Examining the History of Oil Spills to Anticipate What Lies Ahead

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Oil Spill History…If We Had All Day…

- *Introduction*
- *Largest (“worst”) oil spill*
- *“First” oil spill (updated)*
- *Oil spills and war stories*
- *A little bit on oil research*
- *A brief look at oil spills in cinema*
- *Where are they now?*

Oil Spill History…What We'll Discuss Today

- *Introduction*
- *Largest ("worst") oil spill*
- *"First" oil spill (updated)*
- *Oil spills and war stories*
- *A little bit on oil research*
- *A brief look at oil spills in cinema*
- *Where are they now?*

History of Spills Provides Context & Frame of Reference

- *Previous oil spills provide reference for cleanup approaches, understanding impact, and predicting recovery*
- *…also context for media, public, policymakers…and responders…to gauge significance*
  - *How big is big?*
  - *How long is long?*
  - *How bad is bad?*

1979…

Ixtoc-1 and Macondo:
Similarities & Differences

	Ixtoc-1	Macondo
Wellhead depth (m)	45	1,500
Duration (days)	295	87
Cause: drilling mud circulation lost?	Yes	Yes
Fire & explosion?	Yes	Yes
Blowout Preventer casualty?	Yes	Yes
Estimated oil release (bbl)	3.5 million	2.45-4.2 (3.19) million
Dispersants used (liters)	10.2 million	7.0 million
“Junk shot”?	Steel, iron, lead balls	Sponges, rope, golf balls
Containment structure?	“Operation Sombrero”	“Top Hat”
Terminated by relief wells?	Yes	Yes

The Science of Ixtoc-1 and *Deepwater Horizon*

Impact and Resilience of Benthic Foraminifera in the Aftermath of the **Deepwater Horizon** and **Ixtoc** 1 Oil Spills
PT Schwing, ML Machain-Castillo - Deep Oil Spills, 2020 - Springer
Benthic foraminifera, which are single-celled protists that primarily produce calcite shells, have been commonly used as bioindicators of anthropogenic and natural perturbations. Numerous surveys of benthic foraminifera conducted in the Gulf of Mexico (GoM) prior to any …
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The Sedimentary Record of MOSSFA Events in the Gulf of Mexico: A Comparison of the ***Deepwater Horizon*** (2010) and **Ixtoc** 1 (1979) Oil Spills
PT Schwing, DJ Hollander, GR Brooks, RA Larson… - Deep Oil Spills, 2020 - Springer
Abstract Marine Oil Snow Sedimentation and Flocculent Accumulation (MOSSFA) refers to the process of formation, sinking, and seafloor deposition of oil-contaminated marine snow and oil-mineral aggregates. MOSSFA was well documented in the northern Gulf of Mexico …
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Exploring the complexity of two iconic crude oil spills in the Gulf of Mexico (**Ixtoc** I and **Deepwater Horizon**) using comprehensive two-dimensional Gas …
RK Nelson, KM Gosselin, DJ Hollander… - Energy & …, 2019 - ACS Publications
Comprehensive two-dimensional gas chromatography (GC× GC) was used to explore and compare the chemical complexity of oil released from the **Deepwater Horizon** (DWH) disaster in 2010 and the **Ixtoc** I spill in 1979-1980, both in the Gulf of Mexico (GoM). To …
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Chronic Sub-lethal Effects Observed in Wild-Caught Fishes Following Two Major Oil Spills in the Gulf of Mexico: ***Deepwater Horizon*** and **Ixtoc** 1
EL Pulster, A Gracia, SM Snyder, K Deak, S Fogelson… - Deep Oil Spills, 2020 - Springer
During and subsequent to major oil spill events, considerable attention focuses on charismatic and economic megafauna–and especially fishes–and visual manifestations of impacts upon them. Beginning with a series of tanker accidents occurring in Europe and the …
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How quickly will the offshore ecosystem recover from the 2010 **Deepwater Horizon** oil spill? Lessons learned from the 1979 **Ixtoc**-1 oil well blowout
M Rohal, N Barrera, E Escobar-Briones, G Brooks… - Ecological …, 2020 - Elsevier
Abstract The **Deepwater Horizon** (DWH) accident occurred on 20 April 2010 in the Northern Gulf of Mexico and resulted in a **deep-sea** plume of petroleum hydrocarbons and a marine oiled snow sedimentation and flocculent accumulation (MOSSFA) event. It is hypothesized …
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How quickly will the offshore ecosystem recover from the 2010 Deepwater Horizon oil spill? Lessons learned from the 1979 Ixtoc-1 oil well blowout

Melissa Rohal[a], Noe Barrera[a], Elva Escobar-Briones[b], Gregg Brooks[d], David Hollander[c], Rebekka Larson[d], Paul A. Montagna[a,*], Marissa Pryor[a], Isabel C. Romero[c], Patrick Schwing[c,d]

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ARTICLE INFO

Keywords:
Deepwater Horizon
Meiofauna
Macrofauna
Ixtoc
Oil spill

ABSTRACT

The Deepwater Horizon (DWH) accident occurred on 20 April 2010 in the Northern Gulf of Mexico and resulted in a deep-sea plume of petroleum hydrocarbons and a marine oiled snow sedimentation and flocculent accumulation (MOSSFA) event. It is hypothesized that recovery will occur when the contaminated sediment is buried below the biologically active zone of 10 cm. Recovery rate can be inferred from the similar Ixtoc-1 blowout and sub-surface oil release that occurred in the Bay of Campeche, Mexico in 1979 – 1980. In 2015, sediment chemistry effects from the Ixtoc-1 were found at 2.4– 2.8 cm sediment depth at stations within 81 and 273 km away. Trends of total polycyclic aromatic hydrocarbon concentration, macrofauna family-level diversity, and the nematode to copepod ratio with sediment depth supports the interpretation that the benthic community has not yet recovered from the Ixtoc-1 spill. Based on a sedimentation rate of 0.072 cm/year, the Ixtoc-1 benthic community will recover in 103 more years beyond 2015. Recovery around the DWH will occur in 50 years based on an average sedimentation rate of 0.2 cm/year. These rates demonstrate that benthic recovery in the deep sea is very slow.

History of Spills Provides Context & Frame of Reference

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- *Humans have been spilling the stuff ever since they discovered it*

mnn mother nature network APRIL 26, 2016

EARTH MATTERS HEALTH LIFESTYLE TECH

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The 13 largest oil spills in history

Here's a look at the largest spills in world history and spill and the Exxon Valdez disaster compare.

LAURA MOSS

July 16, 2010, 12 p.m.

843

U.S. Navy craft are anchored along the shoreline as Navy and civilian personnel position hoses during oil cle after the Exxon Valdez spill. (Photo: Wikimedia Commons)

The Telegraph

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10 largest oil spills in history

An oil tanker is leaking its cargo after running aground on a Zealand. Here is a list of the 10 biggest oil spills in history:

0 0 0 0 Email

There have been several sightings of oil near the site of last year's Gulf of Mexico accident in recent months Photo: Rex Features

7:00AM BST 07 Oct 2011

Gulf War, 1991

Kuwait

240 to 336 million gallons

As Iraqi forces retreated from Kuwait during the first Gulf War, they opened the valves of oil wells and pipelines in a bid to slow the onslaught

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10 Worst Oil Spills

Melina | April 28, 2010 06:57am ET

Fire boat response crews battle the blazing remnants of the off shore oil rig, Deepwater Horizon on April 21, 2010. The rig, located 51 miles southeast of Venice, Louisiana, exploded on April 20, 2010.

Credit: USCG View full size image

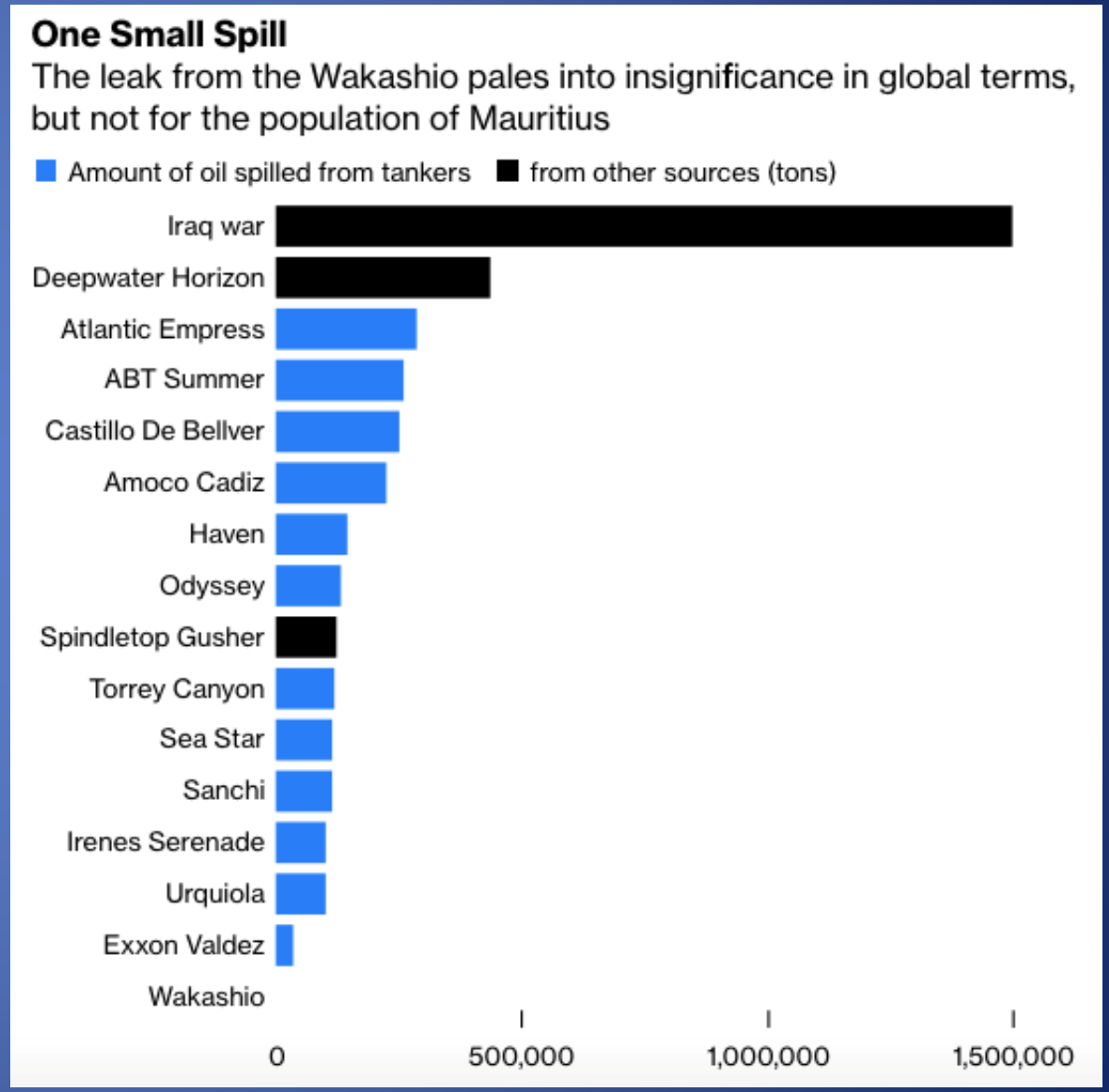
The oil gushing from the well where the Deepwater Horizon oil rig exploded and sank is now spreading through the Gulf of Mexico. Oil spills can kill wildlife, pollute the air and water, and alter the ecosystem for years to come. Many of us think of the Exxon Valdez oil spill as a particularly bad one, but with about 42,800 tons of oil spilled, it doesn't rank as one of the 10 worst ever.

