississippi	63	0
Missouri	200	2
Tennessee	151	2
TOTAL	1,888	29

Tennessee Port Facility Damage

Maps prepared by the Mid-America Earthquake Center - Project PI: Amir Elneashal (MAEC) Project Co-PI: Theresa Jefferson (VT)

Tennessee Impacted Counties

County	Total Facilities
Benton	NA
Carroll	NA
Chester	NA
Crockett	NA
Dyer	3
Fayette	NA
Gibson	NA
Hardeman	NA
Hardin	6
Haywood	NA
Henderson	NA
Henry	1
Ike	3
Lauderdale	5
Madison	NA
McHairy	NA
Obion	NA
Shelby	53
Tipton	2
Wesley	NA

Legend

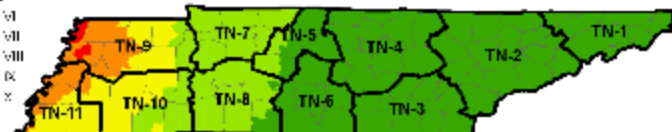
- Port Facility Damage**
% Facilities Damaged
- No Inventory
 - 0% - 19.9%
 - 20% - 59.9%
 - 60% - 100%
- Impacted Counties**
- Planning Areas
 - Major Cities
 - Interstates
 - US Routes

Tennessee Earthquake Intensity

Legend

MMI

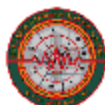
- VI
- VII
- VIII
- IX
- X



Maps Prepared: March 2009



Mid-America Earthquake Center



FEMA



Institute for Crisis, Disaster and Risk Management



Other Critical Infrastructure

- Dams, Levees, and Hazardous Materials facilities are the only forms of additional infrastructure considered*
- All damage to these types of infrastructure occur in northeast AR, southern IL, western KY, southeast MO, and western TN*
- Flooding due to dam/levee failure is most likely in areas of most severe shaking and substantial displacement from liquefaction*
- Common materials stored at hazmat sites include:*
 - Metal compounds: nickel, zinc, manganese, lead, chromium, and copper*
 - Liquid chemicals: hydrochloric acid, sulfuric acid, ammonia, benzene, glycol ether, ethylene, formaldehyde, methanol, nitric acid, and toluene*
 - Other: arsenic, barium, chlorine and cyanide compounds*
- Hazmat facilities do not include nuclear facilities. Please consult the additional maps provided for nuclear facility locations.*

	Dams	
	Total	Damaged
Alabama	2,233	0
Arkansas	1,228	55
Illinois	1,562	31
Indiana	1,187	0
Kentucky	1,196	53
Mississippi	3,544	0
Missouri	5,408	55
Tennessee	1,215	133
TOTAL	17,573	327

	Levees	
	Total	Damaged
Alabama	5	0
Arkansas	124	20
Illinois	576	34
Indiana	101	0
Kentucky	90	10
Mississippi	50	0
Missouri	369	25
Tennessee	11	7
TOTAL	1,326	96

	Hazmat Facilities	
	Total	Damaged
Alabama	3,656	0
Arkansas	1,834	69
Illinois	17,130	36
Indiana	5,112	0
Kentucky	2,865	43
Mississippi	2,042	0
Missouri	3,040	32
Tennessee	4,080	73
TOTAL	39,759	253

To Summarize - What if it happened here today?

7.7M New Madrid Earthquake

8 State Perspective

- 7+ Million People
- 85,000 Injured
- 3,500 Deaths
- 2M Seek Shelter
- 3600 Bridges Damaged
- 700K Buildings Damaged
- 32K Buildings Collapsed
- \$300B Event
- 2.6M Households without electricity
- 1.1M without Water
- 1,500 USAR Teams needed – 28 currently
- Widespread Bridge, Dam and Levee damage
- What about cascading events?

What's being done?

- SONS 07
- FEMA New Madrid Catastrophic Planning
- NLE-11
- Capstone 14
- Post Capstone Planning
 - Regional GIS Integration
 - Associate/Sister State Integration
 - Electric Sector
 - State Geological Survey Integration
 - Building Inspector Resource Deployment Framework
 - Recovery

Upcoming Events

- CUSEC Post Capstone Planning Integration
 - 2016 FEMA Regional Earthquake Plan Updates
 - NGB New Madrid/ Wabash Planning
 - RAW Summer 2016 – Military Support to Civilian Authorities Focused
 - 2017 Multi-State Exercise

Food for Thought

...river-men accustomed to continually “learning” the river, adding to their knowledge after every season of flood or storm, were confronted with a perilously complete transformation of the river they thought they knew.

Latrobe, *The First Steamboat Voyage on the Western Waters*

Sources of Local Earthquake Technical Assistance

- Central U.S. Earthquake Consortium
 - Jim Wilkinson – jwilkinson@cusec.org, www.cusec.org
- Center for Earthquake Research and Information, Univ. of Memphis, USGS Central Regional Office Memphis, TN
 - www.ceri.memphis.edu, www.usgs.gov
- Mid America Earthquake Center <http://mae.ce.uiuc.edu>

Questions





Clean Gulf
Associates



Alternative Dispersants II

James Hanzalik



Clean Gulf Associates

- **A Not-For-Profit Oil Spill Cooperative**
- **Formed By 33 Operators in 1972**
- **“By Industry for Industry”**
- **Mission focused on Gulf of Mexico Exploration & Production Oil Spill Response**
- **Currently has 118 Members**



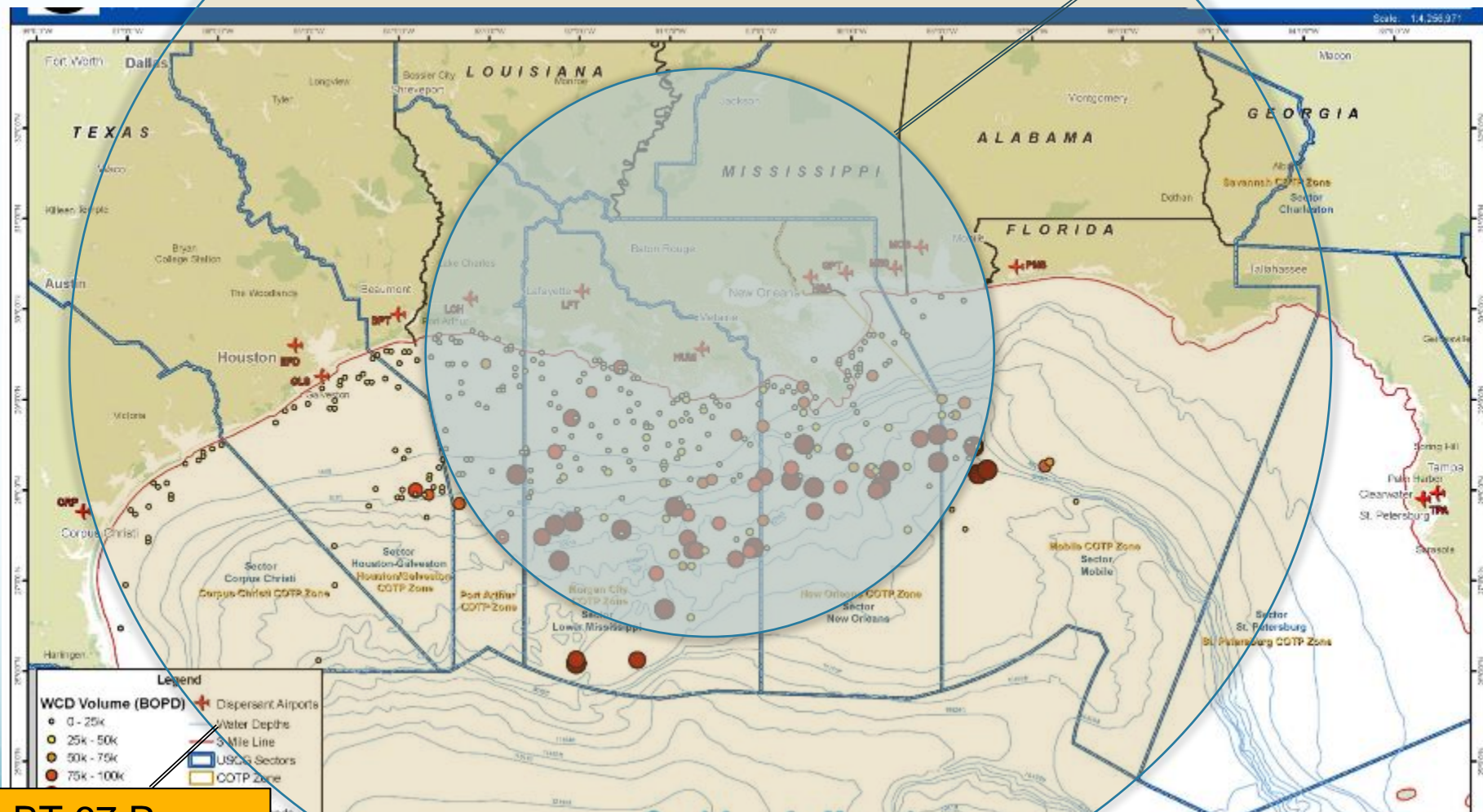
Airborne Support, Inc.

- Airborne Delivery Capabilities via Contract with Airborne Support, Inc. (ASI)
- (1) Spotter & (3) Spray Aircraft
- 16K/day application capacity
- 64K gallons of Corexit 9500A co-located at facility





1-Hour BT-67
Range w/full
load



BT-67 Range
w/full load



- **HWCG formed in 2011 to meet BSEE requirements for Deep Water drilling.**
- **Mission focused on Well Containment for U.S. Gulf of Mexico.**
- **HWCG has 16 Members**
- **HWCG has all the necessary equipment to support subsea dispersant operations.**



Goals



- **Joint Venture by CGA and HWCG for the last three years**
- **Identify for use an alternative dispersant to Nalco Corexit products**
- **Have an inventory of equally effective dispersant with less toxicity**
- **Educate RRT VI & IV and FOSCs alternative dispersant solutions**
- **Alternative(s) selected and stocked in limited quantities available for aerial and subsea use**
- **FOSC is free to use dispersants without an indemnification from the manufacturer or cooperatives**



Product Selection Criteria



- **EPA Subpart J Product Schedule**
- **Effective on Louisiana light sweet crude**
- **Similar toxicity to Corexit**
- **Additional Testing (e.g., EXDET, OHMSETT, others)**
- **Manufacturing capacity and product turnaround**
- **No Indemnification requirement for product use**

Dispersant Testing Status

Dispersant	Toxicity (C50 values in ppm) W/No 2 Fuel oil		Effectiveness (%)		
	Menidia (96-hr)	Mysidopsis (48-hr)	Prudhoe Bay Crude Oil	South Louisiana Crude Oil	Average of Crude Oils
BIODISPERS	5.95	2.66	51.00	63.00	57.00
COREXIT® EC9500A	2.61	3.40	45.30	54.70	50.00
FINASOL OSR 52	5.40	2.37	32.50	71.60	52.10
Accell Clean ® DWD	8.05	1.32	58.70	96.03	77.36
JD-2000™	3.59	2.19	60.40	77.80	69.10
Marine D-Blue Clean	32.00	18.00	45.00	55.59	50.30
SUPERSPERSE™ WAO2500	3.70	2.53	77.84	87.56	82.70

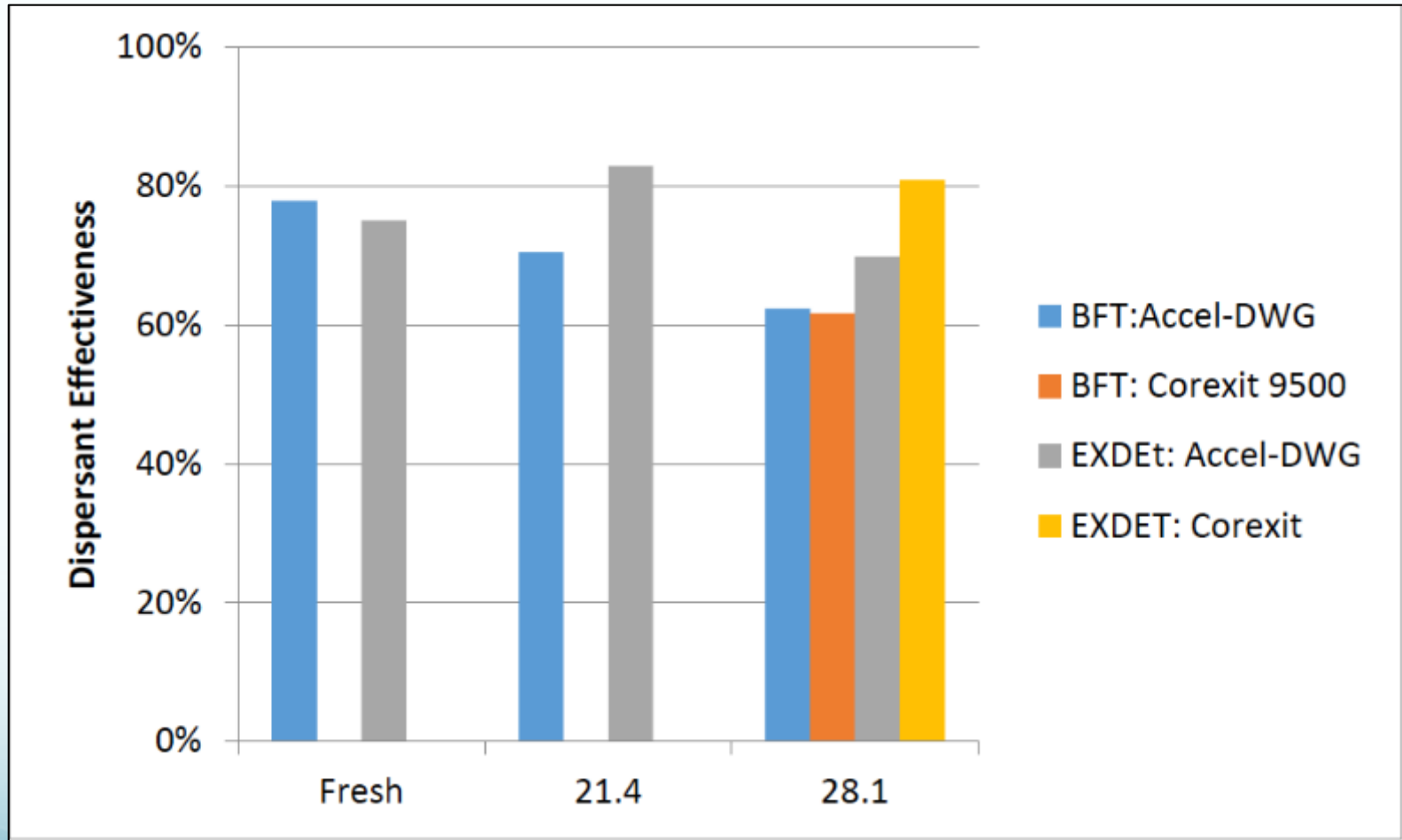
Source: EPA Product Schedule

Dispersant Effectiveness (EXDET)

Dispersant	Replicate	1	2	3	4	Average
Accel-DWG	Fresh	69.6	76.9	77.9	75.7	75.0
	21.4%	79.9	86.8	81.5	83.1	82.8
	28.2%	72.7	52.1	72.8	81.7	69.8
Corexit 9500	28.2%	84.5	76.8			80.7

S.L Ross, 2015

Dispersant Effectiveness (EXDET)



Dispersant Effectiveness (MESO Scale Wave Tank)



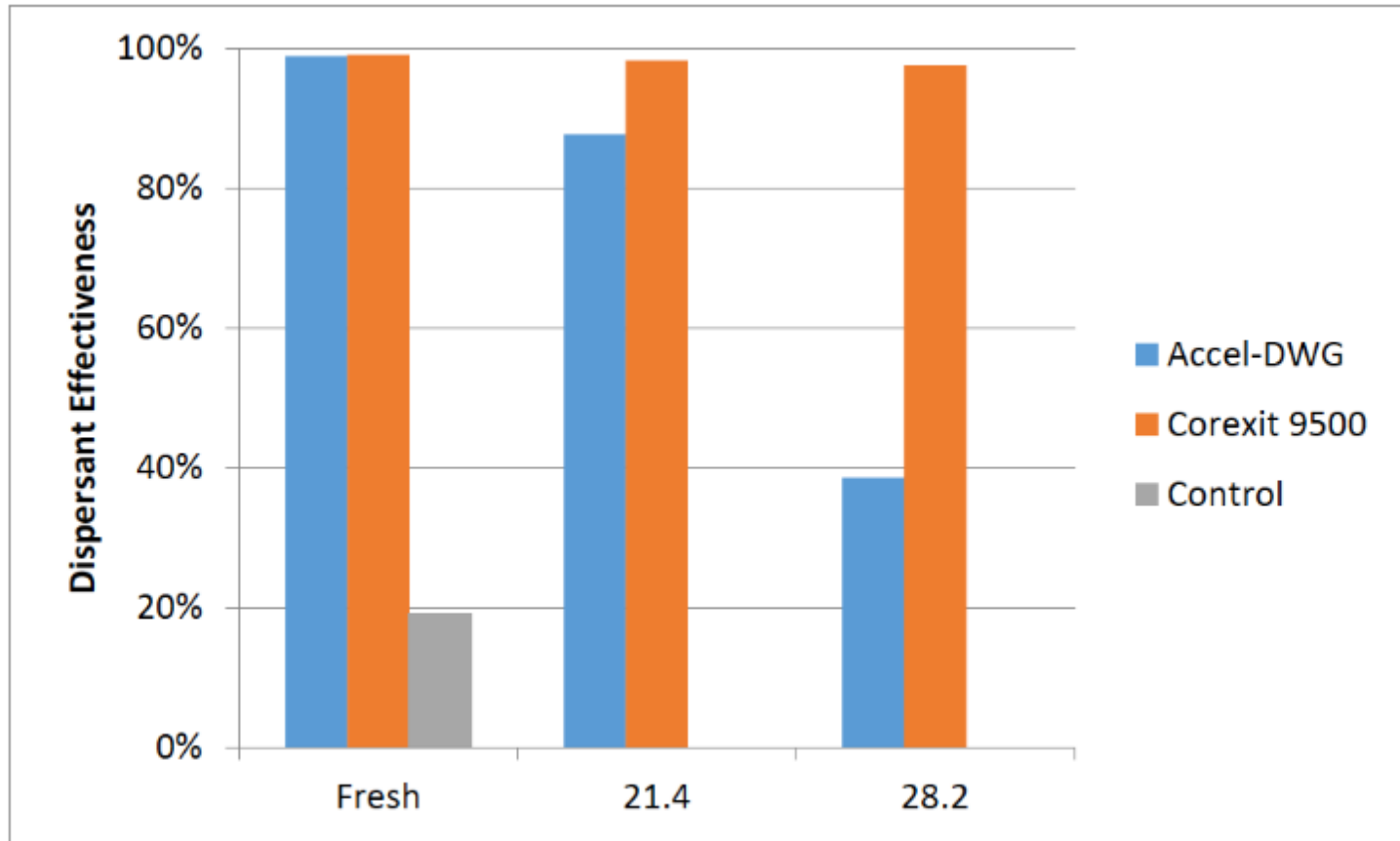
S.L Ross, 2015

Dispersant Effectiveness (MESO Scale Wave Tank)

Dispersant	Fresh	21.4%	28.1%
Accel-DWG	98.8	87.7	38.6
Corexit 9500	99.1	98.2	97.6
Control	19.1		

