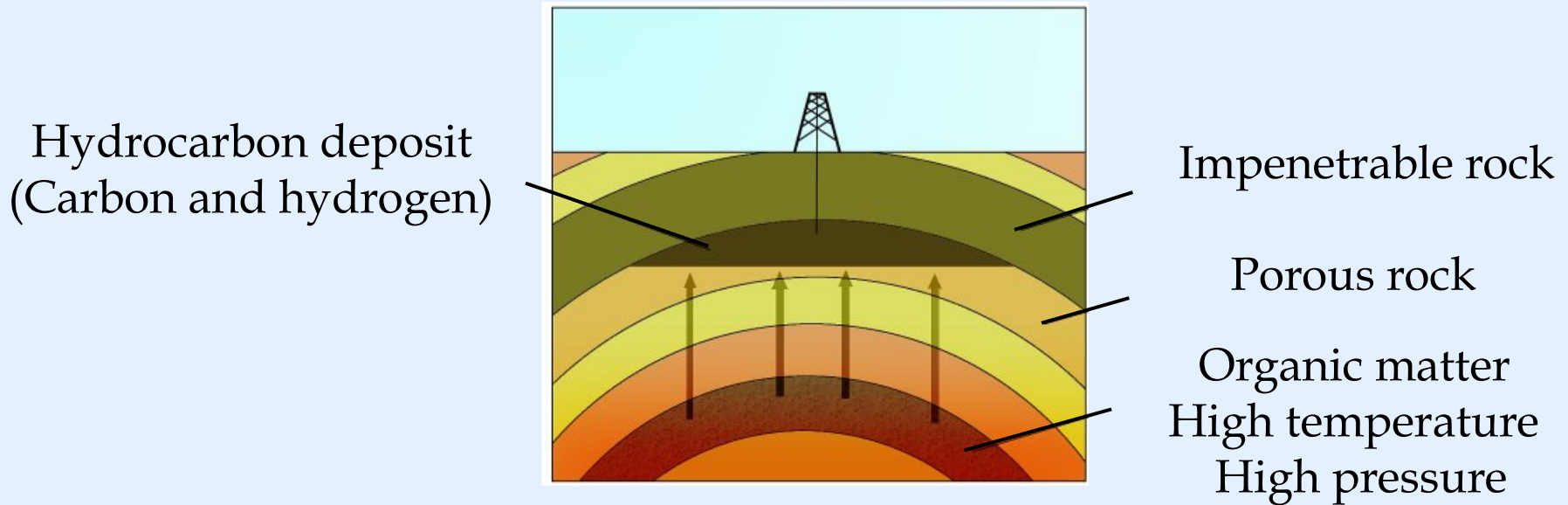


Oil



Maria R. D' Orsogna

Petr-oleum



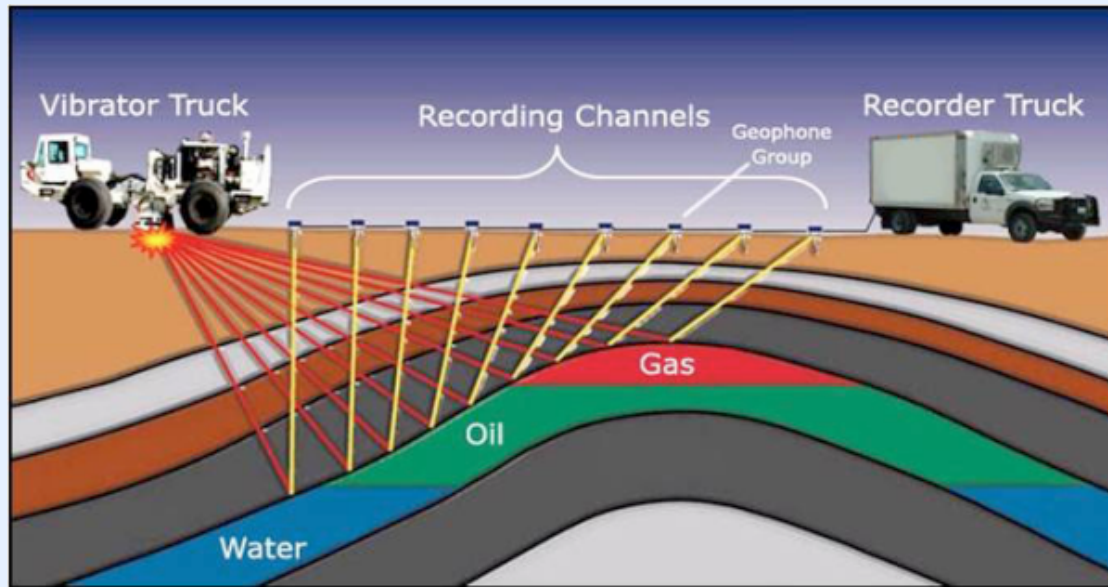
Mostly from the degradation of organic matter over millenia (zooplankton, algae)

Generate energy when burnt

NON RENEWABLE SOURCE

0. SEISMIC TESTING

Vibrator trucks



Thump trucks
Vibroseis trucks

Dozens of miles



Tasmania, Australia 2009



200 strandings

Mexico (2002), Spain (2004), Canada (2004),
New Zealand (2011), Norway (1996), Brazil (2005),
Russia (1999), Alaska (1999), Louisiana (2007)



Air Gun

Sometimes Sperm Whales (*Physeter macrocephalus*) Cannot Find Their Way Back to the High Seas: A Multidisciplinary Study on a Mass Stranding

Sandro Mazzariol^{1*}, Giovanni Di Guardo², Antonio Petrella³, Letizia Marsili⁴, Cristina M. Fossi⁴, Claudio Leonzio⁴, Nicola Zizzo⁵, Salvatrice Vizzini⁶, Stefania Gaspari⁷, Gianni Pavan⁸, Michela Podestà⁹, Fulvio Garibaldi¹⁰, Margherita Ferrante¹¹, Chiara Copat¹¹, Donato Traversa², Federica Marcer¹², Sabina Airoidi¹³, Alexandros Frantzis¹⁴, Yara De Beraldo Quirós¹⁵, Bruno Cozzi¹², Antonio Fernández¹⁵

¹ Department of Public Health, Comparative Pathology and Veterinary Hygiene, University of Padua, Legnaro, Italy, ² Department of Comparative Biomedical Sciences, University of Teramo, Teramo, Italy, ³ Istituto Zooprofilattico Sperimentale della Puglia e della Basilicata, Foggia, Italy, ⁴ Department of Environmental Science, University of Siena, Siena, Italy, ⁵ Department of Veterinary Public Health, University of Bari, Valenzano, Italy, ⁶ Department of Earth and Marine Science, University of Palermo, Palermo, Italy, ⁷ Department of Evolutionary Biology, University of Firenze, Firenze, Italy, ⁸ Department of Animal Biology, Interdisciplinary Center for Bioacoustics, University of Pavia, Pavia, Italy, ⁹ Museum of Natural History of Milan, Milano, Italy, ¹⁰ Department for the Study Territory and its Resources, University of Genova, Genova, Italy, ¹¹ Department of Anatomy, Diagnostic Pathology, Forensic Medicine, Hygiene and Public Health, University of Catania, Catania, Italy, ¹² Department of Experimental Veterinary Science, University of Padua, Legnaro Italy, ¹³ Tethys Research Institute, Milano, Italy, ¹⁴ Pelagos Cetacean Research Institute, Vouliagmeni, Greece, ¹⁵ Department of Morphology, University of Las Palmas de Gran Canaria, Las Palmas, Spain

Abstract

Background: Mass strandings of sperm whales (*Physeter macrocephalus*) remain peculiar and rather unexplained events, which rarely occur in the Mediterranean Sea. Solar cycles and related changes in the geomagnetic field, variations in water temperature and weather conditions, coast geographical features and human activities have been proposed as possible causes. In December 2009, a pod of seven male sperm whales stranded along the Adriatic coast of Southern Italy. This is the sixth instance from 1555 in this basin.

Seismic surveys should also be regarded as potential co-factors

May 2011

Groups oppose air guns offshore in Atlantic

By Bruce Smith | February 06, 2013



CHARLESTON, S.C. (AP) — Conservation groups Tuesday urged the federal government not to permit the use of air guns if energy companies are allowed to search for oil and natural gas off the nation's East Coast.

The guns fire compressed air into the water and researchers use the echoes to map oil and natural gas deposits beneath the ocean floor. Opponents say the devices can also lead to loss of hearing in marine mammals and affect other sea creatures.

Pallone to Interior Secretary: Stop Seismic Airgun Testing in the Atlantic

Jul 17, 2013 | Issues: Energy and Gas Prices, Environment, New Jersey

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Washington, DC — At a House Natural Resources Committee hearing today, Congressman Frank Pallone, Jr. (NJ-06), expressed his strong opposition to offshore oil and gas drilling in the Atlantic Ocean to Secretary of the Interior, Sally Jewell. Pallone, a senior member of the committee, urged the Department of the Interior (DOI) to consider abandoning any plans to drill in the Atlantic.

The DOI is currently deciding whether seismic airgun testing should be allowed to search for offshore oil and gas in the Atlantic Ocean. As the first major step toward offshore oil and gas drilling in the Atlantic, the proposed area for seismic airgun testing spans seven states from Delaware to Florida. Seismic airguns are towed behind ships and shoot loud blasts of compressed air through the water miles into the seabed to search for oil and gas deposits. These airguns make intense pulses of sound, almost as loud as explosives, every ten seconds, 24 hours a day, for days to weeks on end.



The Post's View

Debate over seismic air guns should wait until science has spoken

By Editorial Board, Published: September 5

SEISMIC AIR guns are used to ascertain how much oil and gas lie under certain portions of the ocean floor. They're towed behind ships that trace grids on the surface of the water, and they shoot blasts of compact air to the bottom of the ocean to track the reflected sounds. The problem is that those underwater blasts, at around 180 decibels, are louder than roaring jet engines, and they might harm ocean mammals, disrupting the feeding and migration patterns of whales, dolphins and other creatures.

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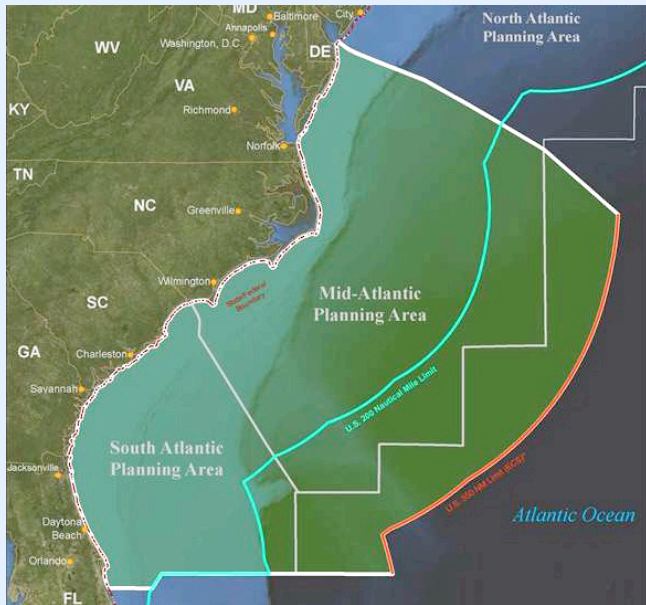
Seismic blast tests for oil, gas off Southeast Coast further delayed

Bo Petersen

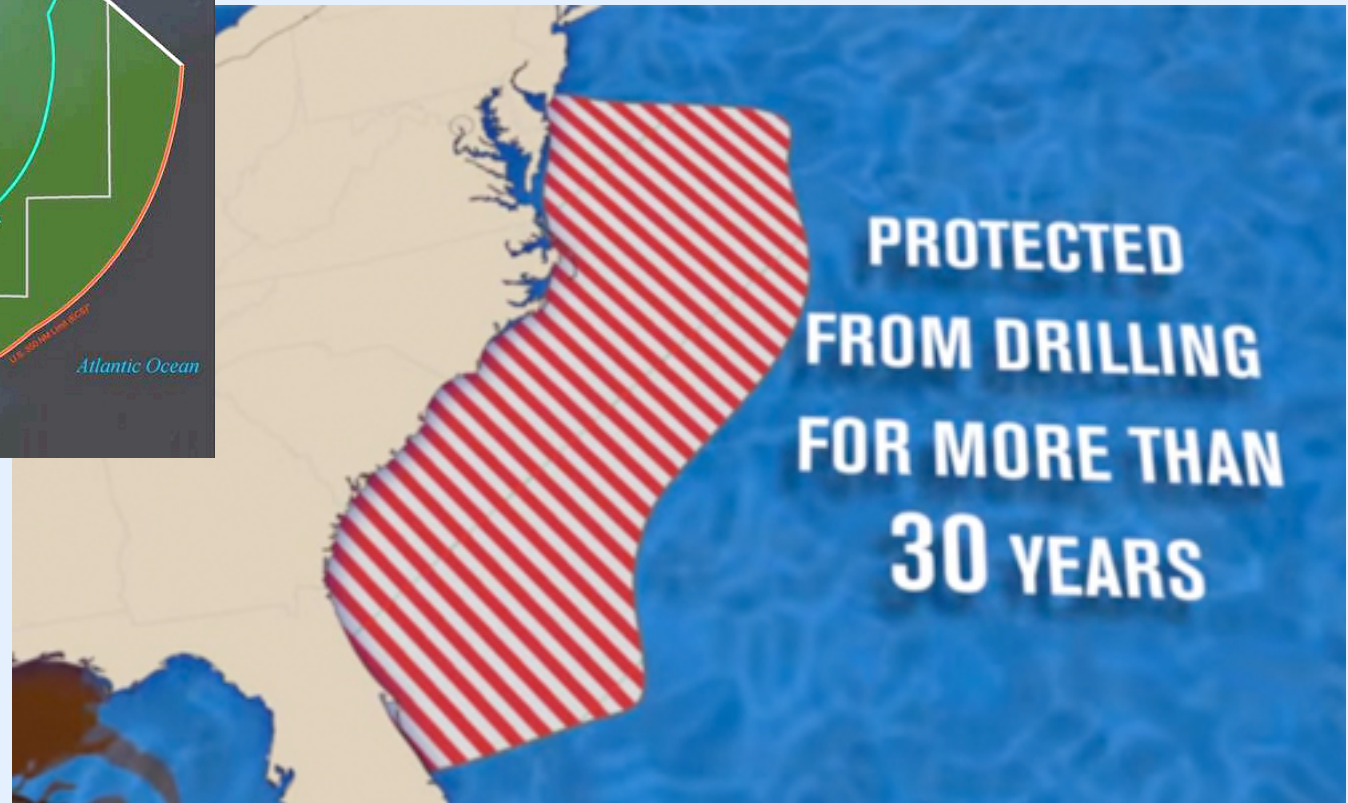
Posted: Thursday, August 22, 2013 5:38 p.m., Updated: Friday, August 23, 2013 2:04 p.m.