Here are some of the worst oil spills in history:

10. The Odyssey: 132,000 tons

M/V *Wakashio*, Mauritius

25 July 2020



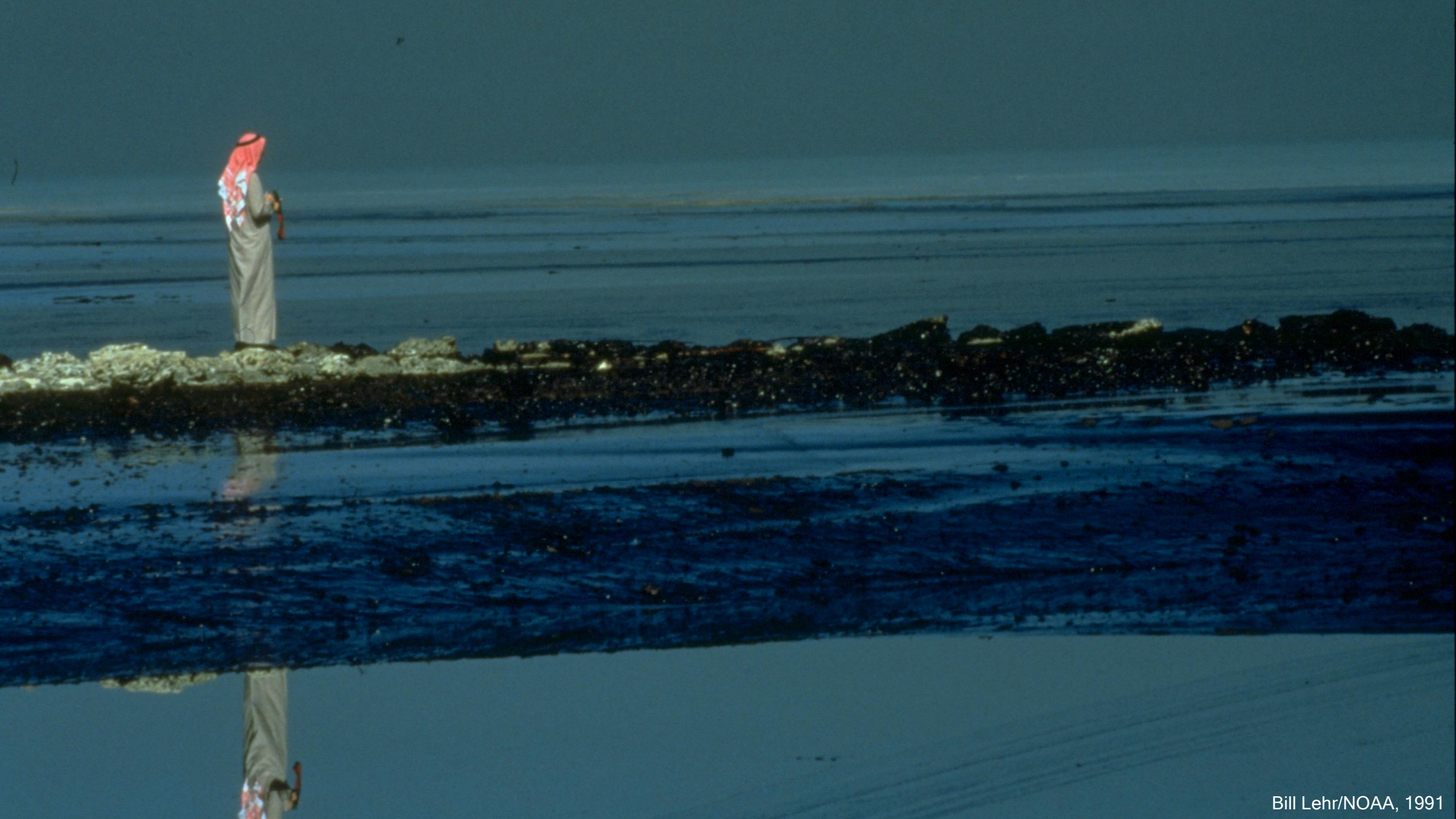
From Bloomberg Opinion, 22 August 2020; data from ITOPF & other sources

1991 Gulf War Spill

6-8 million bbls (252-336 million gal., 954 million -1.27 billion liters)

...but not 11 million bbls (~462 million gal.)

Jacqueline Michel/RPI



Bill Lehr/NOAA, 1991

Deepwater Horizon/Macondo Wellhead, 2010

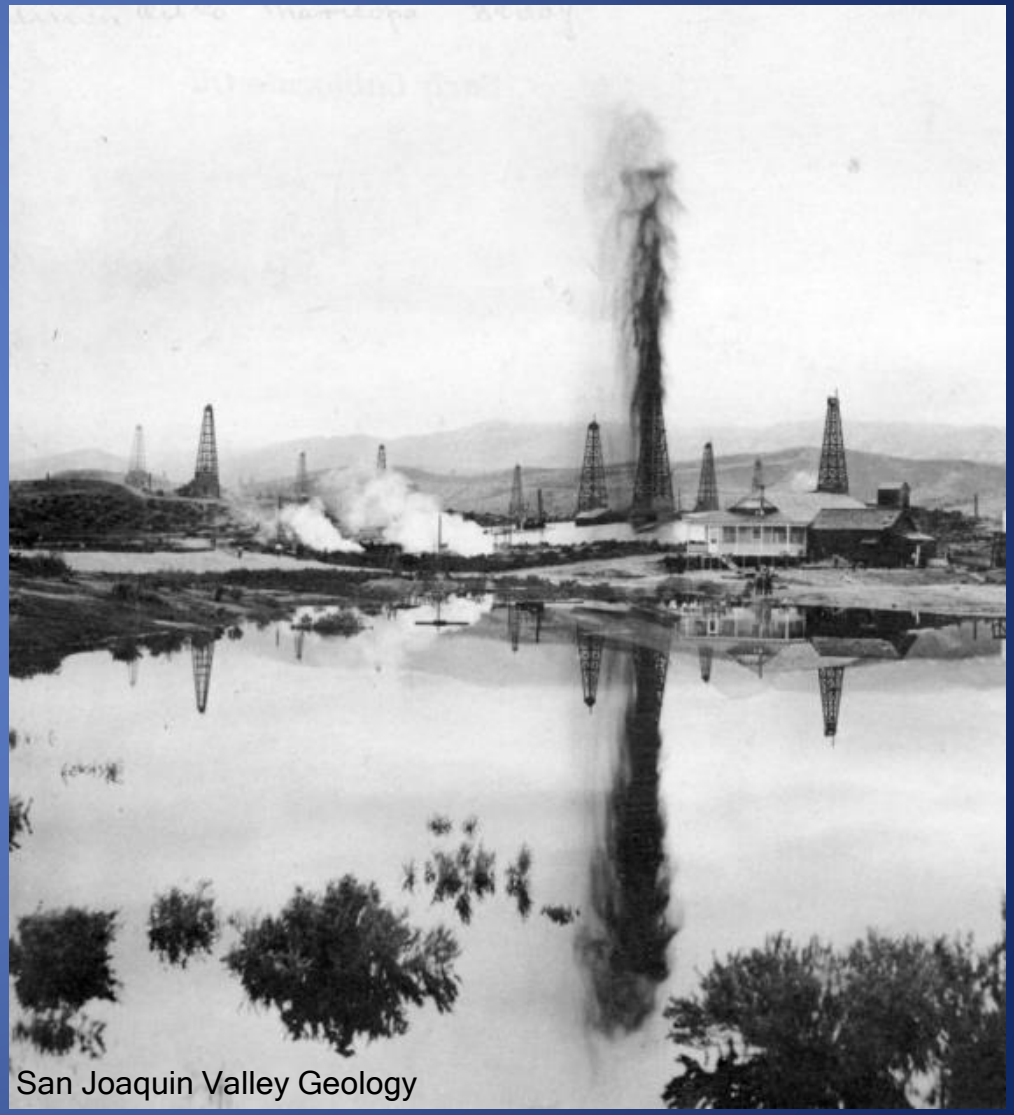
- *April 20-July 15, 2010*
- *Calculated release: 3.19-4.9 million bbl (507-795 million litres)*

Largest Oil Spill in U.S.? Or Anywhere?

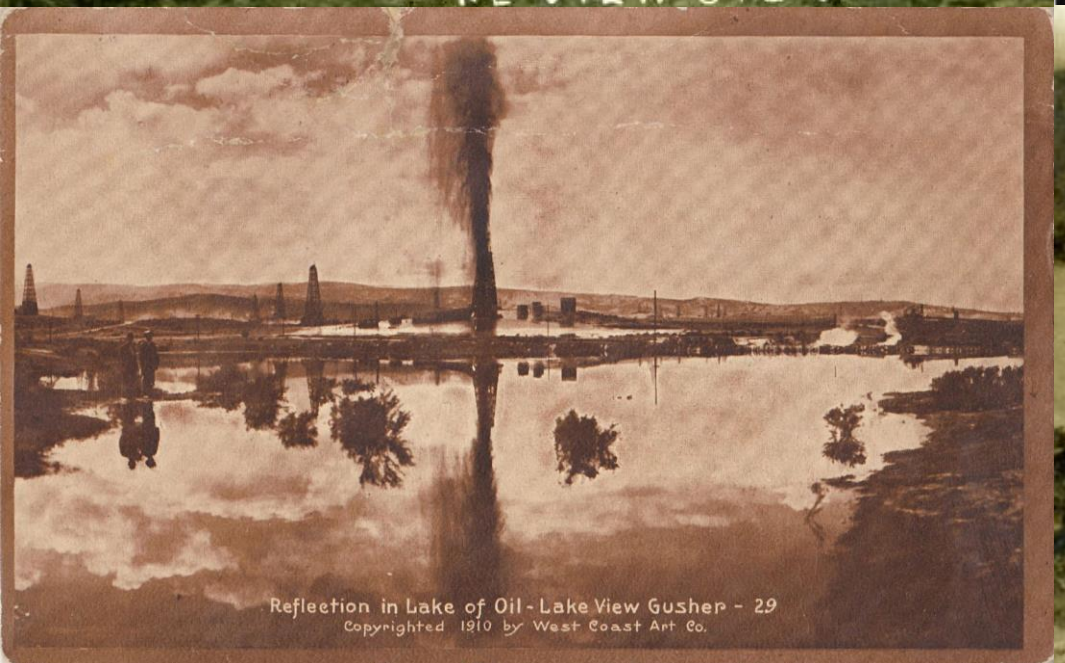
(So far…)

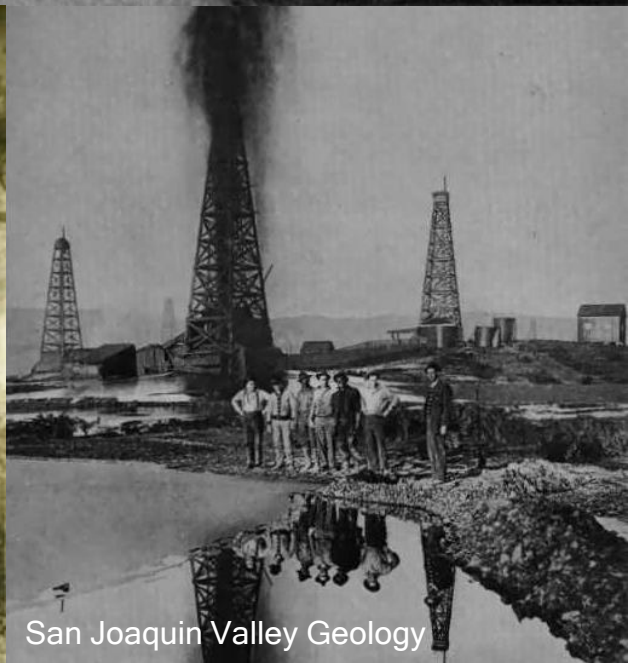
Lakeview Well No. 1, Maricopa, CA

- *15 March, 1910 – 10 September, 1911*
- *9.4 million bbl (1.5 billion litres)*
- *Peak flow: 90,000 bbl/day (14.4 million litres)*