S.L Ross, 2015

Dispersant Effectiveness (MESO Scale Wave Tank)



Dispersant Toxicity (NCP Tests)

Material Tested	Species	LC50 (ppm)
ACCELL CLEAN® DWD	Menidia beryllina Mysidopsis bahia	6.58 96-hr 1.55 48-hr
No. 2 Fuel Oil	Menidia beryllina Mysidopsis bahia	38.0 96-hr 3.61 48-hr
ACCELL CLEAN® DWD & No. 2 Fuel Oil (1:10)	Menidia beryllina Mysidopsis bahia	4.21 96-hr 2.21 48-hr
Reference Toxicant (Sodium Dodecyl Sulfate – SDS)	Menidia beryllina Mysidopsis bahia	2.43 96-hr 5.95 48-hr

Environmental Enterprises USA (EE USA) Toxicity Data for Accell Clean® DWD (2015)

Dispersant Toxicity (NCP Tests)

Material Tested	Species	LC50 (ppm)
ACCELL CLEAN [®] DWD	Menidia beryllina Mysidopsis bahia	5.66 96-hr 2.07 48-hr
No. 2 Fuel Oil	Menidia beryllina Mysidopsis bahia	11.10 96-hr 1.68 48-hr
ACCELL CLEAN [®] DWD & No. 2 Fuel Oil (1:10)	Menidia beryllina Mysidopsis bahia	8.05 96-hr 1.32 48-hr
Reference Toxicant (DDS)	Menidia beryllina Mysidopsis bahia	6.60 96-hr 30.80 48-hr

Retrieved from <http://www2.epa.gov/emergency-response/accell-cleanr-dwd>



Accell Clean ® DWD



- Listed on EPA Subpart J Product Schedule (2011) 😊
- Very effective on Louisiana light sweet crude (E&P crude) 😊
- Similar toxicity to Corexit 😊
- Positive Results EXDET, Meso-scale (BSEE to test at OMSETT) 😊
- 30K gallons/day manufacturing capacity 5-7 days 😊
- No Indemnification for product use 😊
- Protein-based Dispersant 😊



CGA/HWCG Actions



- **Agreement finalized between Advanced BioCatalytics, Corp. (ABC), CGA and HWCG**
- **CGA is planning to stock approximately 5K gallons at Airborne Support in Houma, LA.**
- **Dispersant will be available for “Spills of Opportunity”**

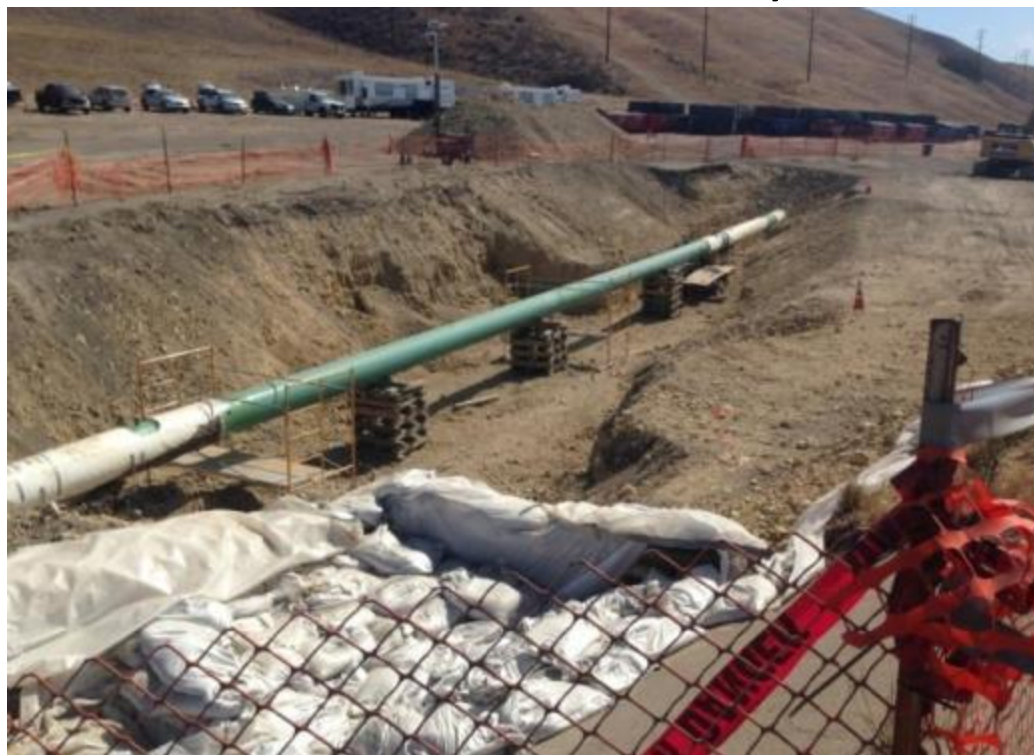


Questions?



The Refugio Incident

Response to the Pipeline Spill Across the
Inland & Coastal Zone Boundary Line



September 7, 2015 Region 7 RRT Meeting



CDR Keith M. Donohue
Commanding Officer
U.S. Coast Guard, Pacific Strike Team
Keith.M.Donohue@USCG.mil

Discharge Discovered May 19, 2015
RPs worse case estimate of 101,000 gals of Santa Barbara Crude



05/19/2015 14:13



Location & Pathway







Santa Barbara County West - Sensitive Sites



Source: Jennifer Gold / Mike Connell (OSPR)
Map produced by: Greg Ewing (OSPR) May 23, 2011

0 2 4 8 Miles

An aerial photograph showing a coastal area. On the left, a paved road with a yellow center line runs vertically. To its right are railroad tracks. Further right is a sandy area with many palm trees and some buildings. The ocean is on the right side of the image, with a dark, rocky shoreline. The text "Day 1" is overlaid in yellow on the ocean.

Day 1



05/19/2015 15:33



05/19/2015 15:33



05/19/2015 15:29



USCG Photo, 19 May 2015 from Jordan Stout NOAA

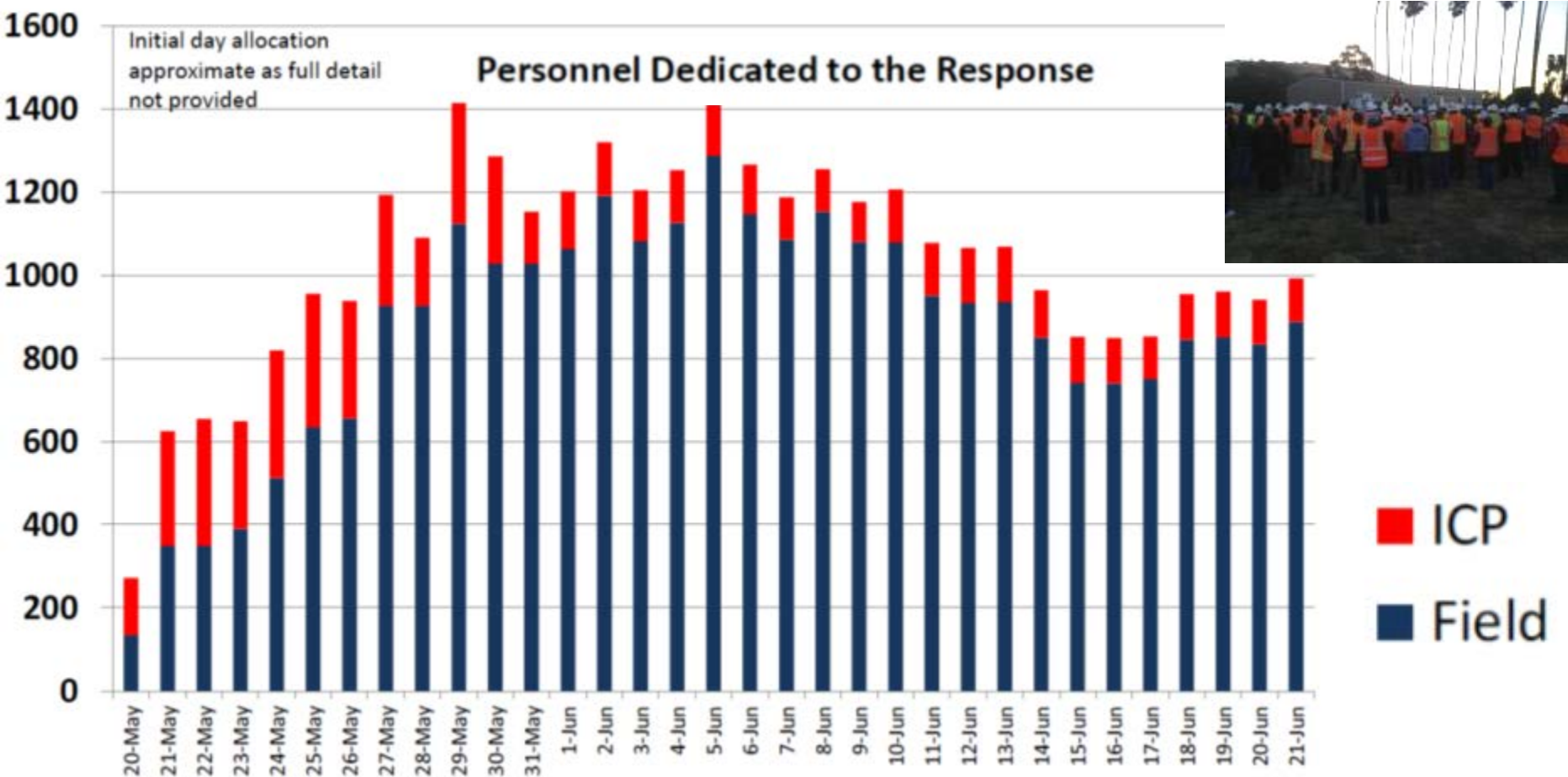


USCG Photo, 19 May 2015 from Jordan Stout NOAA



Unified Command Established

USCG Sector LA-LB Sector Commander, EPA Region 9,
CA DFW, Santa Barbara Co OEM, Plains All American



May 20th, State of Emergency Declared by Gov Brown in Santa Barbara County

- To assist Oil Spill Response
 - cut red tape & help state mobilize resources
 - to utilize & employ state personnel, equipment, and facilities
 - opened EOC for use as initial ICP
- Emergency Permit issued to Plains by SB Planning & Development Dept.
 - Expedited cleanup operations more quickly than the customary permit process
 - Customary permit with public comments follows

Incident Command Post



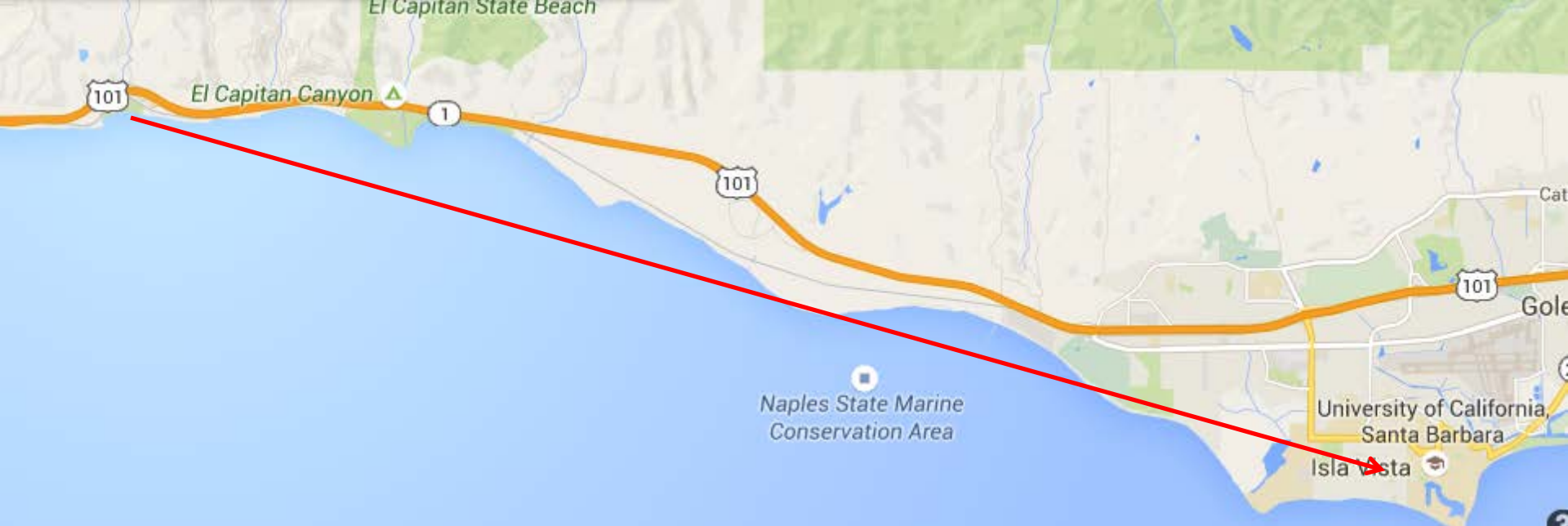
Significant Environmental, Cultural, Historical & Social Concerns

- 2 Marine Protected Areas (Kashtayit & Naples)
- 23-mile by 7-mile fishery closure
- Wildlife impacts
 - birds, mammals, Grunion Spawning
- Chumash Indian Tribe
 - 2,000 - 5,000 members coastal members
 - Inhabitants of SB Coast for over 13,000 years
- Varied Beach composition & environments:
 - Cobble, Rock, Sand, Cliffs, Kelp, Marinas, Parks



High Local, State, National Media & Political Interest

- Santa Barbara:
 - 1 of 2 counties in CA with an MOU to be part of UC for oil spills
- High Tourist Season:
 - Refugio & El Capitan State Beaches closed
 - Memorial Day & University Commencement Weekends; Seafood Festivals; race with 2.5 K bicyclist....
- Affluent & popular residents/land owners:
 - Oprah, Brad Pitt, Kevin Costner, Steven Spielberg...etc.



- 13.4 miles from UC Santa Barbara
- Birthplace of modern environmental movement
- 1969 Santa Barbara Spill
 - led to 1st Earth Day in 1970
- Over 55 local environmental NGOs

Inland Branch





Soil Removal at Source



USCG Operations Photos
Refugio Incident



Pipeline Repair



24-inch Las Flores to Gaviota pipeline



Hwy 101 Traffic





Keith Donohue, USCG

Union Pacific Railway



Keith Donohue, USCG



Keith Donohue, USCG

NOAA Overflight Photos
Refugio Incident



W 120° 05.276'
N 34° 27.702'

5/25/2015 8:01:36 AM



Soil Remediation in Culturally Sensitive Location



W 120° 05.182'
N 34° 27.550'

5/25/2015 8:01:14 AM





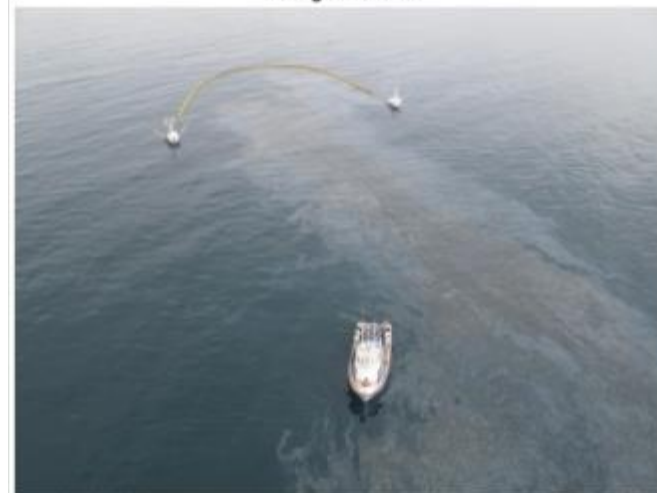
Cleaning at Cliff
Discharge Site

Offshore Branch



5/20/2015 8:49:26 AM

NOAA Overflight Photos
Refugio Incident



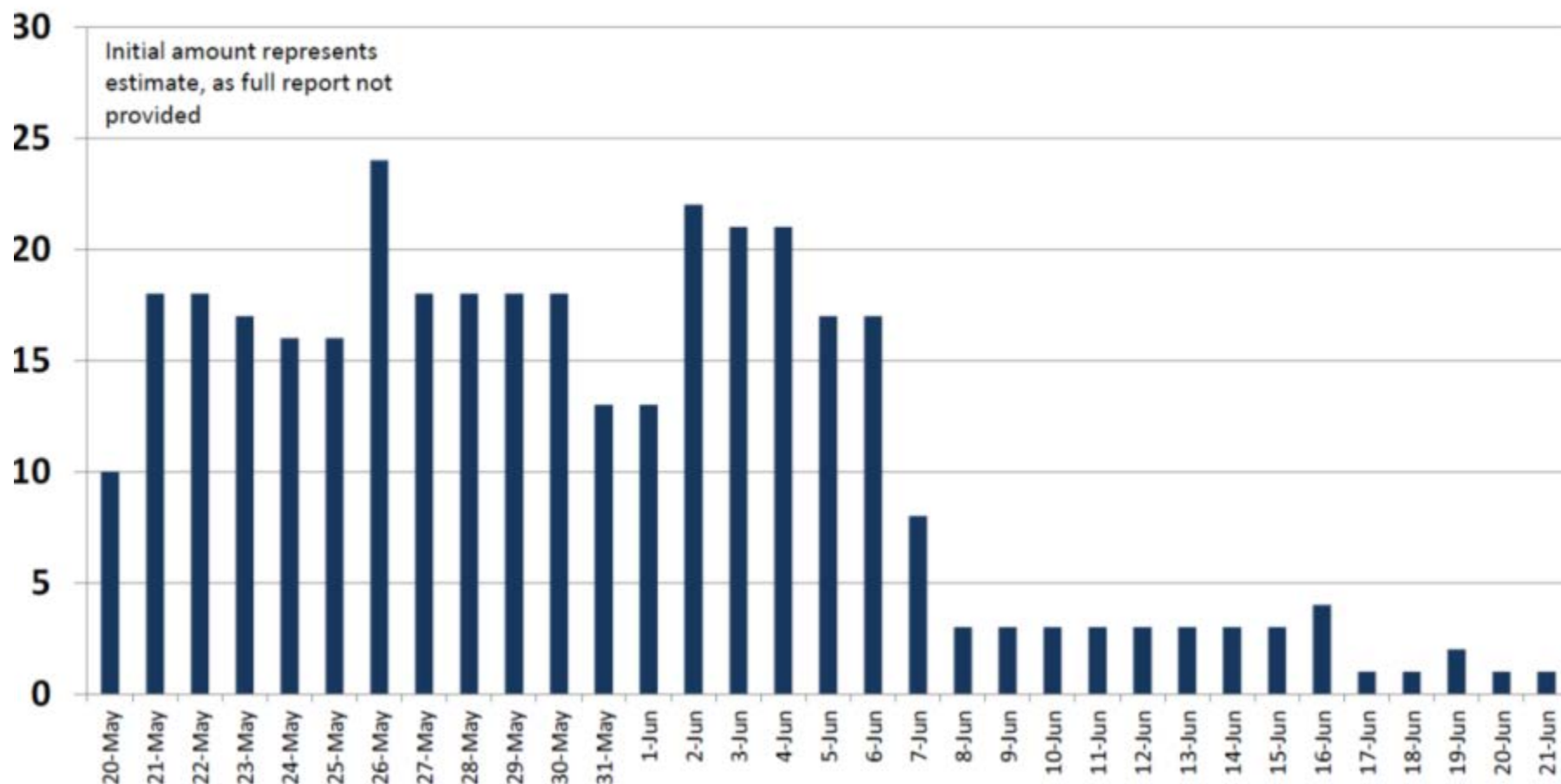
W 120° 03' 39"
N 34° 25' 26"