Landmark Decision Approves Seismic Airgun Testing for Oil & Gas Drilling Off Atlantic Coast

EcoWatch | July 21, 2014 5:02 pm | [Comments](#)



July 21
2014



1. EXTRACTION

Drilling muds and fluids

Water-based muds or fluids (WBM)

Water, clay, chemicals - potassium and bentonite

Oil based muds (OBM)

Diesel fuels and other petroleum byproducts - more toxic

Synthetic based muds (SBM)

Less toxic than OBM

All are toxic, difficult to dispose of

Mud engineer, 10% of total costs

Ingredients

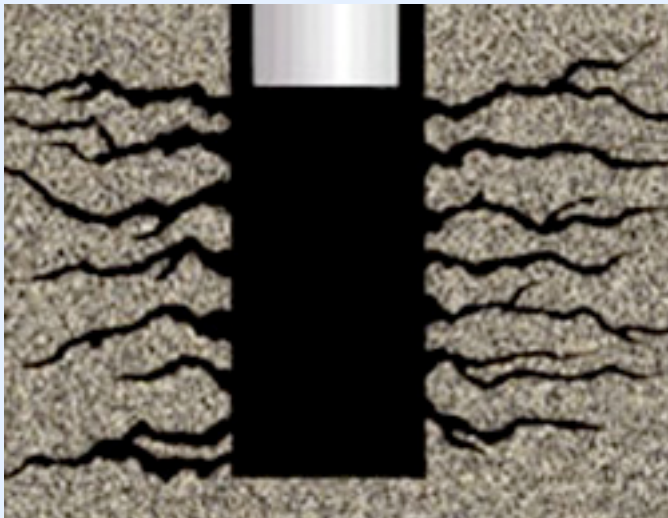
- guar gum derivative • diesel fuel • fumaric acid
 - adipic acid • benzene • ethylbenzene
 - methyl tert-butyl ether • naphthalene
 - toluene • xylene
- sodium hydroxide • poly aromatic hydrocarbons
 - boric acid • ethylene glycol
 - monoethanolamine • isopropanol
 - diethanolamine • hydrochloric acid
 - diammonium peroxodisulfate
 - 2-bromo-2-nitro-1,3-propanediol
 - polynuclear aromatic hydrocarbons
- methanol • propargyl alcohol • lubricants

Drilling acids – HCl, HF

increase permeability

pump acid

dissolve quartz, sand, clay, limestone, dolomite, calcite
cement between sediment grains of rocks
that inhibit rock permeability
enlarge natural pores of the reservoir
stimulate flow of hydrocarbons



mixed with muds,
highly corrosive

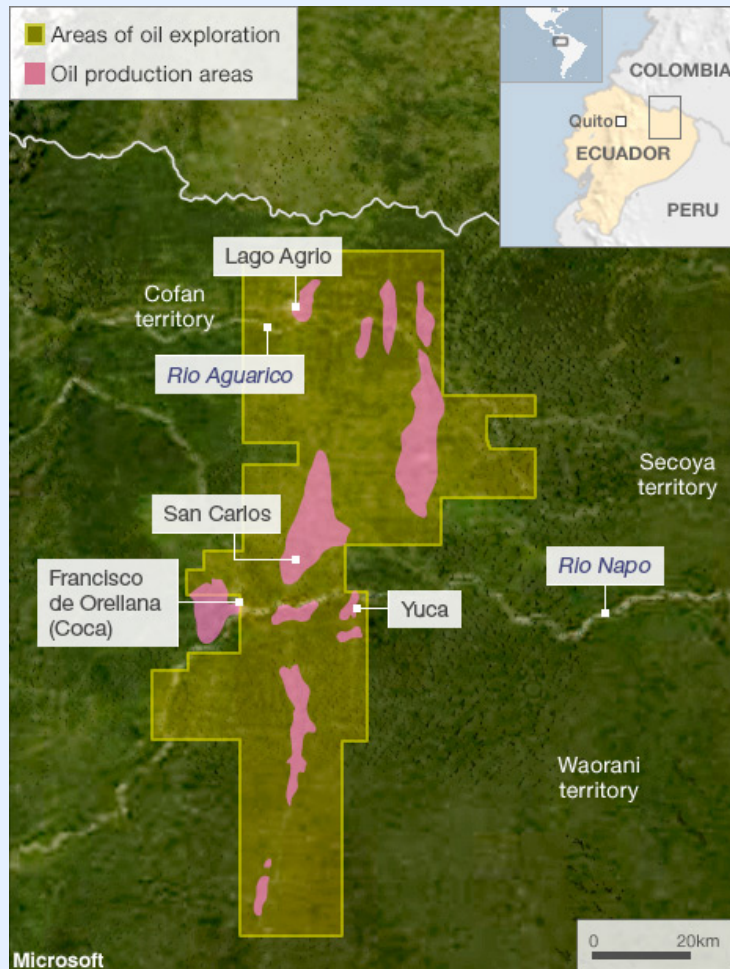
low or high
pressure

Texaco's mess in Ecuador



<http://www.vanityfair.com/politics/features/2007/05/texaco200705?currentPage=all>

Texaco's mess in Ecuador



Lago Agrio, Ecuador

The soil in the concession area has been found to be tainted with unusually high levels of chromium 6, cadmium, and barium—all toxic materials associated with the drilling and extraction process.



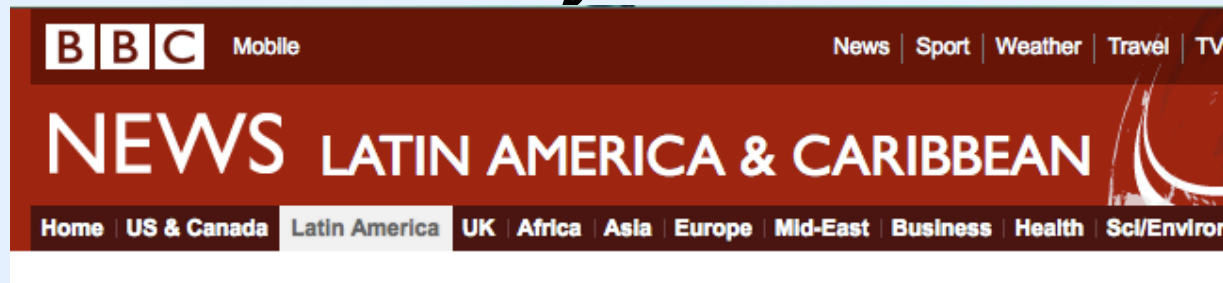
1,700 square miles of
contaminated soil –
more than 340 open pits

billion dollar clean up

Pablo Fajardo

I realized that I was not inferior to the Chevron lawyers.
In fact I had one advantage over them: I know the problems as they really are,
because I live here. I have lived here for more than half my life.
I realized that if I took the case all I would have to think about is how to tell the truth.

February 14th 2011



Chevron fined for Amazon pollution by Ecuador court

A court in Ecuador has fined US oil giant Chevron \$8.6bn (£5.3bn) for polluting a large part of the country's Amazon region.

The oil firm Texaco, which merged with Chevron in 2001, was accused of dumping billions of gallons of toxic materials into unlined pits and Amazon rivers.

Campaigners say crops were damaged and farm animals killed, and that local cancer rates increased.



Maria Eugenia Briceno lives in the area affected by the pollution

\$8.6 billion
+ restoration
=
\$9.5 billion

+ apology

Pablo Fajardo

"a triumph of justice over Chevron's crime and economic power".



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Illegitimate Judgment Against Chevron in Ecuador Lawsuit

[Chevron to appeal in Ecuador, enforcement blocked by U.S. and international tribunals](#)

SAN RAMON, Calif. – Feb. 14, 2011 – Chevron Corporation (NYSE: CVX) today announced there has been an adverse judgment from the Provincial Court of Justice of Sucumbíos in Lago Agrio, Ecuador in an environmental lawsuit involving Texaco Petroleum Company.

In response to the ruling, Chevron issued the following statement:

"The Ecuadorian court's judgment is illegitimate and unenforceable. It is the product of fraud and is contrary to the legitimate scientific evidence. Chevron will appeal this decision in Ecuador and intends to see that justice prevails.

"United States and international tribunals already have taken steps to bar enforcement of the Ecuadorian ruling. Chevron does not believe that today's judgment is enforceable in any court that observes the rule of law.

"Chevron intends to see that the perpetrators of this fraud are held accountable for their misconduct."

More information can be found at www.chevron.com/ecuador.

And appeal they did.

The New York Times

Business Day

Energy & Environment

WORLD

U.S.

N.Y. / REGION

BUSINESS

TECHNOLOGY

SCIENCE

HEALTH

SPORTS

OPINION

Chevron Wins Injunction Against Ecuadorean Plaintiffs

By LAWRENCE HURLEY of [Greenwire](#)

Published: March 8, 2011

Chevron Corp. scored a major legal victory last night when a federal judge ruled that plaintiffs who won an \$8.6 billion judgment for pollution in Ecuador cannot seek to collect damages in the United States or in other countries.

More News From Greenwire

U.S. District Judge Lewis Kaplan of the Southern District of New York

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March 8 2011



REUTERS

EDITION: U.S.

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January 26 2012

Chevron loses injunction in \$18 billion Ecuador case

[Recommend](#) 24 people recommend this. Be the first of your friends.

By Jonathan Stempel

Thu Jan 26, 2012 4:32pm EST

(Reuters) - A U.S. appeals court threw out an injunction that Chevron Corp had won to block enforcement of an \$18 billion judgment in Ecuador for polluting the Amazon jungle and damaging the health of residents.

The 2nd U.S. Circuit Court of Appeals in New York said Chevron acted prematurely in seeking to block enforcement of the judgment worldwide, given that the residents of Ecuador's Lago Agrio region had not yet sought

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Related News

[Chevron a](#)

Unfortunately.. March 4 2014

Judge Lewis Kaplan, in NY declared the
Ecuadorean judgment null and void.

”A five-year effort to extort and defraud Chevron.”

Seizing assets around the world?

Argentina

Brazil

Canada



Canada's Top Court Rules in Favor of Ecuador Villagers in Chevron Case

The case will go back to an Ontario court, where the two sides will argue over a \$9.5 billion judgment against Chevron

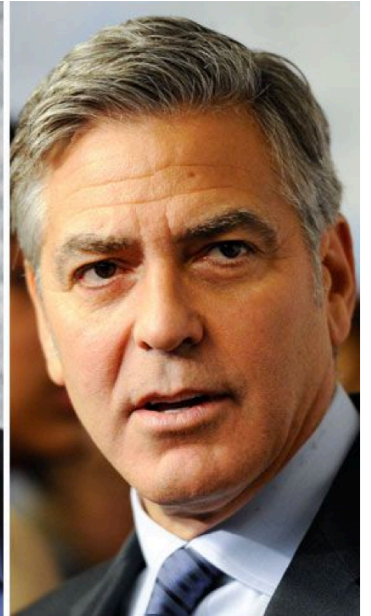


A worker cleans up an oil-waste pit in Shushufindi, Ecuador, in 2009. PHOTO: GUILLERMO GRANJA/REUTERS



Brad Pitt edges out George Clooney for film rights to Chevron-Donziger story

“Law of the jungle”



Paul Barrett's "Law of the Jungle,"

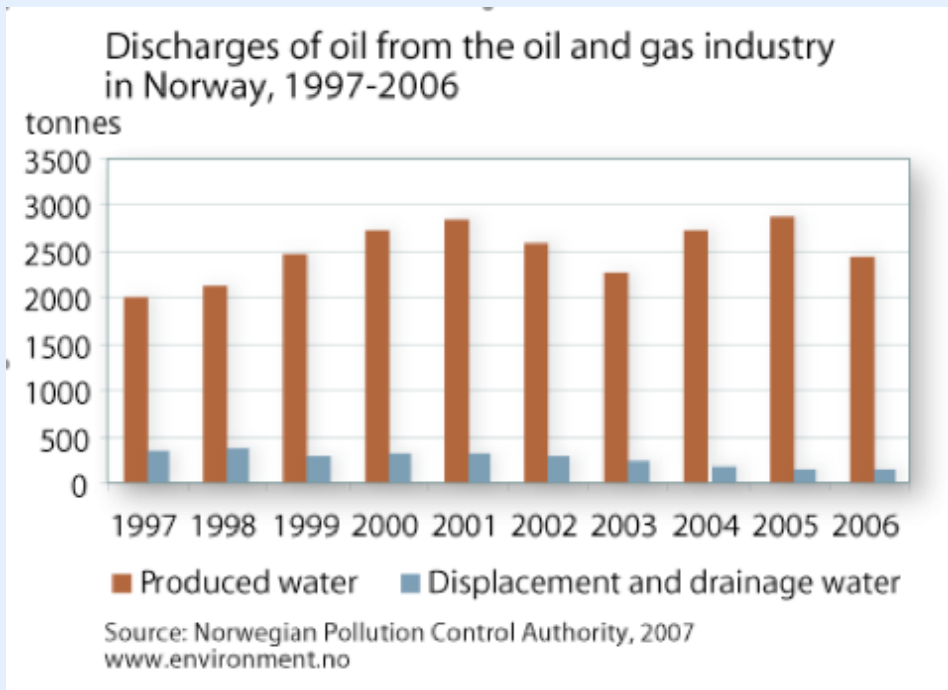
Brad Pitt, left, Steven Donziger,

Water waste

Drilling fluids are **ORDINARILY** dumped in the sea

benzene, toluene, xylene, ethylbenzene, (BTEX), nitrates, cadmium, chrome, barium, arsenic, mercury, lead, zinc, copper

