

# Making Mountains Into Molehills



**HESS**

**By: Stephen Eldridge**



Source: USGS  
Source: NASA, NGA, USGS  
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699.4mi

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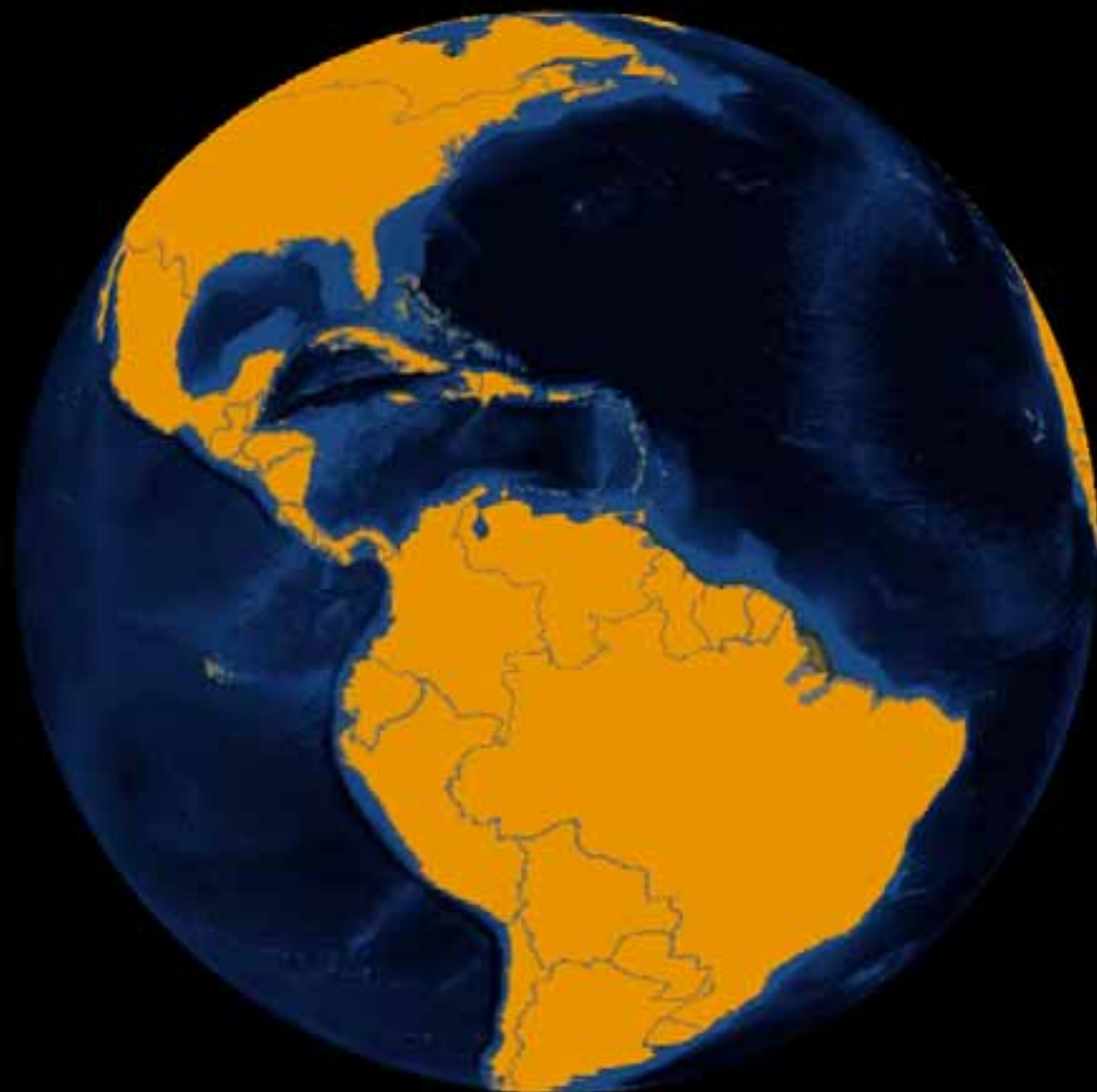
# Data Sources (The Mountain)



And more... These are just the ones I personally have worked with. 

Sources: USGS  
Sources: NASA, NOAA, USGS  
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# Onshore



Source: USGS  
Source: NASA, NGA, USGS  
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# Shelf



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# Deep Water



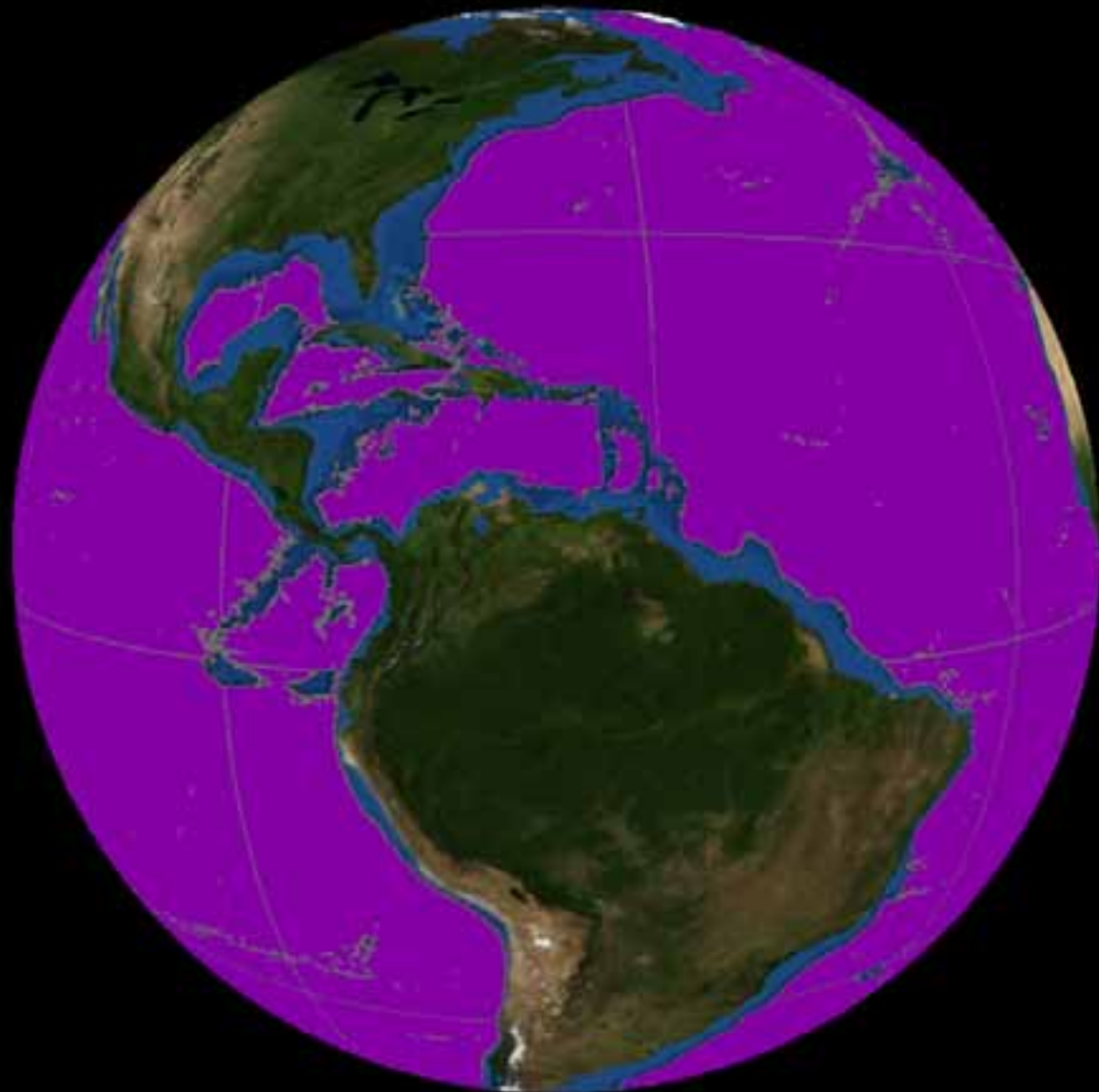
Source: USGS  
Source: NASA, NGA, USGS  
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# Ultra Deep Water



Source: USGS  
Source: NASA, NGA, USGS  
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# Basins

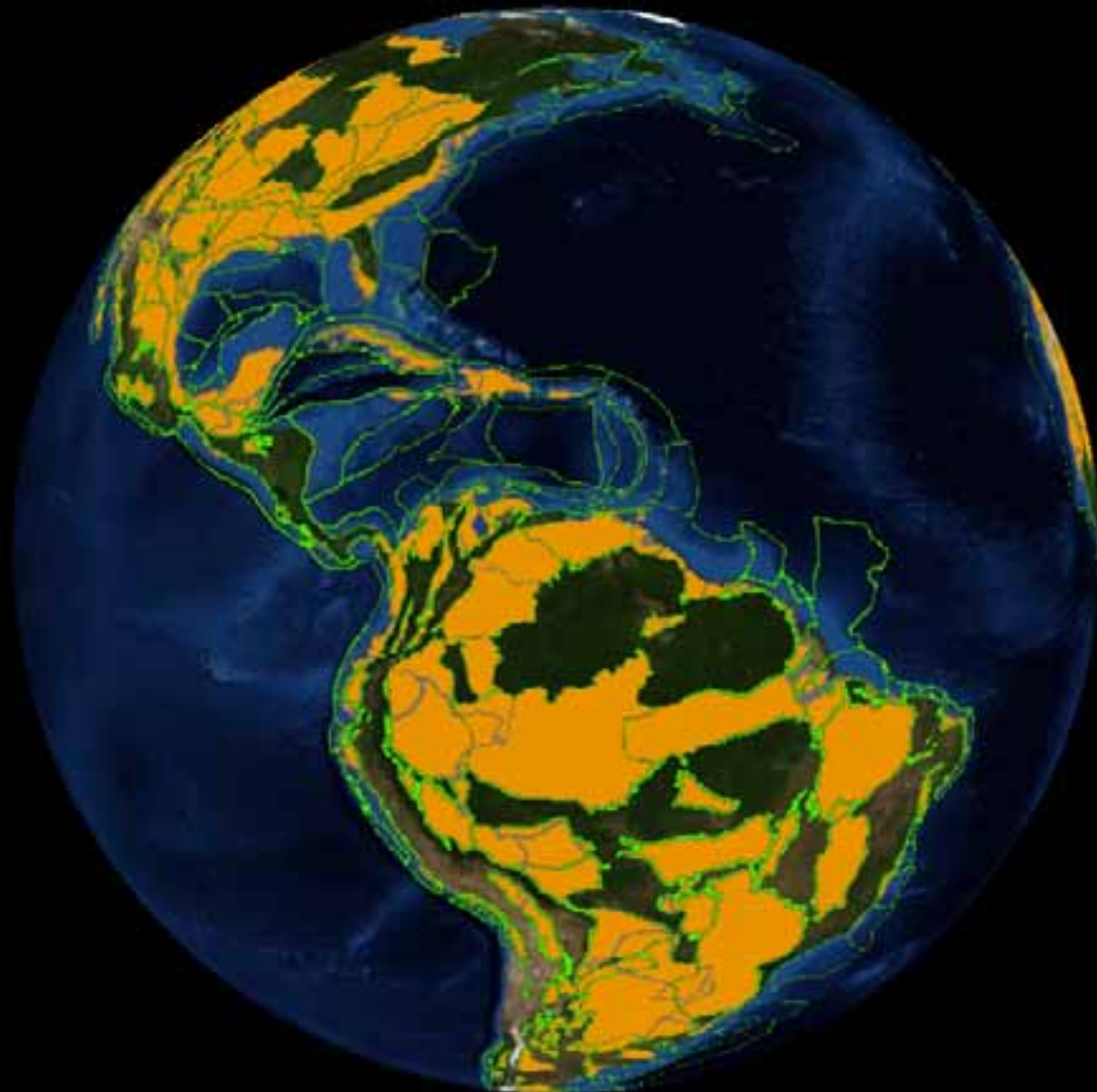


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Source: NASA, NGA, USGS  
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# Basins Onshore