9:30:24 AM 5/28/2015



5/20/2015 9:59:30 AM

Vessels Dedicated to the Response



May 24th



1335 May 24, 2015: Keith Donohue, USCG



May 30 & 31

NOAA Overflight Photos
Refugio Incident



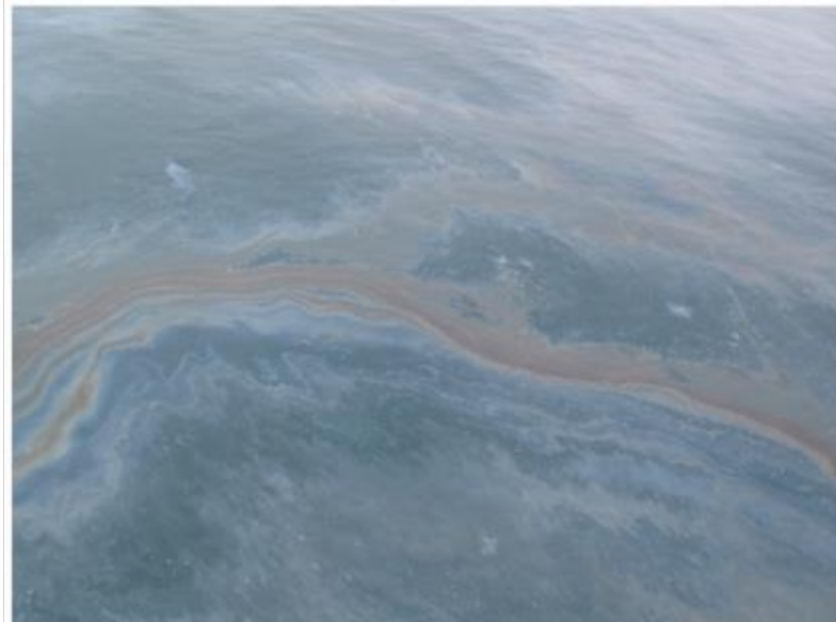
W 119° 59.927'
N 34° 26.910'

5/31/2015 3:19:12 PM



W 119° 57.656'
N 34° 26.221'

5/31/2015 2:39:31 PM



W 119° 53.545'
N 34° 24.677'

5/30/2015 12:35:58 PM

June 1st



W 119° 54.794'
N 34° 23.604'

NOAA Overflight Photos
Refugio Incident

6/1/2015 7:11:30 A



1550 June 1, 2015: Keith Donohue, USCG




June 2nd
(2 weeks after spill)

**NOAA Overflight Photos
Refugio Incident**



**W 119° 56.768' 6/2/2015 8:19:50 AI
N 34° 24.167'**



**W 120° 04.826'
N 34° 26.836'**

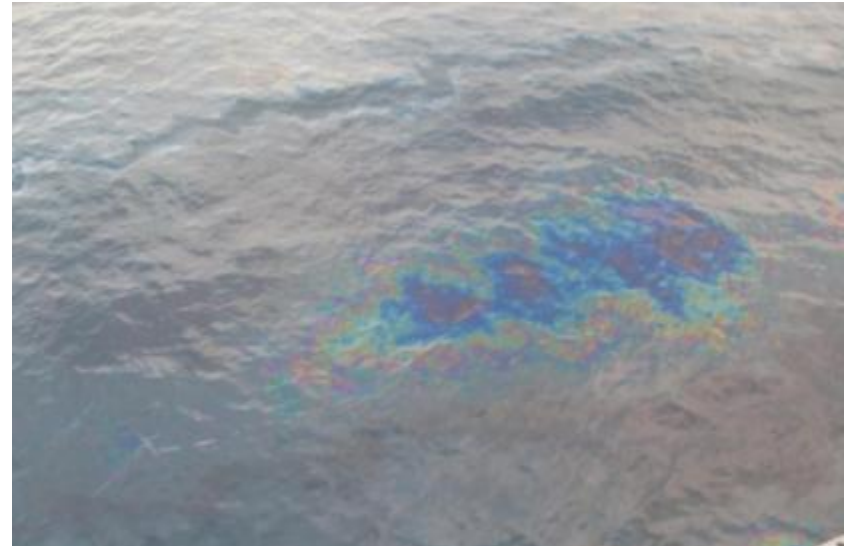
6/2/2015 7:05:22 AM

June 3rd

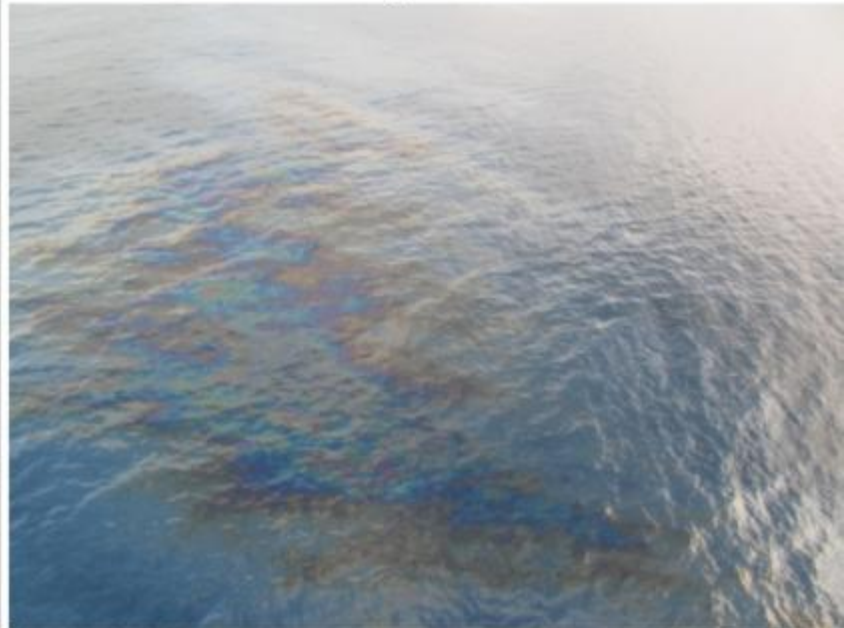


W 120° 03.746'
N 34° 27.471'

6/3/2015 7:25:54 AM

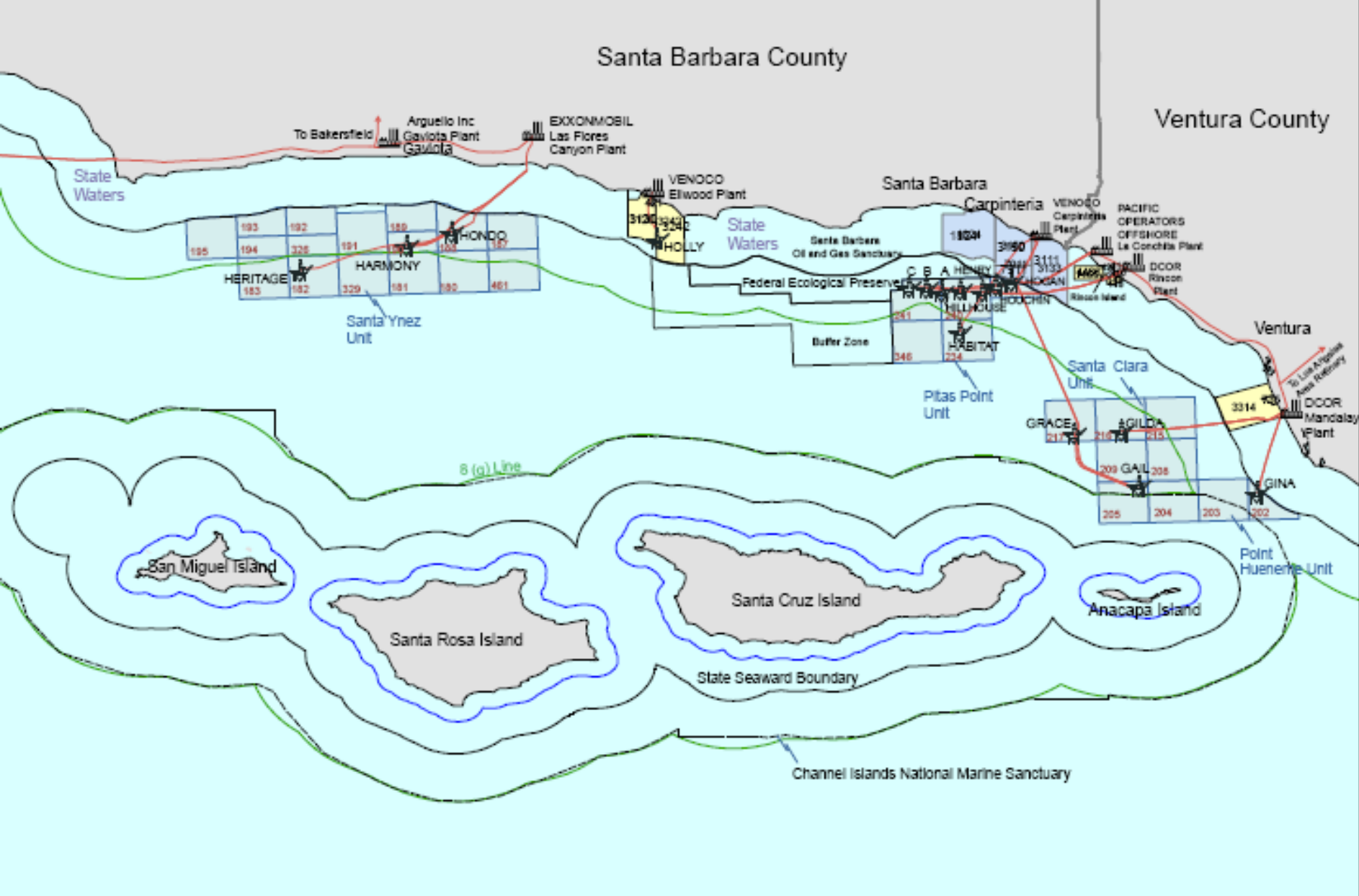


NOAA Overflight Photos
Refugio Incident



W 119° 55.803'
N 34° 21.754'

6/3/2015 6:48:38 AM



Legend

- Platforms (as of 08/2013)
- 8 (g) Line
- Pipelines
- BOEM Pacific Leases (as of 08/2013)
- Channel Islands National Park
- Producing State Leases (as of 08/2013)
- Non-Producing State Leases

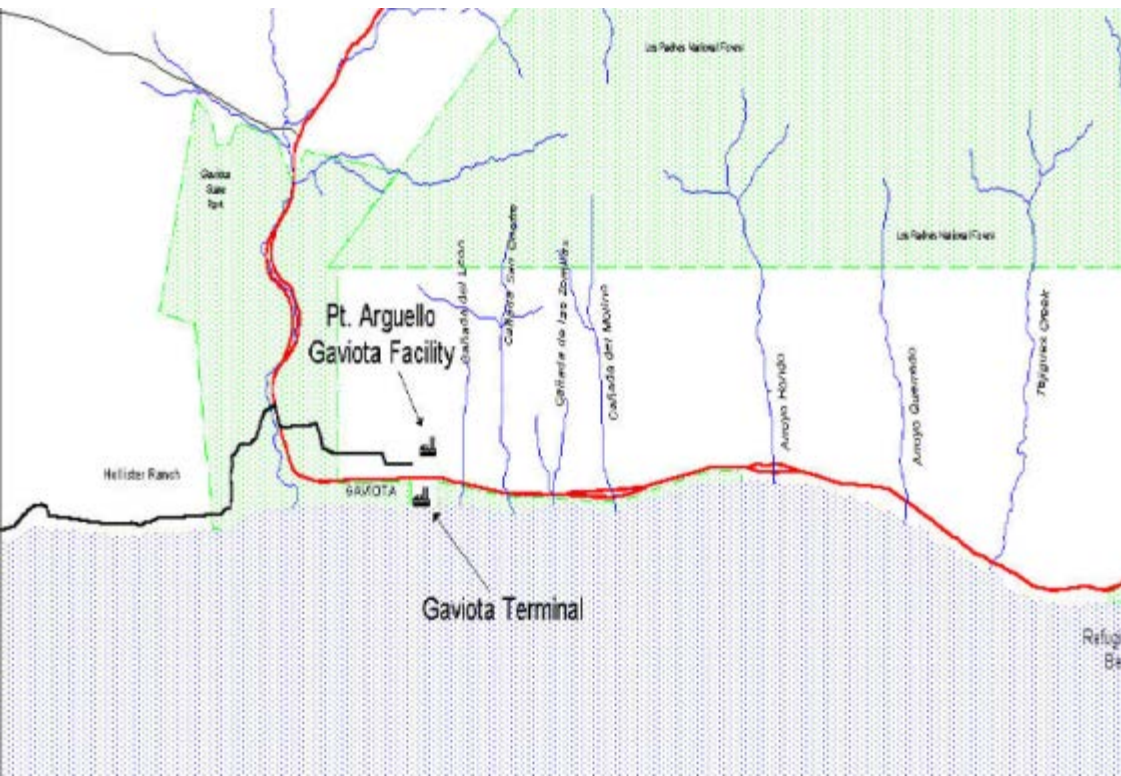
Santa Barbara Channel OCS Operations Map

0 5 10 20 Miles



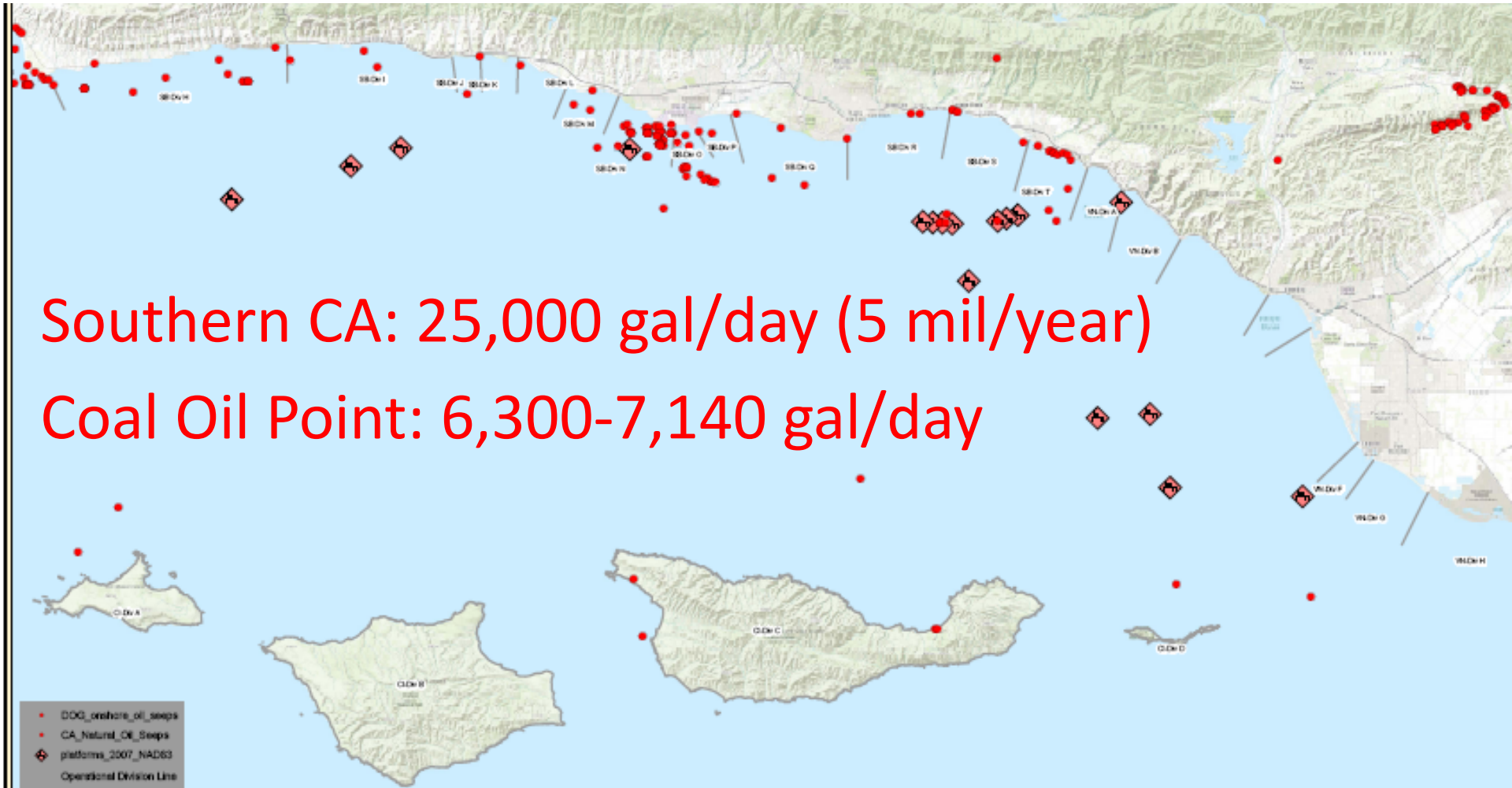
0510164

-
- A large offshore oil platform is situated in the middle of a vast, deep blue ocean. The platform has a complex structure with multiple levels, a prominent crane arm extending to the right, and several flags flying from the top. The horizon is visible in the distance under a clear, bright blue sky.



Location of Worlds 2nd Largest Natural Oil Seeps

Southern CA: 25,000 gal/day (5 mil/year)
Coal Oil Point: 6,300-7,140 gal/day



California Department of Fish and Wildlife
Office of Spill Prevention and Response

Data Source: CGPR GIS
Requestor: P. Maynard
Author: J. Muskat
Date Created: 5/3/2015
Coordinate: NAD 83, California State Plane

Refugio Incident
Production Platforms
Natural Oil Seeps (USGS, CDOC)



0 5 10
Miles

An aerial photograph of a natural gas seep in the ocean. The water is a deep blue with visible ripples. A long, narrow, light-colored plume of gas bubbles rises from the seafloor, creating a distinct white and light blue trail. The plume starts near the center of the frame and extends towards the upper right. The text "Natural Gas Seep" is overlaid in yellow on the left side of the image.

Natural Gas Seep

Oil Seep

Concurrent Incident & Seep Oiling on Beaches

- South Bay Incident Command Post
 - \$1.5 mil FPN
- Oil/tarballs on beaches in:
 - Santa Barbara, Ventura, Los Angeles & Orange Counties
- 96.5 Miles Assessed for Refugio & South Bay Incidents
- Very complicated oil forensic situation
 - Big interest on oil fingerprint analysis

Dive Operations



Onshore Branch



SCAT Oiling Observations

- No Oil Observed
- Tar Balls
- Very Light
- Light
- Moderate
- Heavy
- Background (Natural Seepage)
- Division Lines
- SCAT Segment Lines
- Data indicates most recent survey surface date

Summary data plotted as lines on this map should not be used to calculate lengths of shoreline oiling.

Refugio Incident - SCAT Shoreline Oiling As of Most Recent Survey

Most Recent Survey Data: 5/24/2015



The information presented here is primarily for response purposes, and is based on the best available SCAT data at the time of production. Adjustments to SCAT field information may be made in the future based on further quality/technical reviews. The information presented here may be adjusted accordingly to reflect this.

Refugio Incident - SCAT Maximum Shoreline Oiling Santa Barbara County As of Most Recent Survey Most Recent Survey Data: 6/06/2015

SCAT Oiling Observations

- No Oil Observed
 - Tar Balls
 - Very Light
 - Light
 - Moderate
 - Heavy
- Division Lines
- SCAT Segment Lines
- Data indicates most recent survey surface date
- Summary data plotted as lines on this map should not be used to calculate lengths of shoreline oiling.