PRODUCED WATERS: salt, radon, biocides, anti-corrosives, hydrocarbons



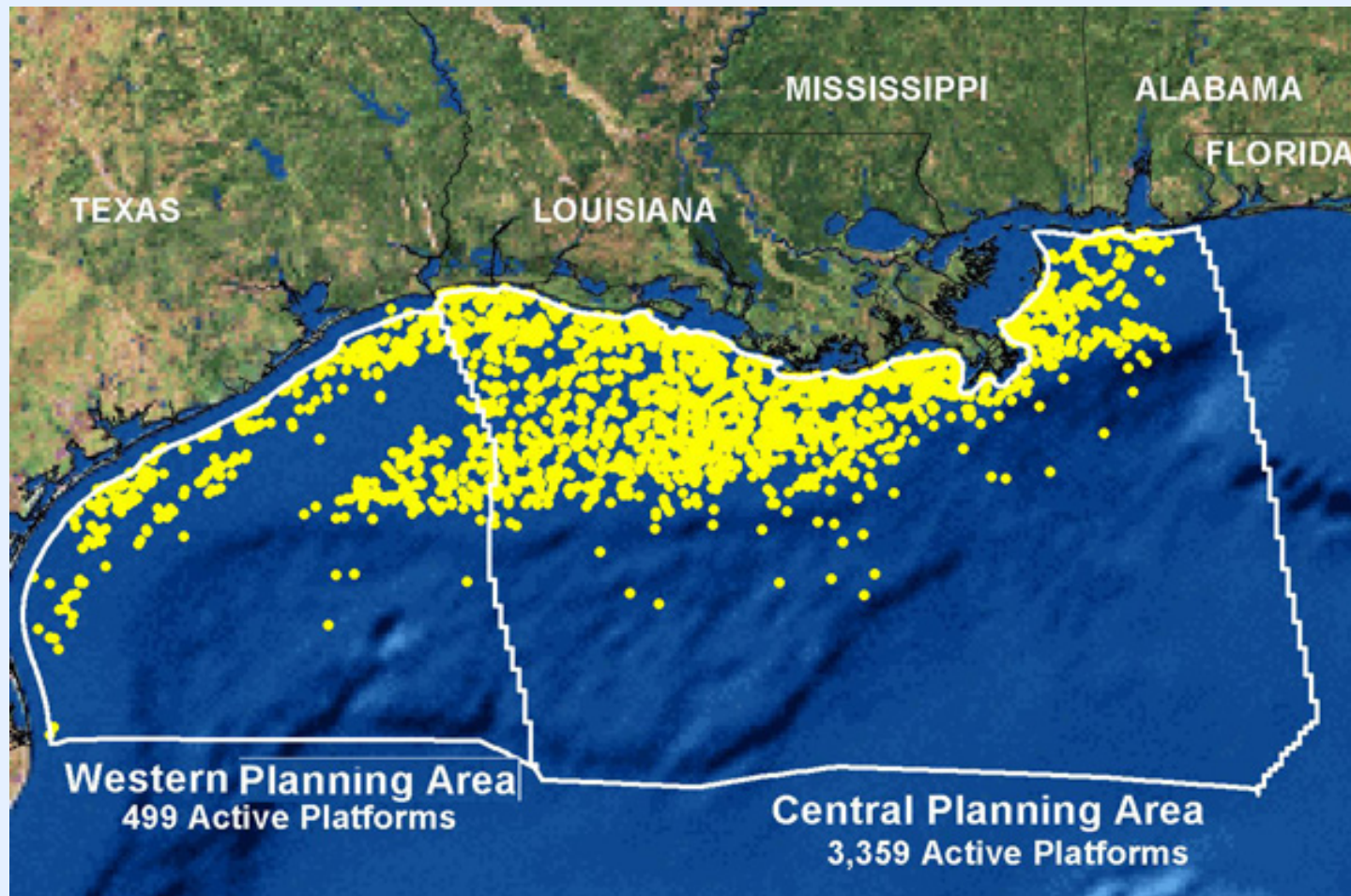
Oceana

“Offshore rigs can dump tons of drilling fluid, metal cuttings, including toxic metals, such as lead chromium and mercury, as well as carcinogens, such as benzene, into the ocean.”

“The drilling waste, including metal cuttings, from exploratory drilling are generally dumped in the ocean, rather than being brought back up to the platform.”

The gulf of Mexico

A Gulf of Mexico rig
dumps about 90,000 tons of drilling fluid and metal cuttings over its
lifetime, with its wells also contributing with heavy metals

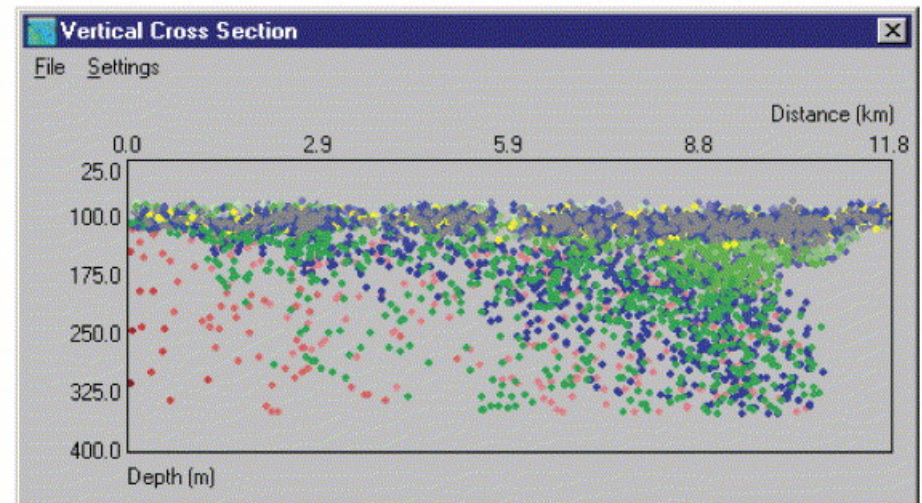
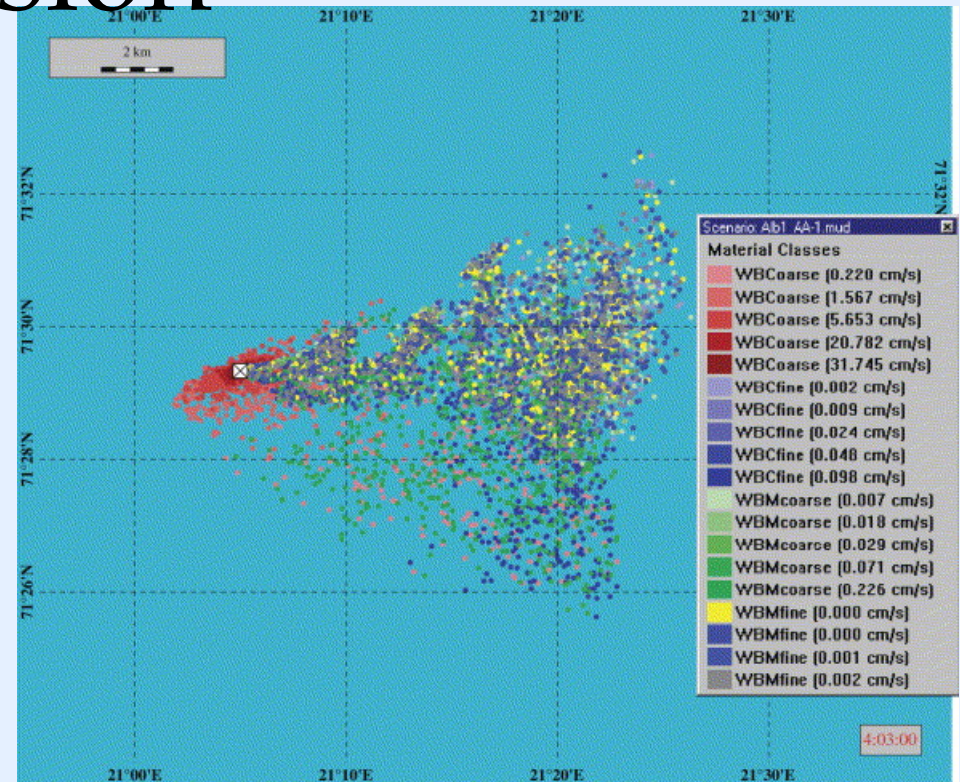
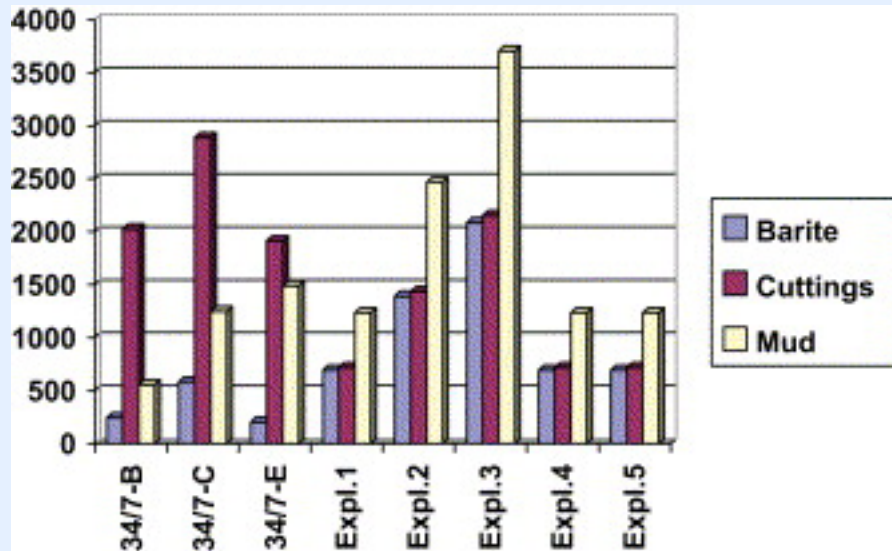


Diffusion

Cutting can be dispersed over a range of several miles

Ryea et al Env Mod 21 (2006)

Exploratory wells



Food and water watch

Recent reports have highlighted a connection between oil and gas rigs and elevated mercury levels in surrounding sediments and wild-caught fish. Data from a 1996 U.S. Department of Interior Minerals Management Service study of three rigs in the Gulf of Mexico revealed that sediments within a few hundred feet of two rigs had mercury levels many times higher than base levels in Gulf of Mexico sediments.⁵ Data also indicated that shrimp and fish caught beneath the rig with the most contaminated sediments had average mercury levels that were two to five times higher than those caught around the least contaminated rigs.⁶

Scientists attribute the mercury contamination in and around the rigs to drilling „muds,”⁷ which are a mercury-rich mixture of the sediments and materials that cool and lubricate drill bits that bore into the ocean and are ultimately discharged into the ocean.⁸

In 2001, federal guidelines limited the amount of mercury in drilling muds,⁹ but approximately 1,600 pounds of mercury are still legally dumped into the Gulf of Mexico from the 1,091 new wells drilled each year.¹⁰ High levels of mercury remain in sediments 12 years after drilling has stopped.¹¹

<http://www.foodandwaterwatch.org/>

Oil rigs do not serve as natural, healthy habitat, but instead cook up a toxic soup for the marine life unknowingly attracted to them.

Linda Sheehan,
California Coastkeeper Alliance

SPECIAL REPORT

PRESS-REGISTER

Mercury concerns hit West

By BEN RAINES
Staff Reporter
04/07/02

In response to reports of mercury contamination at oil and gas rigs in the Gulf of Mexico, California's legislature is considering a bill that would require mercury testing around that state's offshore rigs in the Pacific Ocean.

The California bill, which is being pushed by the California commercial fishing association, also calls for an investigation into possible harm to humans who consume fish or shellfish caught near oil rigs.



Alberta, Canada

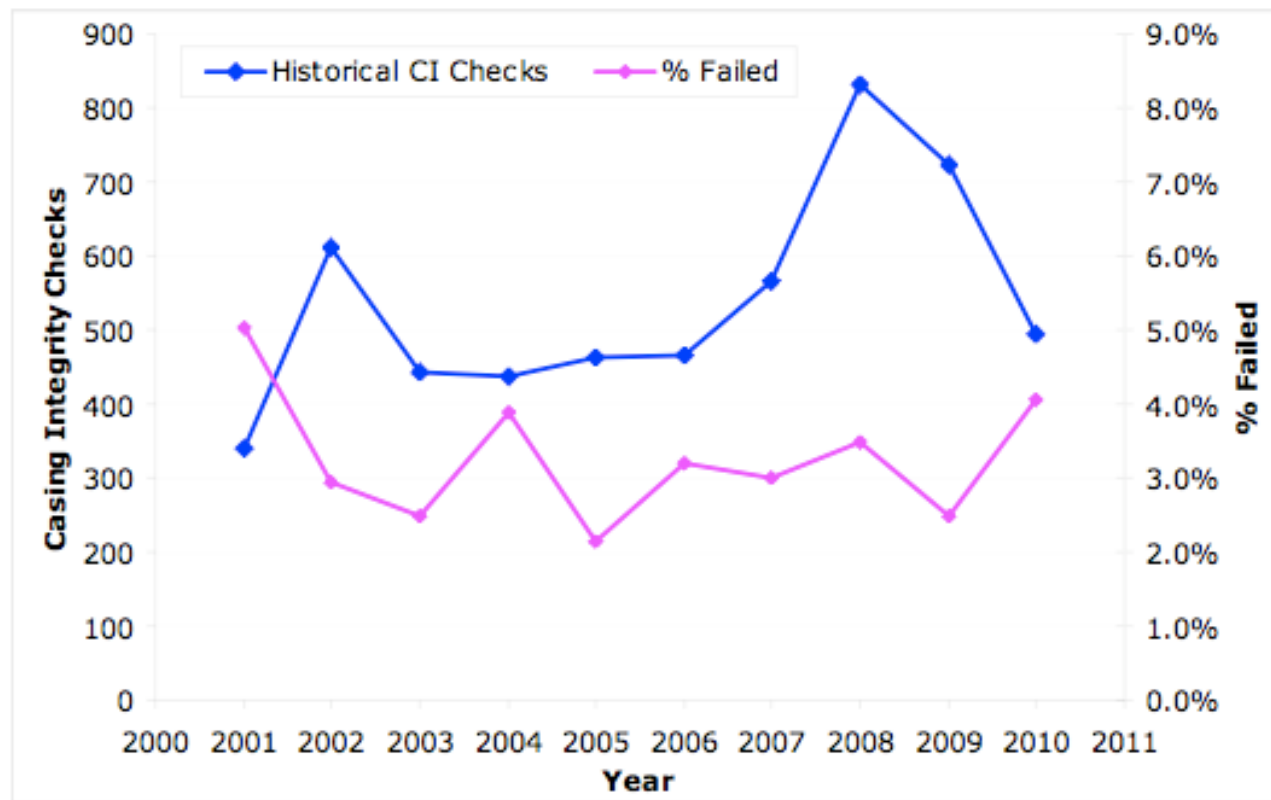


Figure 14: Casing Integrity Check History



Each year, 3% of wells has some kind of structural defect

Flaring of excess gas

Flaring is a process by which unusable or excess natural gas is released by a pressure valve and burned releasing tonnes of carbon dioxide into the atmosphere.



Nigeria - Ogoniland

Flared gases include nitrogen dioxide, sulphur dioxide, and volatile organic compounds like xylene and hydrogen sulfide. Carcinogens such as benzopyrene are also released. People exposed to these substances can suffer from a variety of respiratory problems, which have been reported amongst many children in the Niger Delta but have but have never been systemically investigated. These chemicals can also aggravate asthma, cause breathing difficulties and pain, as well as chronic bronchitis.