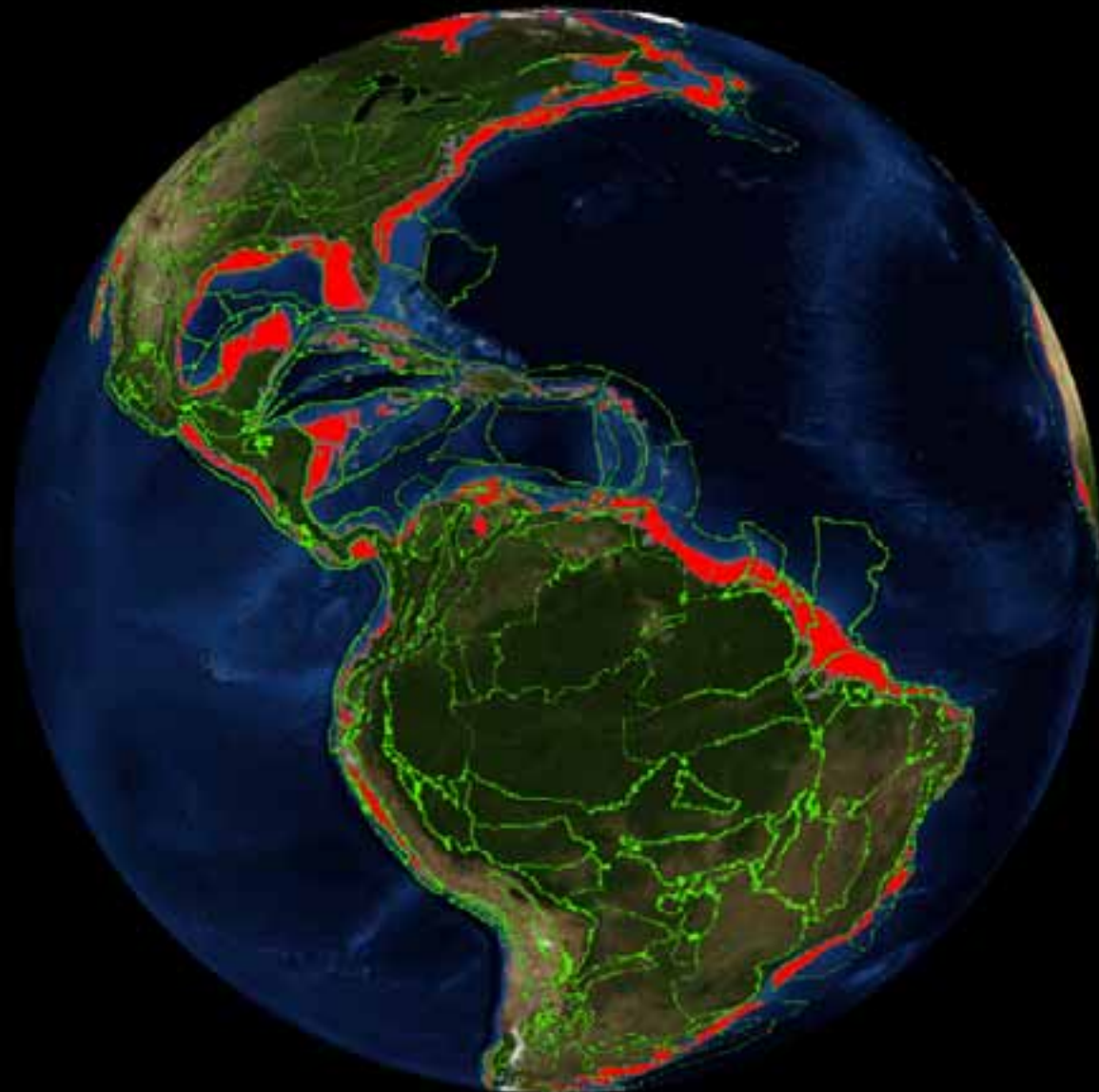
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# Basins Shelf



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# Basins Deep Water



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# Basins Ultra Deep Water



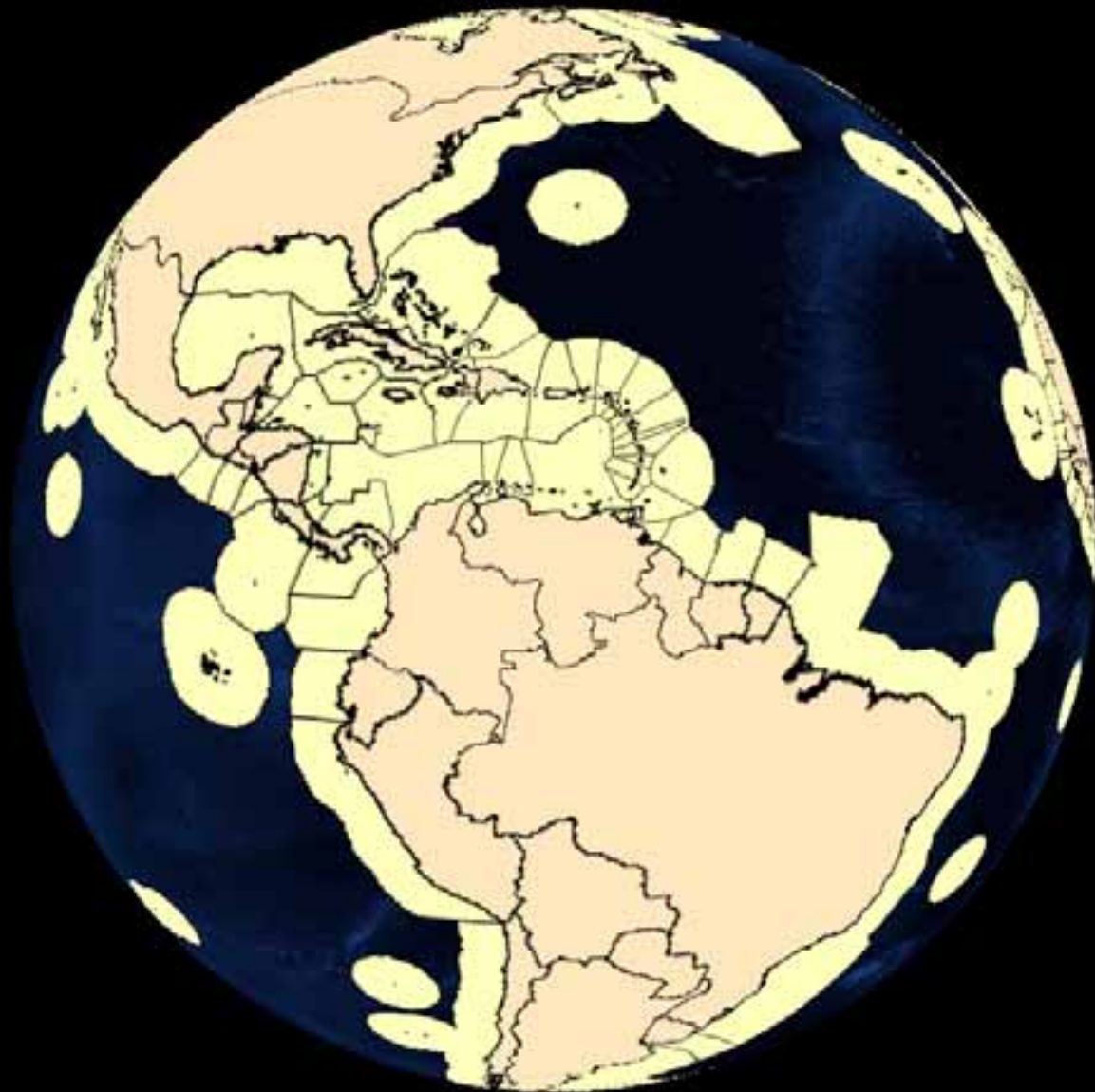
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# Countries and Exclusive Economic Zones



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Source: NASA, NGA, USGS  
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# Shelf Basins by Country

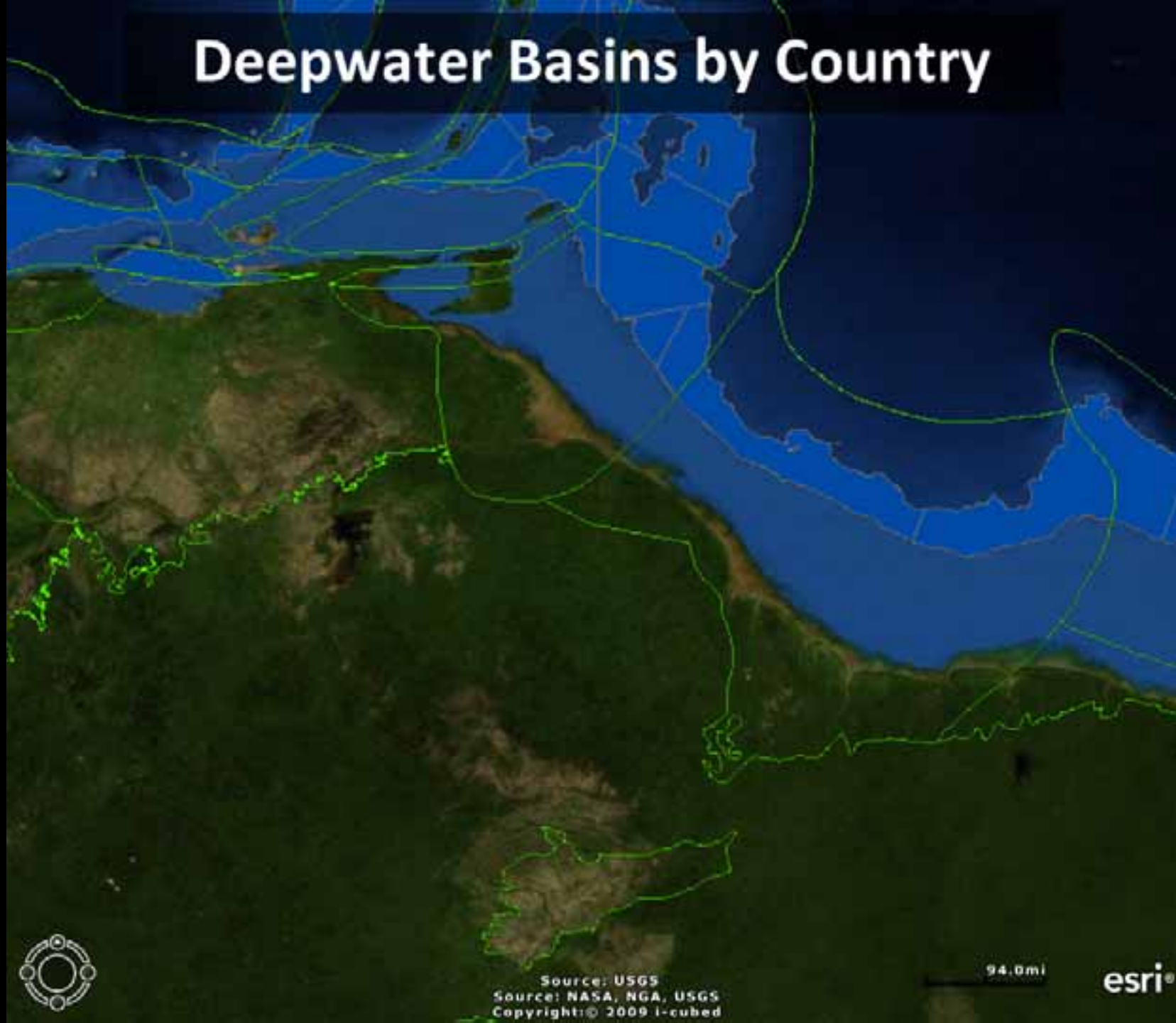


Source: USGS  
Source: NASA, NGA, USGS  
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94.0mi

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# Deepwater Basins by Country



Source: USGS  
Source: NASA, NGA, USGS  
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# Ultra Deepwater Basins by Country



# Lease Blocks



Source: USGS  
Source: NASA, NGA, USGS  
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# Exploration Wells

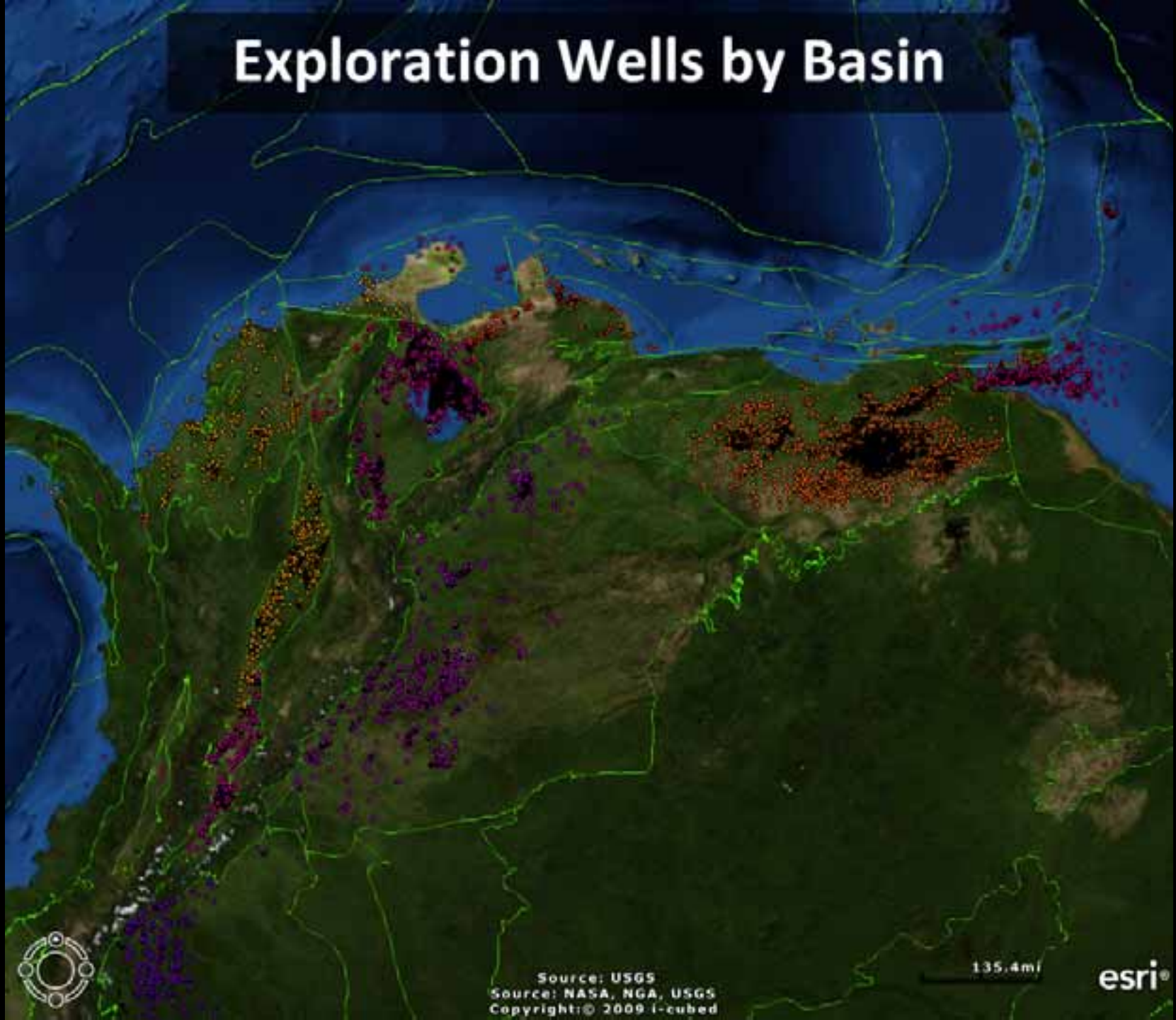


Source: USGS  
Source: NASA, NGA, USGS  
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195.0mi