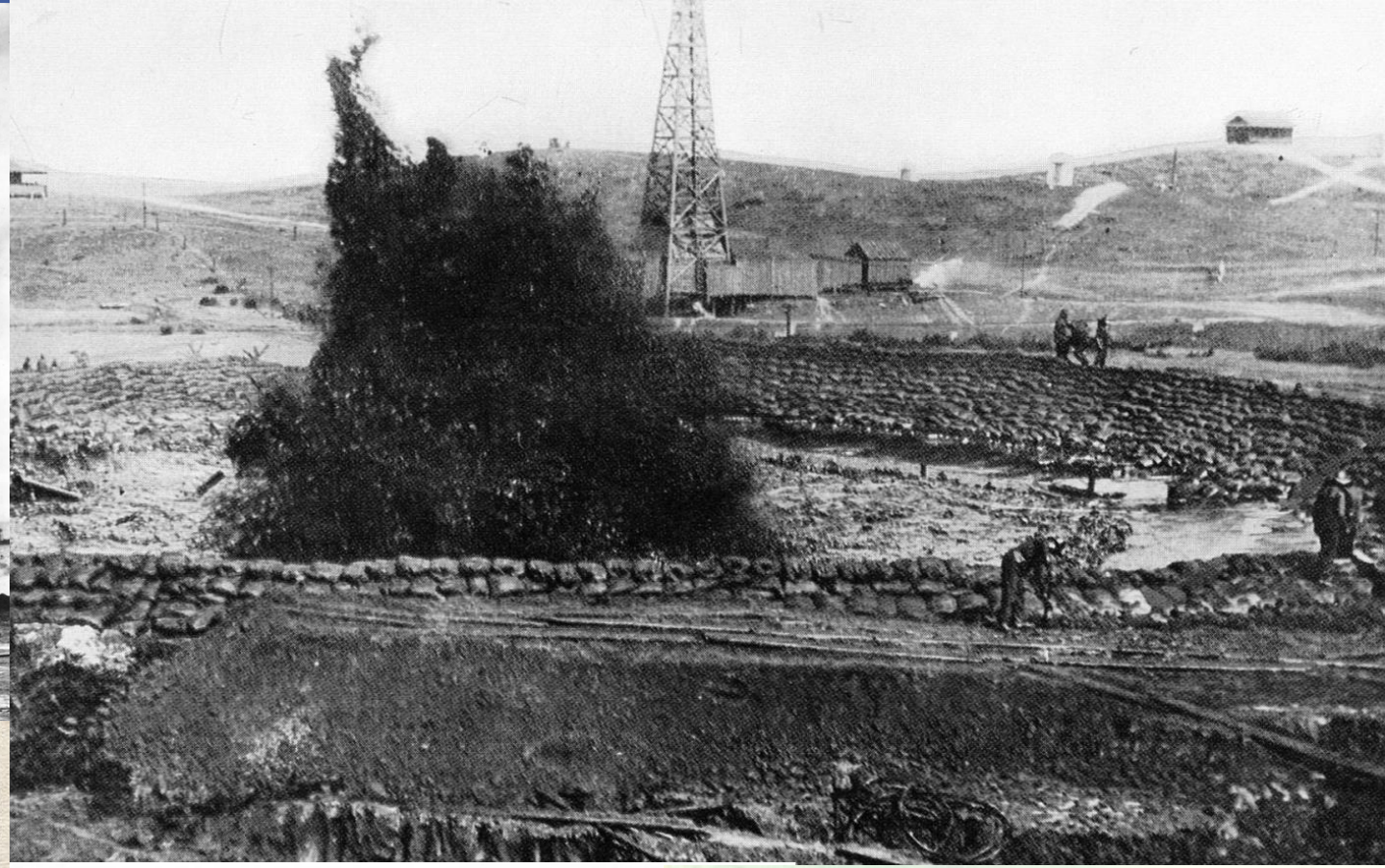
San Joaquin Valley Geology






LAKE VIEW
1ST DAY

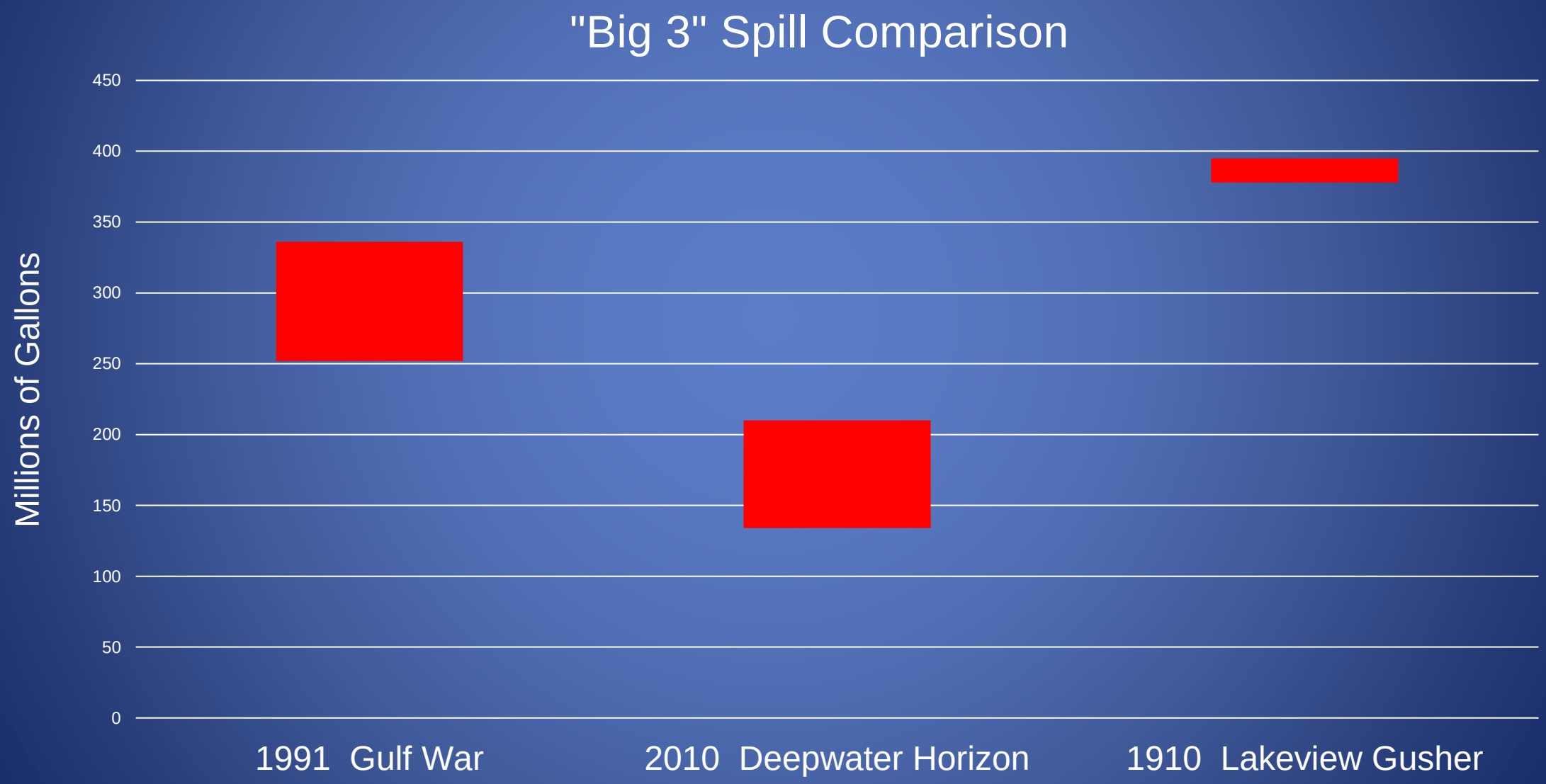

S.D. Lake View Gusher.

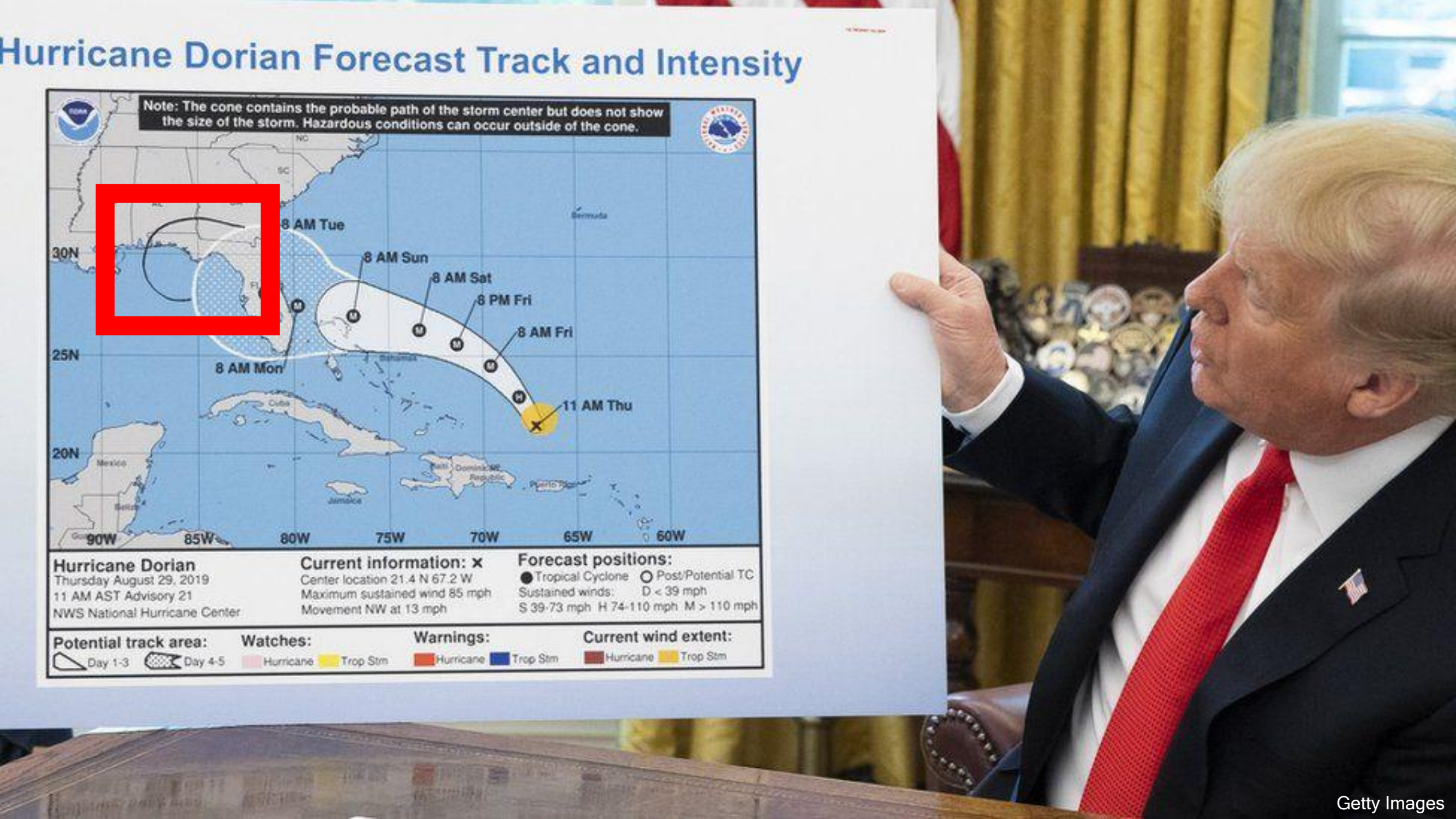



Lake View Gusher, Maricopa. Cal.
Flowing 48000 Bbls. per day

Largest Oil Spill?

Reviewing the bidding…



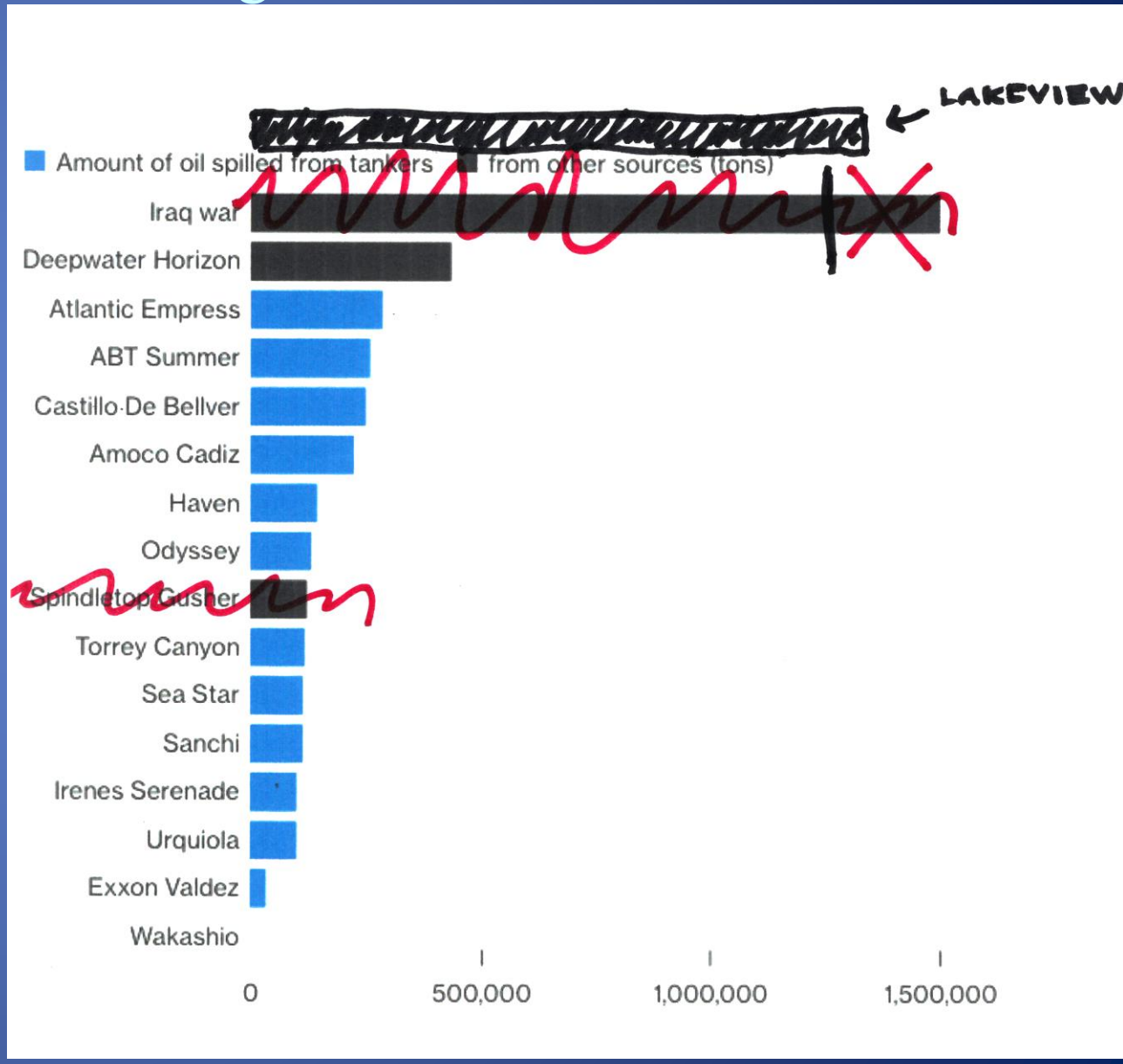


Getty Images

Largest Oil Spill?