Nigeria



Nigeria



Nigeria



Halliburton and deepening roots of corruption in Nigeria



AND ALEX ECHIEJINA

Halliburton to pay \$559 million to settle bribery probe



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The U.S. government's probe of Halliburton related to construction and expansion of a gas liquefaction facility at Bonny Island in Rivers State, Nigeria, and other projects dating back as much as 20 years, Halliburton has said in regulatory filings.

In July, Halliburton said it had "reason to believe" payments may have been made to Nigerian officials by agents of its TSKJ consortium, which built the Bonny Island Facility.

The TSKJ consortium includes France's Technip SA, Italy's Snamprogetti and Japan's JGC Corp.

By [Anna Driver](#)

HOUSTON | Mon Jan 26, 2009 2:18pm EST

(Reuters) - Halliburton Co will pay a \$559 million fine to end an investigation of its former KBR Inc unit if the U.S. government approves the settlement, the largest penalty against a U.S. company for charges of bribery under federal law.

Nigeria - Rampant Corruption



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UNEP Ogoniland Oil Assessment Reveals Extent of Environmental Contamination and Threats to Human Health

Thu, Aug 4, 2011

The environmental restoration of Ogoniland in Nigeria could prove to be the world's most wide-ranging and long term oil clean-up exercise ever undertaken if contaminated drinking water, land, creeks and important ecosystems such as mangroves are to be brought back to full, productive health.

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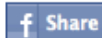
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0



August 2011

UN
environmental
Report

14 months

200 locations

23,000 people

5,000 medical
records

122 km
pipelines



Are you comfortable in your retirement?
If you have a \$500,000 portfolio, download the guide and money manager Ken Fisher's firm. It's called "The Retirement Guide".
[Click Here to Download Your Guide!](#)

4 August 2011 Last updated at 15:30 ET

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Nigeria Ogoniland oil clean-up 'could take 30 years'

Nigeria's Ogoniland region could take 30 years to recover fully from the damage caused by years of oil spills, a long-awaited UN report says.

The study says complete restoration could entail the world's "most wide-ranging and long-term oil clean-up".

Communities faced a severe health risk, with some families drinking water with high levels of carcinogens, it said.



The Ogoni people say their land has been devastated by pollution from the oil industry.

Insight: A year on, Nigeria's oil still poisons Ogoniland

Recommend

108 people recommend this. Be the first of your friends.



By Tim Cocks

OGONILAND, Nigeria | Sun Aug 5, 2012 12:21pm EDT

(Reuters) - A bright yellow sign above the well in this sleepy Nigerian village says 'caution: not fit for use', and the sulphurous stink off the water that children still pump into buckets sharply reinforces that warning.

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Thu, Aug 2 2012

Oil down second day as stimulus hopes

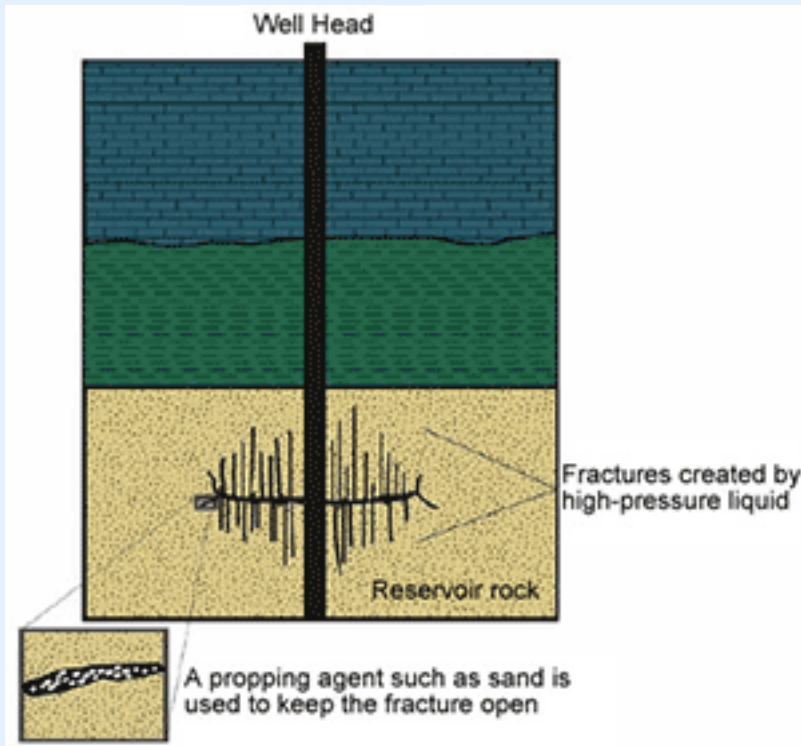
Fracking - USA

Natural gas extraction method for deep well drilling

Millions of gallons of water, sand and proprietary chemicals are injected into a well at high pressure

Fracturing of the rock props open fissures that enable natural gas to flow more freely out of the well.

Before fracturing methods were developed this gas was considered inaccessible



Gas well 8,000 feet
Water well 1,000 feet

November 17, 2008 | [51 comments](#)

Drill for Natural Gas, Pollute Water

The natural gas industry refuses to reveal what is in the mixture of chemicals used to drill for the fossil fuel

By [Abrahm Lustgarten](#) and [ProPublica](#)

1000 water wells polluted – methane levels 1500 times higher than limits in Pennsylvania, Colorado, New Mexico, Alabama, Ohio

Pennsylvania, other states confirm water pollution from natural gas drilling

6

comments



California Halts Injection of Fracking Waste, Warning it May Be Contaminating Aquifers

State's drought has forced farmers to rely on groundwater, even as California aquifers have been intentionally polluted due to exemptions for oil industry.

by [Abrahm Lustgarten](#)
[ProPublica](#), July 18, 2014, 11:50 a.m.



Published: February 26, 2011

Toxic Contamination From Natural Gas Wells

The New York Times collected data from more than 200 natural gas wells in Pennsylvania. Many of them are tapping into the Marcellus Shale, a vast underground rock formation. But a method being used to stimulate wells, called hydraulic fracturing, produces wastewater containing corrosive salts and radioactive and carcinogenic materials. In Pennsylvania, this wastewater has been sent through sewage treatment plants that cannot remove some of the contaminants before the water is discharged into rivers and streams that provide drinking water. The Times was able to map 149 of the wells.

Radium

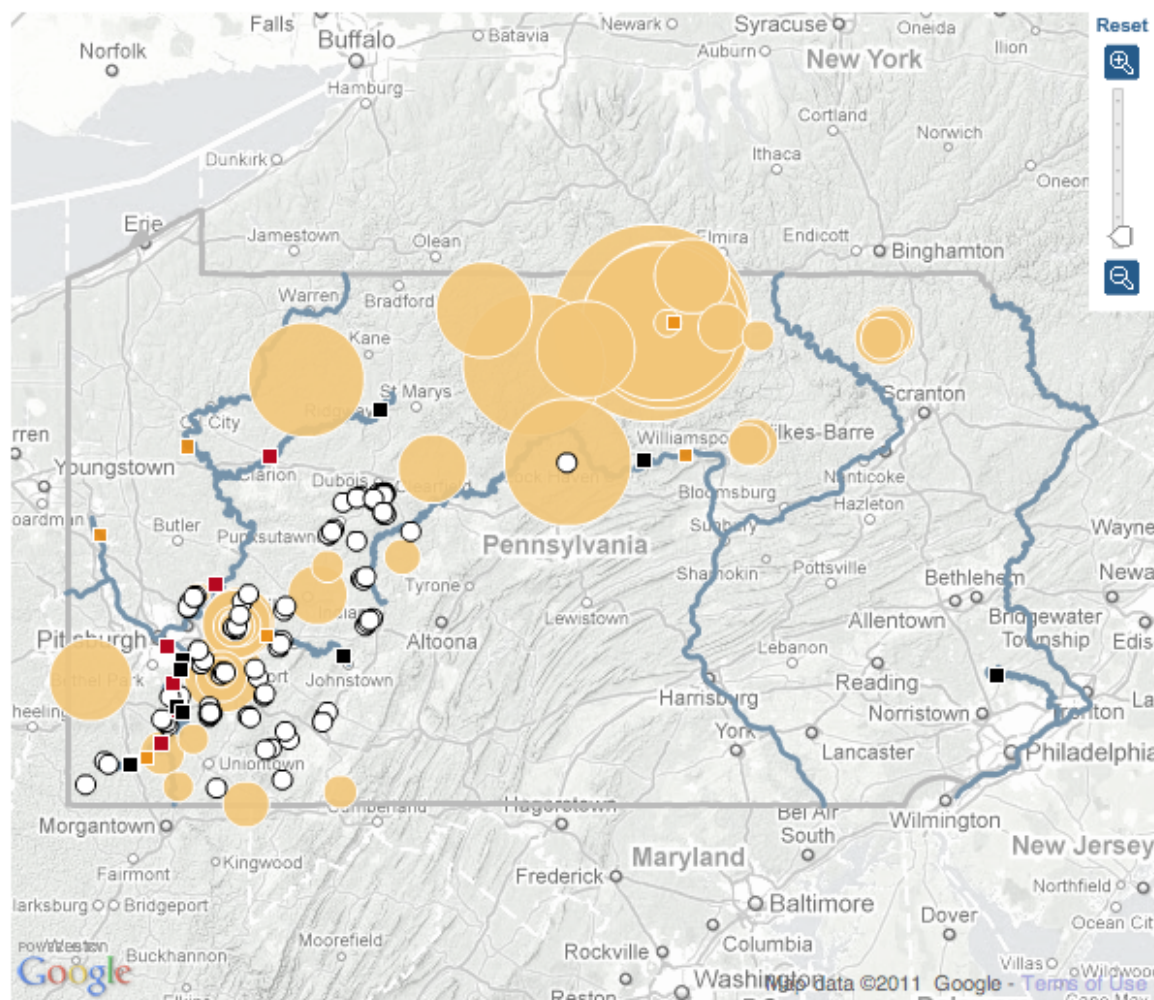
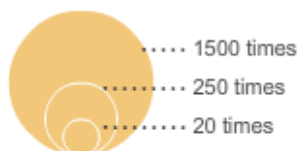
Uranium

Gross Alpha

Benzene

42 wells exceeded the federal drinking water standard for radium.

AMOUNT OVER THE FEDERAL LIMIT FOR RADIUM



How much toxic contamination was found in wastewater from each well

Colored circles on the map are scaled to show the amount of each contaminant found in wastewater from each well. The key to the left shows the amount over the federal limit.

- Under the limit or no data
- Public sewage treatment plant that accepted gas industry wastewater within the past four years
- Drinking water intake plant that drew in water downstream from wastewater discharge
- Water quality monitoring station that began testing for radioactivity in rivers in November 2010

Gasland

In 1974, the Safe Drinking Water Act (SDWA) was passed by Congress to ensure clean drinking water free from both natural and man-made contaminants.

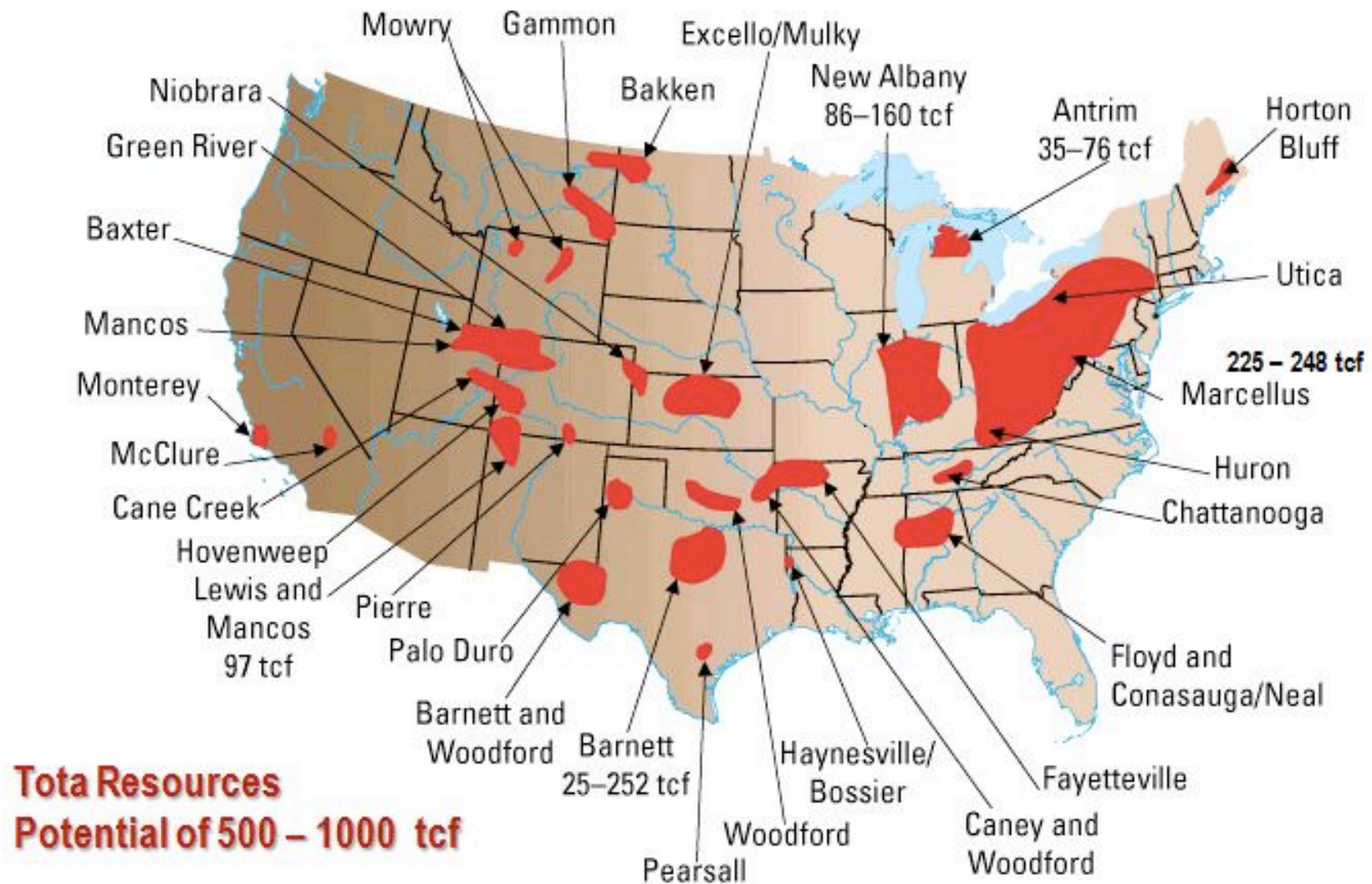
In 2005, the Bush/ Cheney Energy Bill exempted natural gas drilling from the Safe Drinking Water Act. It exempts companies from disclosing the chemicals used during hydraulic fracturing.