The information presented here is primarily for response purposes, and is based on the best available SCAT data at the time of production. Adjustments to SCAT data information may be made in the future based on further quality/technical reviews. The information presented here may be adjusted accordingly to reflect this.

Refugio Incident - SCAT Maximum Shoreline Oiling Ventura County As of Most Recent Survey Most Recent Survey Data: 6/19/2015

SCAT Oiling Observations

■ No Oil Observed	— Division Lines
■ Tar Balls	— SCAT Segment Lines
■ Very Light	Date indicates most recent survey surface date
■ Light	
■ Moderate	
■ Heavy	

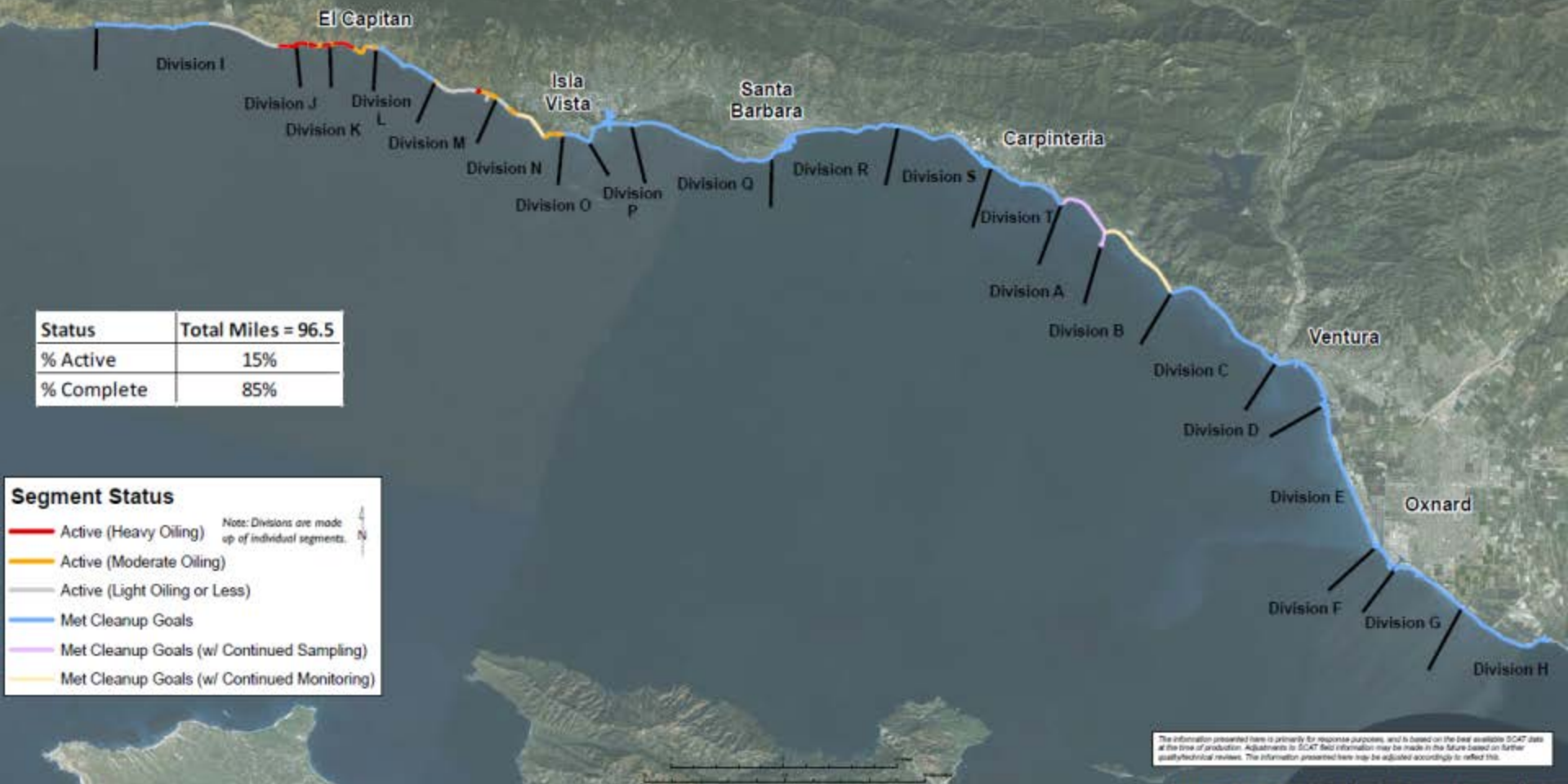
Summary data plotted as lines on this map should not be used to calculate lengths of shoreline oiling.



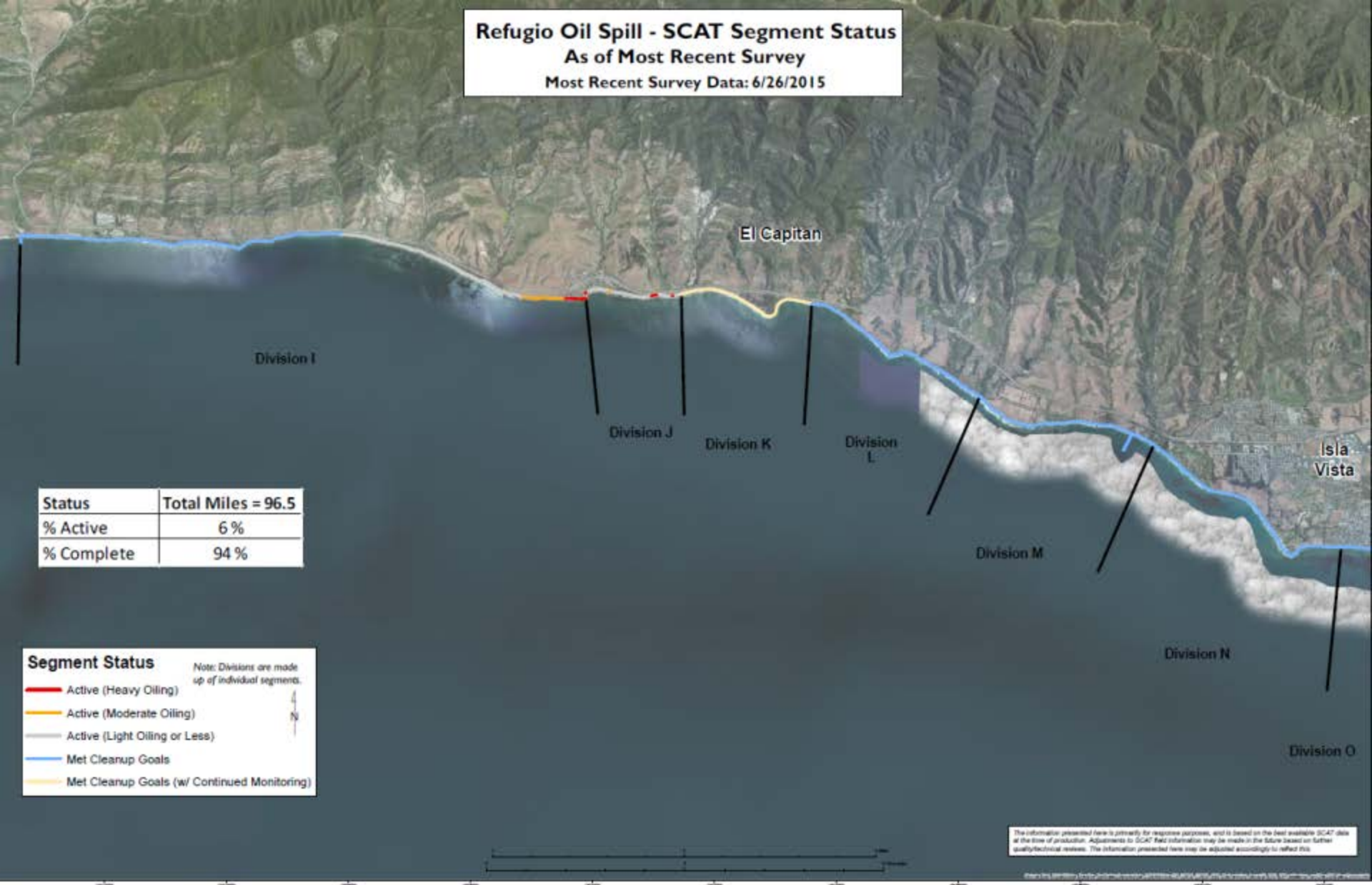
Refugio Oil Spill - SCAT Segment Status

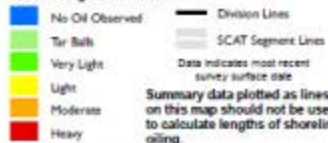
As of Most Recent Survey

Most Recent Survey Data: 6/11/2015



Refugio Oil Spill - SCAT Segment Status As of Most Recent Survey Most Recent Survey Data: 6/26/2015



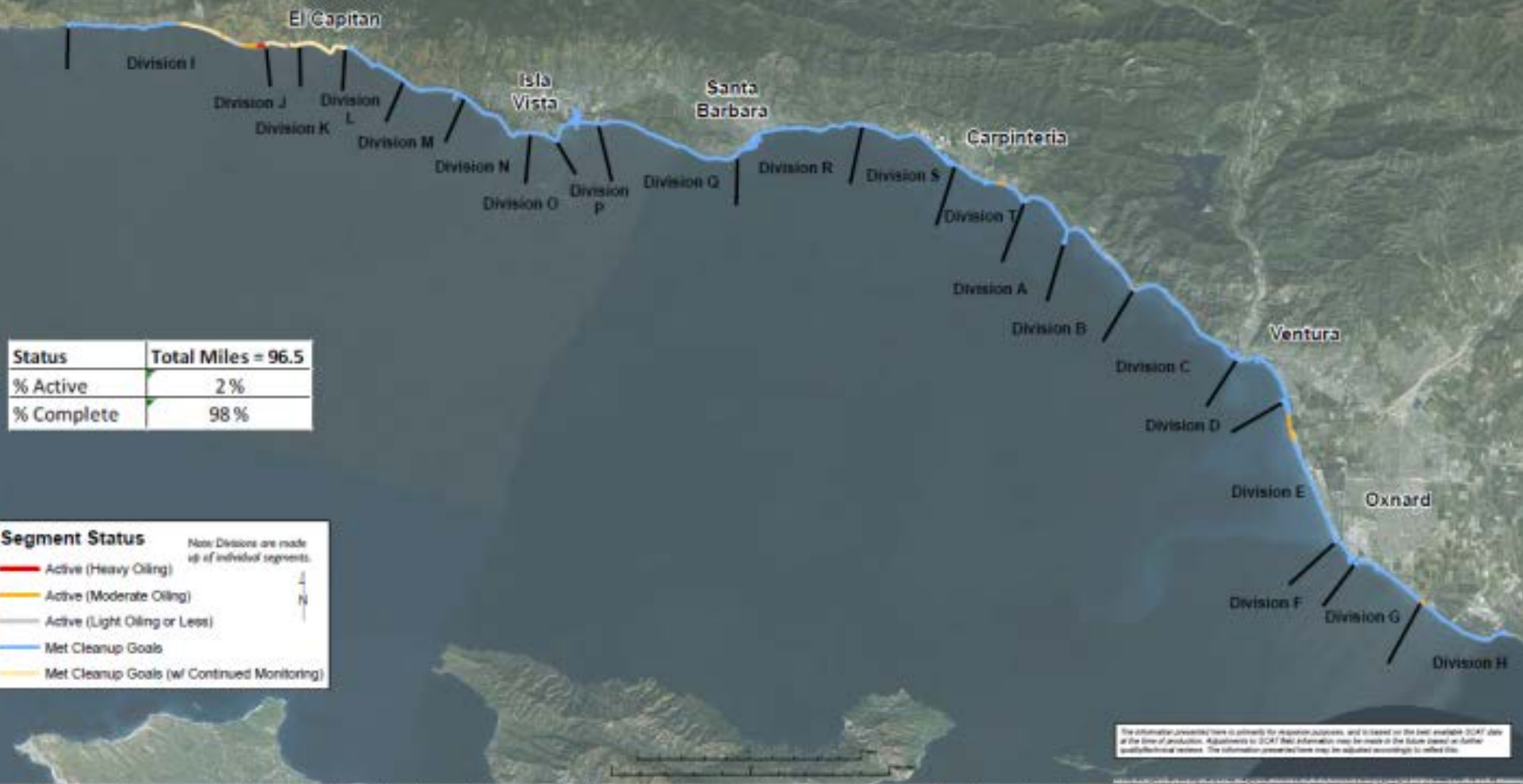
SCAT Oiling Observations

Refugio Incident - SCAT Shoreline Oiling Santa Barbara County - Divisions I J K As of Most Recent Survey Most Recent Survey Data: 7/6/2015

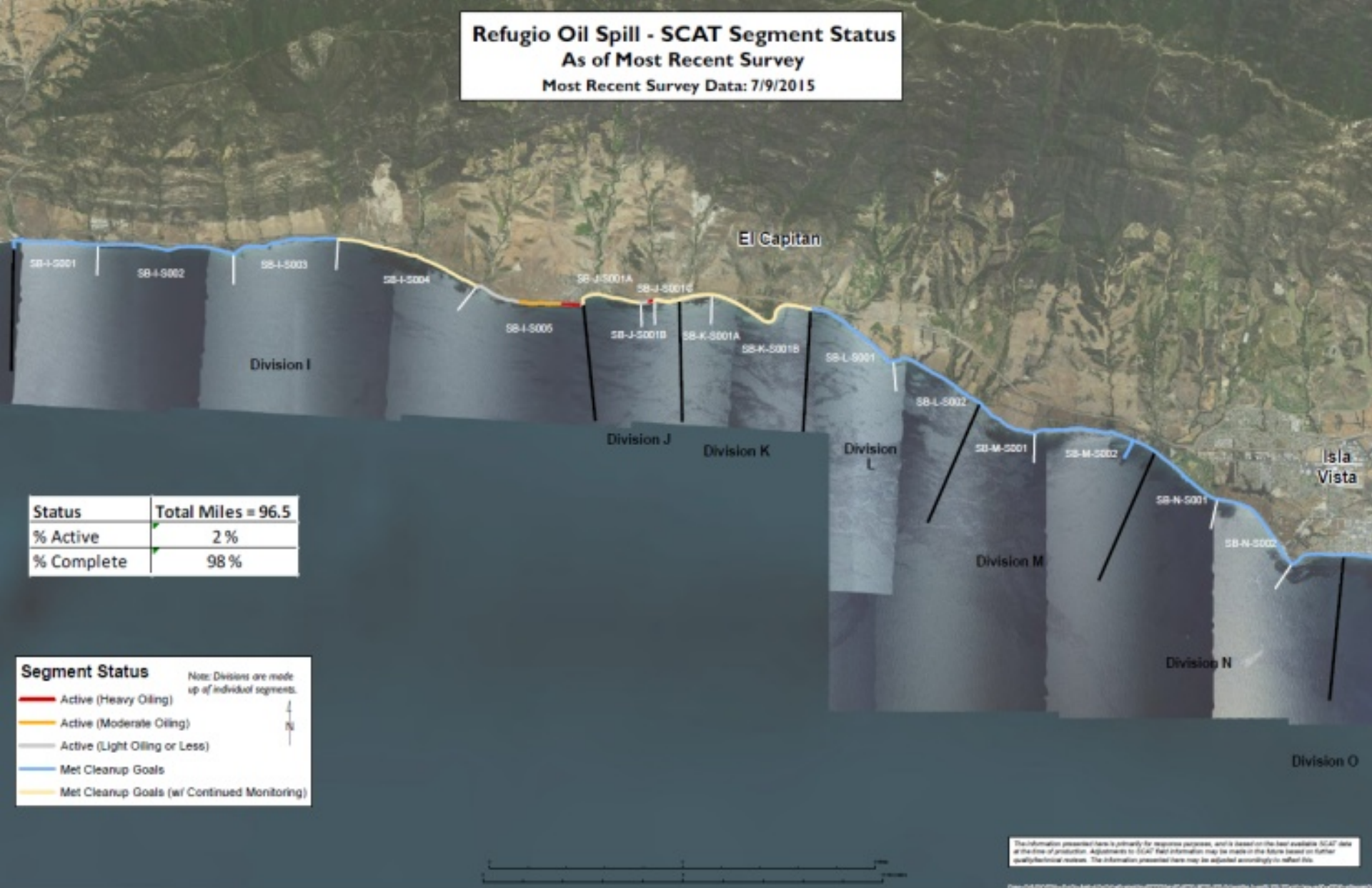


The information presented here is primarily for response purposes, and is based on the best available SCAT data at the time of production. Adjustments to SCAT field information may be made in the future based on further quality/technical review. The information presented here may be adjusted accordingly to reflect this.

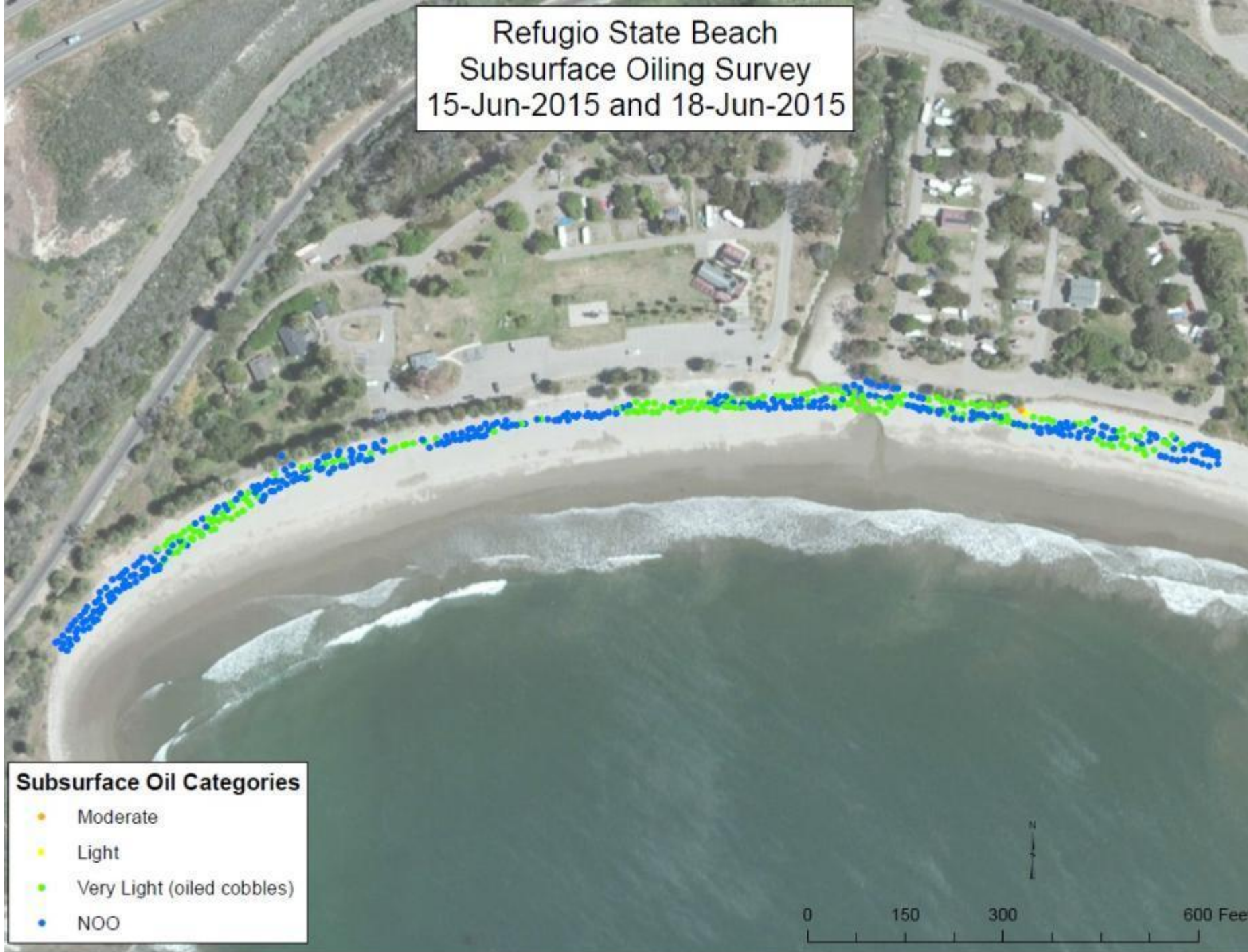
Refugio Oil Spill - SCAT Segment Status As of Most Recent Survey Most Recent Survey Data: 7/9/2015



Refugio Oil Spill - SCAT Segment Status As of Most Recent Survey Most Recent Survey Data: 7/9/2015



Refugio State Beach
Subsurface Oiling Survey
15-Jun-2015 and 18-Jun-2015







Robust JIC, Public Affairs, COMREL

- “Stakeholder listening event “
 - NGOs & interest groups



- Community Relations Open House
 - important public information tactic
 - community knowledge of response ops



- Media availabilities & over-flights for greater transparency & to demonstrate progress.
(worksites, wildlife releases...etc)

Volunteers

- Huge outpour of volunteers & initial bad messages from local companies (Home Depot, Lowes)
- Approx 132 affiliated volunteers
 - Santa Barbara County Community Emergency Response Team (CERT) volunteers
 - California Conservation Corps (CCC)
 - Local Fire Community hand crews
 - Oiled Wildlife Care Network (OWCN) volunteers
 - CDFW Natural Resource Volunteer Program (NRVP) volunteers
 - coordination with Cal Volunteers, Cal OES, City of Santa Barbara, and Santa Barbara County to support volunteer efforts.