Reviewing the bidding…

Sanford ®



History of Spills Provides Context & Frame of Reference

- *We will never be able to state with certainty what the largest oil spill has been–unless we have another big one that we measure fastidiously*
- *Until that time…Lakeview Gusher appears to be #1, followed by the 1991 Gulf War, followed by* Deepwater Horizon

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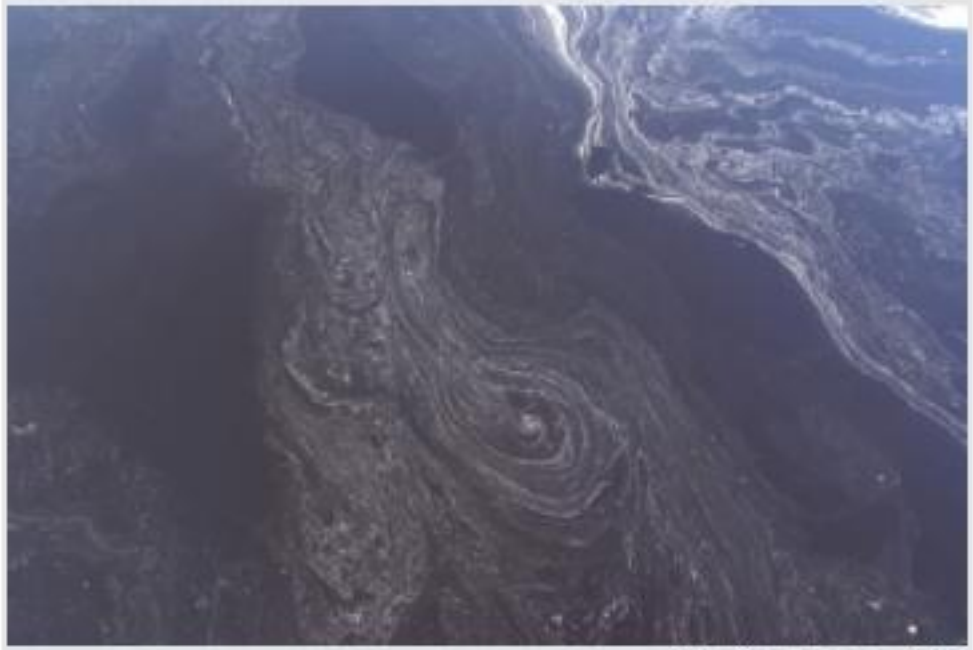
Where did the first major oil spill occur?

Discover where the first major oil spill occurred.

The first major oil spill occurred on March 18, 1967 when the tanker Torrey Canyon grounded on the Seven Stones shoal off the coast of Cornwall, England, spilling 830,000 barrels (119,000 tons) of Kuwaiti oil into the sea.

This was the first major tanker accident; however, during World War II, German U-boat attacks on tankers, between January and June of 1942, off the United States East Coast, spilled 590,000 tons of oil.



The first major oil spill occurred off the coast of England.

Although the Exxon Valdez was widely

Torrey Canyon – March 1967

Smith (1968)

Torrey Canyon, March 1967

Hulton Archive

The Oily Dogs of War…

German U-Boats off the Atlantic Coast of the U.S. and Canada

Jan - Aug 1942:

- *285 Allied ships sunk*

Jan - June 1942:

- *3.45 million bbl / 549 million litres spilled within 50 mi. of U.S.*
- *= average 3 million litres/day*

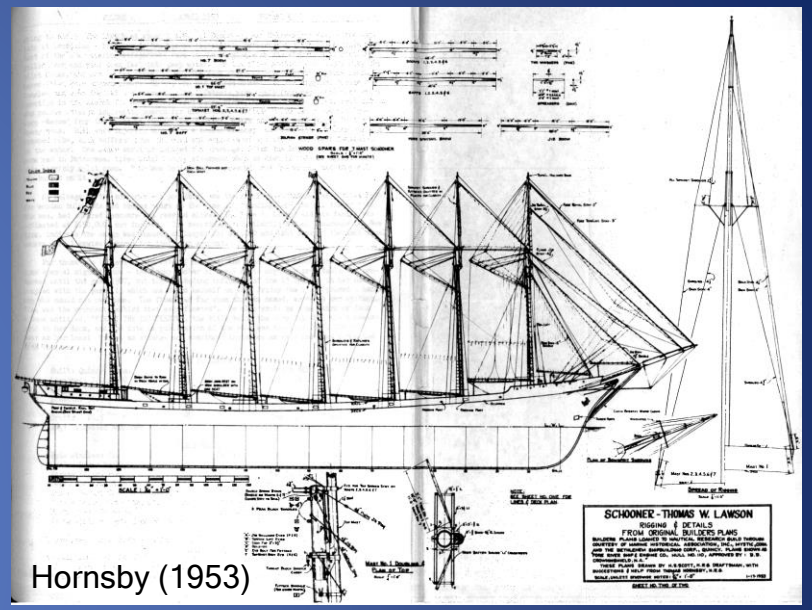
U.S. Navy

Sources: Campbell et al., 1977; Hickam 1996

Jersey Shore: 1942

Life Magazine Photos, Marie Hansen

Thomas W. Lawson: Second Big Spill…



- *First (only) seven-masted schooner, launched in 1902, Quincy MA*
- *Largest (475 ft.) sail-only (i.e., no auxiliary engine) ship*
- *Originally intended for Pacific trade*
  - *…but ship too big and sail area too small*
- *1906: refitted as bulk oil carrier, Texas - U.S. East Coast*
  - *First pure sailing tanker*

The Wreck of the *Thomas W. Lawson*

December 1907; Hall (2006)

December 14 1907; Hall (2006)

- *One (almost) trans-Atlantic crossing*
  - *Philadelphia to London, November 1907*
  - *7.6 million litres light paraffinic oil*
- *Encountered 3 gales; third broke both anchor chains & all seven masts*
  - *Foundered Annet Island/Shag Rock in Scilly Isles, 13 December 1907*
- *16 of 18 crew lost*

The Wreck of the *Thomas W. Lawson*

"When (the Thomas W. Lawson*) was knocked to pieces on the rocks, the tanks of oil escaped from her hold and burst open. The oil floated upon the waves; we could see it washing up here on the shore. At first we could not think what it was– it made the water look black; but soon we learnt from the smell– in fact, we were almost driven away by the smell. They say if it had caught fire it would have cleared the islands, it would have been like a sea of fire, and the smoke would have suffocated all the islanders. As it was, many of the rabbits and birds on Annet were killed by the oil, and lay dead upon the shore.*

"It was a horrible time. Everything seemed to reek of the oil. The very spray on the windows ran down in oily blue streaks for long after, and even now, when eighteen months have passed, we can still smell it at times."

Mothersole (1910)

THE WRECK OF THE *THOMAS W. LAWSON*: THE "FIRST" LARGE OIL SPILL

Gary Shigenaka
National Oceanic & Atmospheric Administration/Emergency Response Division
Seattle, WA
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ABSTRACT: The schooner *Thomas W. Lawson* was an ambitious and novel feat of American shipbuilding, one of the largest sailing vessels ever built and the only seven-masted schooner. Launched in Massachusetts in 1902, the *Lawson* was intended as a trans-Pacific cargo ship. However, her sails were too small for her massive steel hull and she proved to be unwieldy. After being relegated to transporting coal along the east coast, the Lawson was refitted as an oil carrier. In late 1907, she was chartered to carry two million gallons of light oil from Philadelphia to London. However, three storms battered the schooner during the Atlantic crossing, shredding her sails and tearing away all three lifeboats. As the *Lawson* neared the coast of England, she was off-course and ultimately was driven into the rocks in the Isles of Scilly. Sixteen of eighteen crewmembers perished, and the entire cargo of oil was churned into the waters at the wreck site. While there are many accounts of oil spilling into the rivers and coastal waters during the early years of oil production and transportation, the wreck of the *Thomas W. Lawson* was the first documentation of what would be termed a large oil spill even by modern standards. Residents of the Isles of Scilly also described adverse impacts to wildlife and to the people exposed to the spilled oil, foreshadowing accounts that would unfortunately become familiar in the years to come.

INTRODUCTION

The Isles of Scilly are a group of more than 100 islands off the southwest coast of Cornwall, England. They are the southernmost and westernmost part of England. While a number of the Scillies, as they are called, have been settled dating back in history and to prehistoric times, only five of the islands are currently inhabited by people. The others provide productive habitat and rookeries for seals and seabirds.

Figure 1 shows the rugged shorelines of many of the islands as well as the complex patterns of water movement among and through them. This provides some hint of the hazard that the islands have presented for navigators and sailors over the years.

The Isles of Scilly were the setting for a benchmark in the history of oil spills, as one of the first large spills occurred here—very likely, *the* first.[1] And, this event was also the first large oil tanker spill. Given the long association of humans with oil, with archeological evidence of the use of oil as an adhesive for tools dating back 40,000 years (Boëda et al., 1996), the occurrence of this spill in the Scillies in 1907 seems wholly modern and contemporary. However, as has been documented in many historical documents, especially this journal, the development of the oil industry and the need to produce and transport large volumes are relatively modern developments. Accidental releases of large volumes also occurred with this modern development.

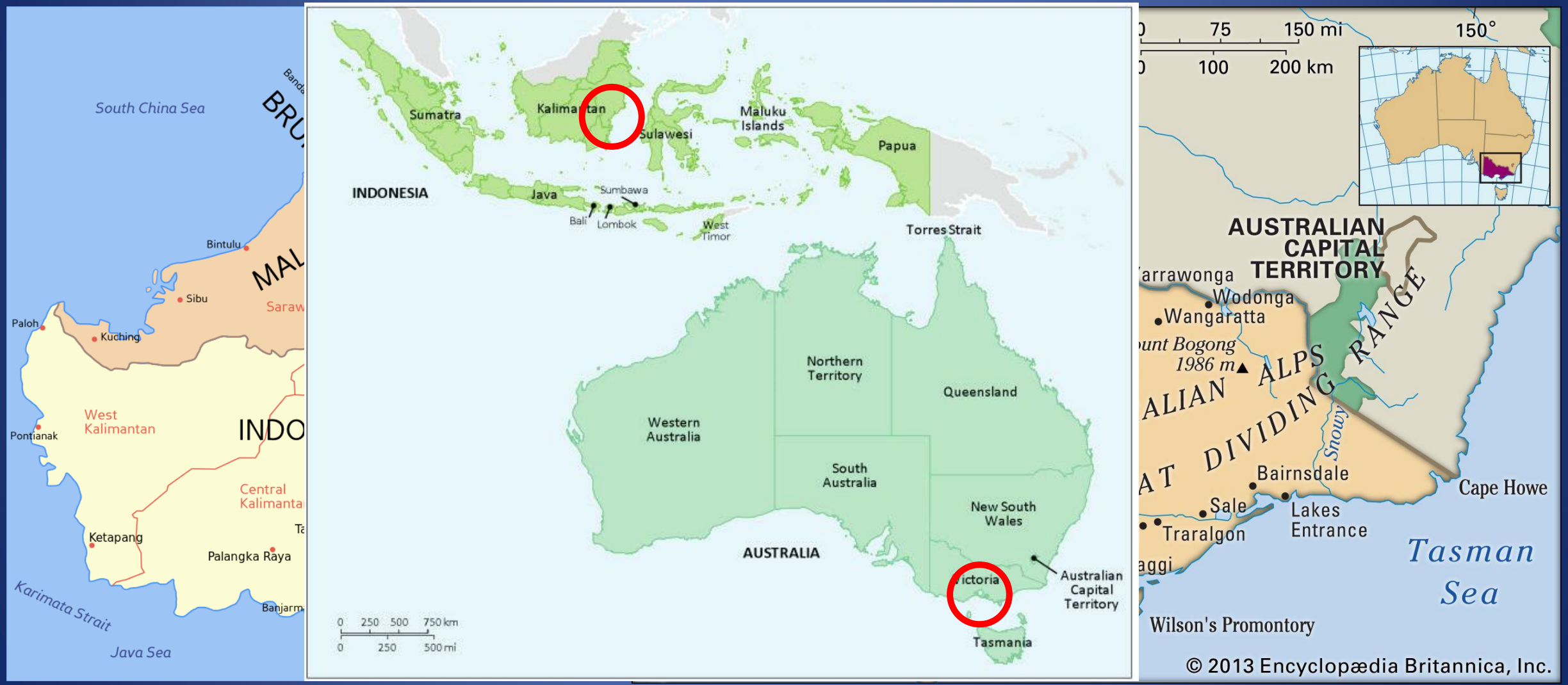
THOMAS W. LAWSON - THE SHIP

The centerpiece for this story is a ship called the *Thomas W. Lawson*, which was a vessel notable in its own right. Hornsby (1953), Hall (2006), and a number of others have documented the short history of the ship. Eagerly anticipated, even

Figure 1. View of the Isles of Scilly from the International Space Station. Photo: NASA.

[1] It is reasonable to ask, what is meant here by the term, "oil spill," particularly in the context of the "first" such event? Surely, oil had been spilled elsewhere, both on land and in water, during the development of the oil industry as we know it. There are numerous accounts of accidental releases of oil, from drilling rig blowouts, to spillage due to lack of adequate storage, or clumsy attempts at transporting oil to refineries. Gushers from oil wells, in fact, were considered to be quaint or even uncommonly good luck. The notion of a down side to oil releases began to grow as larger quantities of oil were released into the environment and industrial wastes polluted streams and rivers. The ability to transport bulk volumes of oil and the potential to release it all at once created scenarios that had not been previously observed or conceived. The wreck of the *Thomas W. Lawson* was one of the first of these scenarios to be realized.