Essentially, the provision took the Environmental Protection Agency (EPA) off the job.

It is now commonly referred to as the Halliburton Loophole.

Our country

Shale Gas Basins In The United States



Williston, North Dakota



Traffic has increased, along with air pollution, job-site accidents, highway accidents, sexual assaults, bar fights, prostitution, and drunken driving. Municipalities have more litter and garbage to haul away, and more sewage to treat. Police and other emergency workers are burning out; the new hires – who get promoted quickly – have almost zero experience on the job.

I considered the price that North Dakotans were paying to help America achieve “energy independence.” **It’s a dream that sounds grand** only if you can ignore the global warming pollution created by burning all this fuel, or the fact that we’re tapping a finite resource, or the many remaining technical challenges involved in drilling every possible reserve left on the planet.

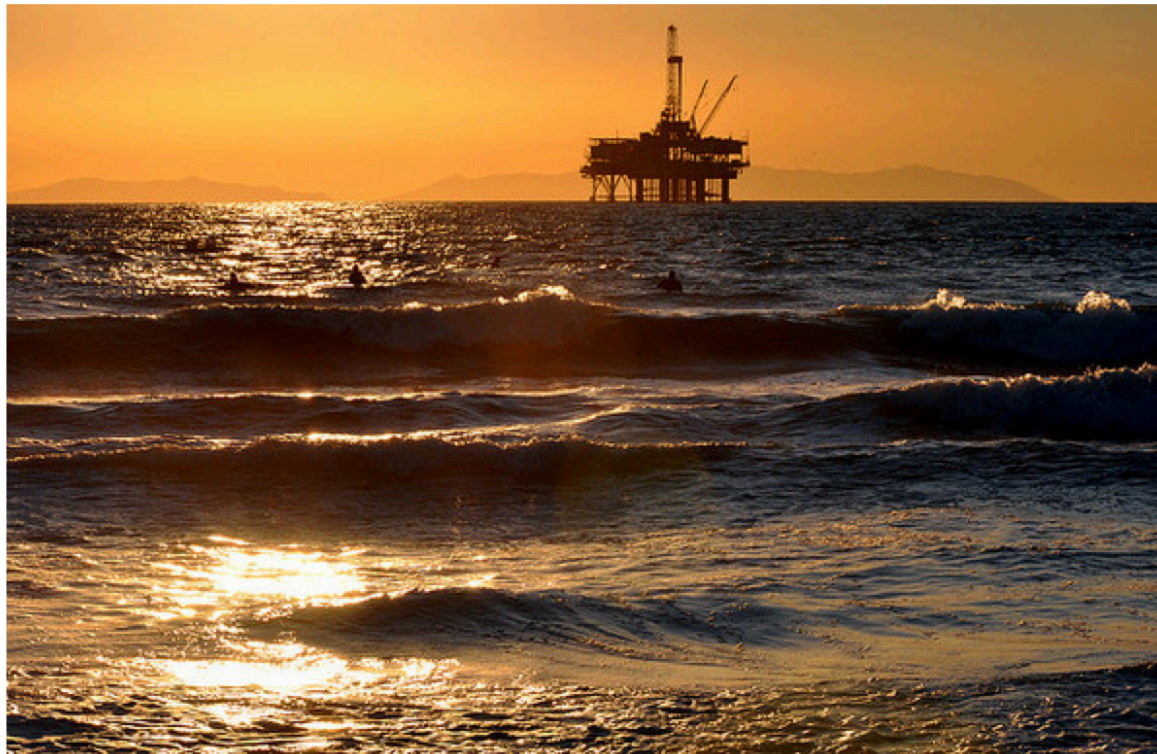
California's Gasland

Fracking Waste is Being Dumped Into the Ocean Off California's Coast

by **Chris Clarke**

February 26, 2014 2:08 PM

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Surfers play near an oil rig off the Santa Barbara coast | Photo: [Peter Bo Rappmund/Flickr/Creative Commons License](#)

California's Gasland

Oil developers want to use controversial fracking method to tap California's oil supply



A controversial method called hydraulic fracturing, or fracking, and its cousin, acidizing a few sites in Los Angeles County, including the Inglewood Oil Field near Baldwin Hills. they don't use fracking because they don't need to, including those in Signal Hill, Long oil island off the coast of Long Beach. (Photo by Brittany Murray/Press Telegram)

Fracking in L.A.? Test Wells at Urban Oil Field Spark Water Worries

300,000 people live within a three-mile radius of the test wells, fracked to reach oil once considered too expensive to extract.

By Ngoc Nguyen, New America
Media/InsideClimate News

Apr 12, 2012



The Inglewood Oil Field in Los Angeles, Calif./Credit: David Roy

Earlier this year, the oil company Plains Exploration and Production (PXP) blasted water and chemicals more than one and half miles into the earth to force oil embedded in a sandstone formation to gush to the surface.

The process—known as hydraulic fracturing or "fracking"—has been

California's Gasland

Fracking moratorium fails in California despite strong public support

Published time: May 30, 2014 21:45

[Get short URL](#)



Drilling wells are pictured in Los Angeles, California (Reuters/Mario Anzuoni)

City Council Passes LA 'Fracking' Ban

February 28, 2014 12:02 PM

CALIFORNIA, ENERGY, FRACKING

Beverly Hills Becomes First City in California to Pass Fracking Ban

Food & Water Watch | April 24, 2014 10:44 am | [Comments](#)

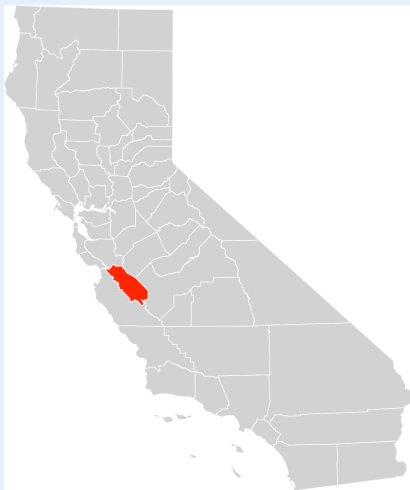
Measure P - Santa Barbara -- failed

In Santa Barbara County, oil firms and environmentalists square off



The Lompoc Gas and Oil Processing Plant north of Lompoc. Oil interests say the November ballot measure would shut down onshore oil production in Santa Barbara County. (Al Seib/ Los Angeles Times)

Measure J - San Benito -- passed



What goes on in a refinery?

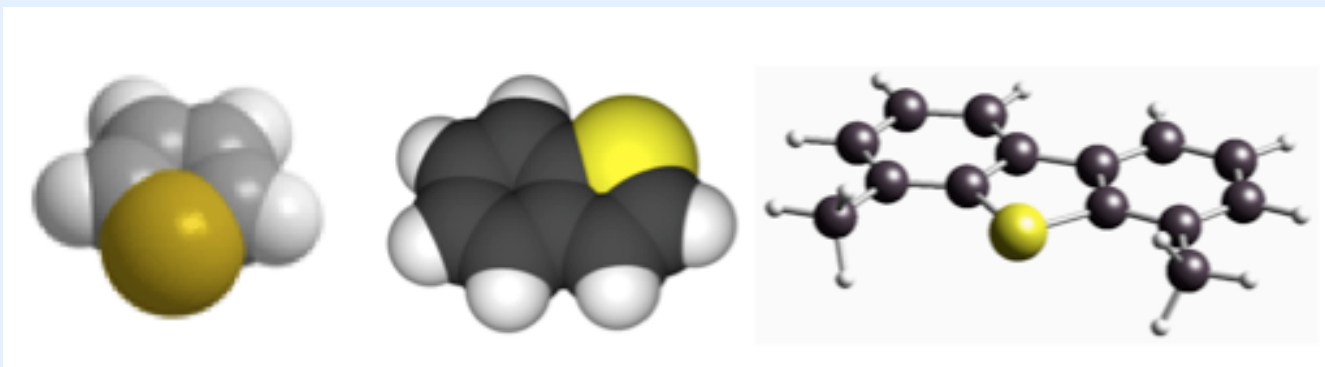


1. Sometimes desulfurization

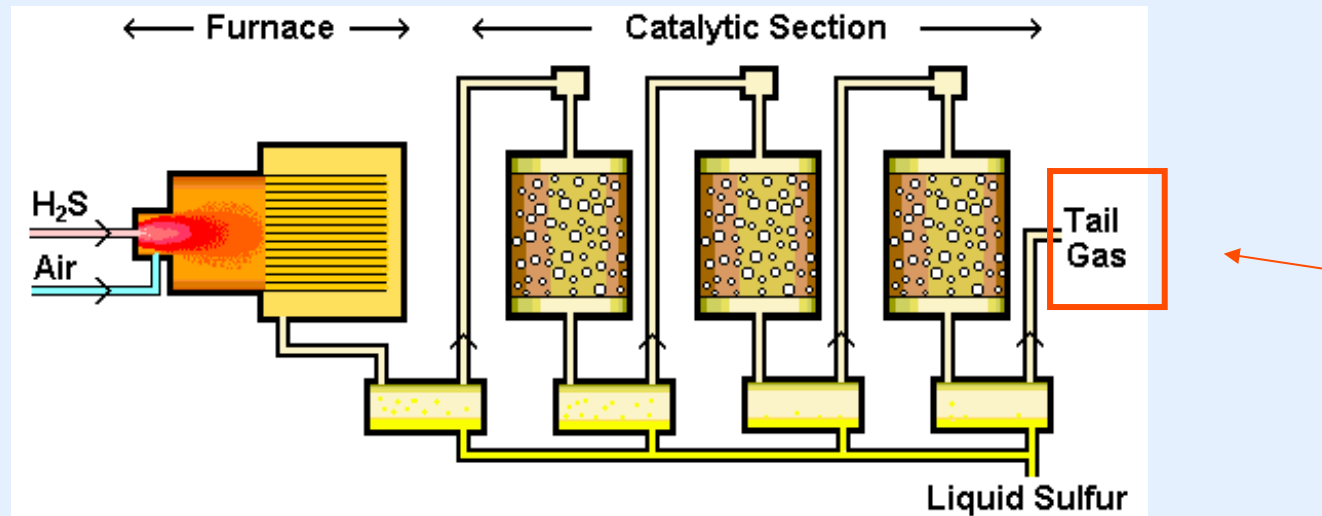
When crude oil has too many impurities
(sulphur, nitrogen, minerals, salt)
we need to eliminate them.

Sulphur is particularly nasty and undesirable.
SOUR CRUDE

The desulfurization process occurs prior to
distillation and cracking to get rid of sulphur

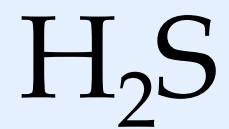


Tail gases



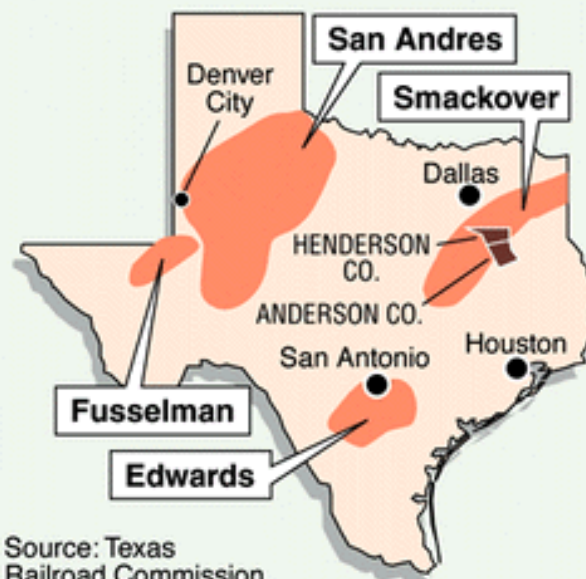
300 C, high pressure, water
 H_2S residuals, often burnt

H_2S may also be present in
gas or crude oil underground
“sour gas”



Sour gas in Texas

"Sour gas," so called because it contains deadly hydrogen sulfide, is present in four large oil and natural gas formations in Texas. They are:



Floating Production Storage Offloading



Petrochemical Corridor, Louisiana

Black residents of Mossville win hearing in legal battle over industrial pollution

Published: Tuesday, March 30, 2010, 5:17 PM Updated: Tuesday, March 30, 2010, 5:44 PM



By Mark Schleifstein, The Times-Picayune

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4.5 million people
9.5 billion pounds of waste



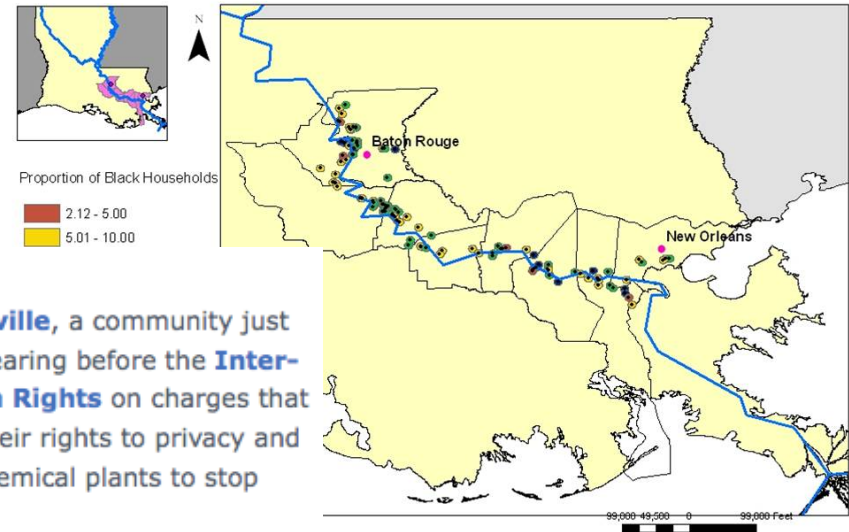
Times-Picayune archive
Chickens strut across the street from a Mossille chemical plant in 2001.

African-American residents of **Mossville**, a community just west of Lake Charles, have won a hearing before the **Inter-American Commission on Human Rights** on charges that the U.S. government has violated their rights to privacy and racial equality in not forcing local chemical plants to stop polluting.

It's the first time the international organization has agreed to hear complaints of environmental racism against the United States by its on citizens, said a spokeswoman for the law firm that filed the complaint.

Mossville is adjacent to 14 chemical plants and refineries that release millions of pounds of toxic chemicals into the air, land and water each year, according to federal and state records.