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# Exploration Wells by Basin



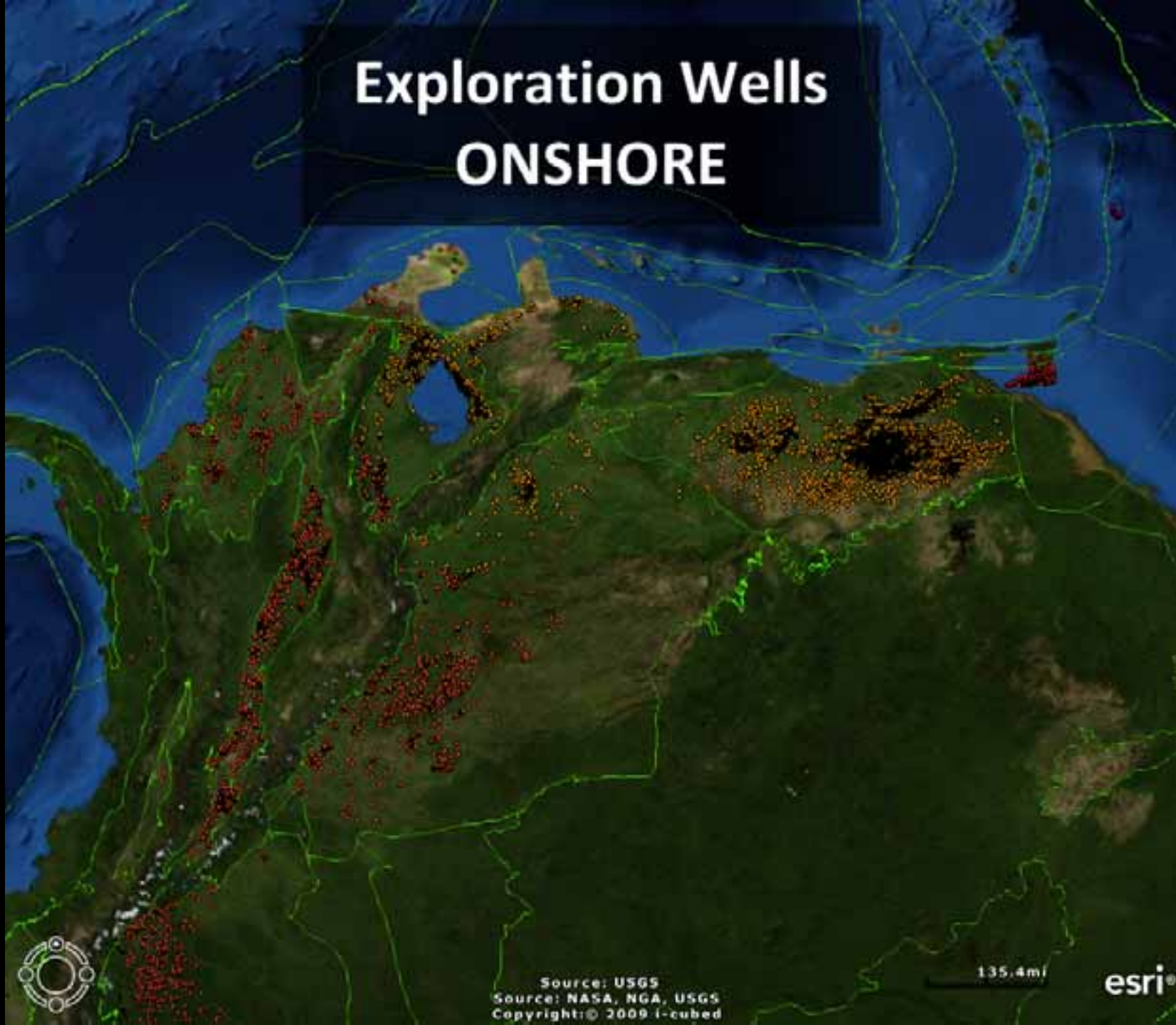
Source: USGS  
Source: NASA, NGA, USGS  
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# Exploration Wells ONSHORE



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# Exploration Wells SHELF



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Source: NASA, NGA, USGS  
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# Exploration Wells DEEPWATER

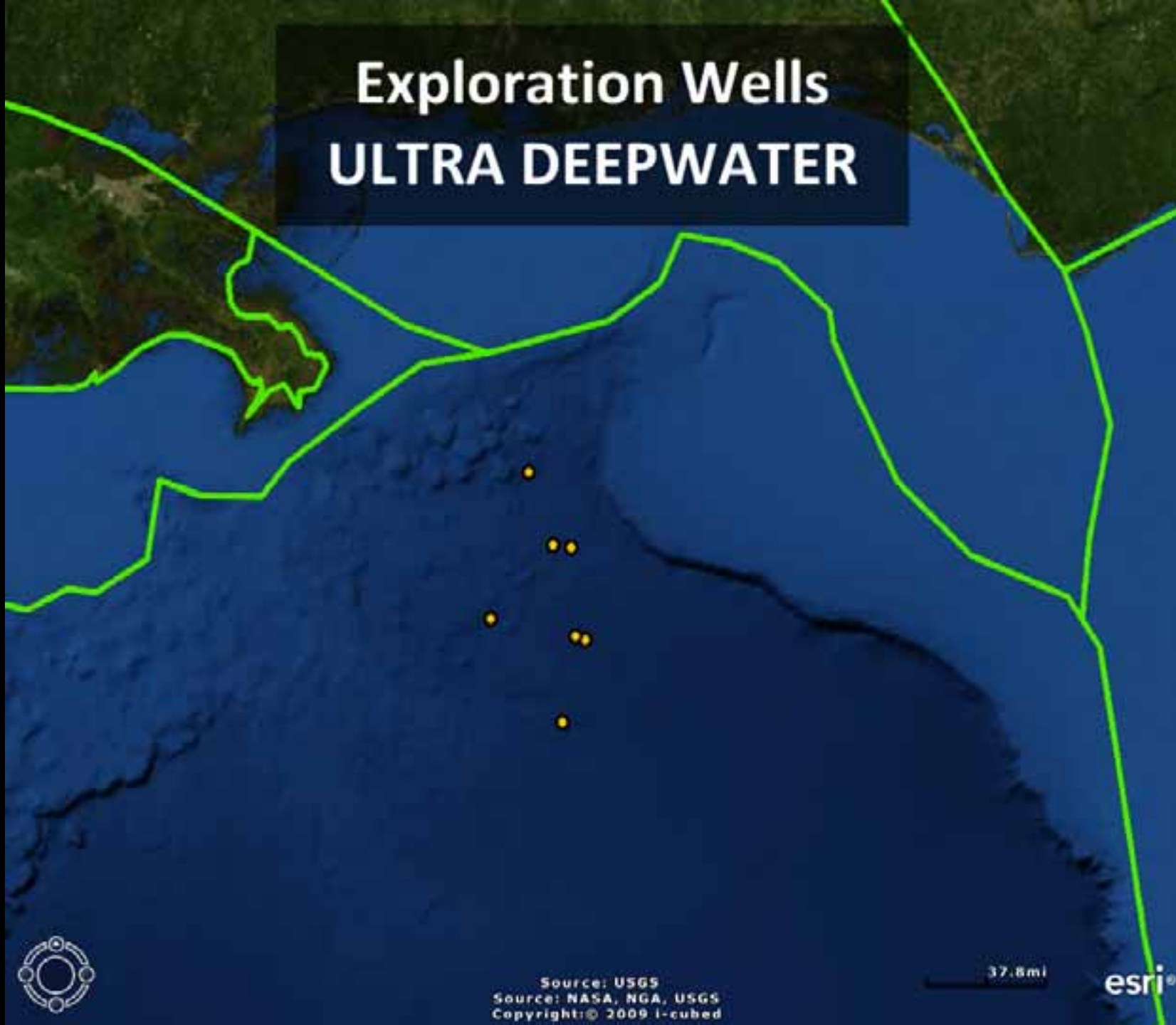


Source: USGS  
Source: NASA, NGA, USGS  
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# Exploration Wells ULTRA DEEPWATER

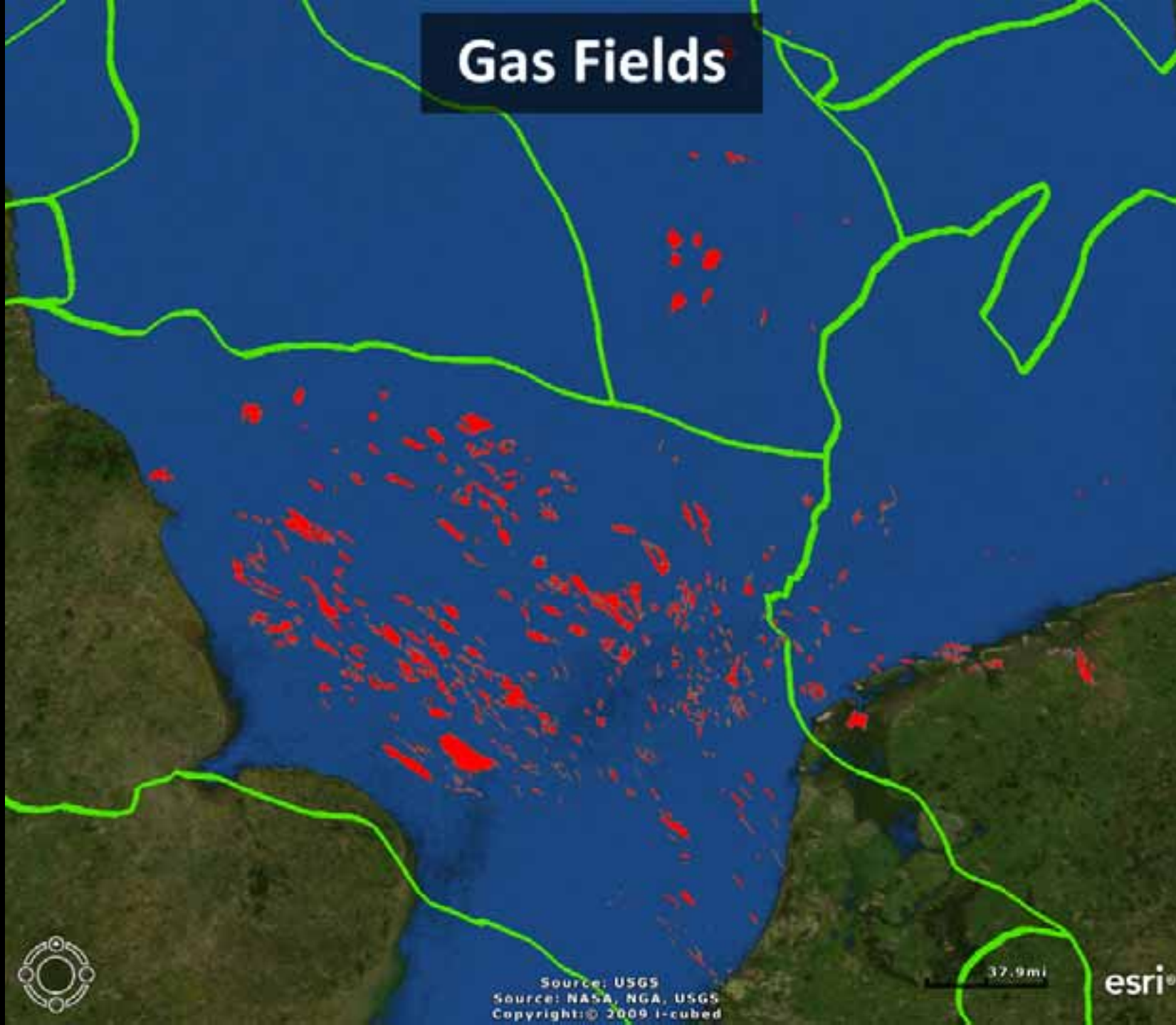


Source: USGS  
Source: NASA, NGA, USGS  
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37.8mi