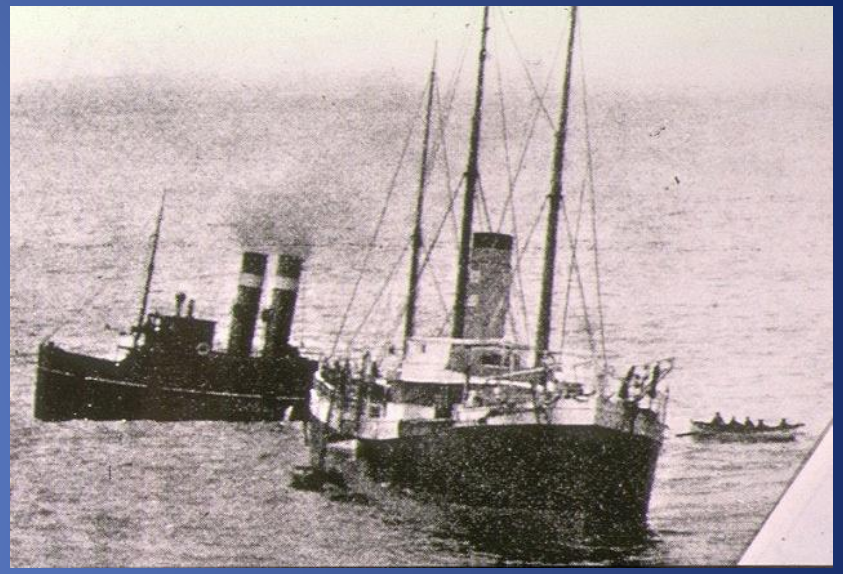
The Wreck of the *S.S. Petriana*…First Big One?



S.S. *Petriana*

28 November, 1903

Australian Maritime Safety Authority; original source Newspaper Collection, State Library of Victoria



- *Built in 1879 in England, converted to tanker in 1891; transferred to Asiatic Petroleum Co. (Royal Dutch Shell) in 1903*
- *Departed Balikpapan, Dutch East Indies en route Melbourne*
- *Cargo 1,300 tons (~9,500 bbl / 400,000 gal.) "bulk oil" , with naphtha and benzene*
- *Grounded in fog at Portsea Back Beach, Victoria, Australia*

S.S. *Petriana*

28 November, 1903

- *Cargo oil was released into the sea to lighten the vessel*
- *"...the spill was described as 'a film of great beauty, radiating all the colours of the rainbow, spread from Sorrento Back Beach to Point Nepean'. The foul-smelling oil contaminated the beaches for months afterwards."*

S.S. *Petriana*

28 November, 1903

- *Victorian authorities tried to prevent the Chinese and Malay from landing, citing the Immigration Restriction Act and the White Australia Policy which prohibited non-European immigrants from entering the Commonwealth*
- Petriana *Captain William Kerr wrote, "If this treatment of my crew is a fair specimen of your humanity it is about equal to the worst barbarity of other nations, and if it is forced on you by your laws, I regret to say they are a disgrace to the British Empire."*

THE WRECK OF THE *THOMAS W. LAWSON*: THE "FIRST" LARGE OIL SPILL

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Figure 1. View of the Isles of Scilly from the International Space Station. Photo: NASA.

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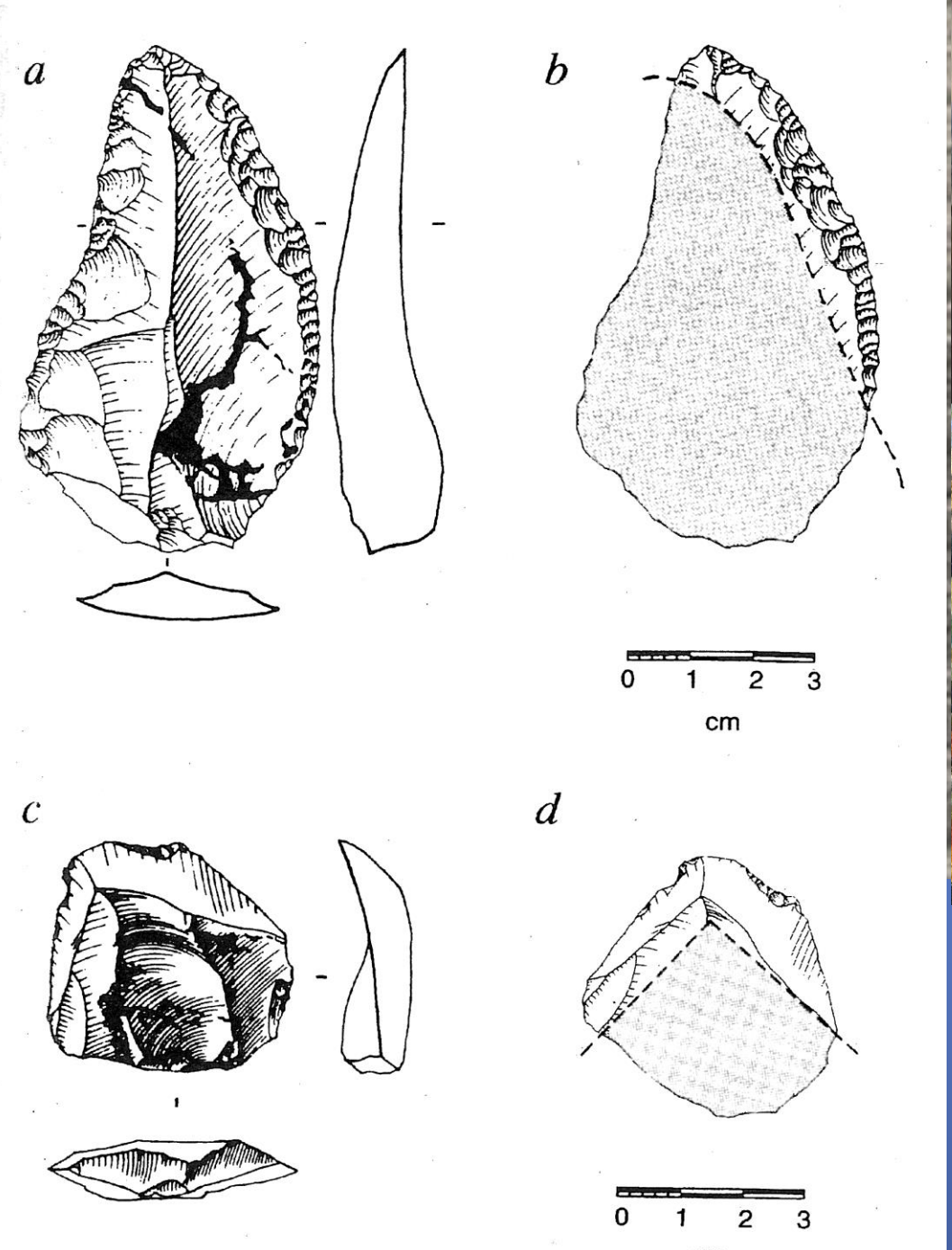
History of Spills Provides Context & Frame of Reference

- *The* Thomas W. Lawson *remains the first* accidental U.S. oil spill*
- *The* Petriana *now assumes the distinction of being the first* documented historical oil spill*

History of Spills Provides Context & Frame of Reference

- *It is difficult, if not impossible, to untangle the history of oil spills from the history of oil itself*
- *Humans have been spilling the stuff ever since they discovered it*

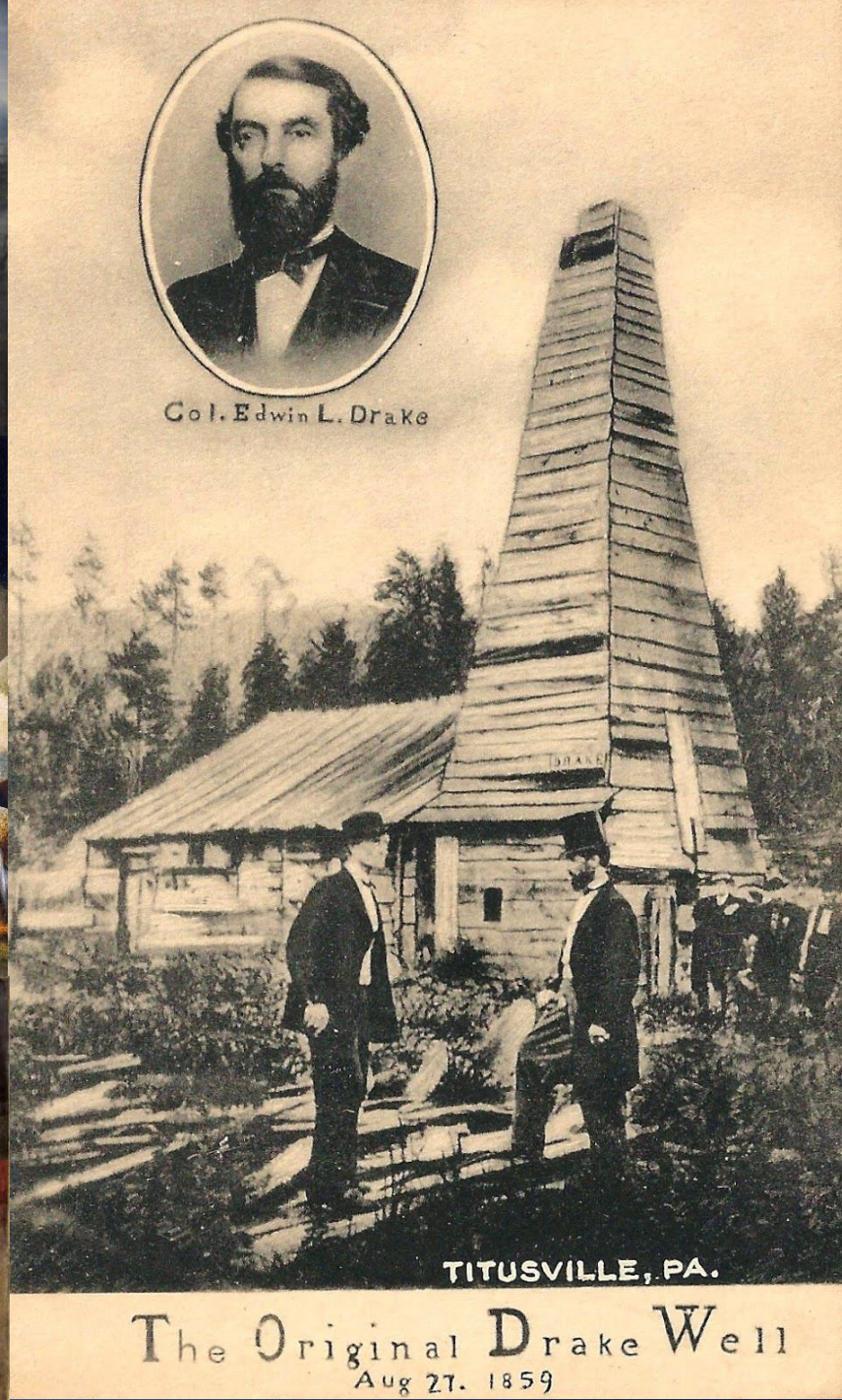


Umm el Tlel site, Syria, 40,000 BC/Boëda et al. (1996)