Map 9: Proportion of Black Households Earning \$15,000 to ,999 (1999) within a One Mile Buffer of Chemical Facilities in Cancer Alley



85-miles between Baton Rouge and New Orleans, 140 industrial plants

Chevron: Richmond, CA



Pollution, poverty, people of color: Chevron Richmond refinery fire

Wednesday, August 08, 2012

The fire on Monday night at the Chevron Richmond Refinery is an Environmental Justice issue, no question. This article, [Pollution, Poverty, People of Color: The factory on the hill](#), published by [Environmental Health Sciences](#), gives you facts as well as personal stories about how environmental issues have been affecting Richmond since long before this fire. Here are some excerpts:



Photo credit: AP

While most coastal cities breathe ocean breezes mixed with traffic exhaust, people in north and central Richmond are exposed to a greater array of contaminants, many of them at higher concentrations. Included are benzene, mercury and other hazardous air pollutants that have been linked to cancer, reproductive problems and neurological effects. People can't escape the fumes indoors, either. One [study](#) showed that some of the industrial pollutants are inside Richmond homes.

It's the triple whammy of race, poverty and environment converging nationwide to create communities near pollution sources where nobody else wants to live. Black leaders from the Civil Rights Movement called the phenomenon environmental racism, and beginning in the early 1980s, they documented the pattern at North Carolina's Warren County PCBs landfill, Louisiana's "Cancer Alley," Tennessee's Dickson County, Chicago's South Side, Houston's