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# Gas Fields



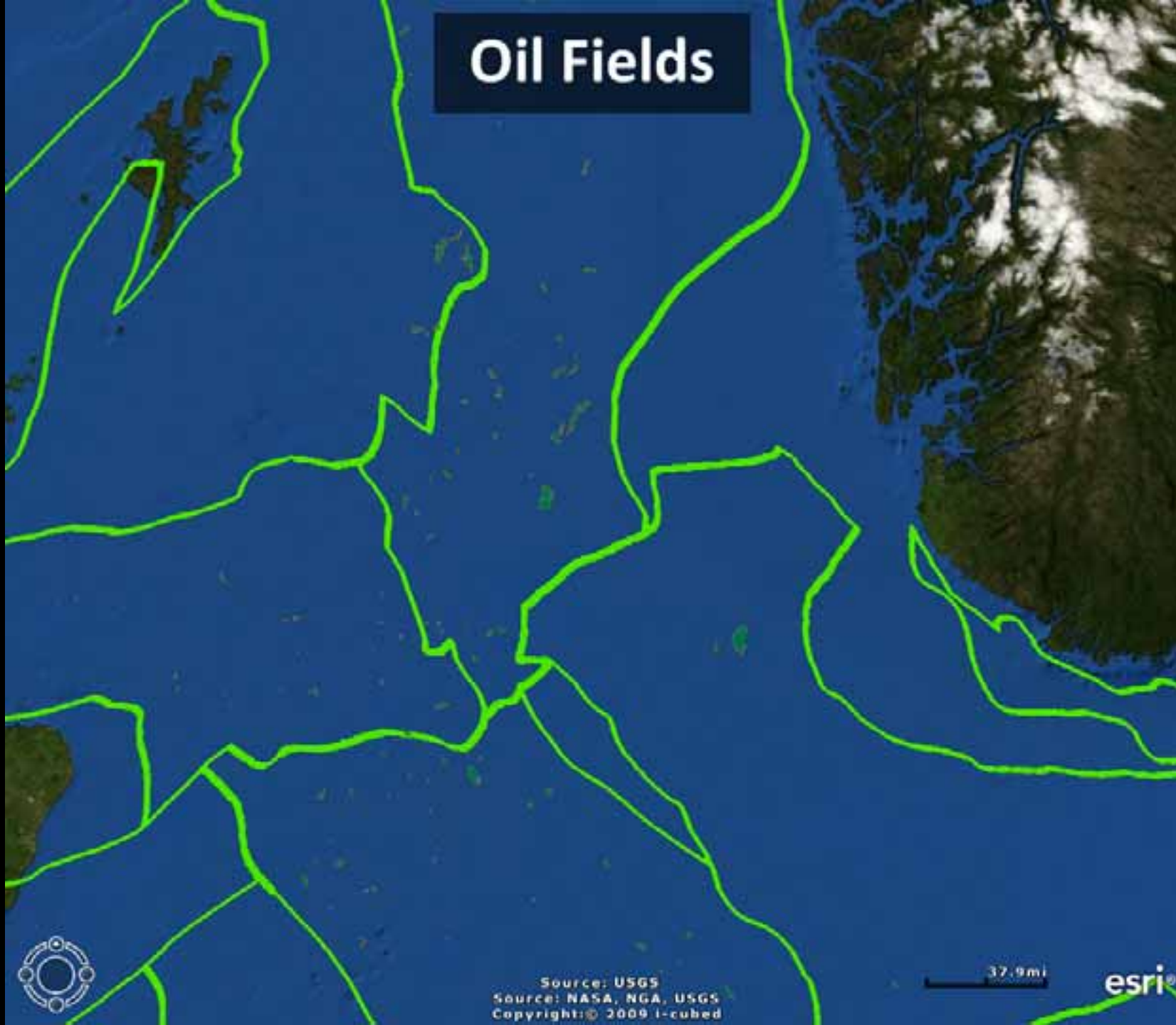
Source: USGS  
Source: NASA, NGA, USGS  
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37.9 mi

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# Oil Fields



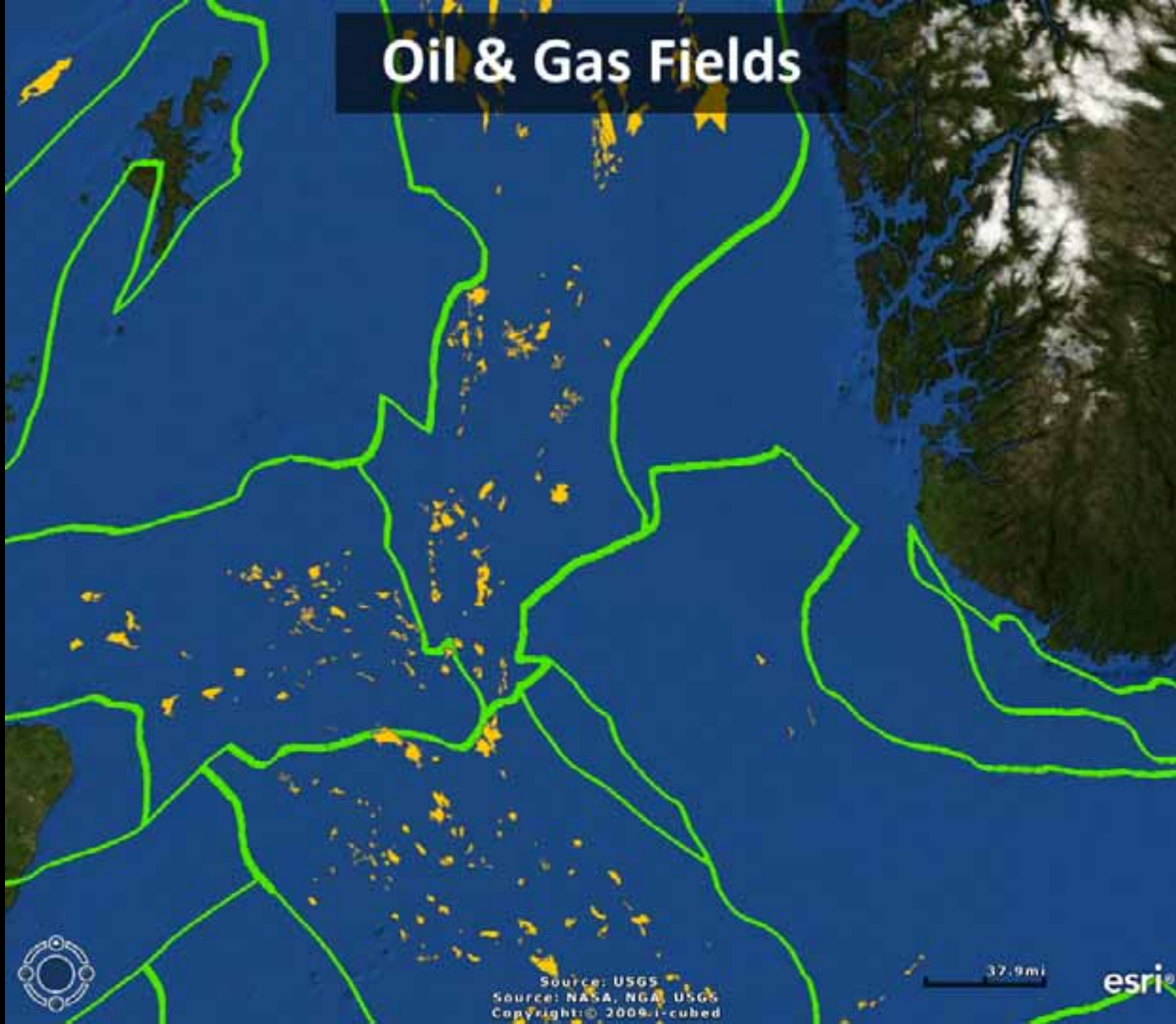
Source: USGS  
Source: NASA, NGA, USGS  
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37.9 mi

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# Oil & Gas Fields

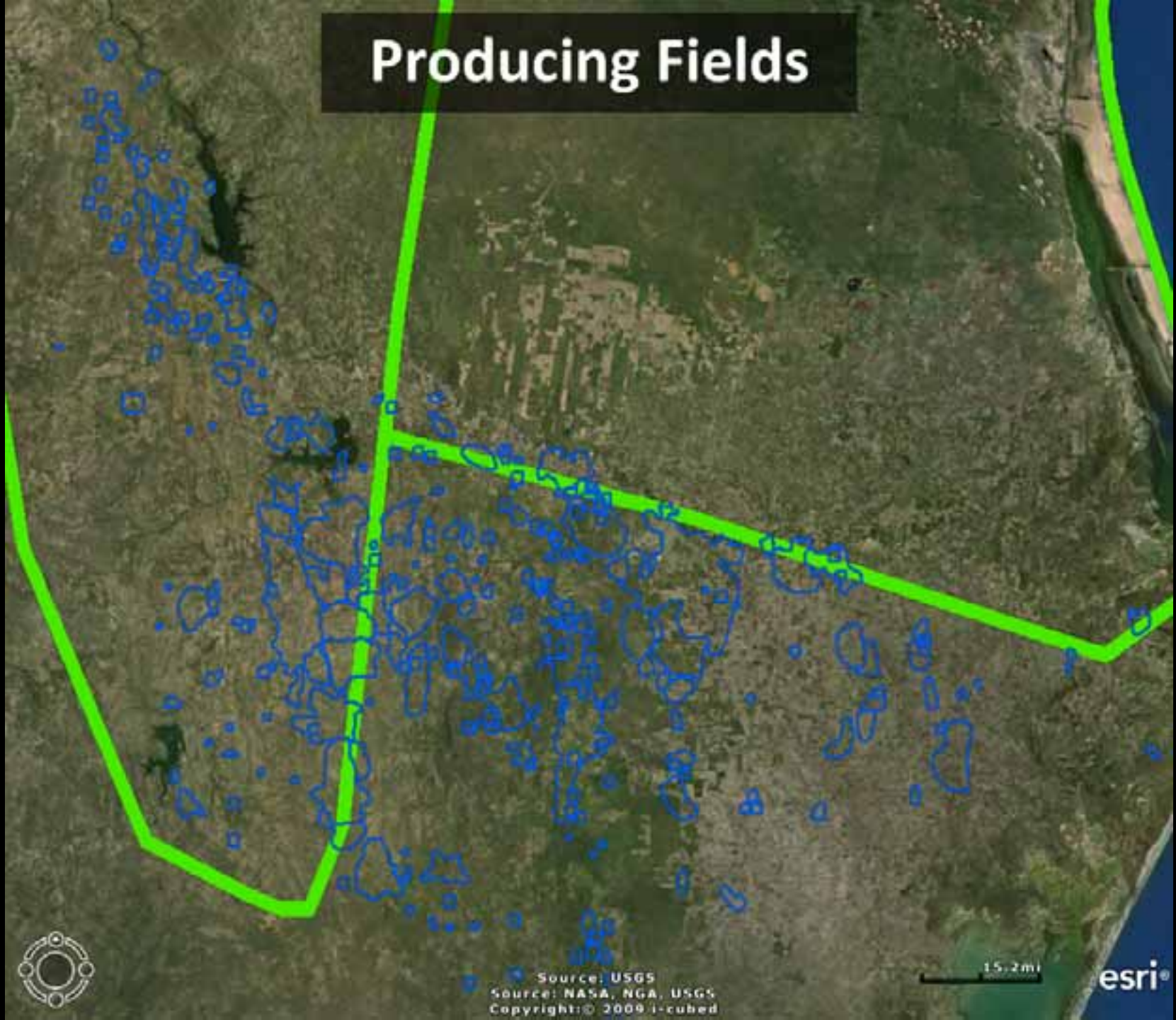


Source: USGS  
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# Producing Fields



Source: USGS  
Source: NASA, NGA, USGS  
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15.2mi

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# Data Sources (The Mountain)



American Association of Petroleum Geologists  
An International Geological Organization



esri | GIS Software that Gives You  
THE GEOGRAPHIC ADVANTAGE



And more... These are just the ones I personally have worked with.

Source: USGS  
Source: NOAA, NEA, USGS  
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Using "Off The Shelf" software to unify field names and automate the processes making things more efficient and easy to use.

ArcTools

The image displays a collage of ArcTools software interfaces. At the top center, a data flow diagram shows four vertical columns of nodes. The first column contains blue circles, the second yellow squares, the third green circles, and the fourth blue circles. Lines connect these nodes horizontally and vertically, illustrating a workflow. Below this diagram are several overlapping screenshots of ArcTools windows. One window on the left shows a tree view of toolboxes. Another window in the center shows a list of data sources. A window on the right displays a complex interface with multiple panes and data tables. At the bottom, a taskbar shows the system clock at 10:41 AM and the ArcTools logo.

Using "Off The Shelf" software to unify field names and automate the processes making things more efficient and easy to use.

# ArcGIS Model Builder

The image displays the ArcGIS Model Builder interface, which is used for creating and running geoprocessing models. The central element is a workflow diagram consisting of several columns of nodes (green and yellow) connected by arrows, representing a sequence of geoprocessing tasks. Surrounding this diagram are various windows from the software, including a toolbox, a catalog, a script editor showing Python code, and a model properties dialog. The bottom of the image shows a Windows taskbar with the ArcGIS logo and system tray icons.

Source: USGS  
Software (MONTANA USGS)  
Copyright © 2006 Esri



Using "Off The Shelf" software to unify field names and automate the processes making things more efficient and easy to use.

# SQL Server Tables

Source: USGS  
Software: MICROSOFT SQL  
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Using "Off The Shelf" software to unify field names and automate the processes making things more efficient and easy to use.

The image is a collage of various software interfaces. At the top center is a network diagram with four vertical columns of nodes (blue and green circles) connected by lines. To the right is a DOS command prompt window with the text "DOS Commands" overlaid in large black font. Below the network diagram are several overlapping windows: a file explorer showing a list of files and folders, a data table with multiple columns and rows, and a window with a large text area containing code or logs. The bottom of the image features a navigation pad icon on the left, a "Source: USGS" watermark, and a logo for "esri" on the right.