Lucas van Valckenborch/Louvre

Edward Hicks/Philadelphia Museum of Art

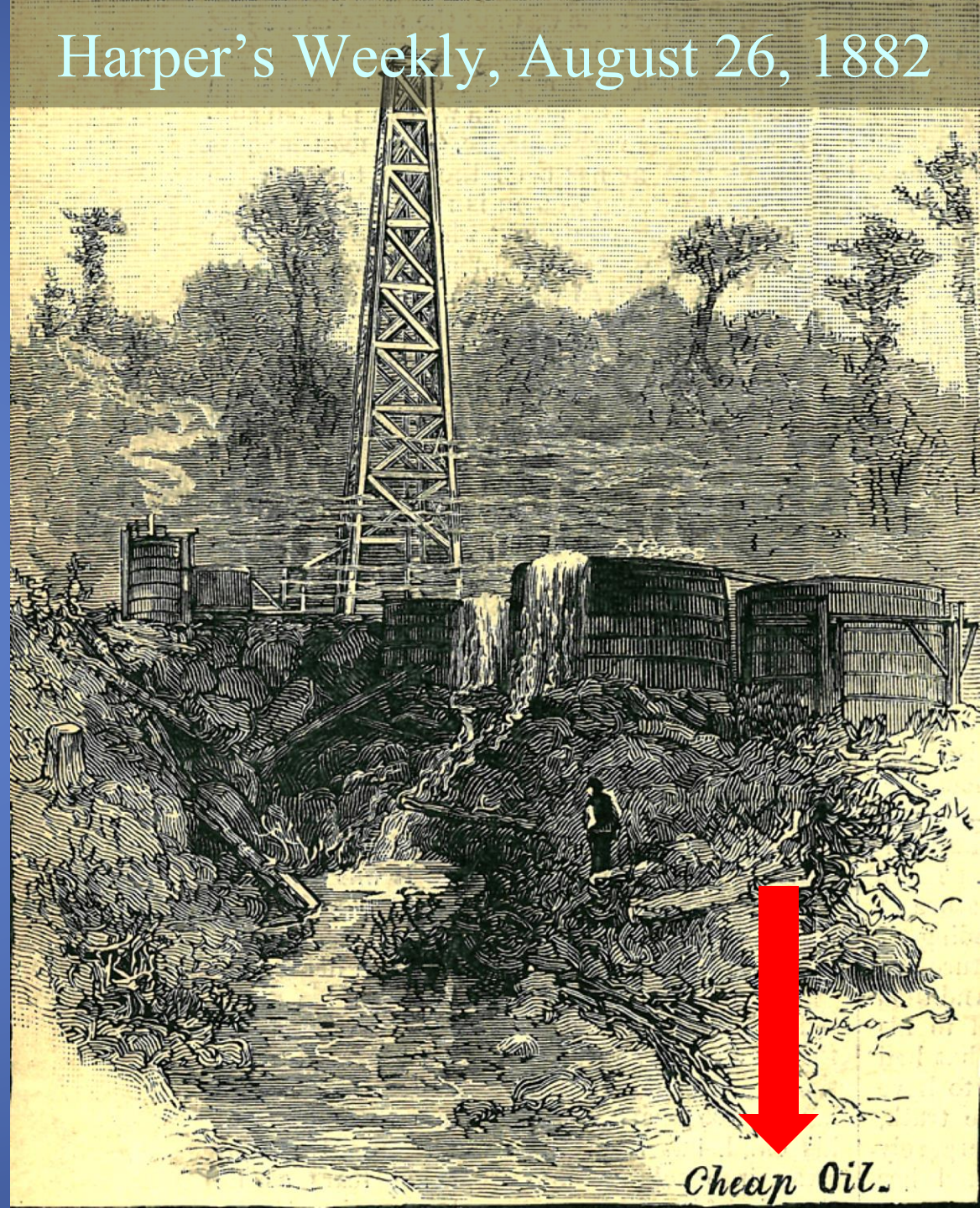
John Martin/Laing Art Gallery



"When the first wells were opened…there was little or no tankage ready to receive it, and the oil ran into the creek and flooded the land around the wells until it lay in small ponds. Pits were dug in the ground to receive it, and dams constructed to secure it, yet withal the loss was very great…the river was flooded with oil, and hundreds of barrels were gathered from the surface as low down as Franklin, and prepared as lubricating oil. Even below this point oil could be gathered in the eddies and still water along the shore, and was distinctly perceptible as far down as Pittsburgh, one hundred and forty miles below."

Petroleum: A History of the Oil Region of Venango County, PA (1866)

Harper's Weekly, August 26, 1882



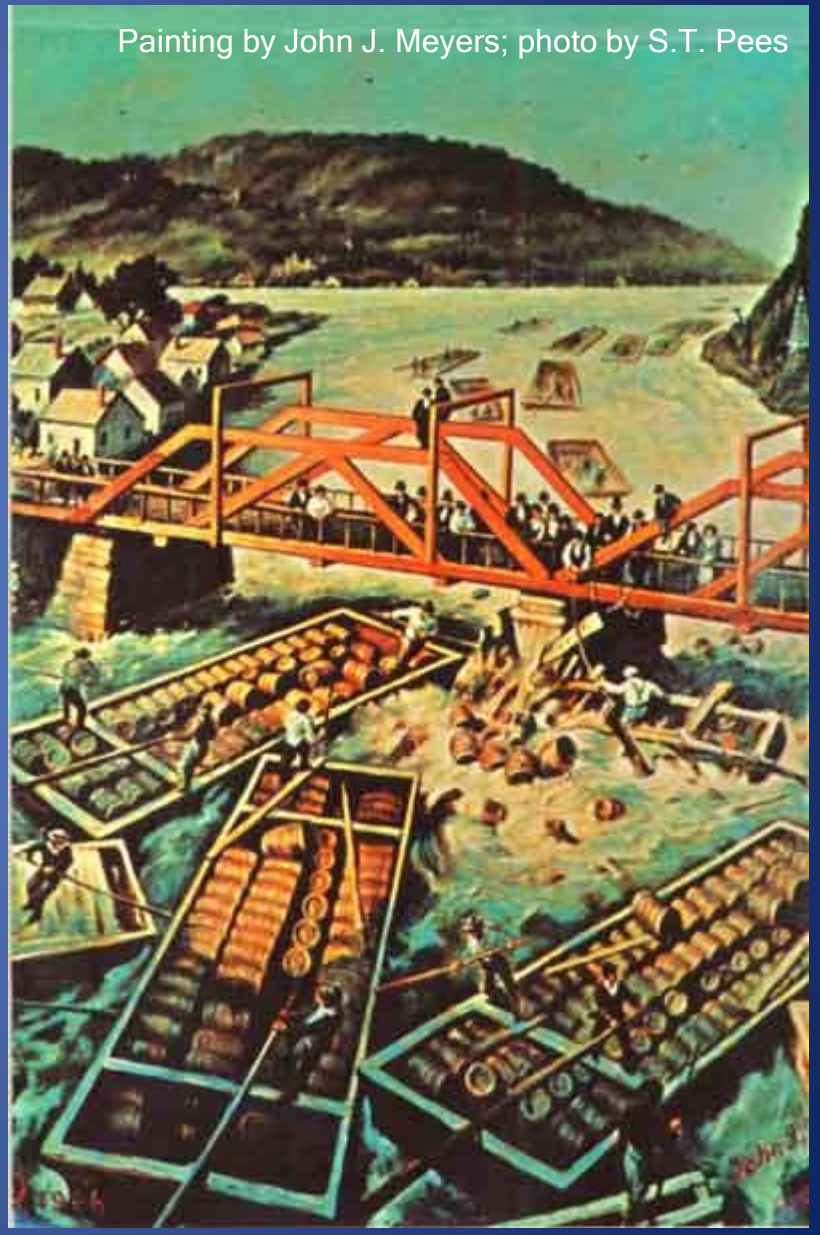
POND FRESH SMASH UP, OIL CREEK.—*Page* 165.

Eaton (1866)

Pennsylvania Historical & Museum Commission

Times of London, April 27 1865:

"The opening of the dam and the consequent freshet sometimes caused great confusion and loss among the boats and rafts, owing, perhaps, to the carelessness of a few boatmen. Ill-secured boats went plunging and smashing among rafts, barrels, and boats. Barrels of oil were sent careening wildly down stream on their own account. Flat boats filled with oil in bulk were stove in, and the oil escaped into the stream. The latest of the great freshet disasters, which occurred in December, 1862, occasioned a loss of 50,000 barrels of oil."



Painting by John J. Meyers; photo by S.T. Pees

John Mather, Collection of Harvard University

History of Spills Provides Context & Frame of Reference

- *It is difficult, if not impossible, to untangle the history of oil spills from the history of oil itself*
- *Humans have been spilling the stuff ever since they discovered it*

Oil Spill History…What We'll Discuss Today

- *Introduction*
- *Largest ("worst") oil spill*
- *"First" oil spill (updated)*
- *Oil spills and war stories*
- *A little bit on oil research*
- *A brief look at oil spills in cinema*
- *Where are they now?*

History of Spills Provides Context & Frame of Reference

- *Studies of the interaction between oil and the environment began hundreds of years ago, but empirical investigations paralleled the history of humans and oil*
- *A famous American personality and statesman was an early oil nerd*

A Taste of Oil Research History

XLIV. *Of the ſtilling of Waves by means of Oil. Extracted from ſundry Letters between* Benjamin Franklin, *LL. D. F. R. S.* William Brownrigg, *M. D. F. R. S. and the Reverend Mr.* Fariſh.

Extract of a Letter from Doctor BROWNRIGG to Dr. FRANKLIN, dated Ormathwait, January 27, 1773.

Redde, June 2, 1774.

BY the encloſed from an old friend, a worthy clergyman at Carliſle, whoſe great learning and extenſive knowledge in moſt ſciences would have more diſtinguiſhed him, had he been placed in a more conſpicuous point of view, you will find that he had heard of your experiment on Derwent Lake, and has thrown together what he could collect on that ſubject; to which I have ſubjoined one experiment from the relation of another Gentleman.

Extract of a Letter from the Reverend Mr. FARISH, to Dr. BROWNRIGG.

I ſome time ago met with Mr. Dun, who ſurpriſed me with an account of an experiment you had tried upon the Derwent water, in company with Sir

Franklin, B., F.R.S. William Brownrigg, and the Reverend Mr. Farish. 1774. Of the stilling of waves by means of oil. Philosophical Transactions of London 64:445-460.

"...the water, which had been in great agitation before, was instantly calmed, upon pouring in only a very small quantity of oil, and that to so great a distance around the boat as seems a little incredible."

Sir JOHN PRINGLE and Dr. FRANKLIN. According to his repreſentation, the water, which had been in great agitation before, was inſtantly calmed, upon pouring in only a very ſmall quantity of oil, and that to ſo great a diſtance round the boat as ſeems a little incredible. I have ſince had the ſame accounts from others, but I ſuſpect all of a little exaggeration. PLINY mentions this property of oil as known particularly to the divers, who made uſe of it in his days, in order to have a more ſteady light at the bottom(*a*). The ſailors, I have been told, have obſerved ſomething of the ſame kind in our days, that the water is always remarkably ſmoother in the wake of a ſhip that hath been newly tallowed, than it is in one that is foul. — Mr. PENNANT alſo mentions an obſervation of the like nature made by the ſeal catchers in Scotland. *Brit. Zool.* Vol. IV. *Article* SEAL. When theſe animals are devouring a very oily fiſh, which they always do under water, the waves above are obſerved to be remarkably ſmooth, and by this mark the fiſhermen know where to look for them. — Old PLINY does not uſually meet with all the credit I am inclined to think he deſerves. I ſhall be glad to have an authentic account of the Keſwick experiment, and if

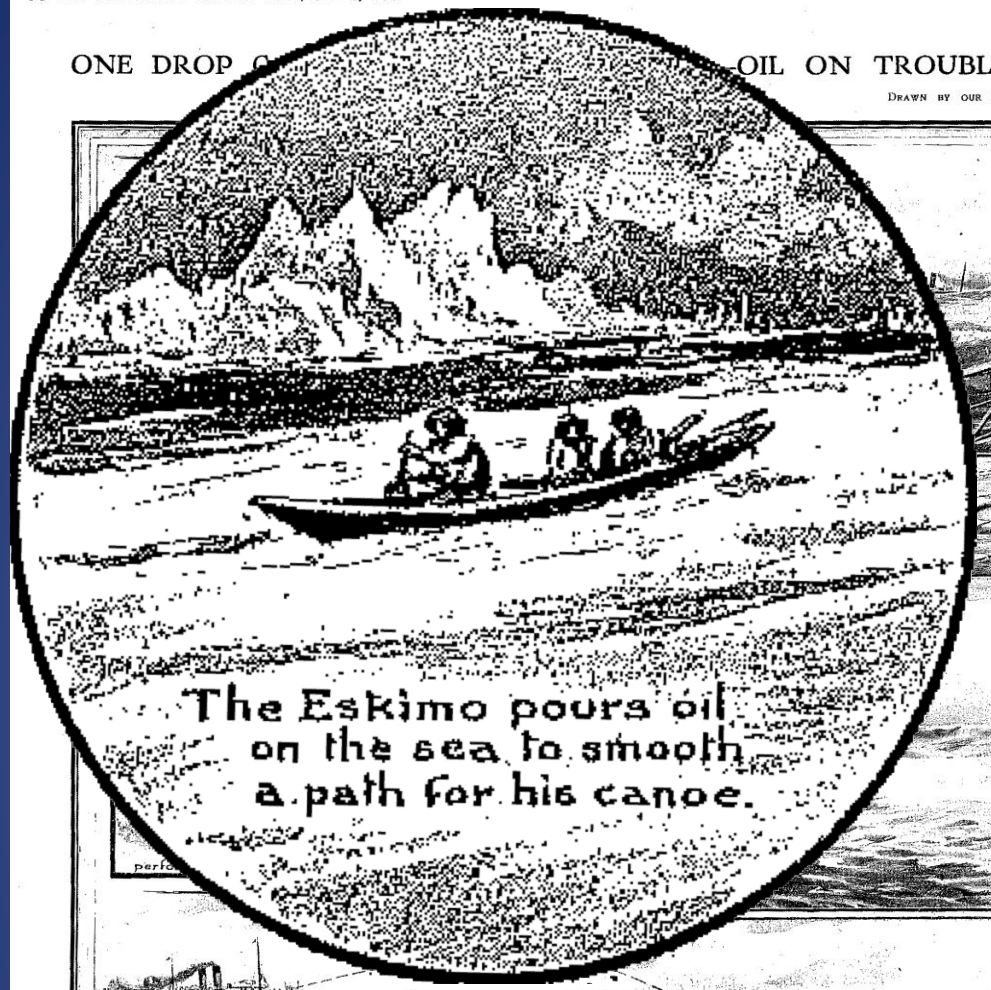
Note by Dr. BROWNRIGG.