Non-Affiliated Volunteers

- Beach clean-up and various tasks
 - May 25 & 28th: 200 people trained in Hazard Safety Communication Training:
 - May 27, 30 & 31 Beach Cleanups

Local Fishing Vessels

- 5 vessels part of the Fort fleet
- Hired through Clean Seas vessels of opportunity program
- Participated by pulling boom & skimming oil.
- Clean Seas pays for HAZWOPER & other training



Wildlife Impacts

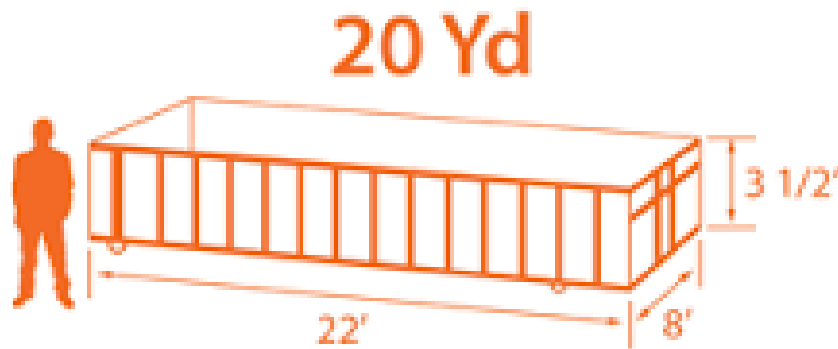
	Total Birds			Total Mammals		
	Live	Dead	Date Total	Live	Dead	Date total
Cum Total	57	195	252	62	106	168



Photo by Valerie Kushnerov, City of Goleta

Oil & Oil Debris Recovered

Oily Water Mixture (gal)	14,267
Oiled Sand (cu yds)	1140
Oiled Vegetation (cu yds)	855
Oiled Debris/PPE (cu yds)	1470
Oiled Soil (cu yds)	7812
Culvert Soil (cu yds)	1860
Absorbent material (tons)	345



= approx 1,300
(filled ½ way
for weight)

Emergency Response to Gold King Mine Release



United States
Environmental Protection Agency
Region 6

Incident

- On August 5, 2015, while investigating the Gold King Mine near Silverton, Colorado, an excavation above the old adit triggered the release of about three million gallons of mine water into Cement Creek, and subsequently the Animas and San Juan River
- Spill impacted parts of Colorado, New Mexico, Utah, and the Southern Ute, Mountain Ute and Navajo Tribes

Reconnaissance

- EPA Airborne Spectral Photometric Environmental Collection Technology (ASPECT) aircraft was deployed to conduct overflight reconnaissance of the plume in the Animas and San Juan Rivers



8/7/2015 09:15 Animas River South of Sunnyside Mesa



8/8/2015 0900 Confluence of Animas and San Juan River Near Farmington, NM

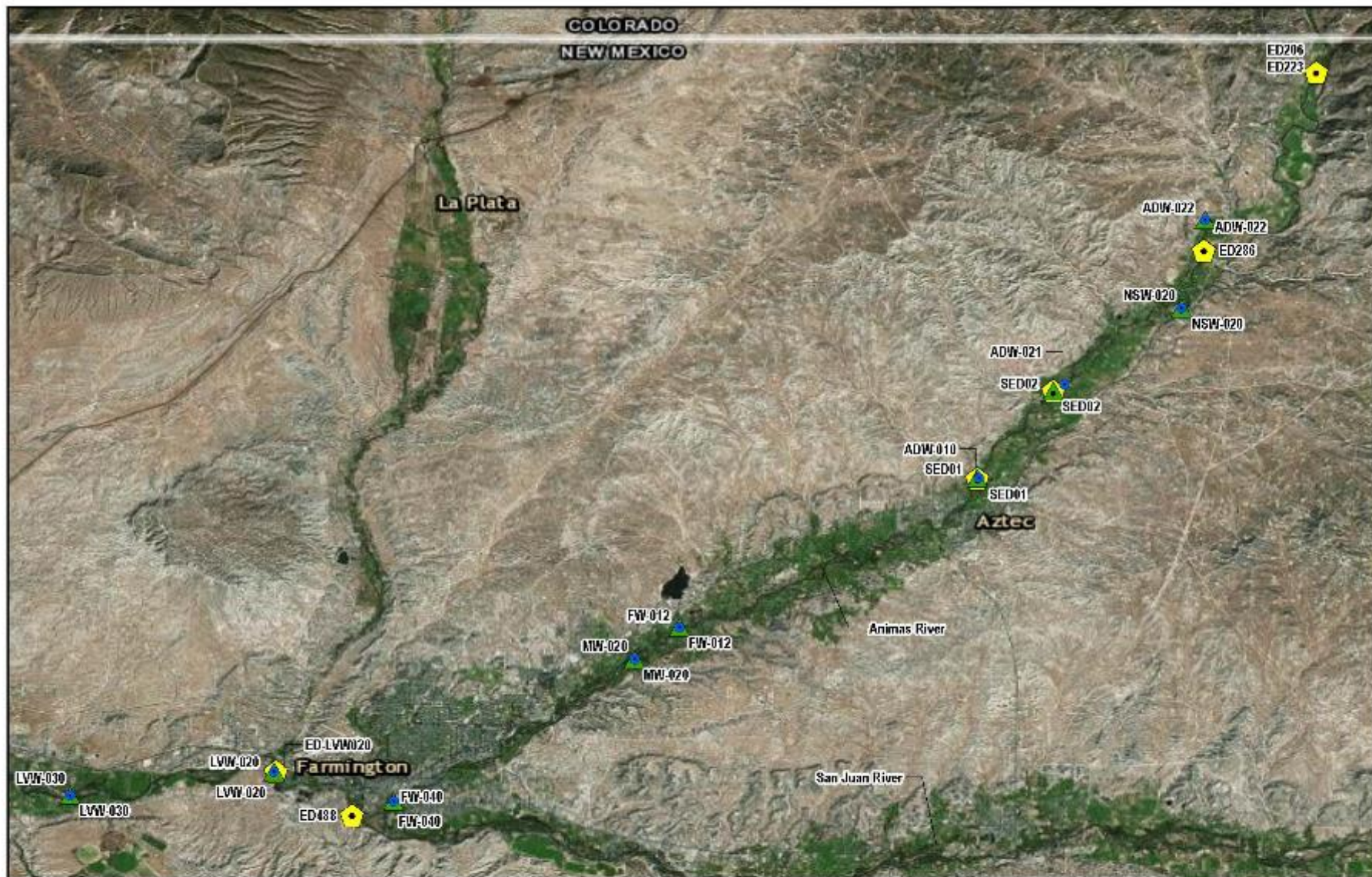
Response

- On August 6, 2015, after receiving notification, EPA Region 6 was able to respond and initiate pre-impact sampling operations in New Mexico

Response – Sampling to Date

- Surface water and sediment at 9 locations

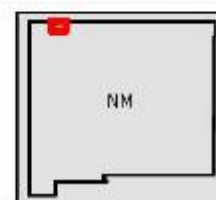
465 surface water and 435 sediment



Legend

- Surface Water Sample Location
- ▲ Sediment Sample Location
- ⬡ Core Sediment Sample Location

US EPA REGION 6 Surface Water, Sediment and Core Locations Gold King Mine Spill



EPA GIS
Printed: 2/21/17 PM 10:26:23



Surface Water Sampling at Public Drinking Water Intakes



EPA Sampling efforts on Animas River



Response – Sampling to Date

- 119 private drinking water wells and 2 public drinking water wells
- Focus on sampling wells within 500 feet of Animas and San Juan Rivers and less than 100 feet deep.
- Criteria developed in conjunction with NMED

Private Well Water Sampling from August 21st



NMED Water Fair



Response – Sampling to Date

- 19 irrigation ditches and 2 residential properties

EPA Sampling Efforts at Irrigation Ditches



EPA Sampling Efforts at Irrigation Ditches



Response - Agricultural

- Provided 59 farms and ranches with deliveries of over one million gallons of water to meet irrigation and livestock needs
- 244 bales of hay and alfalfa were supplied to ranchers

Delivery of water by EPA for Agriculture/Livestock needs





Response – Sampling to Date

- 4 public drinking water systems after treatment, one system remains to be sampled

Response – Drinking Water

- While working with NMED and Public Water System Operators to track remaining water supply, Town of Morningstar reported a dramatic drop in water levels, perhaps due to increased drawdown by customers.
- Morningstar requested EPA assistance for their construction of a temporary service connection with a nearby system. EPA provided valves, pipes, fittings, temporary pump and storage tanks for water supply.

Morningstar Water System Pump



Tanks at the Morningstar Water System



Response

- Based on the results of the EPA sampling data, the State of New Mexico and San Juan County lifted restrictions on water usage of the Animas and San Juan Rivers on August 14



**Animas River in
Flora Vista**



**Highway 516 Bridge,
Aztec**



**Animas River in
Aztec**



**Animas River in
Farmington**



**San Juan River at
Fruitland**

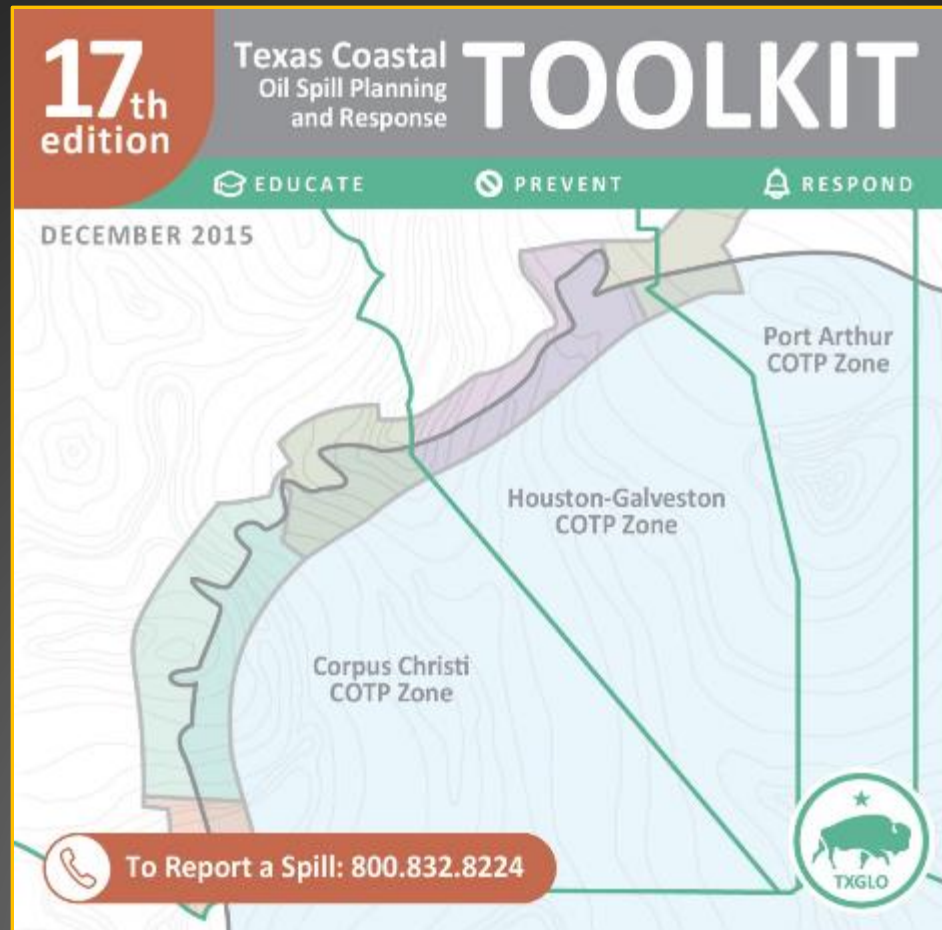
Current Status

- EPA's test results show metal concentration for surface water and sediments throughout the area are below soil recreational screening levels and returning to pre-event conditions.
- EPA has developed a draft watershed-wide Conceptual Monitoring Plan for Surface Water, Sediments, and Biology.
- EPA is currently evaluating input received from stakeholders.

The background of the slide features a large, faint, light blue circular seal of the United States Environmental Protection Agency. The seal contains a stylized flower with three leaves and a sun-like symbol above it. The words "UNITED STATES ENVIRONMENTAL PROTECTION AGENCY" are written around the perimeter of the seal.

<http://www2.epa.gov/goldkingmine>

Oil Spill Toolkit 17th Edition



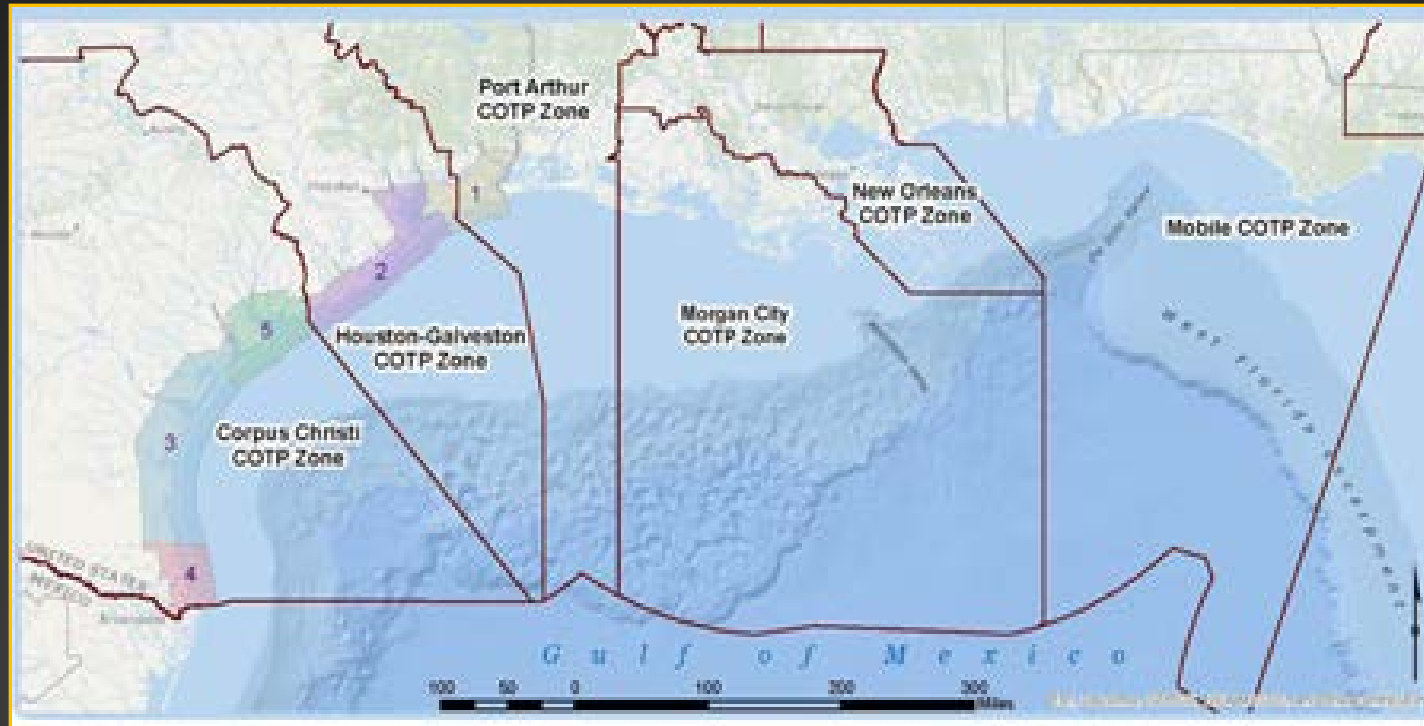
Steven Buschang, State Scientific Support Coordinator/Director of Research and Development, RRT VI Science and Tech Committee Chair



Texas General Land Office Oil Spill Prevention and Response Program



A Decision-Support Resource for the Spill Response Community in USCG District 8



*A Multipurpose Oil Spill Response Tool Built and Maintained for District 8
Regional Response*