Using "Off The Shelf" software to unify field names and automate the processes making things more efficient and easy to use.

The image is a collage of various software interfaces. At the top center is a network diagram with four vertical columns of nodes. The nodes are represented by blue and green circles, with yellow arrows indicating connections between them. Below the diagram are several overlapping windows from different applications. On the left, there's a window with a tree view of folders and files. In the center, a large window displays a data table with many columns and rows. To the right, there's a window titled 'Microsoft (SQL Server 9.0.2100 - sqlr\_svr)' showing a complex interface with multiple panes and data. At the bottom left, there's a window with a list of items, possibly a file explorer or a database catalog. At the bottom right, there's a window with a large text area, possibly a code editor or a log viewer. The text 'MS Access' is overlaid in the center, and 'Personal Geodatabases' is overlaid in the lower-left quadrant. At the bottom of the image, there's a small circular icon on the left, a scale bar labeled '300.4mi' in the center, and the 'esri' logo on the right.

**MS Access**

**Personal Geodatabases**

Source: USGS  
Software: Microsoft Access  
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Using "Off The Shelf" software to unify field names and automate the processes making things more efficient and easy to use.

The image is a collage of various software interfaces. At the top center is a flowchart with four columns of nodes. The nodes are colored blue, yellow, and green, connected by lines. To the left is a window with a tree view and a list of items. To the right is a window titled 'Microsoft (SQL Server 9.0.2100 - sqlr\_svr)' showing a list of database objects. Below these are several overlapping windows. One shows a list of items with a search bar. Another shows a large grid of data with a pink horizontal line. A code editor window is visible in the bottom right, showing lines of code. The text 'Excel with VBA' is overlaid in large black font in the lower right quadrant. At the bottom, there is a Windows taskbar with a clock showing 10:41 AM and a taskbar with several icons. A small 'esri' logo is in the bottom right corner.

## Excel with VBA

Source: [Excel VBA](#)  
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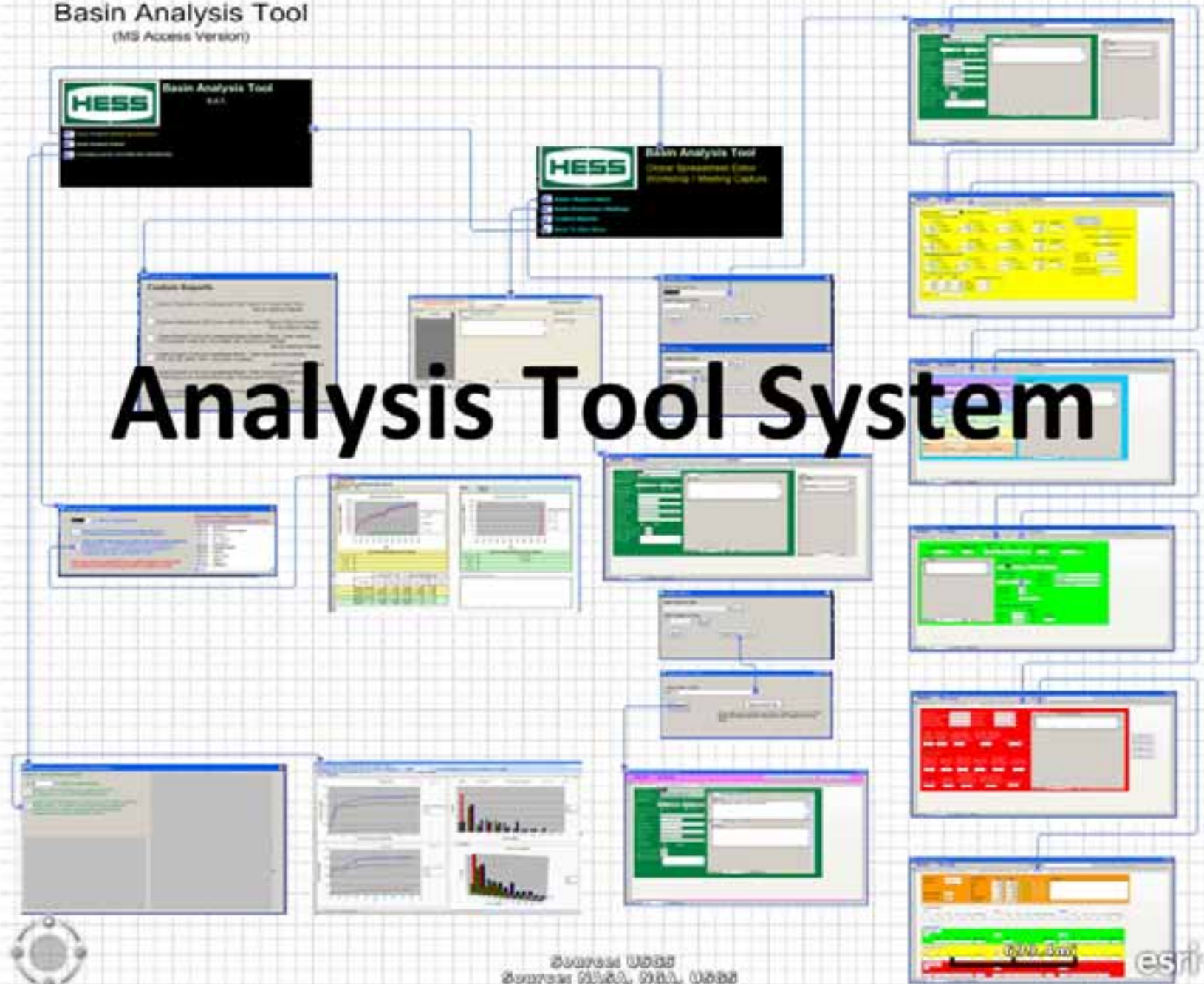
Using "Off The Shelf" software to unify field names and automate the processes making things more efficient and easy to use.

The image is a collage of various software interfaces. At the top center is a data flow diagram with four columns of nodes. On the left is a tree view of a database structure. In the top right is a SQL Server Enterprise Manager window showing a server instance. Below that is a window with multiple data grids. In the bottom left is a window with a list of items. In the bottom center is a window displaying a large table of data. In the bottom right is a window with Python code, overlaid with the text "Python Scripting". At the bottom center, there is a footer with the text "Source: USGS, Google, MINERAL USA, Copyright © 2016, Esri".

**Python Scripting**

Source: USGS, Google, MINERAL USA, Copyright © 2016, Esri

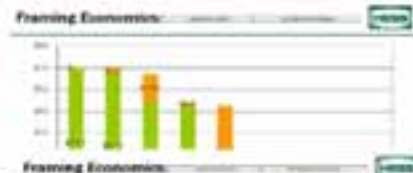
B.A.T.  
Basin Analysis Tool  
(MS Access Version)



# Analysis Tool System



# Current Applications



Source: U.S. Census Bureau, BLS, U.S. Dept. of Commerce  
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1/10/05





Opportunity > Opportunity Request > GIS Day Demonstration > Edit Item

## Opportunity Request: GIS Day Demonstration

Opportunity Name:

Country:

Basin:

Operation Setting:

Play:  Play Name if not in list:

**Opportunity Type**

Conventional  
 Unconventional

**Hydrocarbon Type**

Oil  
 Gas

**Owner**

Owned  
 Third Party  
 Mineral Rights Owner  
 Notional

**Operator**

Hcas  
 Other Company  
 Notional

Capture Status:

Stages:

Pool Size (MMBOE) P10:  14200  
P50:  7144  
P90:  1786

Sensitive Opportunity  A shape file is available

**Company Interest (Percent)**

Working Interest:  %

Paying Interest:  %

Net Revenue Interest:  %

Exploration Paying Interest:  %

**Well Data**

Drilling Depth (ft):

Horizontal Section Length (ft):

Wells Drilled Per Year:

Well Cost (\$MM/Well):

**Exploration**

Capture Chance:  %

Acquisition Year:

Acquisition Cost (\$):

Area:

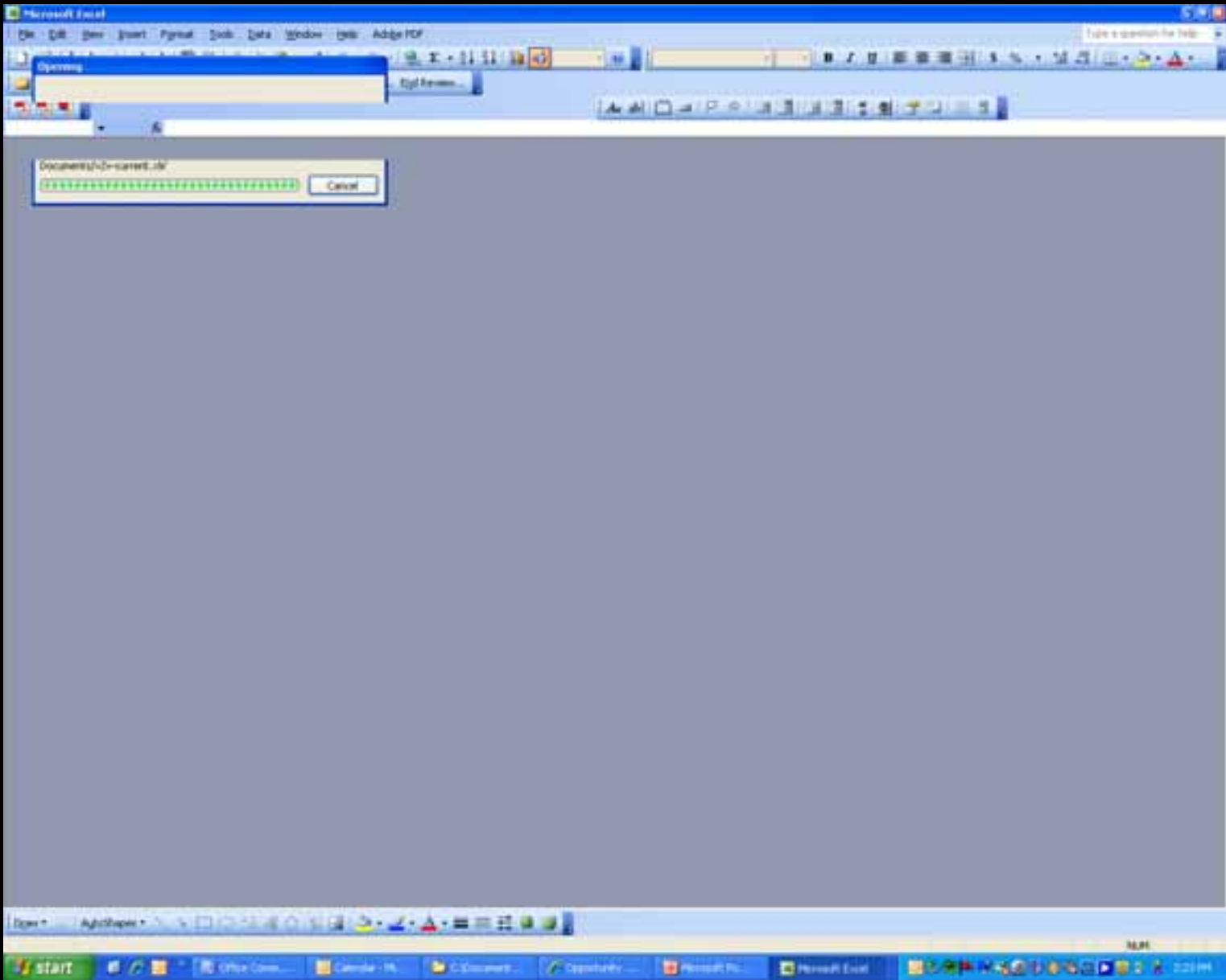
Quantity of Wildcat Wells:

Wildcat Drill Year:

Success Case Sanction Year (if known else 0):

**Well Performance**

Play Chance:



File Edit View Insert Format Tools Data Window Help Adobe PDF
Type a question for help
100%
B I U
\$ %
Reply with Changes... Egd Review...

Table with columns BE, BF, BG, BH, BI, BJ, BK and rows 1-40. Row 15 is highlighted in yellow. Cell B15 contains the value -14.8472176.