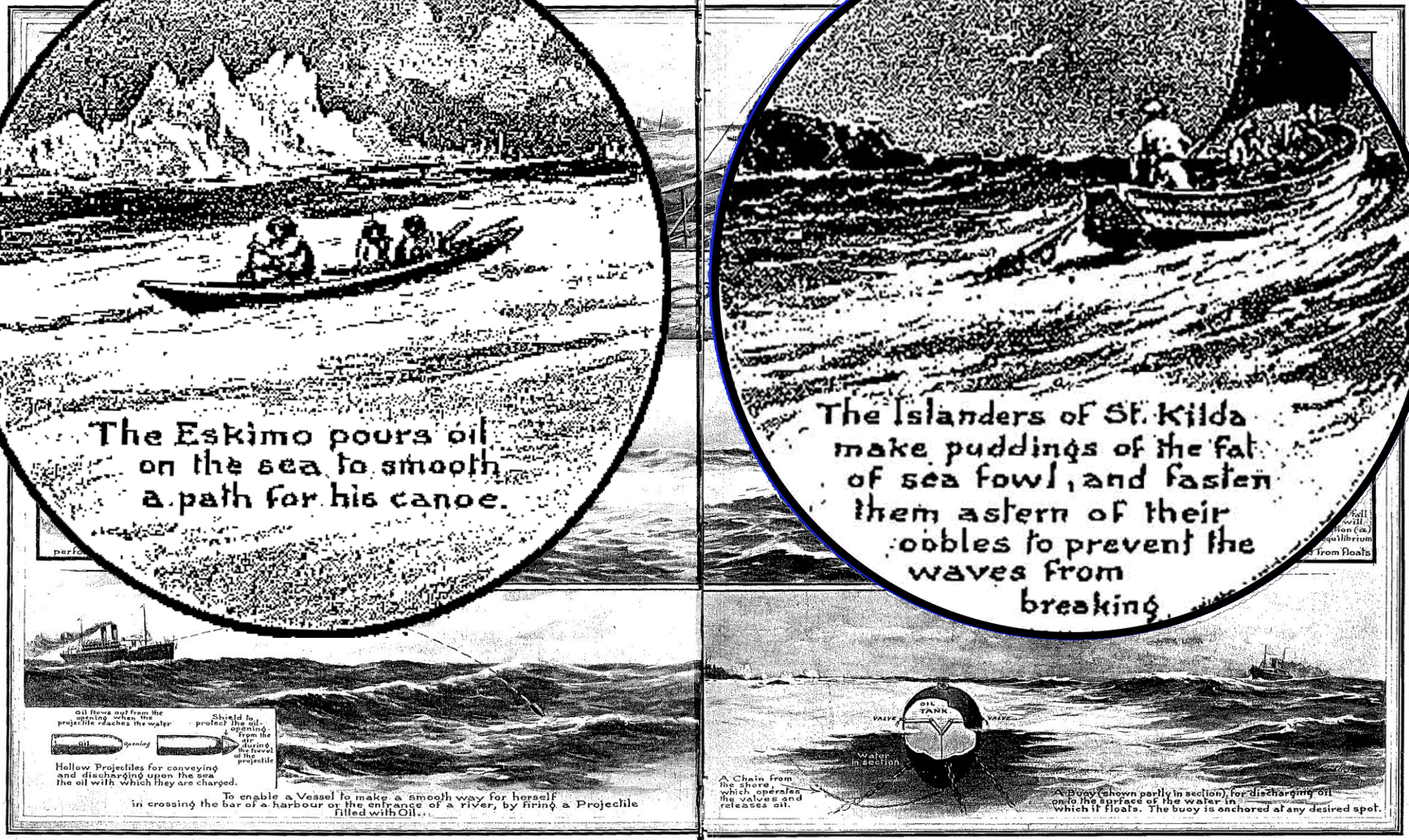
(*a*) Sir GILFRED LAWSON, who ſerved long in the army at Gibraltar, aſſures me that the fiſhermen in that place are accuſtomed to pour a little oil on the ſea, in order to ſtill its motion, that they may be enabled to ſee the oyſters lying at its bottom; which are there very large, and which they take up with a proper inſtrument. This Sir GILFRED had often ſeen there performed, and ſaid the ſame was practiſed on other parts of the Spaniſh coaſt.

it

ONE DROP C… OIL ON TROUBLE… WATERS, TO SM… …IRACULOUS.

Drawn by our Sp… rtist, W. B. Robinson.





COVERING THE SEA WITH A FILM TO SMOOTH IT: OIL MODIFYING THE EFFECT OF BREAKING WAVES, AND THUS MAKING NAVIGATION THE SAFER.

The very valuable part played by the oil-tank steamer "Narragansett" at the time of the "Volturno" disaster has caused keen attention to be directed once more to the way in which oil may be used to calm the troubled waters. Sir Ray Lankester, for example, dealt with the question very thoroughly the other day in the "Daily Telegraph"; and there have been various other printed notes about the subject. That being so, these drawings must prove of exceptional interest; more especially when it is pointed out that nine pints of oil cover a square mile of water effectively; that is to say, provide it with a film which will prevent it from breaking. The film is effective when it has the almost unimaginable thickness of two-millionths of a millimetre. So much is the use of oil recognised in this connection that the Board of Trade's "Notices to Mariners" quotes at length the Admiralty's information, given in their sailing directions, on "The Use of Oil for Modifying the Effect of Breaking Waves." From this we quote the following points; "On free waves, that is, waves in deep water, the effect is greatest. In a surf, or waves breaking on a bar, where a mass of liquid is in actual motion in shallow water, the effect of the oil is uncertain; as nothing can prevent the larger waves from breaking under such circumstance; but even here it is of some service. The heaviest and thickest oils are most effectual. . . . All animal and vegetable oils, such as waste oil from the engines, have very great effect. . . . The best method of application in a ship at sea appears to be: Hanging over the side, in such a manner as to be in the water, small canvas bags, capable of holding from one to two gallons of oil, such bags being pricked with a sail needle to facilitate the leakage of the oil. . . . For boarding a wreck, it is recommended to pour oil overboard to windward of her before going alongside." This use of oil was well known to the ancients. The officers of Pliny's fleet knew it eighteen hundred years ago. Three of our drawings are based on details in the 'specification of John Shields in "Apparatus for the Protection of Harbours and Shipping."

Tampico (Maru):
The First Oil Impact Study 1957-1984

- *Estimated to be carrying 60,000 bbl (9.5 million litres) dark diesel oil*
- *One third of cargo estimated to have leaked immediately, with the remainder over the next nine months as the ship was battered on the rocks*
- *Dr. Wheeler North, Emeritus Professor at California Institute of Technology, began studying effects of the oil release*
- *By 1964, had completed 22 field visits to the site*

Chuck Mitchell, MBC Applied Environmental Sciences

Tampico (Maru):
The First Oil Impact Study

- *Wheeler North retrospective conclusions after 27 years:*
  - *Initially near-total mortality in the vicinity of the wreck;*
  - *No visible oiling in the cove (site of grounding) after two to three months;*
  - *By 1984, size structure restored for abalones and urchins, and lobsters had returned;*
  - *"So after three years, things were pretty normal but they weren't completely normal for quite a long time."*
- *"In a number of clearly defined ways the 'Tampico' cove has not returned to the status which existed before the catastrophe. In most instances the reasons are not known, but in others it is possible to propose quite logical explanations for the changes. One might expect that even if the catastrophe had never occurred, conditions in 1964 would be different from those in 1956, and it is well to keep this in mind when assessing the significance of changes."*

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- *Class review: "First" oil spill (updated)*
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- *Where are they now?*

Whatever happened to…?

Where Are They Now? *Petriana*

THE PETRIANA CREW.

THEIR TREATMENT AT MELBOURNE.

THE CAPTAIN'S STORY.

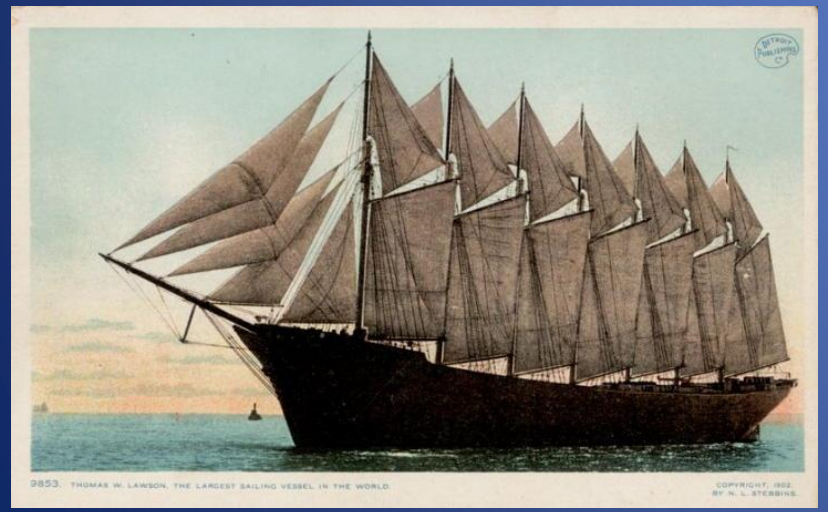
MELBOURNE, December 8.

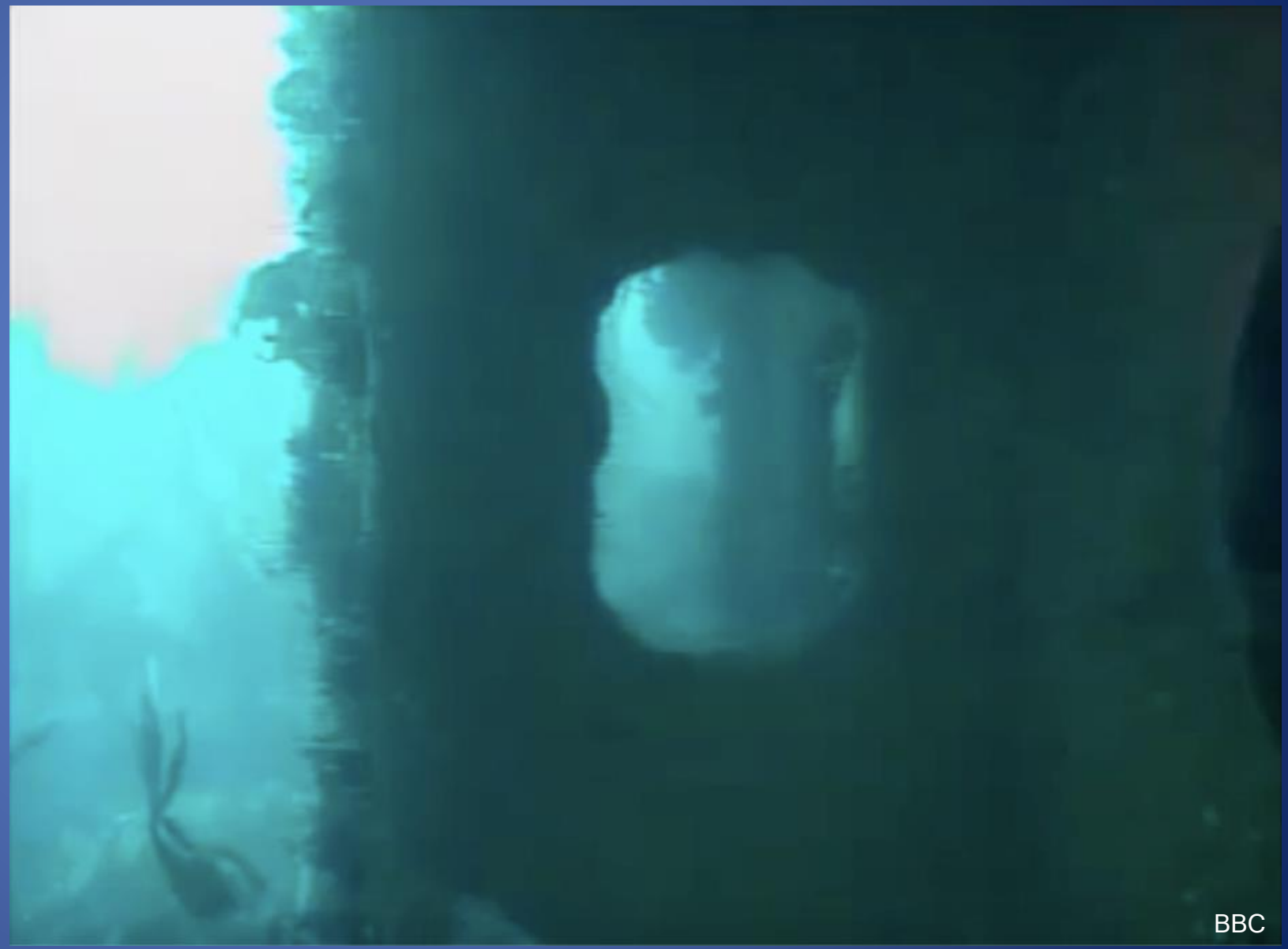
Ever since the steamer Petriana was wrecked the Federal Government have been endeavoring to stem the outburst of public indignation caused by the difficulties which arose owing to the provisions of the Immigration Restriction Act in regard to the landing of the colored crew on Australian shores. Mr Deakin eventually explained that the External Affairs Department was not responsible for the non-landing of the crew, who were transferred to a Japanese mailboat without coming ashore at all.