Texas General Land Office Oil Spill Prevention and Response Program



17th
edition

Oil Spill
Planning
and Response

TOOLKIT

texasoilspilltoolkit.org

Report A Spill: 800-832-8224
» Join our Mailing List

HOME

ESI MAPS ▾

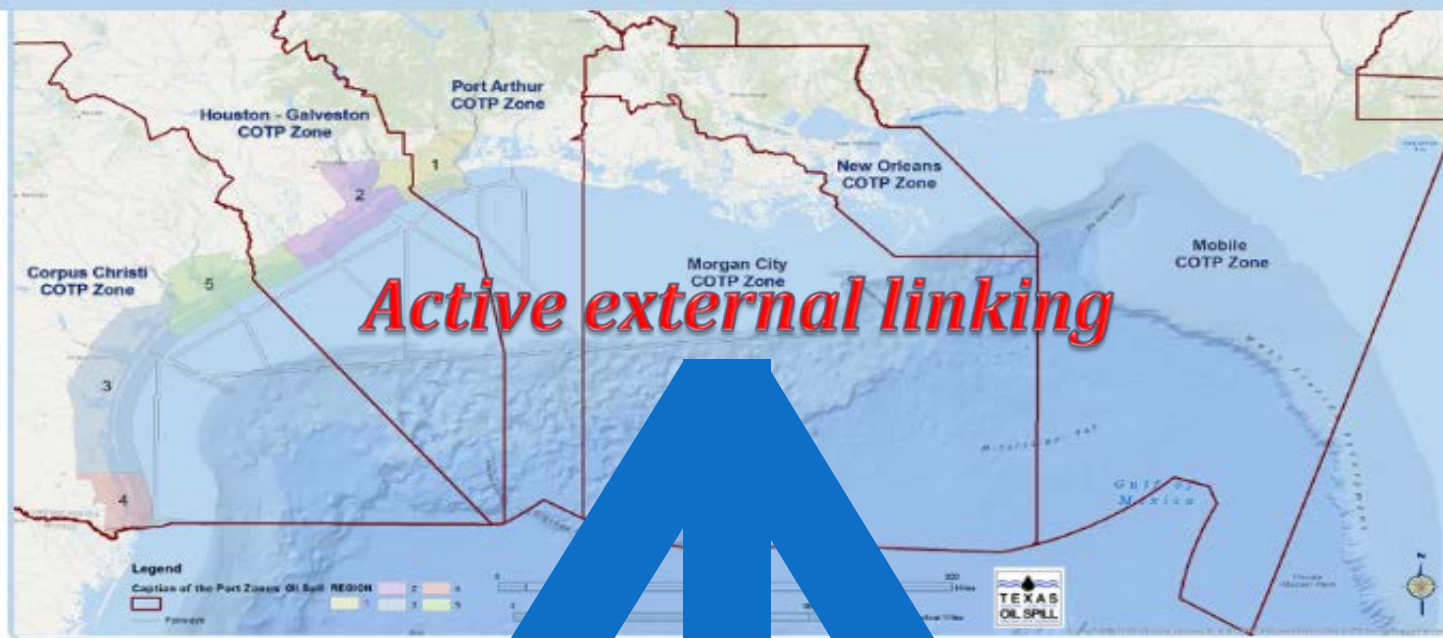
GRP MAPS ▾

AREA CONTINGENCY PLANS

SPILL RESPONSE RESOURCES ▾

You are here: Home

// HOME



- GLO Pre-Staged Equipment Map
- Gulf Beach Stakeholder Maps

Nearshore Pre-Approved and
Exclusionary Areas for the Alternatives
Technology

- Regional Response Team VI Pre-Approved & Exclusionary Areas For
Dispersant Use and In-Situ Burns



OIL SPILL
PREVENTION
AND RESPONSE
PROGRAM



The Texas General Land Office

George P. Bush, Commissioner



1.800.998.4GLO (4456)



HOME THE GLO - EDUCATION ENERGY VETERANS HISTORY - LAND - COAST - RECOVERY CONTACT -

COAST - OIL SPILL OIL SPILL TOOLKIT

The 2015 Toolkit website houses all Area Contingency Plans (ACPs) within U.S. Coast Guard District 8, maps covering Texas, Louisiana, Mississippi, Alabama and Florida, Regional Response Team (RRT) guidance and documents, ICS Forms (in WORD, EXCEL, PDF, MAC and Spanish), Response Plans, NOAA Job Aids, SCAT Forms, Internet links and oceanographic and meteorological information and much, much more!

The Toolkit is a response tool brought to you through a combined effort of the Texas General Land Office, U.S. Coast Guard District 8, and NOAA, as well as contributions from many of our sister State and Federal partners!

[Oil Spill Toolkit Website](#)



The 2014 Toolkit is also available on a DVD format free of charge to the spill response community by submitting the request form located at <http://www.glo.texas.gov/ost/toolkit-request/index.html> or by contacting your local GLO Oil Spill Field Office, or by contacting Steven Buschang, Director of Research and Development /Scientific Support Coordinator, at 512-475-4611 or email at Steve.buschang@glo.texas.gov.

STATE OF TEXAS COMPACT WITH TEXANS LINKS & ACCESSIBILITY STATEWIDE SEARCH PRIVACY POLICY PUBLIC INFORMATION

Copyright 2015 | © The Texas General Land Office
1700 N. Congress Ave. Austin, TX 78701-1495 | PO Box 12873 Austin, TX 78711-2873
1.800.998.4GLO (4456) | 512.463.5001



Texas General Land Office Oil Spill Prevention and Response Program



17th
edition

Oil Spill
Planning
and Response

TOOLKIT

texasoilspilltoolkit.org

Report A Spill: 800-832-8224
» Join our Mailing List
» Request Toolkit on DVD

HOME

ESI MAPS ▾

GRP MAPS ▾

AREA CONTINGENCY PLANS

SPILL RESPONSE RESOURCES ▾

DOWNLOADABLE VERSION

You are here: Home

// HOME



- GLO Pre-Staged Equipment Map
- Gulf Beach Stakeholder Maps

- Nearshore Pre-approved and Exclusionary Areas for the Alternative Technologies

- Regional Response Team VI Pre-Approved & Exclusionary Areas For Dispersant Use and In-Situ Burns



© 2015 Texas General Land Office // DISTRIBUTION INFORMATION | ACKNOWLEDGEMENTS | v08-04-2015

To Report A Spill: 800-832-8224

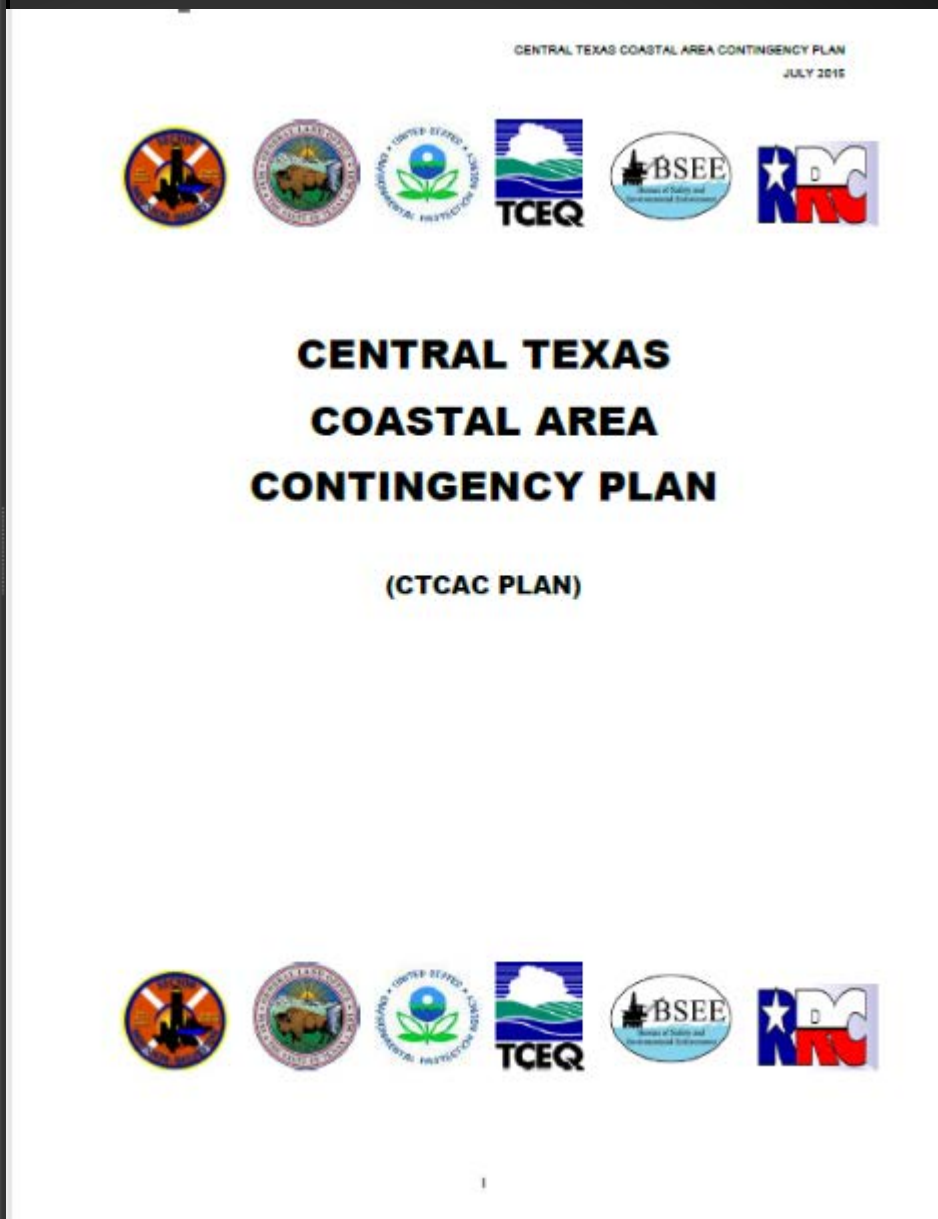


Texas General Land Office Oil Spill Prevention and Response Program



2014 Updated Area Contingency Plans

- CENTRAL TEXAS COASTAL AREA CONTINGENCY PLAN
 - TABLE OF CONTENTS
- 1000 INTRODUCTION
 - 1100 Introduction/Authority
 - 1200 Geographic Boundaries
 - 1300 Area Committee
 - 1400 National Response System
 - 1500 State/Local Response System
 - 1600 National Policy and Doctrine
 - 1700 National Incident Management System (NIMS)
 - 1800 Response Doctrine
- 2000 COMMAND
 - 2100 Unified Command Organization
 - 2200 Safety/Safety Officer (SOFR)
 - 2300 Information
 - 2400 Liaison Officer (LNO)
 - 2500 Intelligence



Te



ESI Maps

Contain 3 Elements

- **Human-Use Resources** Resources and places important to humans and sensitive to oiling (public beaches and parks, marine sanctuaries, water intakes, and archaeological sites).
- **Biological Resources** Oil-sensitive animals, as well as habitats that either (a) are used by oil-sensitive animals, or (b) are themselves sensitive to spilled oil (e.g., black mangrove).
- **Shoreline Rankings** Shorelines are ranked according to their sensitivity, the natural persistence of oil, and the expected ease of cleanup. includes **Habitat Priority Protection Areas**.



ESI Mapping

HUMAN-USE FEATURES



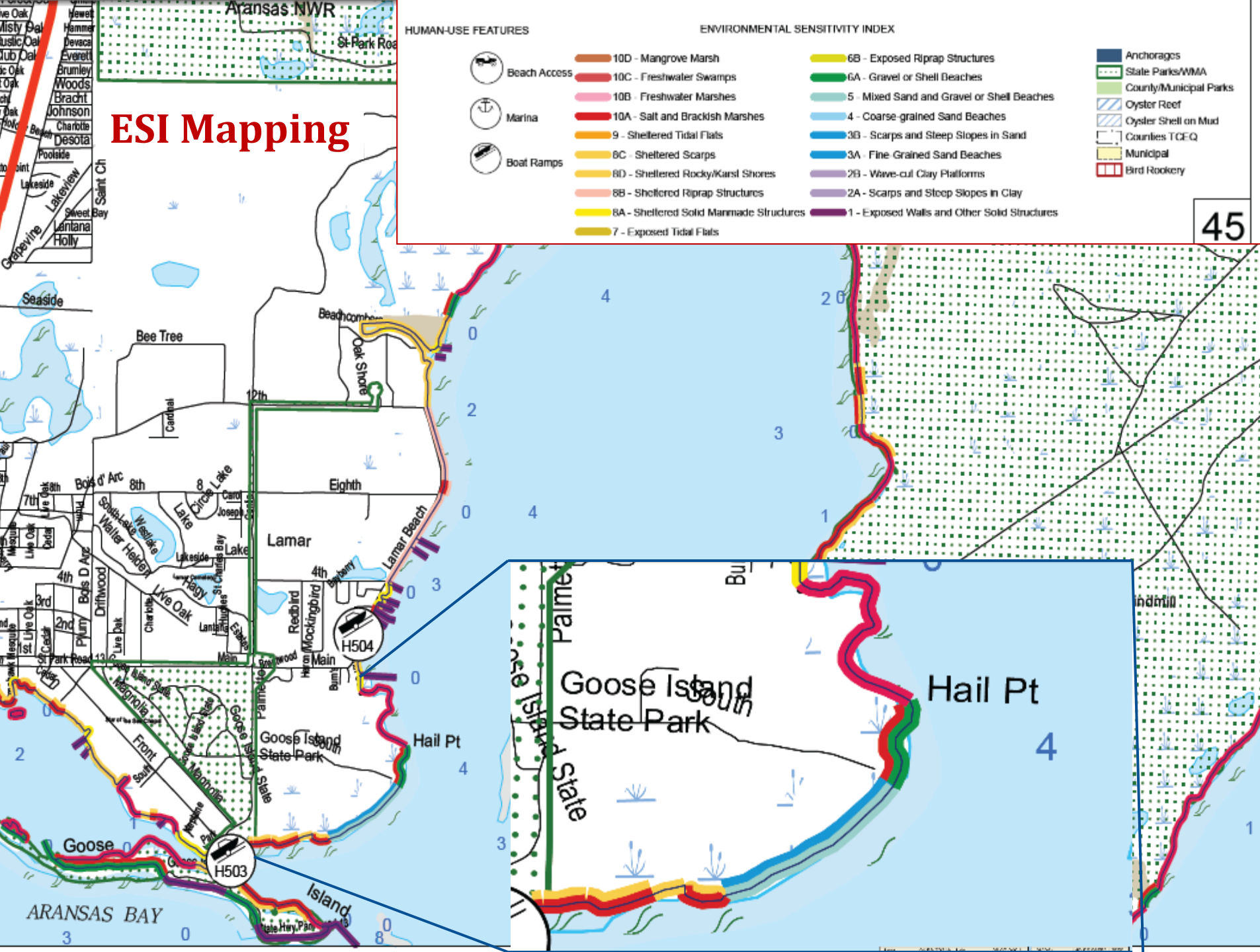
- 10D - Mangrove Marsh
- 10C - Freshwater Swamps
- 10B - Freshwater Marshes
- 10A - Salt and Brackish Marshes
- 9 - Sheltered Tidal Flats
- 8C - Sheltered Scarps
- 8D - Sheltered Rocky/Karst Shores
- 8B - Sheltered Riprap Structures
- 8A - Sheltered Solid Manmade Structures
- 7 - Exposed Tidal Flats

ENVIRONMENTAL SENSITIVITY INDEX

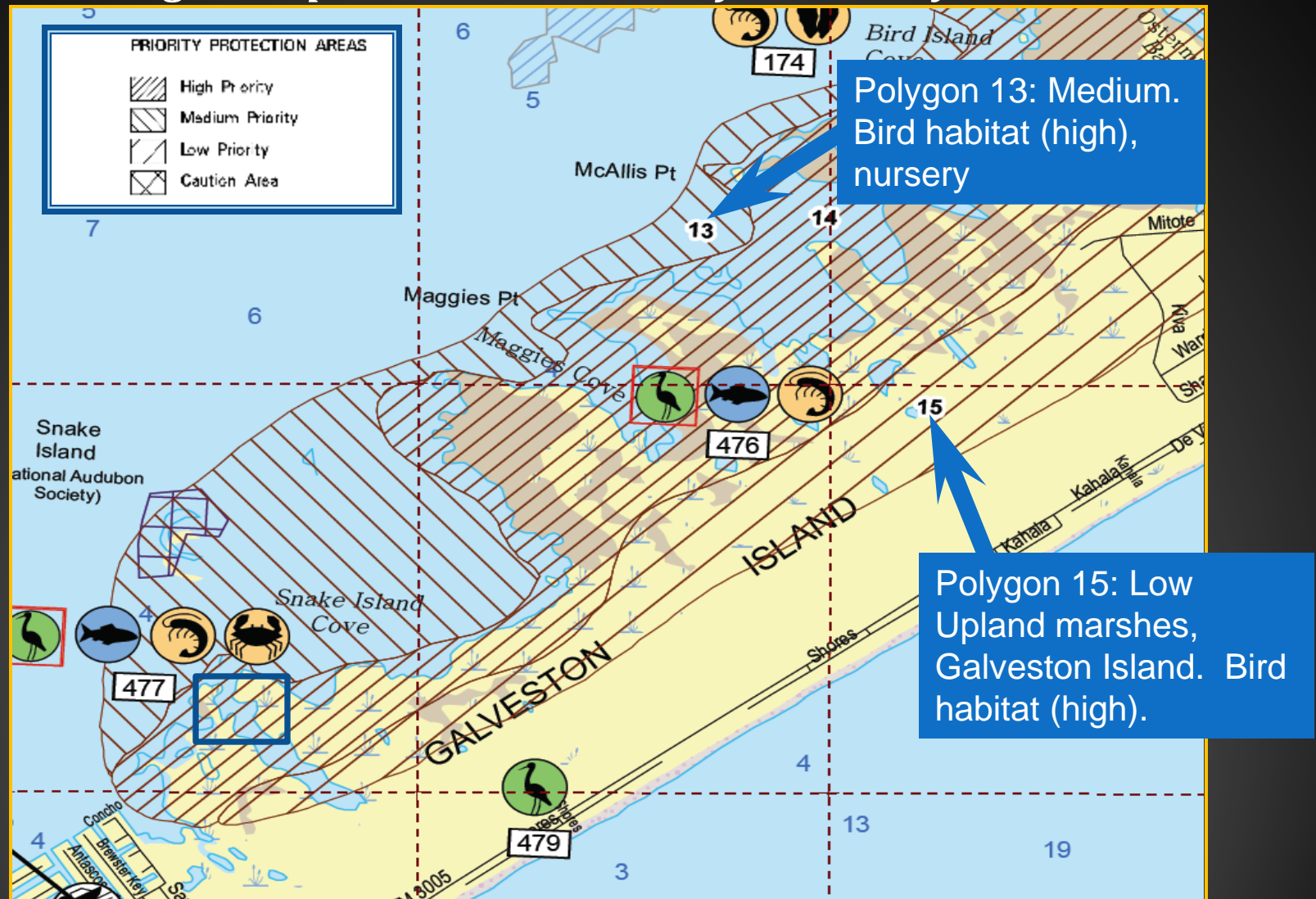
- 6B - Exposed Riprap Structures
- 6A - Gravel or Shell Beaches
- 5 - Mixed Sand and Gravel or Shell Beaches
- 4 - Coarse-grained Sand Beaches
- 3B - Scarps and Steep Slopes in Sand
- 3A - Fine Grained Sand Beaches
- 2B - Wave-cut Clay Platforms
- 2A - Scarps and Steep Slopes in Clay
- 1 - Exposed Walls and Other Solid Structures

- Anchorage
- State Parks/WMA
- County/Municipal Parks
- Oyster Reef
- Oyster Shell on Mud
- Counties TCEQ
- Municipal
- Bird Rookery

45



Environmental Index Shoreline including Critical Habitat Resources At Risk, Endangered Species and Pre-identified Priority Protection Areas



PORT ARTHUR SOUTH

Map #9

HUMAN USE RESOURCES

Boat Ramps			
BARNUM	NAME		
H665	Lake Sabine Causeway		
H666	Lake Sabine Causeway		
H669	Keith Lake		
H670	Public Ramp		
Marinas			
BARNUM	NAME	ADDRESS	PHONE
H163	Pleasure Island Marina	520 Pleasure Island Blvd. Port Arthur 77641	(409) 942-4675
Water Intake Points			
BARNUM	OWNER	TYPE	
H093	Star Enterprise	6	
H095	Jefferson Co Navigation Dist.	1	
H091	Rice-Carden Corp.	6	
H092	Chevron U.S.A. Inc.	6	