3. ACCIDENTS



Offshore



About 500 every year
Total clean ups almost
impossible

Norway 1980,
Exxon-Valdez, Alaska 1989
Korea, 2007





Galicia, 2002
India, 2005

Australia, 2009
Egypt (ENI), 2004

Exxon-Valdez, 1989



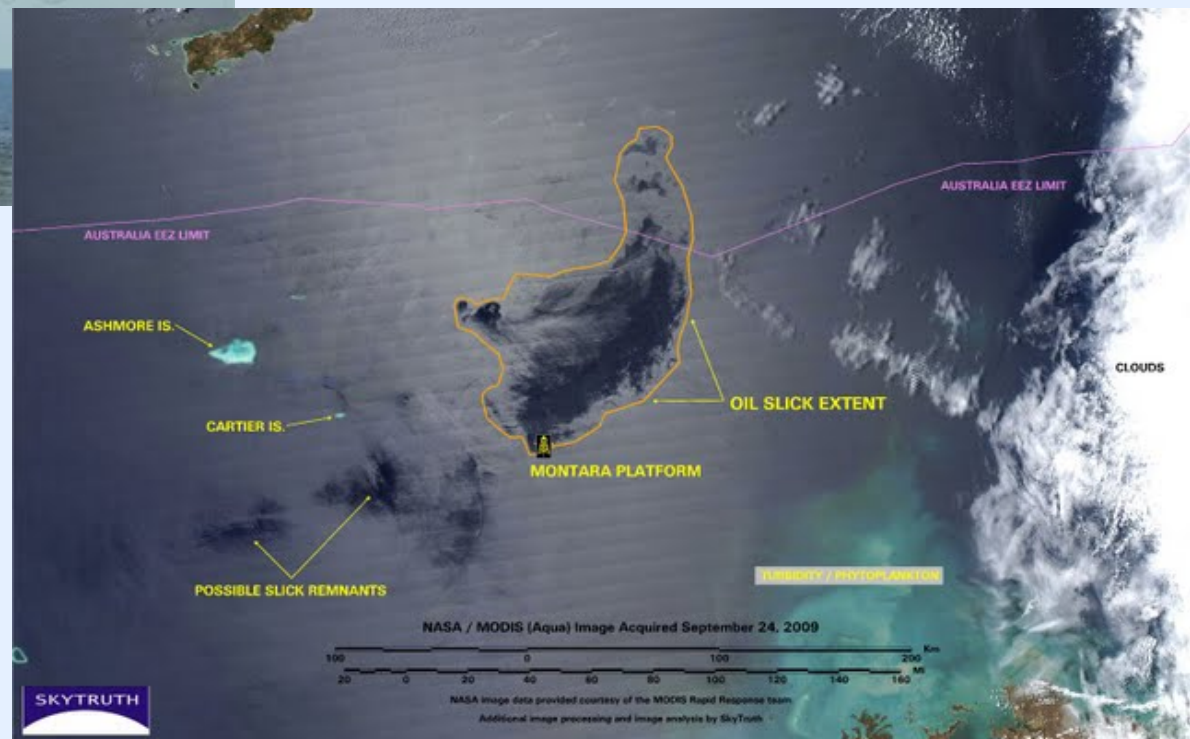
Australia, 2009



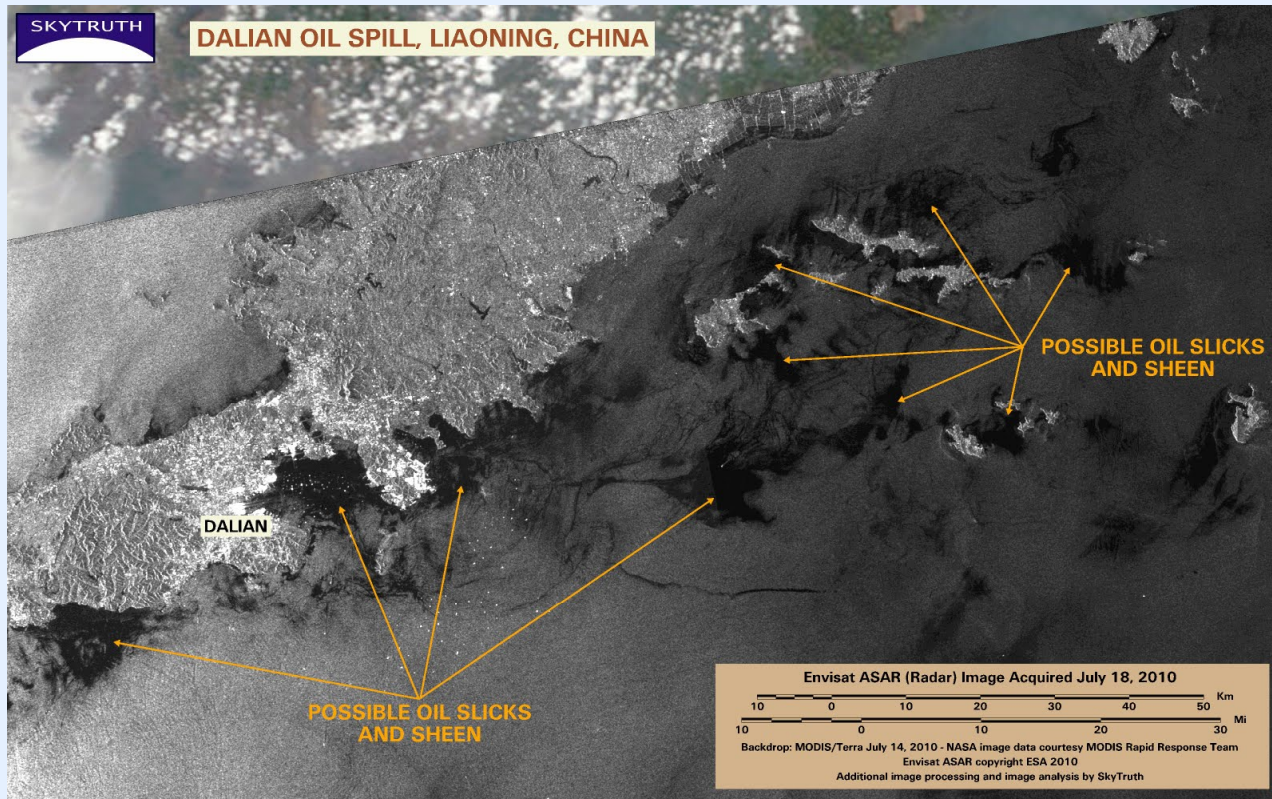
Montara Oil Spill
2 and a half months

Sky Truth

100 million gallons



China, 2010



300 square kilometers

10 thousand fisheries

Brazil, 2011



Frede,
Rio De Janeiro, Chevron



Russia, 2011

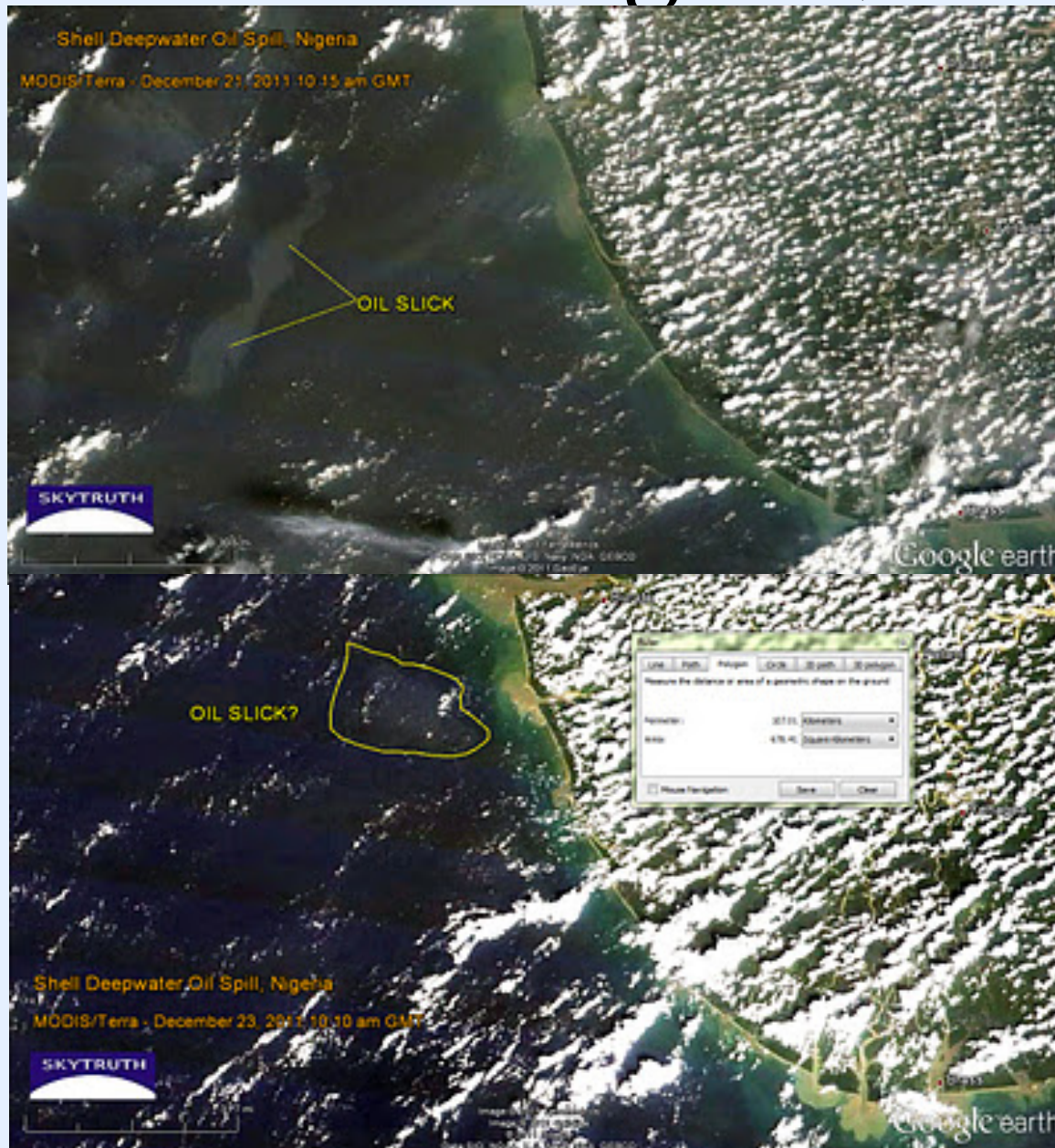


53 victims

5 milion tons per year
dumped to sea



Nigeria, 2011



Campo Bonga,
Shell
12.5 % ENI

Louisiana sinkhole



collapse of an abandoned brine mining cavern – 2012, ongoing

Santa Barbara, 1969



BP - Gulf of Mexico, 2010

Our greatest environmental disaster

20 billion USD and counting

250.000.000 gallons of oil

Questionable reports

Questionable dispersants

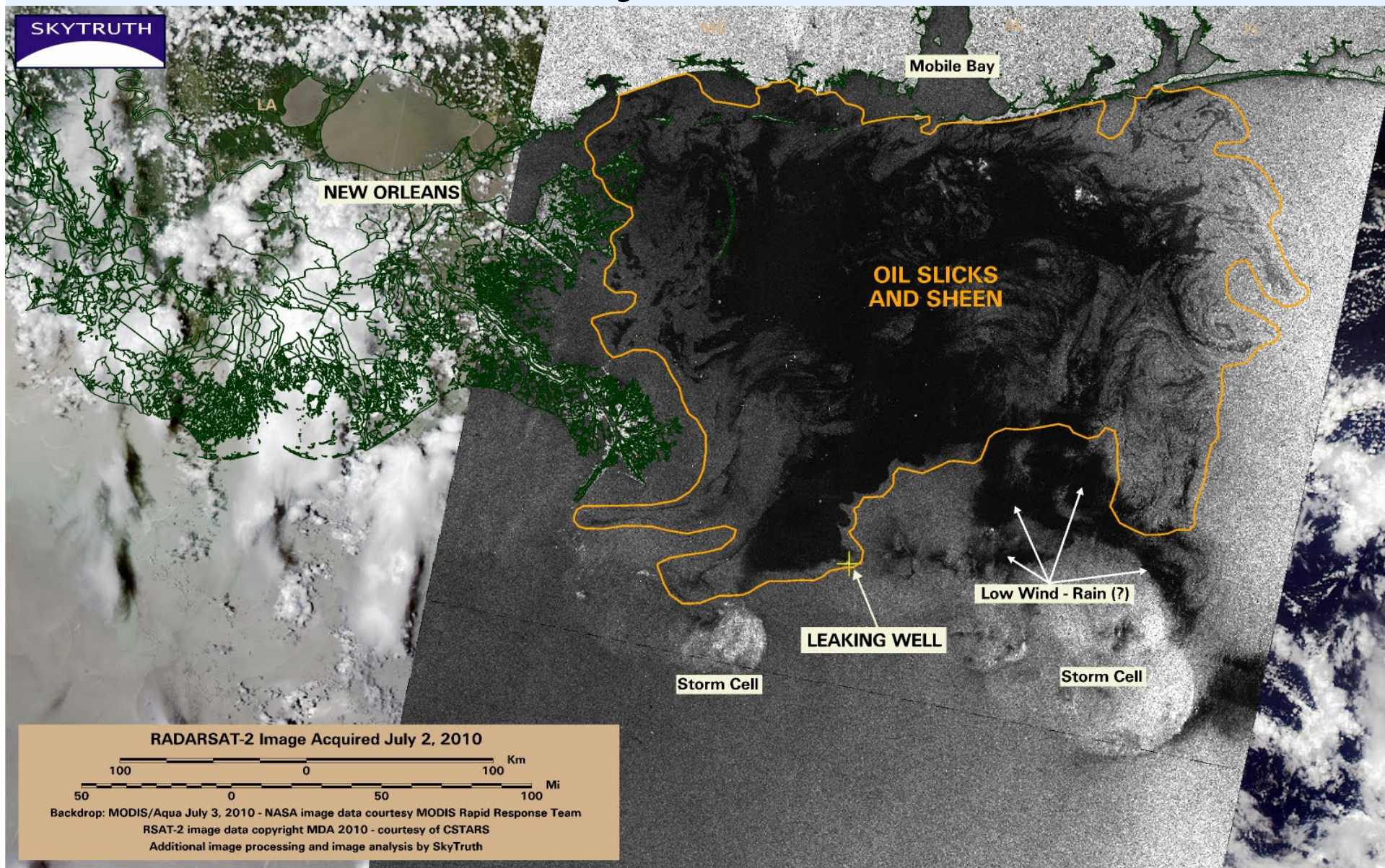
Questionable timescales

Ecosystem in shambles

11 dead

1 suicide

4 July 2010



















6. THE TAR SANDS OF CANADA

Canada Tar Sands



Canada Tar Sands



Canada Tar Sands



Canada Tar Sands

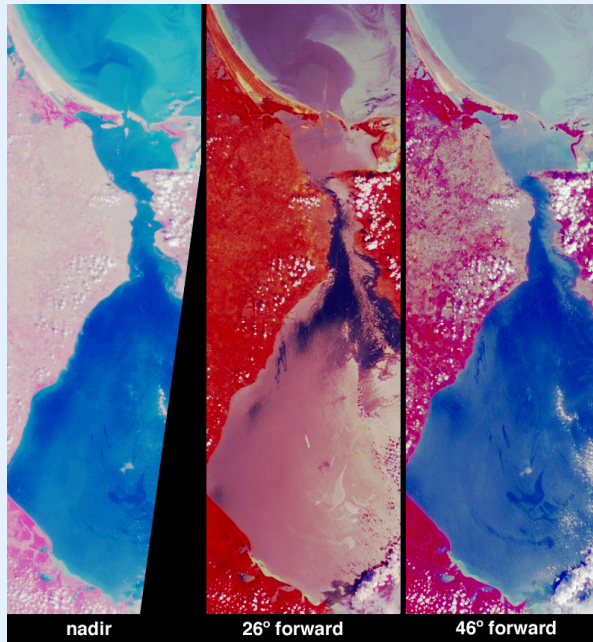




Clusters of rare cancers - close to mining operations
Fort Chipewyan
High incidence - oil related?
Water no longer drinkable from Lake Athabaska

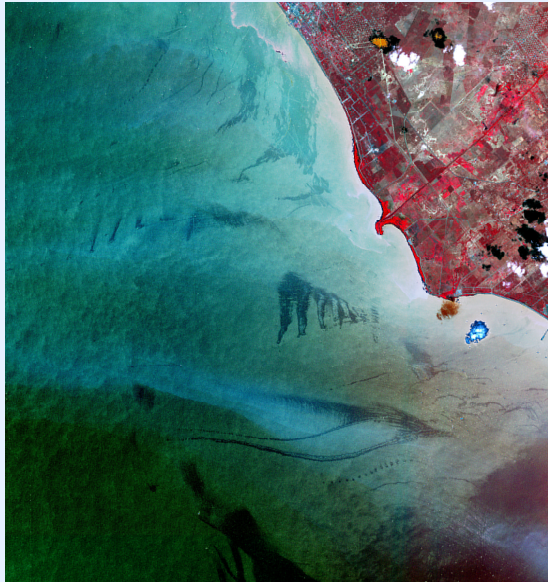
7. AT RISK AREAS

Maracaibo, Venezuela



5 meters - 20 cm a year

Highly populated
Inundation, lake is polluted
Shaky dams



Ekofisk, Norway

Conoco-Phillips 35%
Eni 12%

180 offshore
70 meters deep

42 cm a year (1986)

In 20 years: 5 meters

Total estimate ~ 9 meters



Ekofisk, Norway

Consequences, costs:

Wells, rigs and pipelines deformed

Artificially raise
platform by 10 meters

Water reinjection

1996: 1 billion dollars

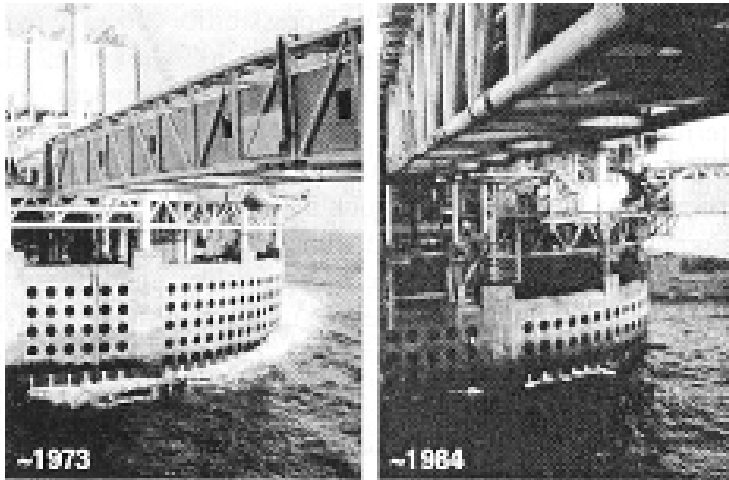


Fig. 5. Photographs of the 2/4T platform at the Ekofisk field. Subsidence was confirmed by comparison of the number of holes visible in the exterior protective wall.

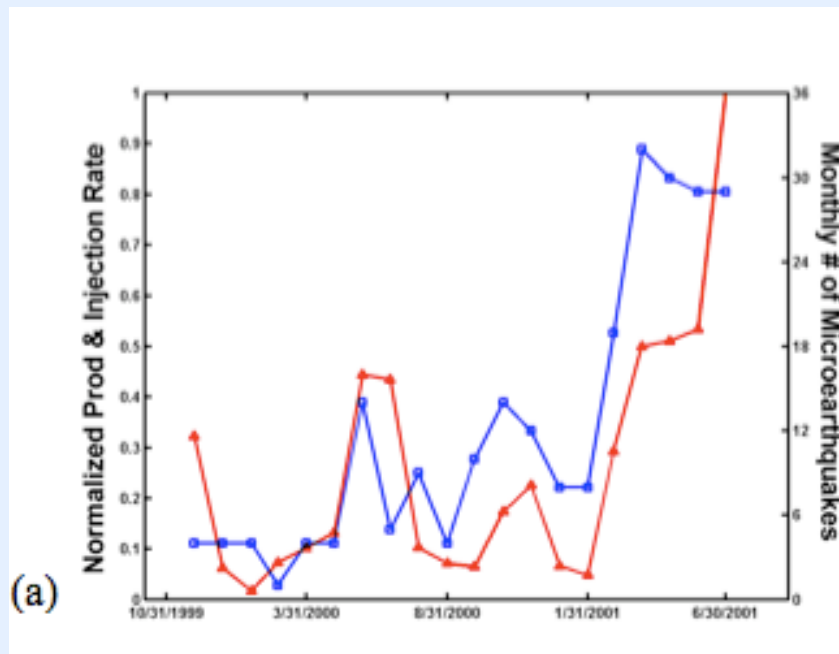
THEY COULD ONLY SLOW IT DOWN AND NOT STOP IT

5. INDUCED SEISMICITY

Oman, 1990:

Characterization of Induced Seismicity in a Petroleum Reservoir: A Case Study

Edmond Sze, M. Nafi Toksöz, and Daniel R. Burns
Earth Resources Laboratory
Dept. of Earth, Atmospheric and Planetary Sciences
Massachusetts Institute of Technology
Cambridge, MA 02139



Rosso: hydrocarbon production
Blu: micro-earthquakes

Oman: 400 micro-earthquakes in 2 years 1999-2001

France, 1990:

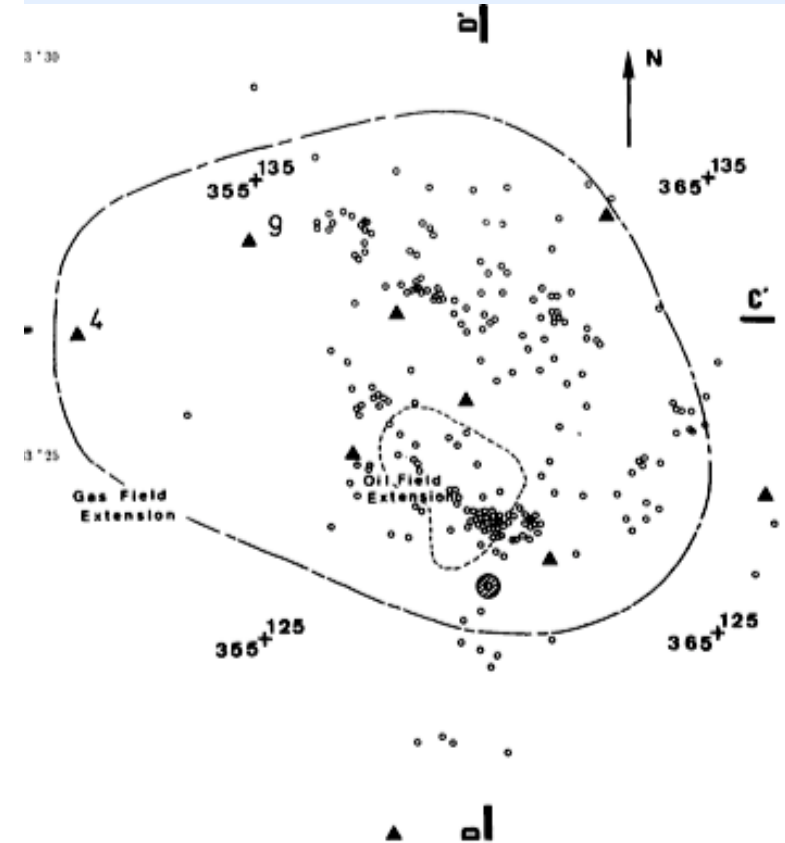
Bulletin of the Seismological Society of America, Vol. 80, No. 2, pp. 450-473, April 1990

TEN YEARS OF SEISMIC MONITORING OVER A GAS FIELD

BY J. R. GRASSO AND G. WITTLINGER

ABSTRACT

Ten years of seismic recording allows us to locate more than 800 tremors with magnitudes ranging from 1.0 to 4.2, in a small (10 by 10 by 5 km) volume near a major gas field (Lacq, France). The seismic activity began 10 yr after gas extraction began. Nearly all of the epicenters are located within the lateral extent of the gas field. The only perturbation of the stress or strain fields, which has the same spatial and temporal scale as the seismicity, is the 500-bar drop in gas pressure due to 20 yr of gas exploitation, demonstrating that these events are induced. The network, established to monitor this activity, consists of eight telemetered stations including a well-bottom geophone located at 3200 m depth. Using three-dimensional relocation techniques, we computed new hypocenter positions for more than 280 events. These better-located hypocenters form a diffuse zone that mimics the local dome structure. Taking the regional tectonic stresses into account, we suggest that these ruptures may be the result of unfolding of the dome structure.



Francia: 800 micro-earthquakes in 10 years 1980-1990
Up to 4.2 Richter

Texas, 2009:

Earthquakes in Cleburne? Some North Texans suspect drilling behind recent quakes

BY JOHN-LAURENT TRONCHE

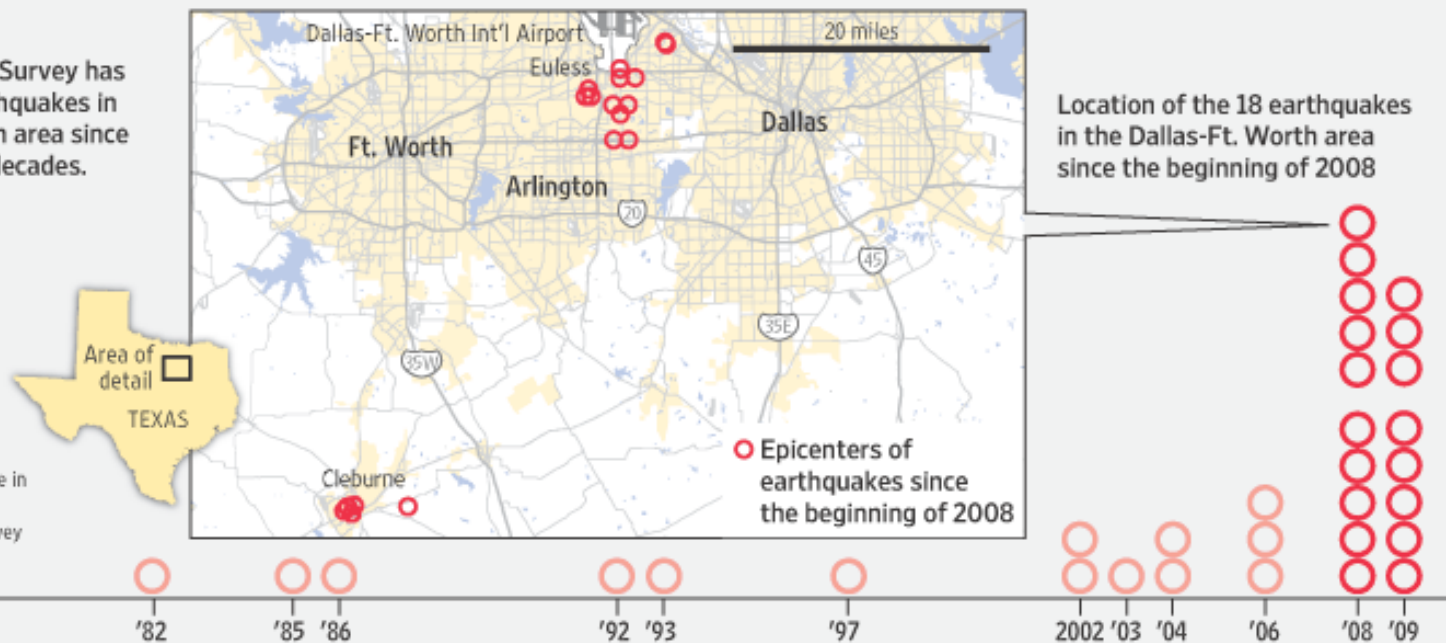
June 10, 2009

2/3 Richter

Shaken Up

The U.S. Geological Survey has detected more earthquakes in the Dallas-Ft. Worth area since 2008 than in prior decades.