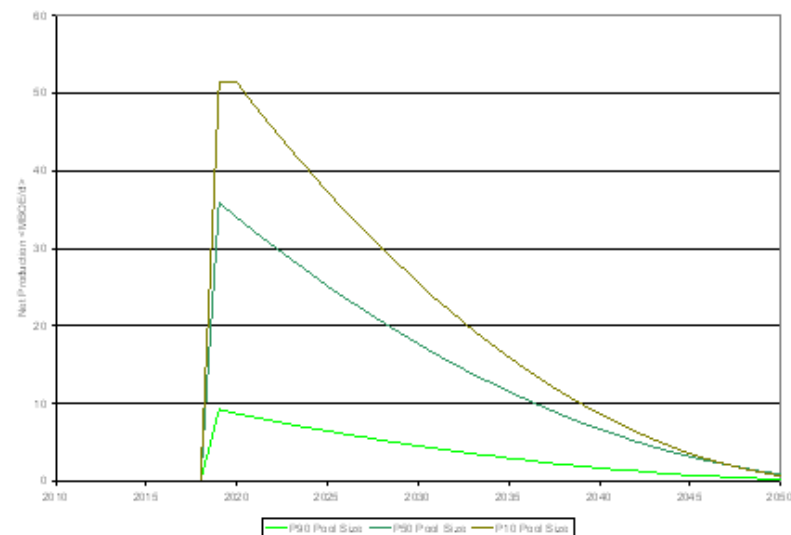
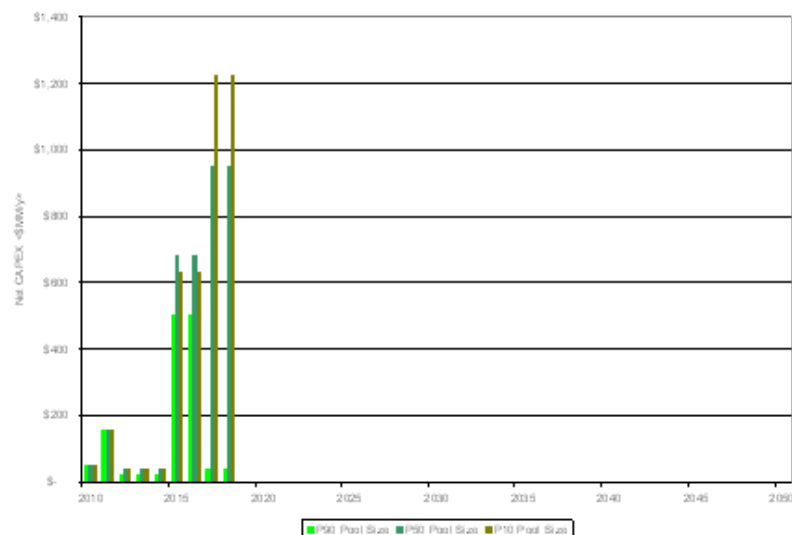
# Framing Economics:

Opportunity Name

GIS Day Demonstration



Opportunity Characterization			
Opportunity Name	GIS Day Demonstration		
Exploitable Business Unit	EMEA		
Country	ANGOLA		
Basin	Kwanza/Benguela		
Play Chance	50%		
Prospect Chance	70%		
Probability of Success	35%		
Working Interest	50%		
Gross Company Take	27%		
Net Company Take	14%		
Acquisition Cost	\$ 50,000,000		
Opportunity Resource			
Resource Case	Low	6TE	High
Pool Size - (MMBOE)	90.0	350.0	500.0
Drilling Summary			
Development Well Cost	\$ 40.0 MM		
Resource Case	Low	6TE	High
Number of Development Wells	4	14	20
Average Drilling Activity - (Wells/Year)	2	7	7
Exploration/Appraisal Phase			
Net Undiscounted Exploration Cost	\$ 160.0 MM		
Resource Case	Low	6TE	High
Number of Appraisal Wells	2	3	3
Net Undiscounted Appraisal Cost	\$ 80.0 MM	\$ 120.0 MM	\$ 120.0 MM
Exploration Well Drill Year	2011		
Development Phase			
Resource Case	Low	6TE	High
Gross Midstream CAPEX	\$ 28 MM	\$ 40 MM	\$ 44 MM
Gross Facilities Startup CAPEX	\$ 1,800 MM	\$ 4,703 MM	\$ 6,000 MM
Gate Rig and Pads - (\$MM)	\$ 0 MM	\$ 0 MM	\$ 0 MM
Gross Total Facilities CAPEX - (\$MM)	\$ 1,800 MM	\$ 4,703 MM	\$ 6,000 MM
Gross Nominal CAPEX - (\$/b)	\$ 20.0	\$ 13.4	\$ 12.0
Commercial Input			
Price Scenario	Low Price	Mid Price	High Price
Oil Price - (\$/b)	\$ 6.00	\$ 13.00	\$ 18.00
Net Back Sales Price - (\$/b)	\$ 67.17	\$ 67.17	\$ 67.17
Production Phase			
Resource Case	Low	6TE	High
Gross Well EUR - (MMBOE/Well)	25.0	25.0	25.0
Date of First Production	2018	2018	2018
Net Peak Production - (MMOED)	9.2	36.0	51.4
Net Recovery - (MMBOE)	43.2	168.0	240.5



# Framing Economics:

Opportunity Name

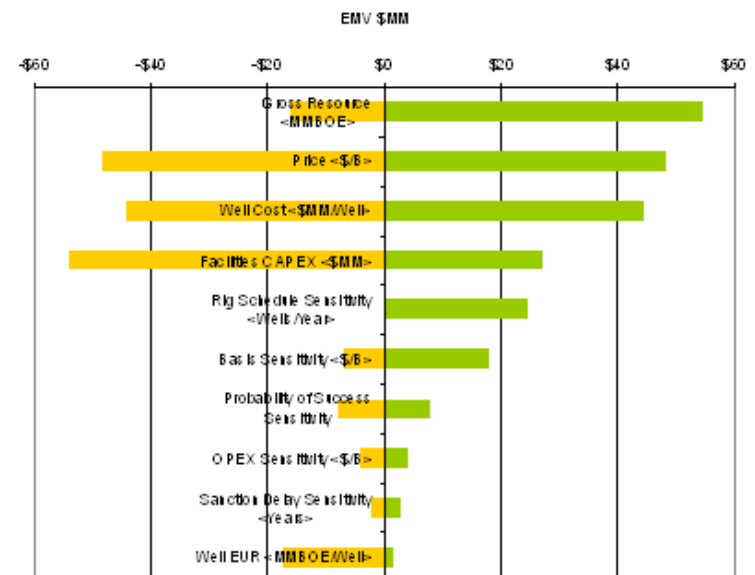
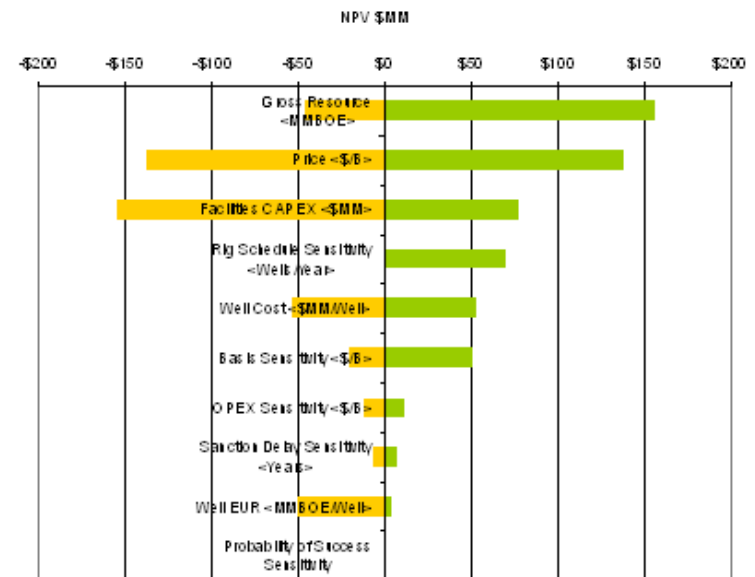
GIS Day Demonstration



Resource Sensitivity			
Pool Size <MMBOE>	90.0	350.0	500.0
NPV <\$MM>	\$ (112)	\$ (65)	\$ 90
EMV <\$MM>	\$ (155)	\$ (138)	\$ (84)
Project Success IRR <%>	3.0	8.2	12.1
Project Success PVI	0.9	1.0	1.0

Price Sensitivity			
Price Scenario	Low Price	Mid-Price	High-Price
NPV <\$MM>	\$ (203)	\$ (65)	\$ 73
EMV <\$MM>	\$ (187)	\$ (138)	\$ (90)
Project Success IRR <%>	3.9	8.2	11.8
Project Success PVI	0.9	1.0	1.0

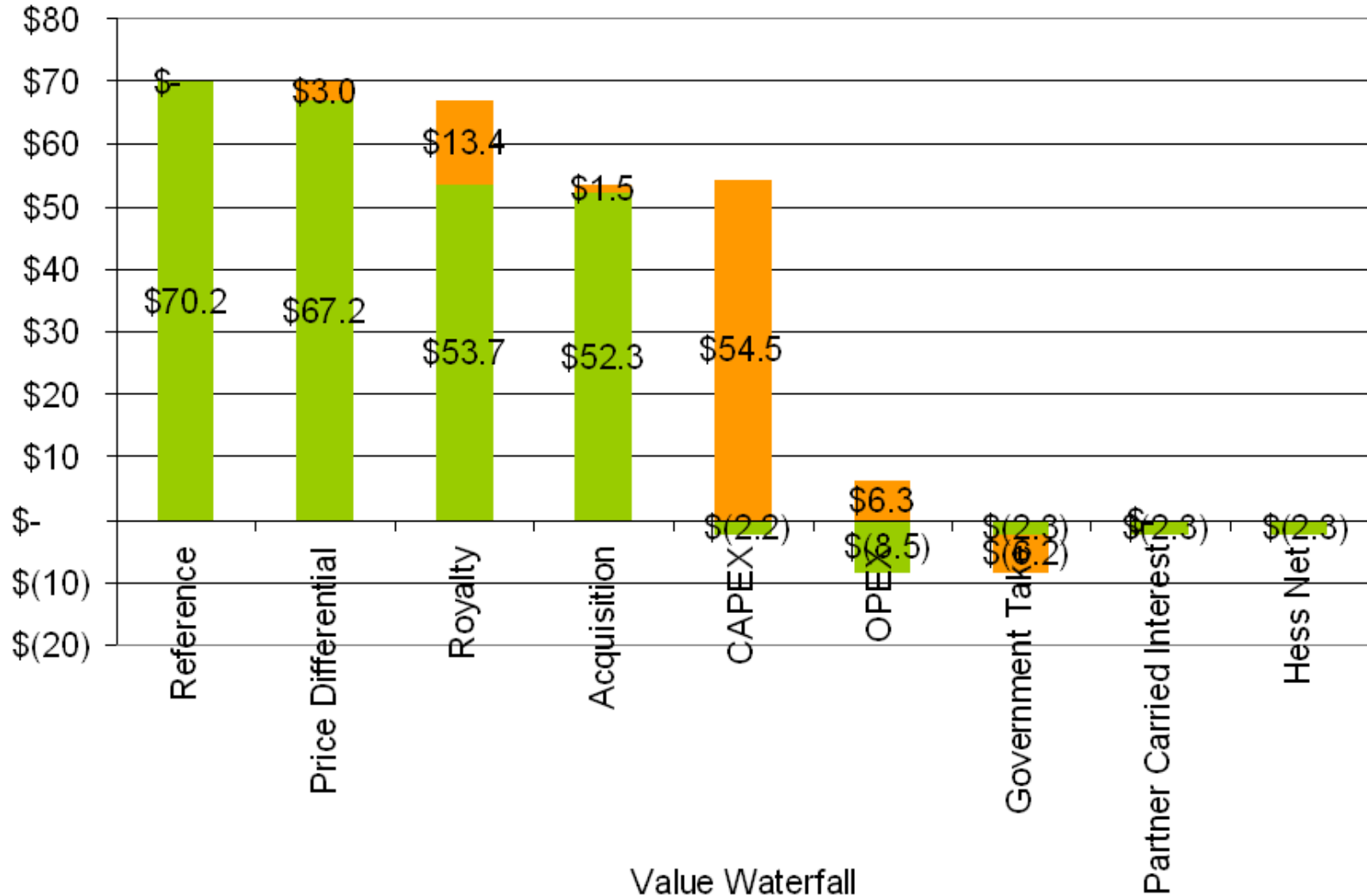
	Low	BTE	High
Probability of Success	28%	35%	42%
Rig Schedule <Wells/year>	3.0	4.0	6.0
Delay <Years>	1	0	-1
OPEX <\$/B>	\$ 7.5	\$ 6.3	\$ 5.0
Basis Sensitivity <\$/B>	\$ 64.4	\$ 67.2	\$ 74.0
Facilities CAPEX <\$MM>	\$ 7,055	\$ 4,703	\$ 3,528
Well Cost <\$MM/Well>	\$ 52.0	\$ 40.0	\$ 28.0
Well EUR <MMBOE/Well>	12.50	25.00	37.50
Resource <MMBOE>	90	350	500
Price <\$/B>	\$ 47.2	\$ 67.2	\$ 87.2



# Framing Economics:

Opportunity Name

GIS Day Demonstration







# Hess Exploration Dashboard

My Actions

[Opportunity Ranking](#) | [Opportunity Characterization](#) | [Opportunity Costs](#) | [Portfolio Components](#) | [Portfolio Forecast](#) | [Above Ground](#) | [Energy Portfolio](#) | [Natural Gas](#) | [Data Refresh](#)

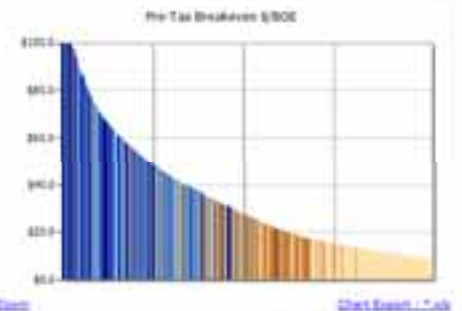
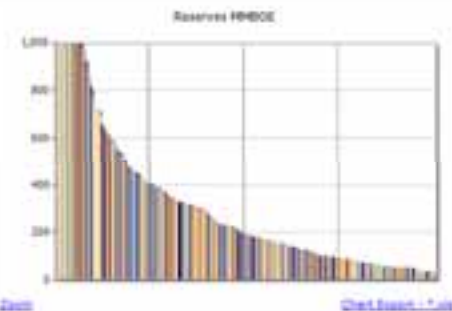
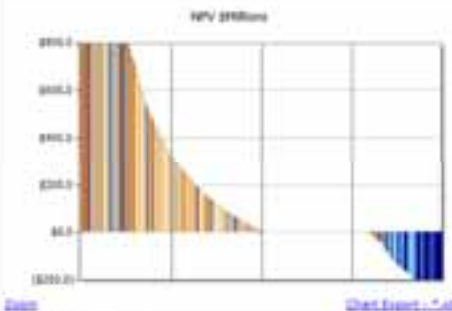
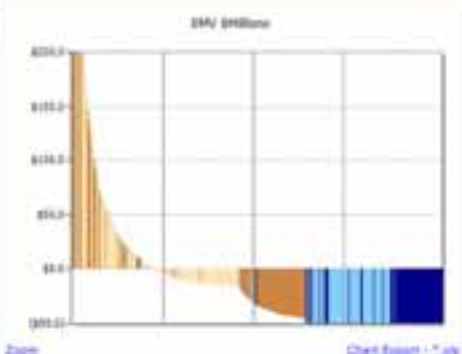
**Welcome to the Hess Exploration Dashboard**  
**Please select one of the tabs above**