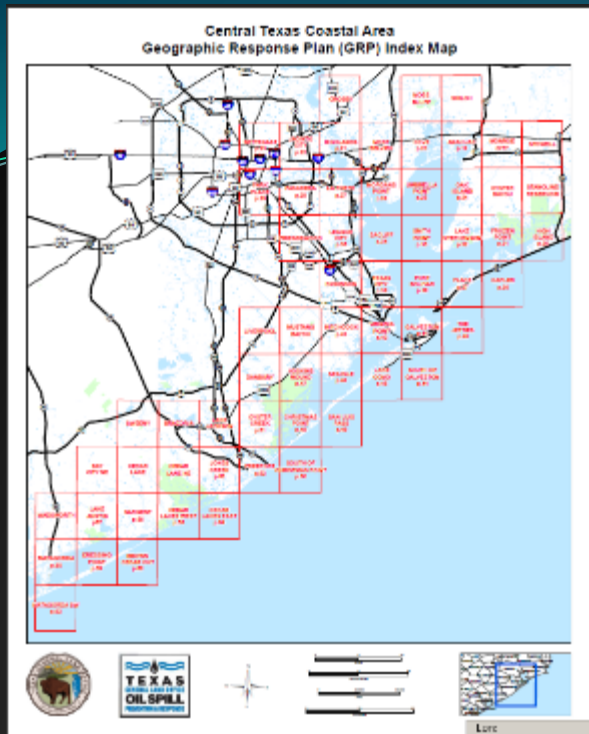
BIOLOGICAL RESOURCES

Birds																				
BARNUM	NAME	S/F	T/E	CONCEN	J	F	M	A	M	J	J	A	S	O	N	D	NESTING	LAYING	HATCHING	FLEDGING
B21	Red-breasted merganser				X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-
B24	Diving birds	F	E		X	X	X	X	X	X	X	X	X	X	X	X	APR-SEP	APR-SEP	MAY-SEP	MAY-OCT
B25	Black skimmer				X	X	X	X	X	X	X	X	X	X	X	X	APR-SEP	APR-SEP	APR-SEP	APR-SEP
	American white pelican				X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-
	Lesser scaup				X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-
	Canvasback				X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-
B28	Gadwall				X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-
	Northern shoveler				X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-
	Geese				X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-
	Waterfowl				X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-
	Green-winged teal				X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-
B30	Gadwall				X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-
	Green-winged teal				X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-
	Waterfowl				X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-
	Gadwall				X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-
	Northern shoveler				X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-
	Geese				X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-
B31	Waterfowl			HIGH	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-
B32	Roseate spoonbill				X	X	X	X	X	X	X	X	X	X	X	X	APR-AUG	APR-AUG	APR-AUG	MAY-SEP
	Tricolored heron				X	X	X	X	X	X	X	X	X	X	X	X	APR-AUG	APR-AUG	APR-AUG	MAY-SEP
	Snowy egret				X	X	X	X	X	X	X	X	X	X	X	X	APR-JUL	APR-JUL	APR-JUL	MAY-AUG
	Waterfowl			HIGH	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-
	Canvasback			HIGH	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-
B35	Wading birds				X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-
	Gadwall			HIGH	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-
	Tails			HIGH	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-
	Canvasback			VERY HIGH	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-
	Waterfowl			HIGH	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-
	American wigeon				X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-
	Roseate spoonbill				X	X	X	X	X	X	X	X	X	X	X	X	APR-AUG	APR-AUG	APR-AUG	MAY-SEP
B37	Waterfowl			HIGH	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-
B39	Waterfowl				X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-
B41	Waterfowl				X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-
B42	American wigeon				X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-
	Lesser scaup				X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-
	Gadwall				X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-
	Waterfowl				X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-
	Green-winged teal				X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-
Reptiles/Amphibians																				
BARNUM	NAME	S/F	T/E	CONCEN	J	F	M	A	M	J	J	A	S	O	N	D	NESTING	HATCHING		
B31	American alligator				X	X	X	X	X	X	X	X	X	X	X	X	JUN-SEP	JUN-DEC		
B35	American alligator				X	X	X	X	X	X	X	X	X	X	X	X	JUN-SEP	JUN-DEC		
B37	American alligator				X	X	X	X	X	X	X	X	X	X	X	X	JUN-SEP	JUN-DEC		
773	Gulf saltmarsh snake	C2	N																	
Fish																				
BARNUM	NAME	S/F	T/E	CONCEN	J	F	M	A	M	J	J	A	S	O	N	D	SPAWNING	LARVAL/JUV		
B20	Hardhead catfish				X	X	X	X	X	X	X	X	X	X	X	X	MAY-SEP	JUN-OCT		
	Red drum				X	X	X	X	X	X	X	X	X	X	X	X	AUG-NOV	SEP-DEC		
	Striped mullet				X	X	X	X	X	X	X	X	X	X	X	X	NOV-JAN	DEC-FEB		
	Pinfish				X	X	X	X	X	X	X	X	X	X	X	X	MAR-MAY	MAY-JUN		
	Bay anchovy				X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC		
	Atlantic croaker				X	X	X	X	X	X	X	X	X	X	X	X	-	APR-OCT		
B21	Atlantic croaker				X	X	X	X	X	X	X	X	X	X	X	X	-	APR-OCT		
	Bay anchovy				X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC		

PORT ARTHUR SOUTH CONTINUED

BIOLOGICAL RESOURCES CONT.

Fish Continued																		
BARNUM	NAME	S/F	T/E	CONCEN	J	F	M	A	M	J	J	A	S	O	N	D	SPAWNING	LARVAL/JUV
B29	Spotted seatrout				X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC
	Striped mullet				X	X	X	X	X	X	X	X	X	X	X	X	NOV-JAN	DEC-FEB
	Bay anchovy				X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC
B33	Pinfish				X	X	X	X	X	X	X	X	X	X	X	X	MAR-MAY	MAR-MAY
	Spotted seatrout				X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC
B36	Atlantic croaker				X	X	X	X	X	X	X	X	X	X	X	X	-	APR-OCT
B39	Striped mullet				X	X	X	X	X	X	X	X	X	X	X	X	NOV-JAN	DEC-FEB
	Gulf menhaden				X	X	X	X	X	X	X	X	X	X	X	X	NOV-FEB	DEC-MAR
	Red drum			HIGH	X	X	X	X	X	X	X	X	X	X	X	X	AUG-NOV	SEP-DEC
	Pinfish				X	X	X	X	X	X	X	X	X	X	X	X	MAR-MAY	MAR-MAY
	Southern flounder				X	X	X	X	X	X	X	X	X	X	X	X	-	OCT-DEC
B41	Spotted seatrout			HIGH	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC
	Red drum				X	X	X	X	X	X	X	X	X	X	X	X	AUG-NOV	SEP-DEC
	Spotted seatrout				X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC
	Striped mullet				X	X	X	X	X	X	X	X	X	X	X	X	NOV-JAN	DEC-FEB
	Pinfish				X	X	X	X	X	X	X	X	X	X	X	X	MAR-MAY	MAR-MAY
	Southern flounder				X	X	X	X	X	X	X	X	X	X	X	X	-	OCT-DEC
B42	Gulf menhaden				X	X	X	X	X	X	X	X	X	X	X	X	NOV-FEB	DEC-MAR
	Southern flounder				X	X	X	X	X	X	X	X	X	X	X	X	-	OCT-DEC
	Spotted seatrout			HIGH	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC
	Striped mullet				X	X	X	X	X	X	X	X	X	X	X	X	NOV-JAN	DEC-FEB
	Red drum				X	X	X	X	X	X	X	X	X	X	X	X	AUG-NOV	SEP-DEC
	Pinfish				X	X	X	X	X	X	X	X	X	X	X	X	MAR-MAY	MAR-MAY
	Gulf menhaden				X	X	X	X	X	X	X	X	X	X	X	X	NOV-FEB	DEC-MAR
Shellfish																		
BARNUM	NAME	S/F	T/E	CONCEN	J	F	M	A	M	J	J	A	S	O	N	D	SPAWNING	LARVAL/JUV
B68	Penaeid shrimp				X	X	X	X	X	X	X	X	X	X	X	X	-	MAY-AUG
	Blue crab				X	X	X	X	X	X	X	X	X	X	X	X	APR-JUL	MAY-OCT
B20	White shrimp				X	X	X	X	X	X	X	X	X	X	X	X	MAY-OCT	MAY-OCT
	Blue crab				X	X	X	X	X	X	X	X	X	X	X	X	APR-JUL	MAY-AUG
B21	Brown shrimp				X	X	X	X	X	X	X	X	X	X	X	X	NOV-MAR	FEB-JUN
	White shrimp				X	X	X	X	X	X	X	X	X	X	X	X	MAY-OCT	MAY-OCT
B22	Brown shrimp				X	X	X	X	X	X	X	X	X	X	X	X	NOV-MAR	FEB-JUN
B29	American oyster (eastern)				X	X	X	X	X	X	X	X	X	X	X	X	MAR-JUL	APR-JUL
	American oyster (eastern)				X	X	X	X	X	X	X	X	X	X	X	X	MAR-JUL	APR-JUL
	Brown shrimp				X	X	X	X	X	X	X	X	X	X	X	X	NOV-MAR	FEB-JUN
	White shrimp				X	X	X	X	X	X	X	X	X	X	X	X	MAY-OCT	MAY-OCT
B33	American oyster (eastern)				X	X	X	X	X	X	X	X	X	X	X	X	MAR-JUL	APR-JUL
	White shrimp				X	X	X	X	X	X	X	X	X	X	X	X	MAY-OCT	MAY-OCT
	Brown shrimp			HIGH	X	X	X	X	X	X	X	X	X	X	X	X	NOV-MAR	FEB-JUN
	Blue crab				X	X	X	X	X	X	X	X	X	X	X	X	APR-JUL	MAY-AUG
B36	Grass shrimp				X	X	X	X	X	X	X	X	X	X	X	X	-	-
	White shrimp				X	X	X	X	X	X	X	X	X	X	X	X	MAY-OCT	MAY-OCT
	Brown shrimp				X	X	X	X	X	X	X	X	X	X	X	X	NOV-MAR	FEB-JUN
B38	Blue crab				X	X	X	X	X	X	X	X	X	X	X	X	APR-JUL	MAY-AUG
	Brown shrimp				X	X	X	X	X	X	X	X	X	X	X	X	NOV-MAR	FEB-JUN
	White shrimp				X	X	X	X	X	X	X	X	X	X	X	X	MAY-OCT	MAY-OCT
B39	American oyster (eastern)				X	X	X	X	X	X	X	X	X	X	X	X	MAR-JUL	APR-JUL
	American oyster (eastern)				X	X	X	X	X	X	X	X	X	X	X	X	MAY-OCT	MAY-OCT
	White shrimp			HIGH	X	X	X	X	X	X	X	X	X	X	X	X	APR-JUL	MAY-AUG
	Blue crab				X	X	X	X	X	X	X	X	X	X	X	X	NOV-MAR	FEB-JUN
	Brown shrimp				X	X	X	X	X	X	X	X	X	X	X	X	-	-
B41	Grass shrimp			HIGH	X	X	X	X	X	X	X	X	X	X	X	X	-	-
	White shrimp			HIGH	X	X	X	X	X	X	X	X	X	X	X	X	MAY-OCT	MAY-OCT
	Brown shrimp			HIGH	X	X	X	X	X	X	X	X	X	X	X	X	NOV-MAR	FEB-JUN
	Blue crab				X	X	X	X	X	X	X	X	X	X	X	X	APR-JUL	MAY-AUG
B42	Blue crab				X	X	X	X	X	X	X	X	X	X	X	X	APR-JUL	MAY-AUG
	White shrimp				X	X	X	X	X	X	X	X	X	X	X	X	MAY-OCT	MAY-OCT
	Brown shrimp				X	X	X	X	X	X	X	X	X	X	X	X	NOV-MAR	FEB-JUN
Plants/Communities																		
BARNUM	NAME	S/F	T/E															
B20	Salt meadow cordgrass (wiregrass)																	
B30	Salt meadow cordgrass (wiregrass)																	
B31	Salt meadow cordgrass (wiregrass)																	
B32	Salt meadow cordgrass (wiregrass)																	
B37	Bulrush																	
B39	Salt meadow cordgrass (wiregrass)																	
B41	Salt meadow cordgrass (wiregrass)																	
B42	Salt meadow cordgrass (wiregrass)																	



Over 650 Geographic Response Plans –
Pre-identified and surveyed site specific
response plans for spill response.

Note: new base map
for GRPs



1. Incident Name		2. Operator/Port/Type of Ship		3. Response Unit	
4. Location		5. Response Strategy			
6. Incident Details					
7. Response Strategy					
8. Response Details					
9. Response Details					
10. Response Details					
11. Response Details					
12. Response Details					
13. Response Details					
14. Response Details					
15. Response Details					
16. Response Details					
17. Response Details					
18. Response Details					
19. Response Details					
20. Response Details					
21. Response Details					
22. Response Details					
23. Response Details					
24. Response Details					
25. Response Details					
26. Response Details					
27. Response Details					
28. Response Details					
29. Response Details					
30. Response Details					
31. Response Details					
32. Response Details					
33. Response Details					
34. Response Details					
35. Response Details					
36. Response Details					
37. Response Details					
38. Response Details					
39. Response Details					
40. Response Details					
41. Response Details					
42. Response Details					
43. Response Details					
44. Response Details					
45. Response Details					
46. Response Details					
47. Response Details					
48. Response Details					
49. Response Details					
50. Response Details					
51. Response Details					
52. Response Details					
53. Response Details					
54. Response Details					
55. Response Details					
56. Response Details					
57. Response Details					
58. Response Details					
59. Response Details					
60. Response Details					
61. Response Details					
62. Response Details					
63. Response Details					
64. Response Details					
65. Response Details					
66. Response Details					
67. Response Details					
68. Response Details					
69. Response Details					
70. Response Details					
71. Response Details					
72. Response Details					
73. Response Details					
74. Response Details					
75. Response Details					
76. Response Details					
77. Response Details					
78. Response Details					
79. Response Details					
80. Response Details					
81. Response Details					
82. Response Details					
83. Response Details					
84. Response Details					
85. Response Details					
86. Response Details					
87. Response Details					
88. Response Details					
89. Response Details					
90. Response Details					
91. Response Details					
92. Response Details					
93. Response Details					
94. Response Details					
95. Response Details					
96. Response Details					
97. Response Details					
98. Response Details					
99. Response Details					
100. Response Details					



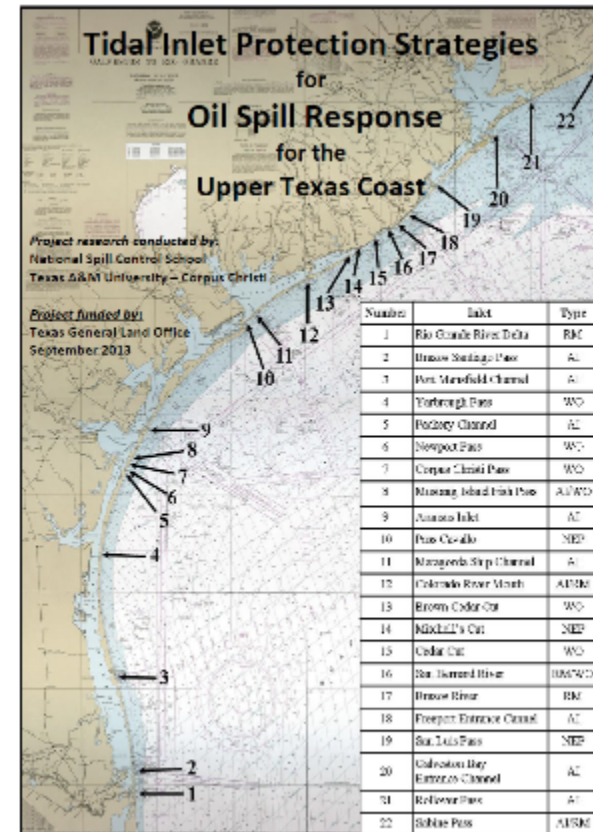
Texas General Land Office Oil Spill Prevention and

Under Development

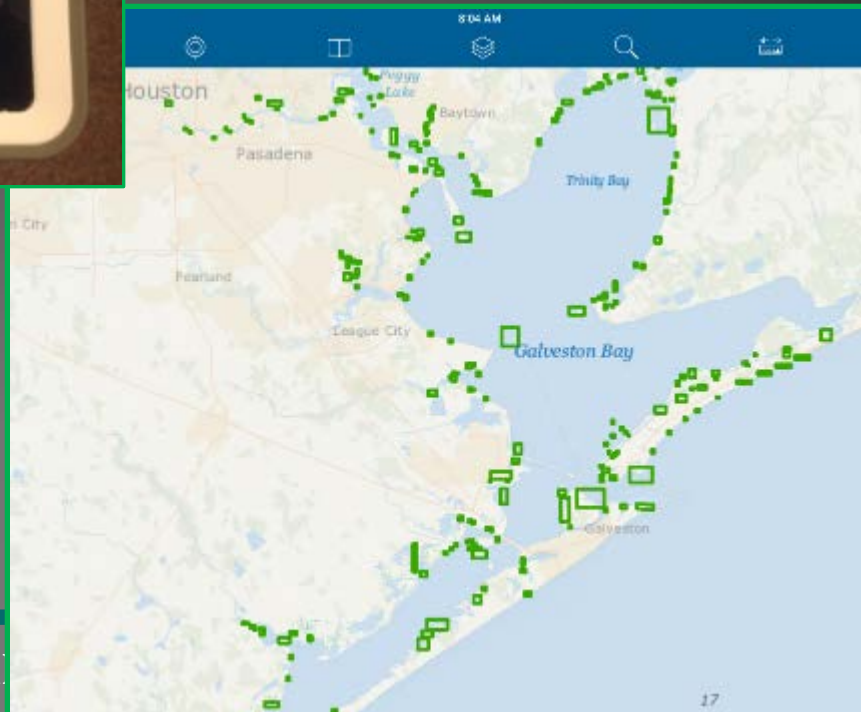
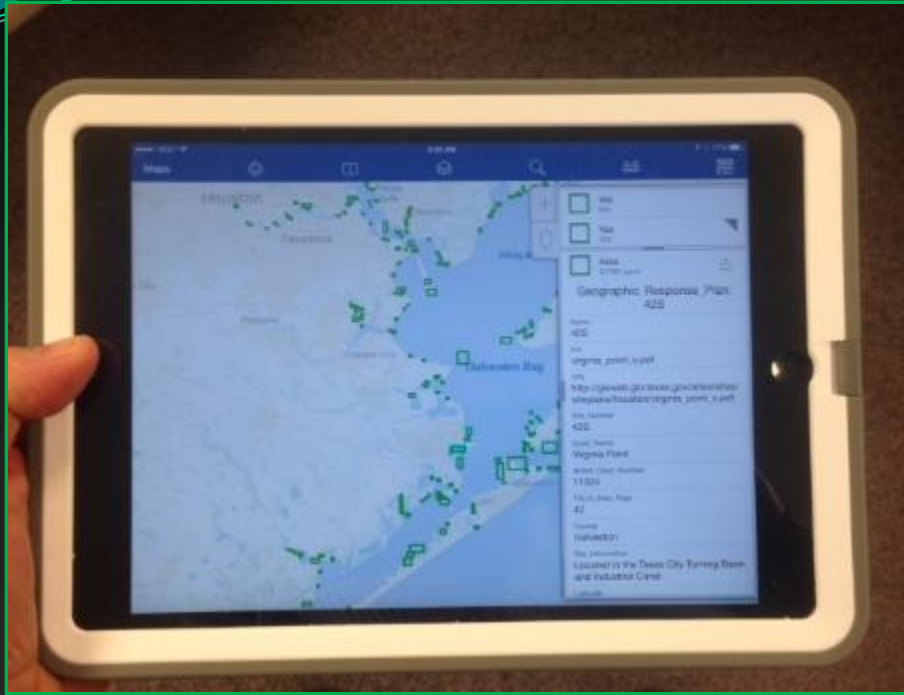
- Tidal Inlet Protection Strategies (TIPS)