Note: Earthquakes here range in magnitude from 1.7 to 3.5.
Source: U.S. Geological Survey



Oil Drilling Likely Caused Texas Earthquake

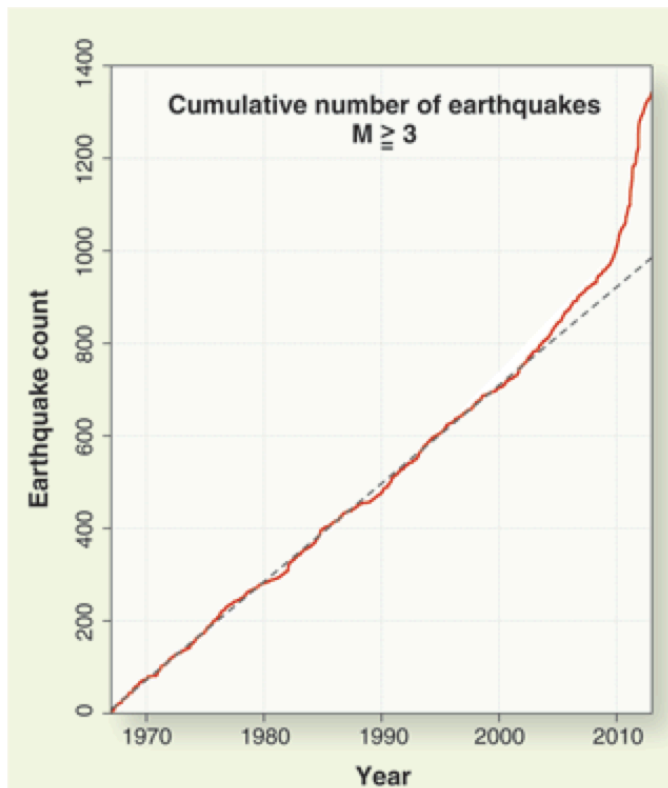
Posted by [feww](#) on May 17, 2009

Magnitude 3.3 Quake Strikes Northern Texas

Texas quake likely caused by oil and natural gas drilling

Science, 2013

Human-induced earthquakes have become an important topic of political and scientific discussion, owing to the concern that these events may be responsible for widespread damage and an overall increase in seismicity. It has long been known that impoundment of reservoirs, surface and underground mining, withdrawal of fluids and gas from the subsurface, and injection of fluids into underground formations are capable of inducing earthquakes. In particular, earthquakes caused by injection have become a focal point, as new drilling and well-completion technologies enable the extraction of oil and gas from previously unproductive formations.



Earthquakes with magnitude (M) ≥ 3 in the U.S. midcontinent, 1967–2012.

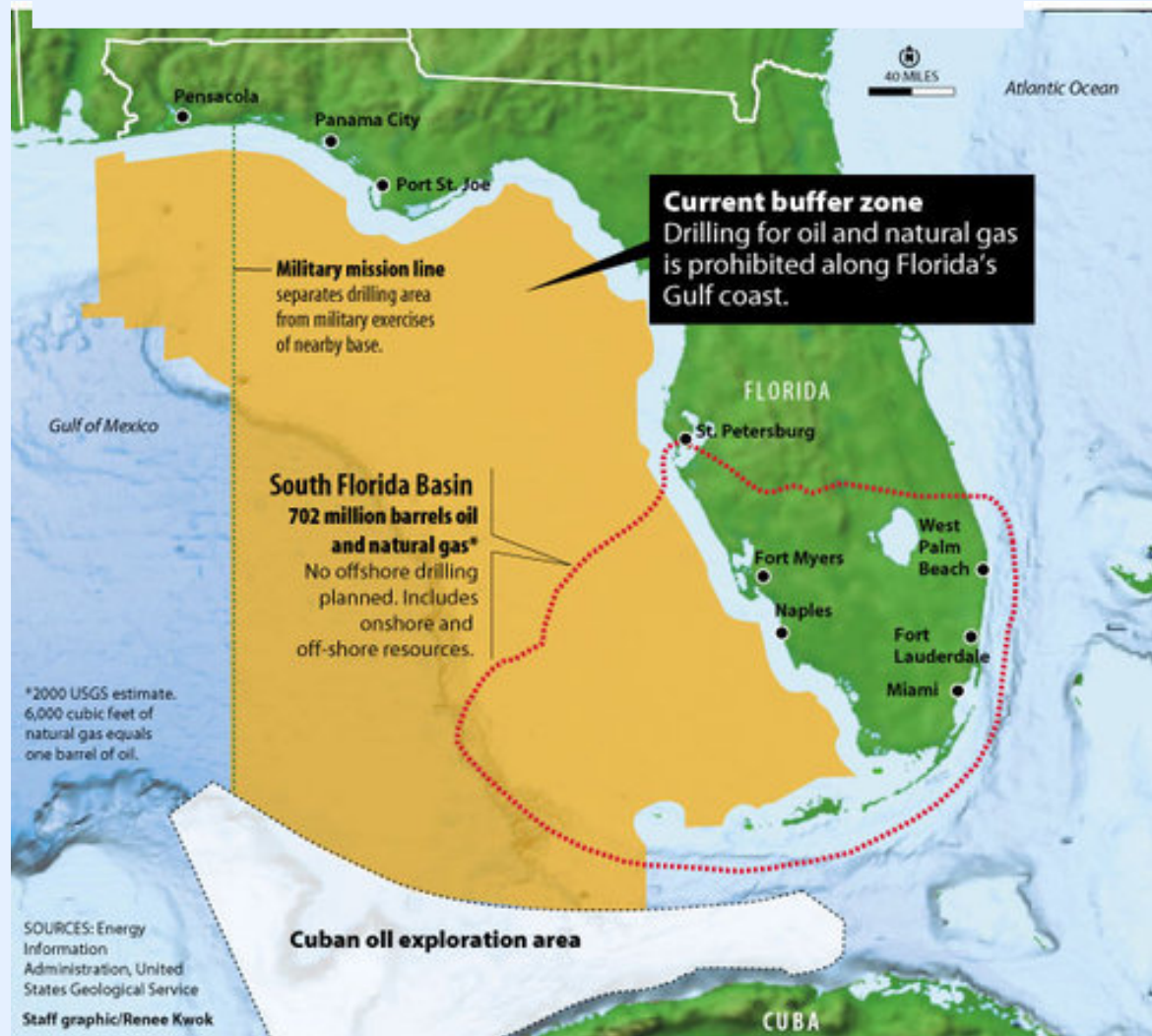
After decades of a steady earthquake rate (average of 21 events/year), activity increased starting in 2001 and peaked at 188 earthquakes in 2011. Human-induced earthquakes are suspected to be partially responsible for the increase.

Arctic



US, Canada, Russia, Norway, Denmark
Haphazard patchwork of legislation - no current regulations
Clean up is difficult in frozen areas - Pollution risks
Lisa Speer, NDRC

Florida



Lake Michigan

Michigan drilling ban legislation moves through committee today in state House



Legislation calling for a [constitutional ban on drilling](#) in Michigan's Great Lakes took its first steps toward becoming law today.

State Rep. **Rebekah Warren**, D-Ann Arbor, is calling for permanent measures to protect the state's waters from a tragic oil spill disaster like the one caused by BP that is devastating the coastline of the Gulf of Mexico.

Warren, chairwoman of the House [Great Lakes and Environment Committee](#), passed a series of plans through her committee today that would let Michigan voters decide in November on a permanent ban on drilling in the Great Lakes. The plans also urge Canada and other Great Lakes states to do the same.

"Today we took some very important steps toward permanently banning drilling in the Great Lakes," Warren said. "I simply cannot picture what a catastrophe the likes of which we're seeing in the Gulf of Mexico would look like on Michigan's shorelines, nor do I want to. With a permanent ban we can make sure that day never comes."

While drilling in the Great Lakes is against state law, Warren said the state Legislature and governor currently could change that at anytime. The plans passed by the House Great Lakes and Environment Committee today would:

- Give Michigan voters the right to make the ban permanent by making it part of the state constitution. If the Legislature passes the plan, the measure will appear on the November 2010 ballot.
- Urge all of the Great Lakes states and Canada to adopt a Great Lakes drilling ban.
- Recommend adding a ban on drilling in the Great Lakes to the Great Lakes Water Quality Agreement between the United States and Canada.

Michigan would be the first Great Lakes state to enact a permanent ban on drilling. Under current law, companies caught drilling without a permit face fines of up to \$1,000 per day. Those responsible for a spill face fines of up to \$25,000 per day and are liable for up to \$75 million in damages and are accountable for cleanup.



Rebekah Warren

The Delaware river watershed

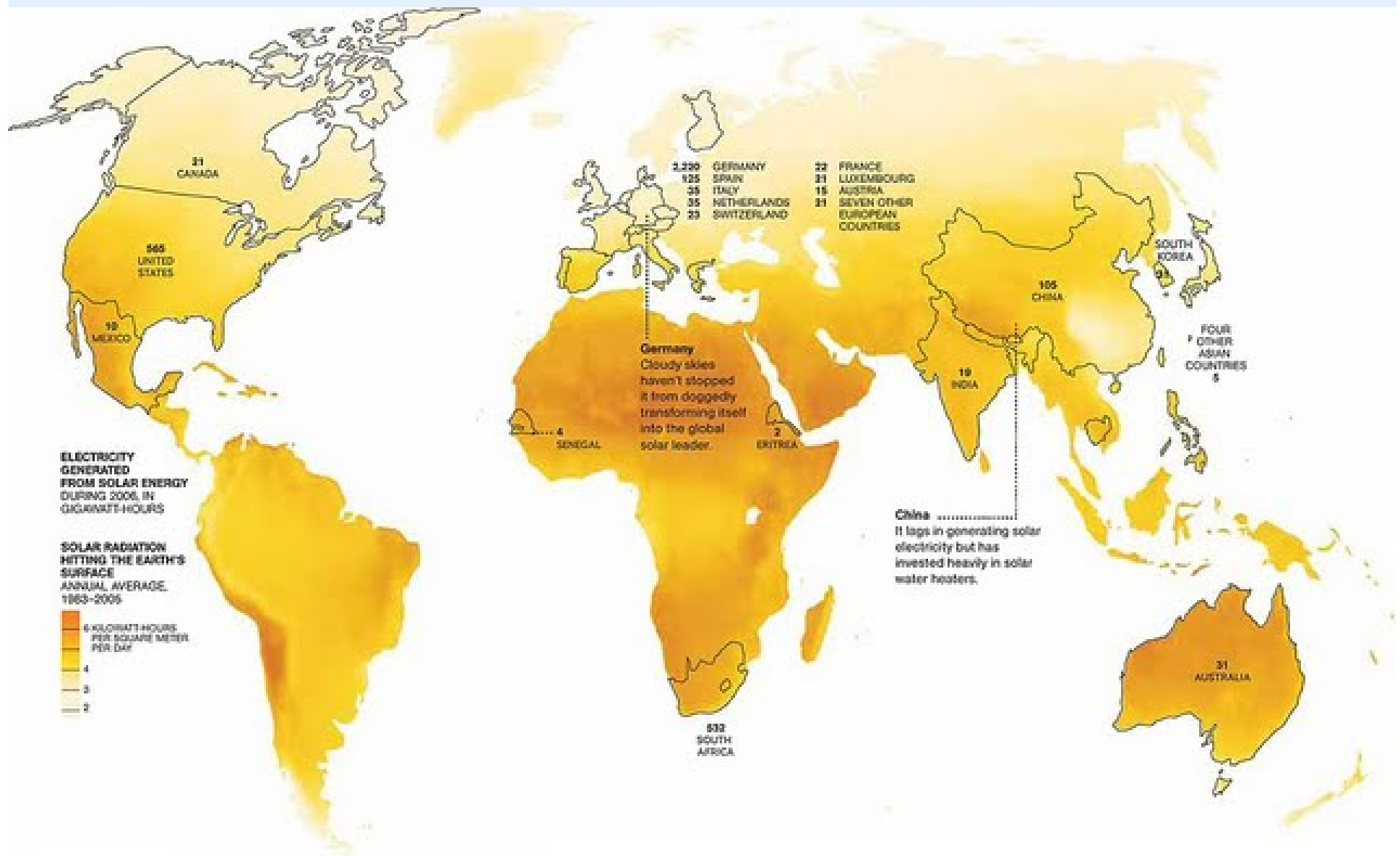


Yasuni, Ecuador



8. WHAT TO DO?

Look up



Germany sets new solar power record, institute says

[Recommend](#) [f](#) 13,331 people recommend this. Be the first of your friends.

By Erik Kirschbaum

BERLIN | Sat May 26, 2012 2:02pm EDT

[Tweet](#) 1,971

(Reuters) - German solar power plants set a world record 22 gigawatts of electricity production equal to 20 nuclear power stations at full capacity through the midday hours on Friday and the head of a renewable energy think tank.

The German government decided to abandon nuclear power after the Fukushima nuclear disaster last year, closing eight plants and shutting down the remaining nine by 2022.

They will be replaced by renewable energy sources such as wind and bio-mass.



MarketWatch

THE WALL STREET JOURNAL

September 14, 2012

1:59 AM EDT

New York

London

Tokyo

Closed

Closed

Open



1:58a Thai billionaire raises Fraser & Neave stake

1:57a China's labor market defies slowdown — but why?

1:49a HSBC: China stimulus will help steady growth

1:27a Asia stocks jump after Fed unveils QE3

DOW

+206.51

NASDAQ

+41.52

S&P 500

+23.43

13,539.86

+1.55%

3,155.83

+1.33%

1,459.99

+1.63%

[TOKYO MARKETS CLOSE IN:](#)

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May 26, 2012, 3:52 p.m. EDT

German Solar Power Plants Produce 50% of the Nation's Electric Energy On Saturday

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By [Benzinga.com](#)

Solar power plants in Germany produced a record 22 gigawatts of electricity per hour on Saturday, according to Reuters. This was enough to meet 50% of the country's electric power needs for the day.

The German government decided to shut down all nuclear power plants by 2022, following the Fukushima nuclear disaster. Those plants will be replaced by renewable energy sources including wind and solar.

But most of all



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&
THINK

DON'T LET
CONSUMERISM
GET TO YOU

<http://www.ecomall.com/greenshopping/20things.htm>

Thank you:

Prof. Thomas Chou, UCLA (USA)

Prof. Kaye Kilburn, USC (USA)

Dr. Bob Morton (USGS)

Prof. Chad Topaz, Macalester Univ. (USA)

Prof. Tee Guidotti, Univ. of Alberta (Canada)

Prof. Igor Burstyn, Univ. of Alberta (Canada)

Dr. Valeria Tano, EPO (Germany)

Fabrizia Arduini

NSF grant 0719462