# HESS Hess Exploration Dashboard

Opportunity Ranking | Opportunity Characterization | Opportunity Costs | Portfolio Components | Portfolio Forecast | Above Ground | Energy Portfolio | Natural Gas | Data Refresh

**Chart Filters**

- Price / Cost / Risk
- Opportunity Selection
- Geographic Filters
- Opportunity Filters
- Range Filters
- Above Ground Filters
- Chart Coloring
- Charts



Generate Clear All

**OPERATIONAL SETTING**

- Oil/Gas
- Coal
- Deepwater
- Ultra-Deepwater

Source: Hess Corporation

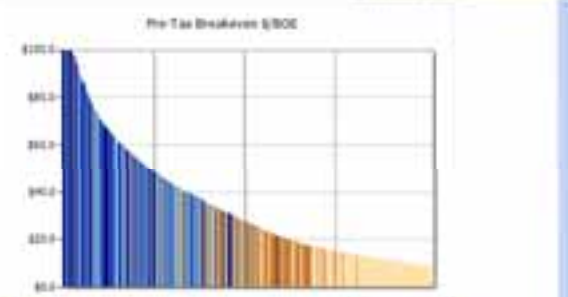
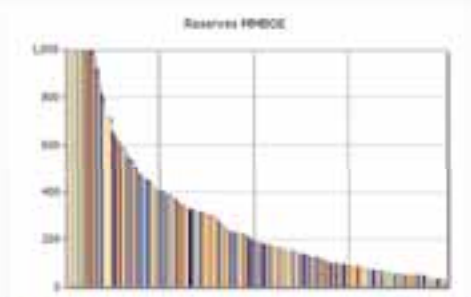
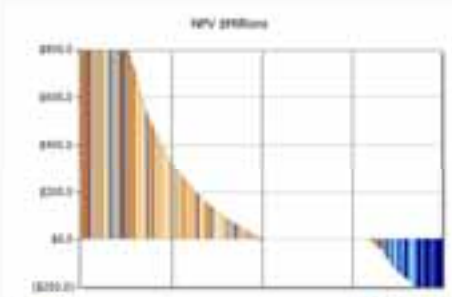
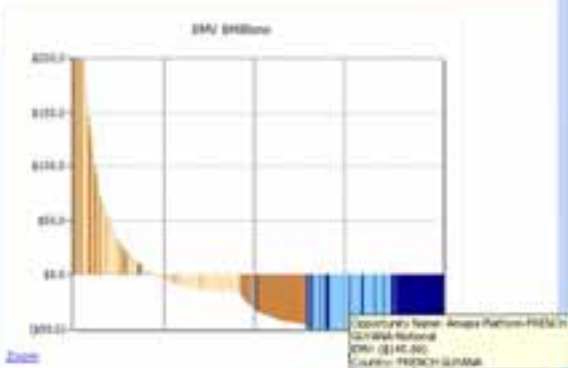
Last Updated: 8/11/2010 12:34:08 PM

# HESS Hess Exploration Dashboard

Opportunity Ranking | Opportunity Characterization | Opportunity Costs | Portfolio Components | Portfolio Forecast | Above Ground | Energy Portfolio | Natural Gas | Data Refresh

### Chart Filters

- Price / Cost / Risk
- Opportunity Selection
- Geographic Filters
- Opportunity Filters
- Range Filters
- Above Ground Filters
- Chart Coloring
- Charts



Source: Hess Corporation  
 Last Updated: 8/11/2010 12:34:08 PM

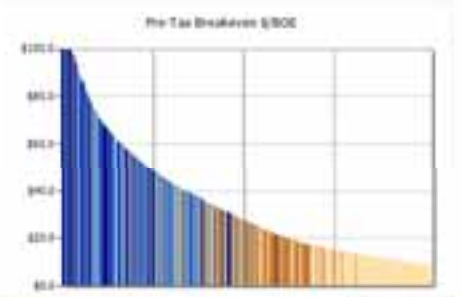
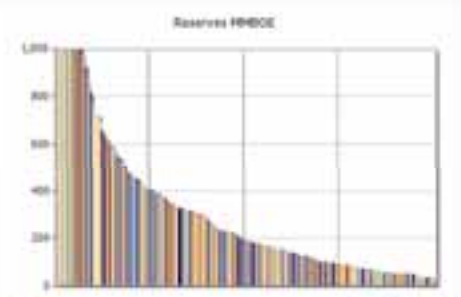
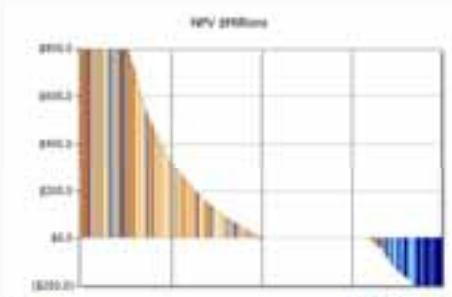
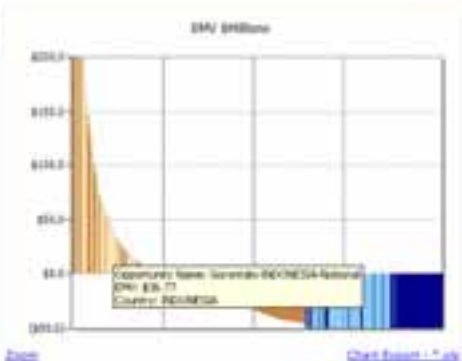


# HESS Hess Exploration Dashboard

Opportunity Ranking | Opportunity Characterization | Opportunity Costs | Portfolio Components | Portfolio Forecast | Above Ground | Energy Portfolio | Natural Gas | Data Refresh

### Chart Filters

- Price / Cost / Risk
- Opportunity Selection
- Geographic Filters
- Opportunity Filters
- Range Filters
- Above Ground Filters
- Chart Coloring
- Charts



Source: Hess Corporation  
 Last Updated: 8/11/2010 12:34:48 PM

**Generate** **Clear All**

#### OPERATIONAL SETTING

- Oilstone
- Staff
- Deepwater
- Ultra-Deepwater

# HESS Hess Exploration Dashboard

Opportunity Ranking | Opportunity Characterization | Opportunity Costs | Portfolio Components | Portfolio Forecast | Above Ground | Energy Portfolio | Natural Gas | Data Refresh

Site Actions

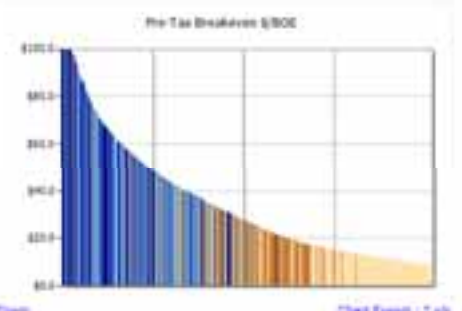
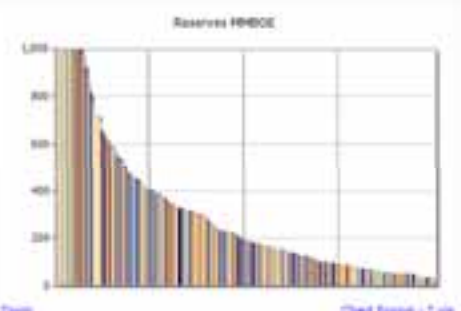
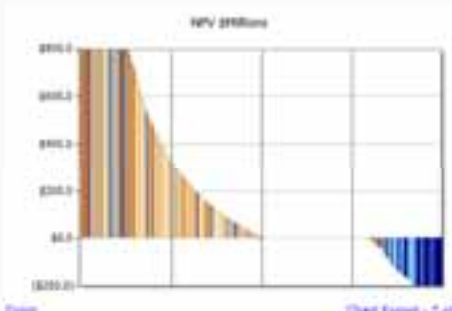
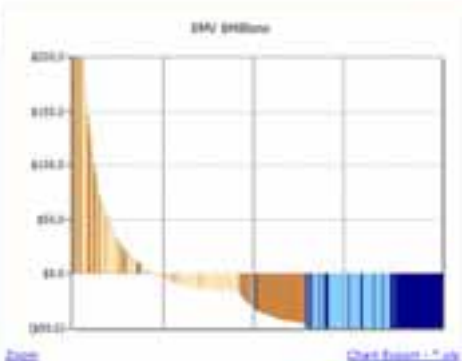
### Chart Filters

- Price / Cost / Risk
- Opportunity Selection
- Ownership
- Business Unit
- Continent
- Country
  - BOTSWANA
  - BRAZIL
  - BRITISH VIRGIN
  - BRUNEI DARUSSALAM
  - MALAYSIA
- Basin
- Opportunity Name
- Geographic Filters
- Opportunity Filters
- Range Filters
- Above Ground Filter

Generate Clear All

**OPERATIONAL SETTING**

- Oil/Gas
- Coal
- Deepwater
- Ultra-Deepwater



Source: Hess Corporation

Last Updated: 8/11/2010 12:34:48 PM

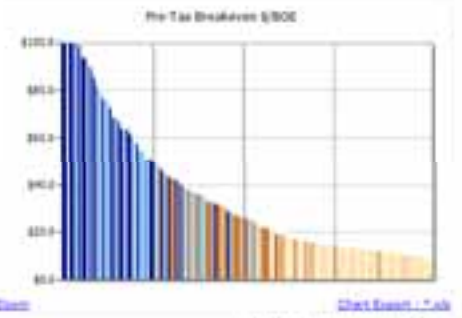
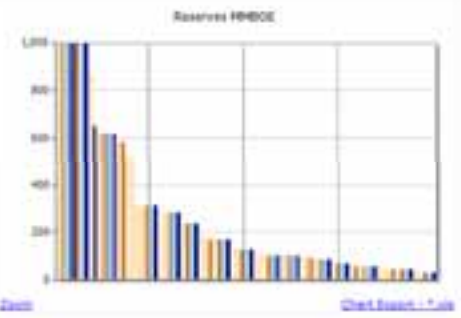
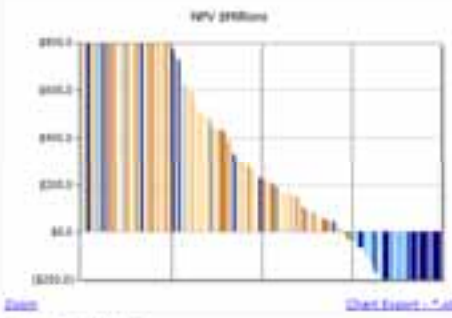
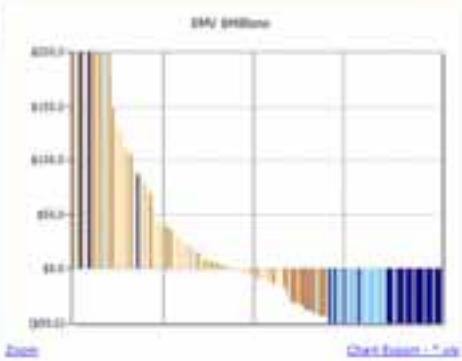
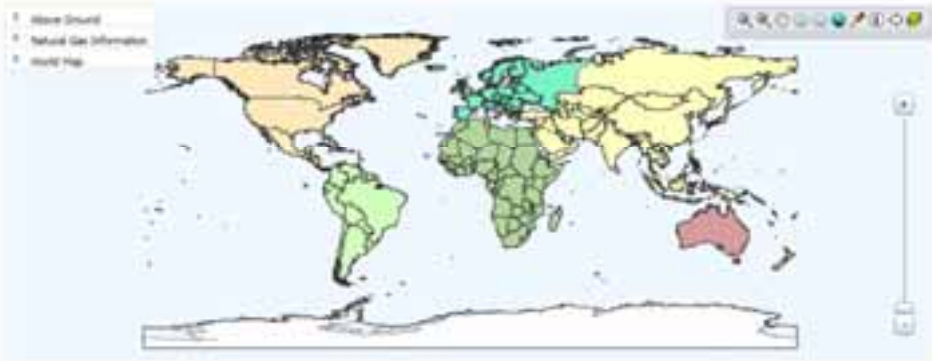
# HESS Hess Exploration Dashboard

Opportunity Ranking | Opportunity Characterization | Opportunity Costs | Portfolio Components | Portfolio Forecast | Above Ground | Energy Portfolio | Natural Gas | Data Refresh

Site Actions

**Chart Filters**

- Price / Cost / Risk
- Opportunity Selection
- Geographic Filters
- Opportunity Filters
- Range Filters
- Above Ground Filters
- Chart Coloring
- Charts