- ICS 232 Tool

- Update all GRPs



GRP Collector App



Texas General Land Office Oil



Toolkit Available online at:

<http://www.glo.texas.gov/ost/>

Steven Buschang

Steve.buschang@glo.texas.gov

512-475-4611

Cell 512-463-2232

Poly Viewer

[Booming video](#)

Texas General Land Office Oil Spill Prevention and Response Program





**ARCTIC
RESPONSE
TECHNOLOGY**
OIL SPILL PREPAREDNESS

HERDING AGENTS ENABLE ISB IN ICE AND OPEN WATER

THE ARCTIC OIL SPILL RESPONSE TECHNOLOGY JOINT INDUSTRY PROGRAM

TIM NEDWED

ARCTIC JIP PROGRAM FIELD TEST CO-CHAIR

RRT VI Semi Annual Meeting

November 4, 2015

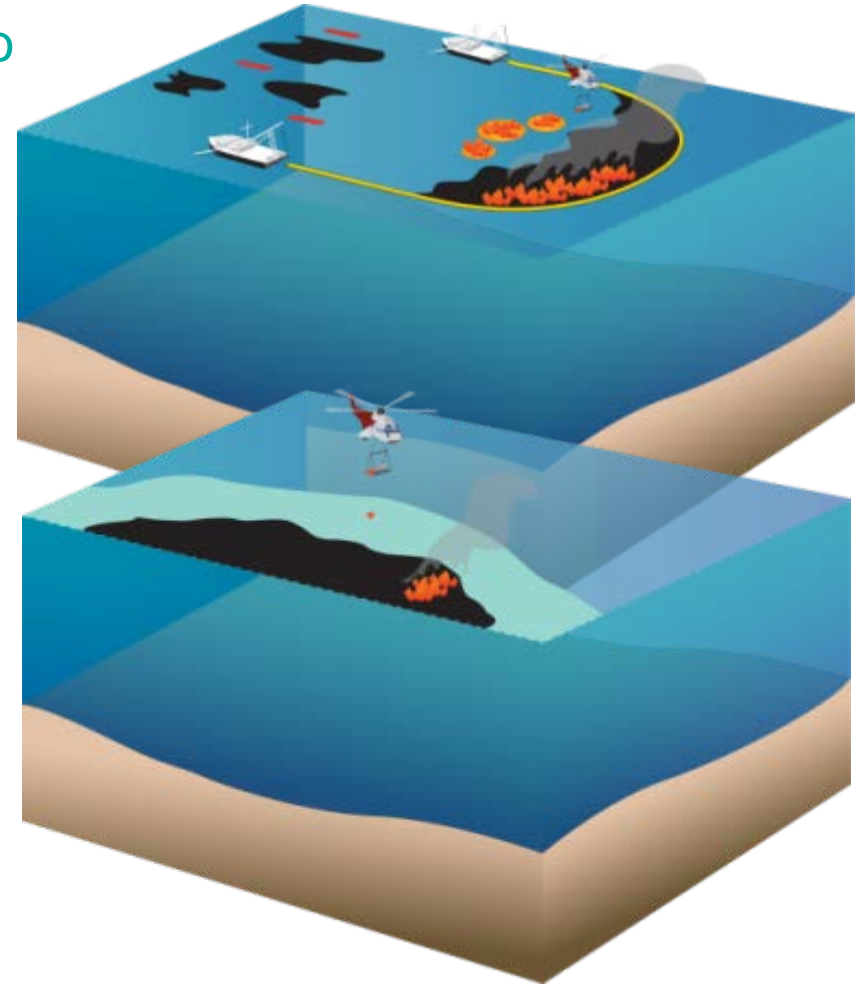
TECHNOLOGY DESCRIPTION

Herders use surfactants as a 'chemical boom' to thicken slicks, no boundary required

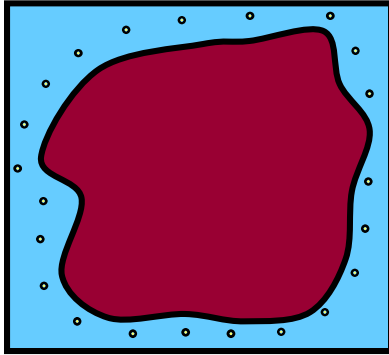
Herders typically require at least an order of magnitude less product than treating slicks with dispersants

Herder technology has been evaluated for marine applications with ice but research has shown it is applicable to open water

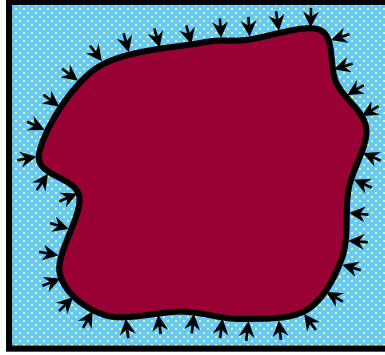
The goal is to develop another tool that can be applied using aircraft to make ISB a routinely used response option



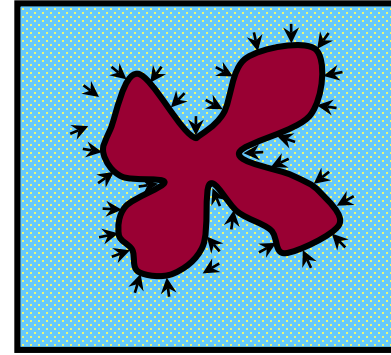
TECHNOLOGY DESCRIPTION



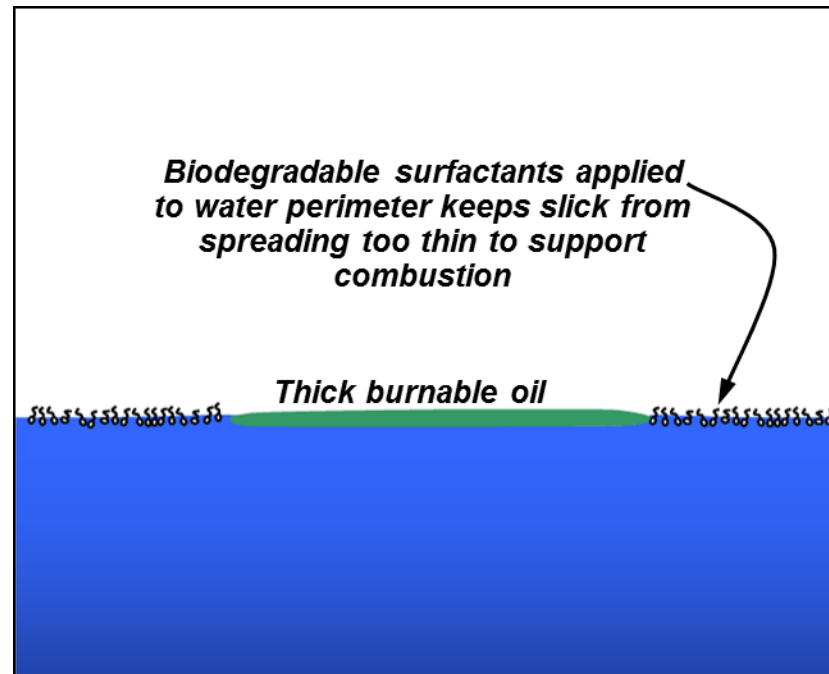
Herders sprayed on water around perimeter of slick via helicopter or boat



Herders rapidly spread to form monolayer of surfactant on water surface



Herders change surface chemistry of water forcing slick into smaller areas



RESEARCH

Research has proven that the concept works

Herders have been formulated to be low toxicity and rapidly biodegradable

Research is underway to improve the knowledge base of herder fate, effects, and performance in ice affected waters

Herders may work in sea states greater than boom as the surfactants reduce wave creasting

Results of EPA Required Toxicity Testing for NCP Listing

Herder	Menidia beryllina (minnow) 96 hr LC ₅₀	Mysidopsis bahia (shrimp) 48 hr LC ₅₀
Thickslick™	138 ppm (practically non-toxic ^a)	286 ppm (practically non-toxic ^a)

^aas defined by the US EPA aquatic toxicity ranking system
(<http://www.epa.gov/espp/litstatus/effects/redleg-frog/naled/appendix-i.pdf>)

Results of Biodegradation Testing

Herder	% biodegradation Day 1	% biodegradation Day 20
Thickslick™	14.8	>99

LABORATORY TESTING VIDEO



FIELD RESULTS IN ICE



*Oil release &
spread
(15 minutes)*

*630 liters of fresh
crude*



*Herder applied
& contracts
slick
(9 minutes)*



*Ignition & ISB
(9 minutes)*

Courtesy of Ian Buist/SL Ross

FIELD RESULTS IN ICE - VIDEO



HERDER COMMERCIALIZATION

- Herders are commercial ready
 - Two herders on US EPA NCP Product Schedule
 - Helicopter-mounted delivery system built
 - Commercial quantity of herders available

2015 Field Tests at Poker Flats

AIM: Validate the operational feasibility of an aerial herder/burn response strategy using both manned and remote controlled helicopters

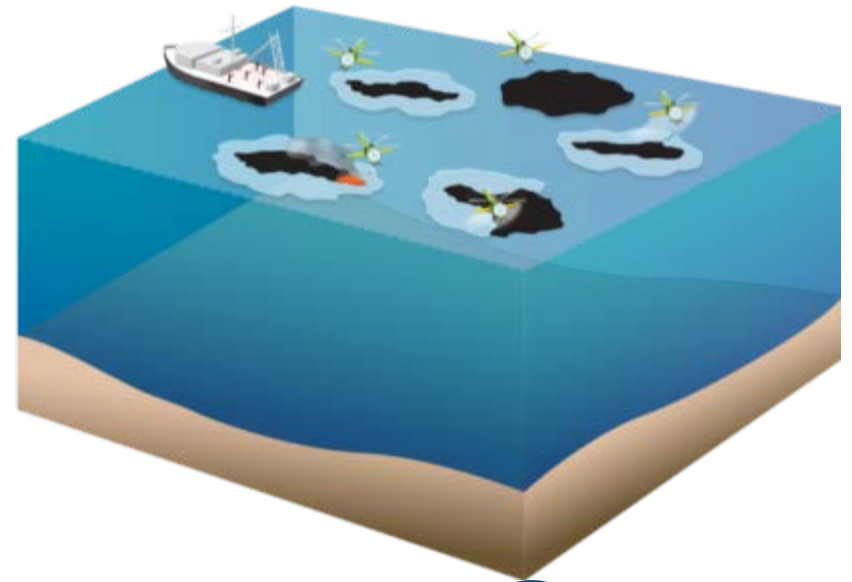
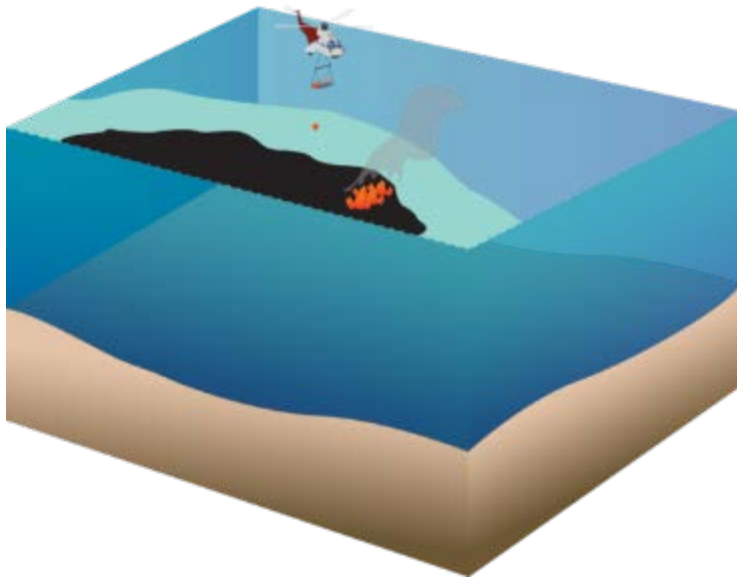
- **Constructed a large, above ground, fully lined, temporary test basin 90m x 90m in Fairbanks, Alaska**
- **Tested herder on ~ 1 barrel releases of ANS**



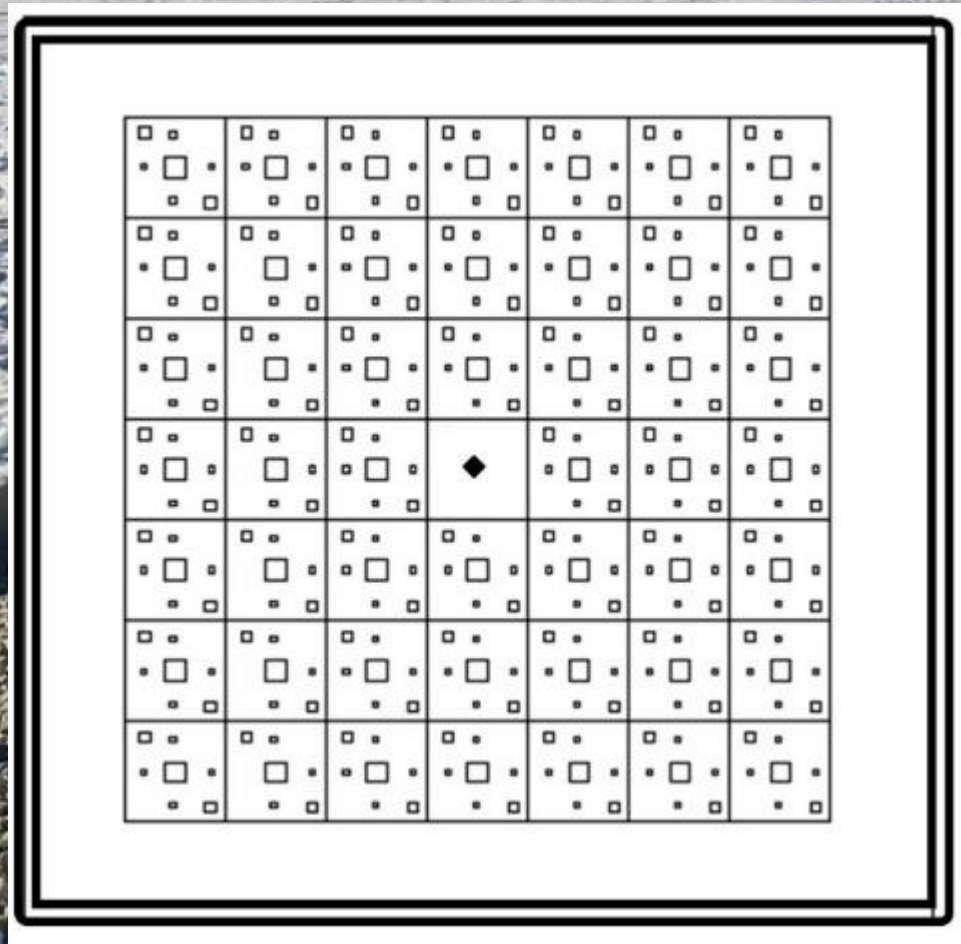
Photo: J. Mullin

Field Testing

- **Primary goal was to use a manned helicopter to both spray herder and ignite slick**
- **Secondary goal was to use a remote-controlled helicopter to perform same activities**



Planned layout of small, medium and large ice forms in test basin. Release frame shown in centre



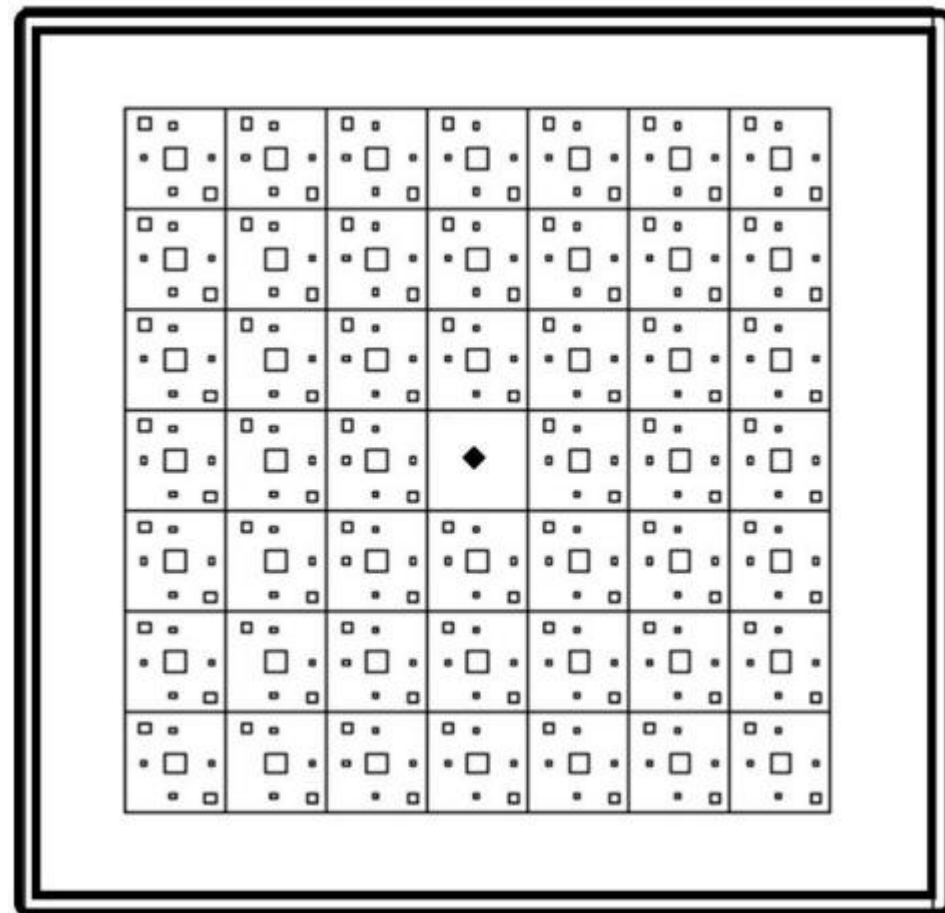




Video

JIP FIELD TESTING – 27TH APRIL 2015

- Oil released in the centre of the basin and allowed to spread for a few minutes (100 to 200 liters or up to ~ 1 barrel of oil).
- A helicopter sprayed herder (approximately 1.2 litres) around the perimeter of the oil slick.
- After a few minutes the oil contracted and an igniter placed in the slick.
- When the burn is complete, residue was collected to determine efficiency.



Summary

- Herders to enable in situ burning have undergone over 10 years of study
- Field tests in 2008 demonstrated they work in open water
- Herding typically requires very small quantities of a very low toxicity surfactant
- Herders commercially available
- Helicopter mounted delivery system developed
- Field test demonstrated helicopter-based herder delivery and subsequent slick ignition

What's Next?

- Research to improve the knowledge base of herder fate, effects, and performance in ice affected waters
- Design and build a system to spray herder and ignite the herded slick from a single helicopter
- **Offshore field test of integrated herder delivery / ignition system ideally with both a manned helicopter and robotic helicopter**
- Longer-term need is to develop a system to spray herder and ignite slick from a fixed wing aircraft.

QUESTIONS?