Generate Clear All

**OPERATIONAL SETTING**

- Onshore
- Shelf
- Deepwater
- Ultra-Deepwater

Source: Hess Corporation

Last Updated: 8/11/2010 12:34:08 PM



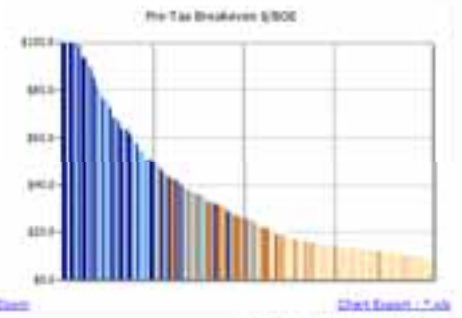
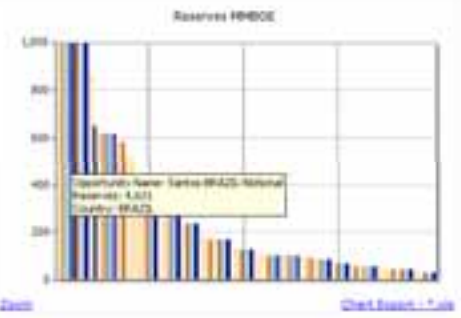
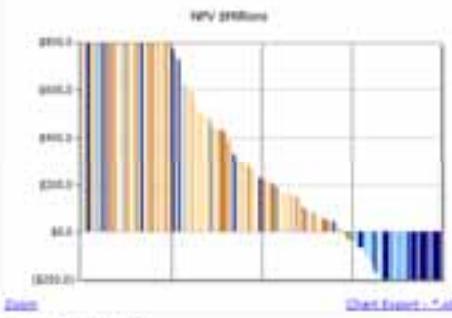
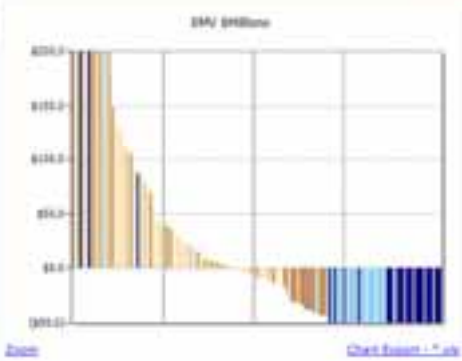
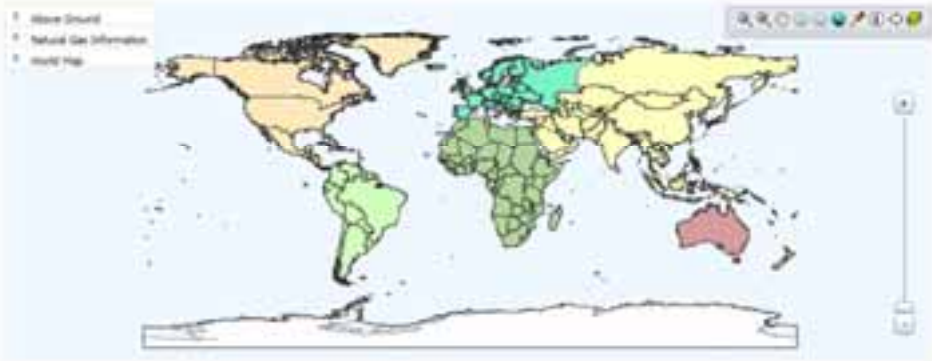
# HESS Hess Exploration Dashboard

Opportunity Ranking | Opportunity Characterization | Opportunity Costs | Portfolio Components | Portfolio Forecast | Above Ground | Energy Portfolio | Natural Gas | Data Refresh

Site Actions

### Chart Filters

- Price / Cost / Risk
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- Opportunity Filters
- Range Filters
- Above Ground Filters
- Chart Coloring
- Charts



Generate Clear All

### OPERATIONAL SETTING

- Onshore
- Off
- Deepwater
- Ultra-Deepwater

Source: Hess Corporation

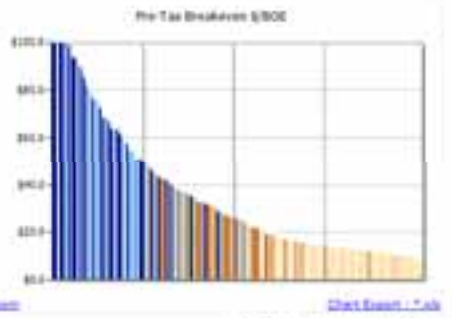
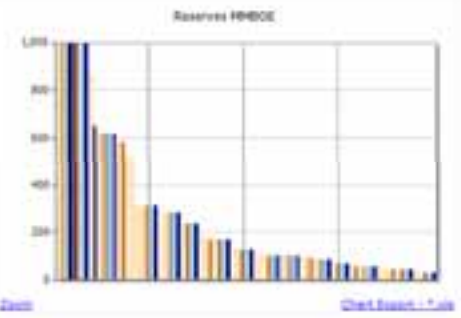
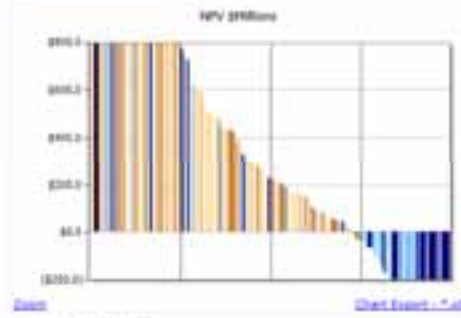
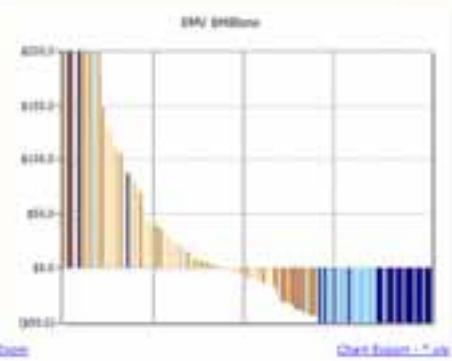
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# HESS Hess Exploration Dashboard

Opportunity Ranking | Opportunity Characterization | Opportunity Costs | Portfolio Components | Portfolio Forecast | Above Ground | Energy Portfolio | Natural Gas | Data Refresh

**Chart Filters**

- Price / Case / Risk
- Opportunity Selection
- Geographic Filters
- Opportunity Filters
- Range Filters
- Above Ground Filters
- Chart Coloring
- Charts



Source: Hess Corporation

Last Updated: 8/11/2010 12:34:08 PM

Generate Clear All

Opportunity Selected: wntbr-brasil-retitled

**OPERATIONAL SETTING:**

- Onshore
- Shelf
- Deepwater
- Ultra Deepwater

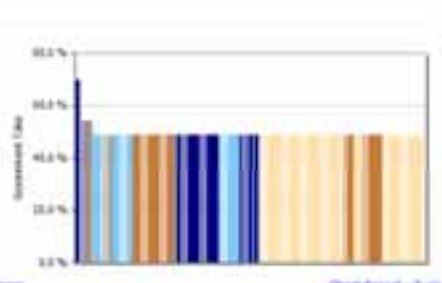
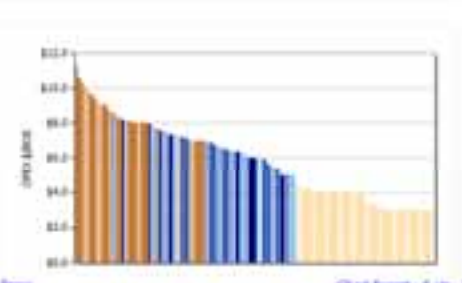
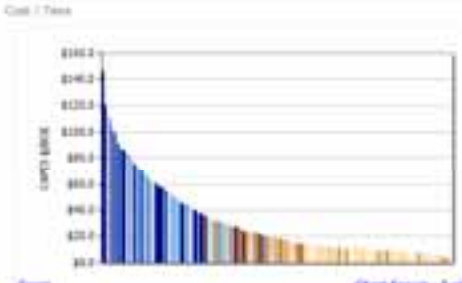
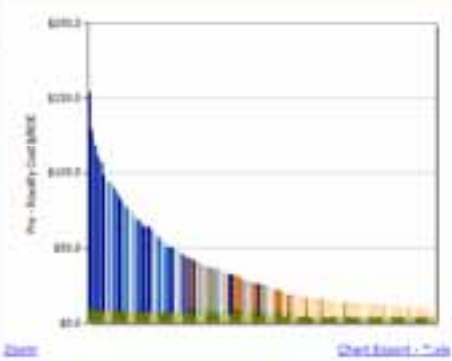
# HESS Hess Exploration Dashboard

Opportunity Ranking | Opportunity Characterization | **Opportunity Costs** | Portfolio Components | Portfolio Forecast | Above Ground | Energy Portfolio | Natural Gas | Data Refresh

Site Actions

### Chart Filters

- Price / Cost / Risk
- Opportunity Selection
- Geographic Filters
- Opportunity Filters
- Range Filters
- Above Ground Filters
- Chart Coloring



Source: Hess Corporation

Last updated: 8/11/2010 12:54:04 PM

Generate Clear All

### OPERATIONAL SETTINGS

- Onshore
- Shelf
- Deepwater
- Ultra-Deepwater



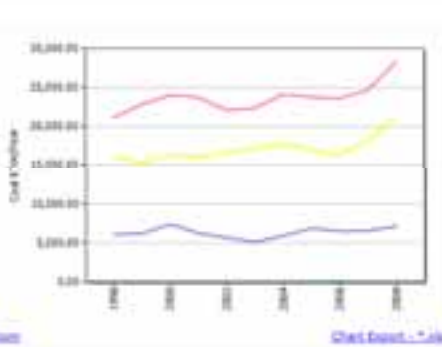
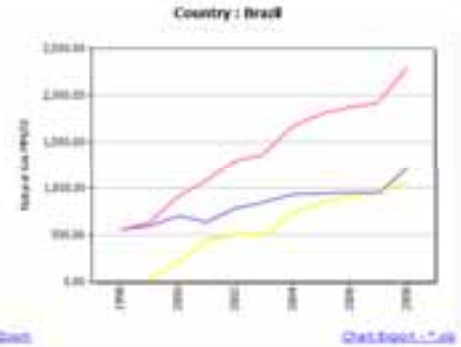
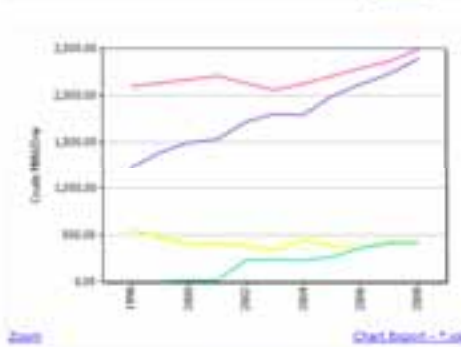
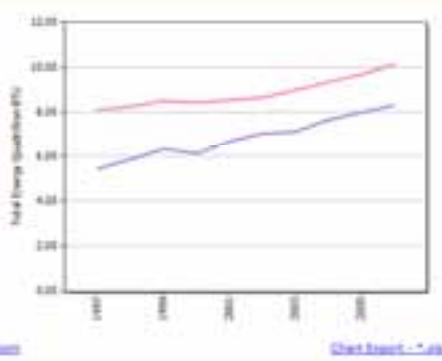
# HESS Hess Exploration Dashboard

Opportunity Ranking | Opportunity Characterization | Opportunity Costs | Portfolio Components | Portfolio Forecast | Above Ground | **Energy Portal** | Natural Gas | Data Refresh

Site Actions

**Chart Filters**

Energy Portal





**HESS**

New Opportunity  
**Screening Analysis Tool**  
S.A.T.

Add New Opportunity  
 View / Edit Opportunity

Program Update 4/7/2011



### Define Opportunity

Owner:

Has?:  C.A.  A.M.I.

Seller:

Date Received:

Age:

Depositional Environment

Primary	Sub 1	Sub 2	Sub 3
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="button" value="Add Primary"/> <input type="button" value="Refresh List"/>	<input type="button" value="Add Sub 1"/> <input type="button" value="Refresh List"/>	<input type="button" value="Add Sub 2"/> <input type="button" value="Refresh List"/>	<input type="button" value="Add Sub 3"/> <input type="button" value="Refresh List"/>

Basin:

Country:

Business Unit:  (auto-filled)

Opp Setting:

Region:  (auto-filled)

Opp Nickname:





# Play Analysis Tool

P.A.T.

- Add / Edit Unconventional Play Summary
- Add / Edit Conventional Play Summary

Program Update 04/08/2011 [View Updates](#)

**Unconventional Play Summary**

Select Basin to view and then click "List by Basin by Play" or "List By Region" or "Add New" or "Add New No Selection"

Basin Name  
Amapa Platform

List by Basin by Play **OR** Add New  
**OR** Add New No Selection  
List By Region **Then** Refresh List

To see new Basins in the list

Unconventional Region Select

Amapa Platform **OR** Add New

Click Play To Edit/View

Play

Demo

Record: 14 1 11 of 1 (Filtered)

H

Add / E

Add / E

Program Up

ool



# ANY QUESTIONS???



Source: USGS  
Source: NASA, NGA, USGS  
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699.4mi

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# Making Mountains Into Molehills



**HESS**

**By: Stephen Eldridge**



Source: USGS  
Source: NASA, NGA, USGS  
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