The Prime Minister said that this arrangement had been made by the agents of the wrecked steamer, in accordance with the provisions of the Imperial Merchant Shipping Act, which requires shipwrecked crews to be conveyed back to the port of shipment at the expense of the owners of the lost vessel. Mr Deakin declared the whole thing to be a myth, which had been brought startlingly before the public for election purposes. How this could be is not quite clear, as it was in the columns of the Ministerial journal, the Age, that the first account of the difficulties in regard to the landing of the crew were published and emphasised.

Victorian Heritage Database

Where Are They Now? *Thomas W. Lawson*





Where Are They Now? *Thomas W. Lawson*

Valhalla Museum, Isles of Scilly

National Maritime Museum

Adrian Colston

"Slippen is the oldest pilot gig, she was built in 1830 and was then known as Bernice – at that time she was a St Martin's boat. In 1869 she was sold to St Agnes and became the Slippen. In 1907 Slippen went to the rescue of the *Thomas W Lawson* after she grounded off Annet – two of the 18 crew were rescued… After the disaster a historical society from Massachusetts part funded her restoration. Slippen is now a St Mary's boat. At the 2015 World Gig Rowing Championships a ladies team from Massachusetts were lent the Slippen in order to race in her – a nice historical connection – she had been especially refurbished for the occasion."

Where Are They Now? *Thomas W. Lawson*

LOT 67

A BRASS PORTHOLE RECOVERED FROM THE WRECK OF THE S.V. THOMAS W. LAWSON SUNK OFF

In Maritime and Scientific Models, Instruments & ...

This auction is live! JOIN THE AUCTION NOW TO PLACE YOUR BID

Prev lot: 66 | Search by lot # | Next lot: 68

Feedback

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Your max bid **650 GBP**

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Additional fees apply

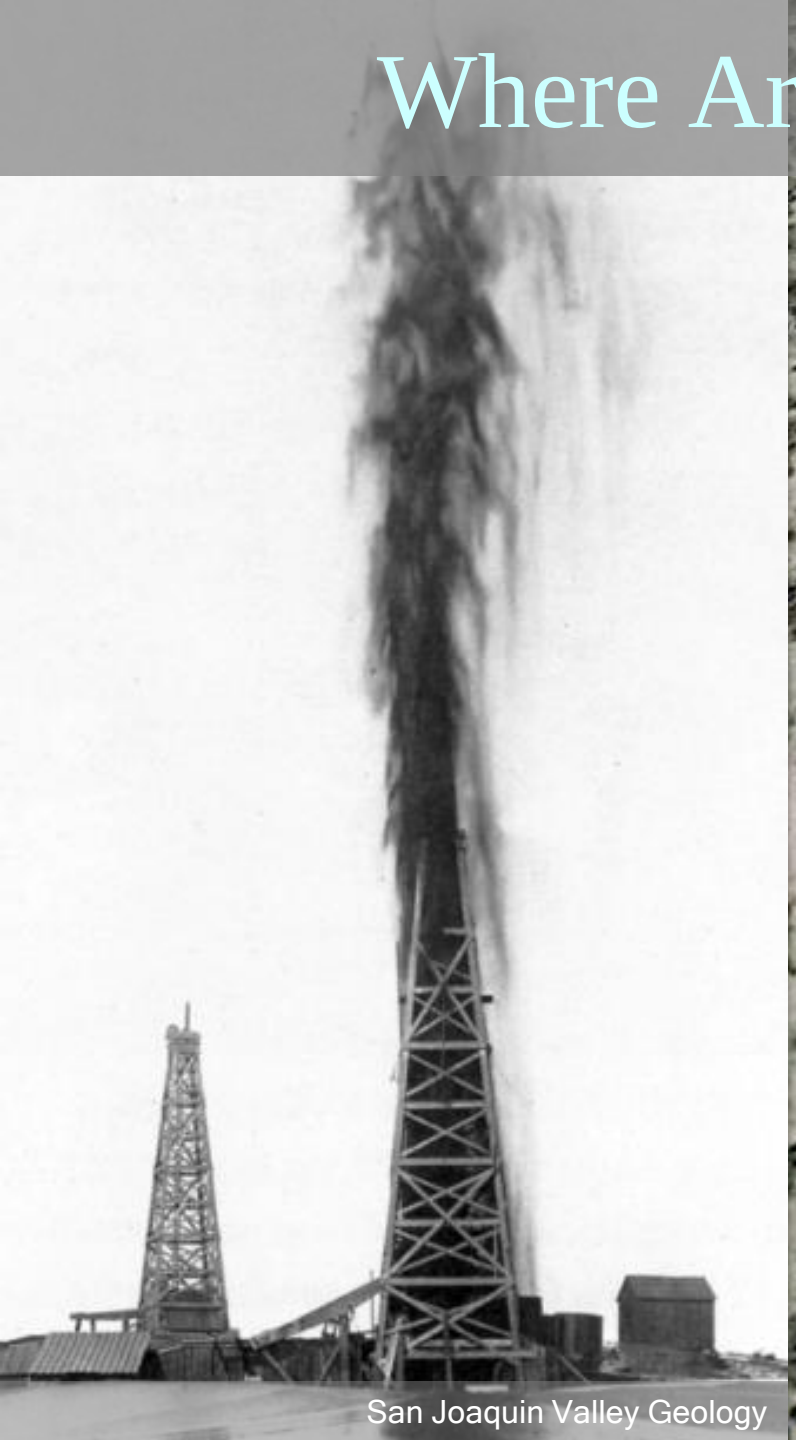
Watching (7 watching) | You're registered for this auction

Live Auction: **27 Apr 2021 10:00 BST**

Lot Location: **London**

Shipping: See options

Where Are They Now? Lakeview Gusher

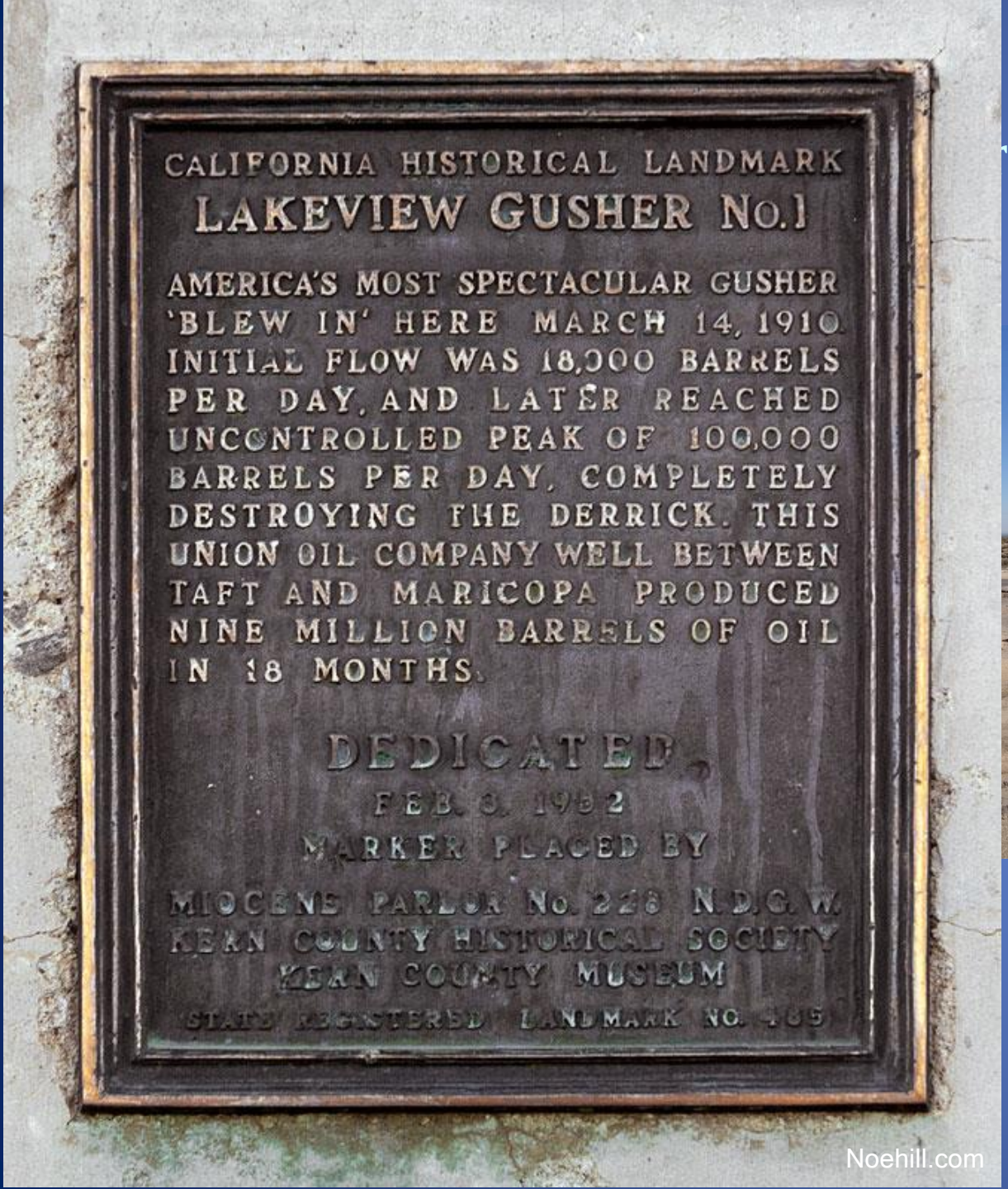


San Joaquin Valley Geology


Approx. 250 cm
Antandrus

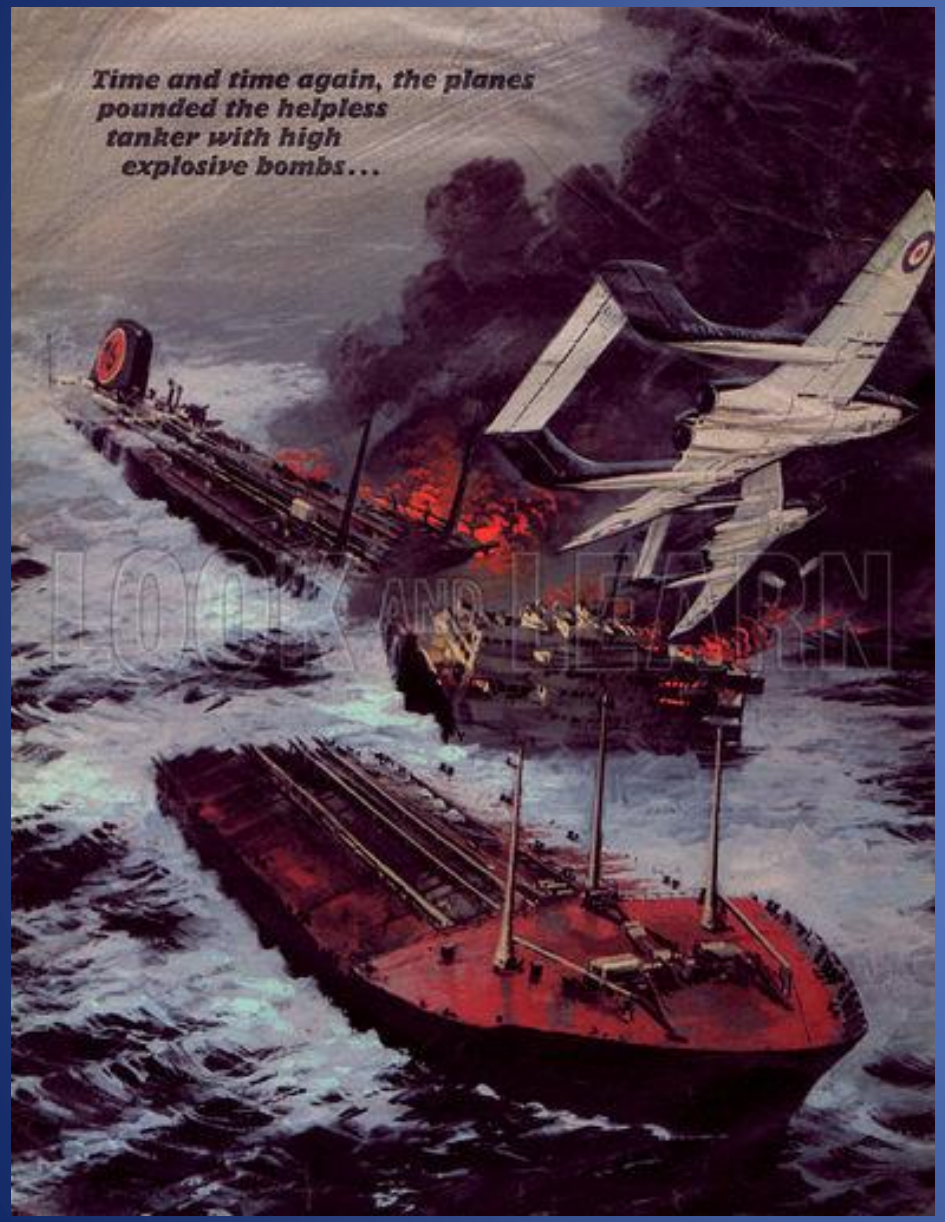
Gusher Site:

rch 2015



Noehill.com

Where Are They Now? *Torrey Canyon*

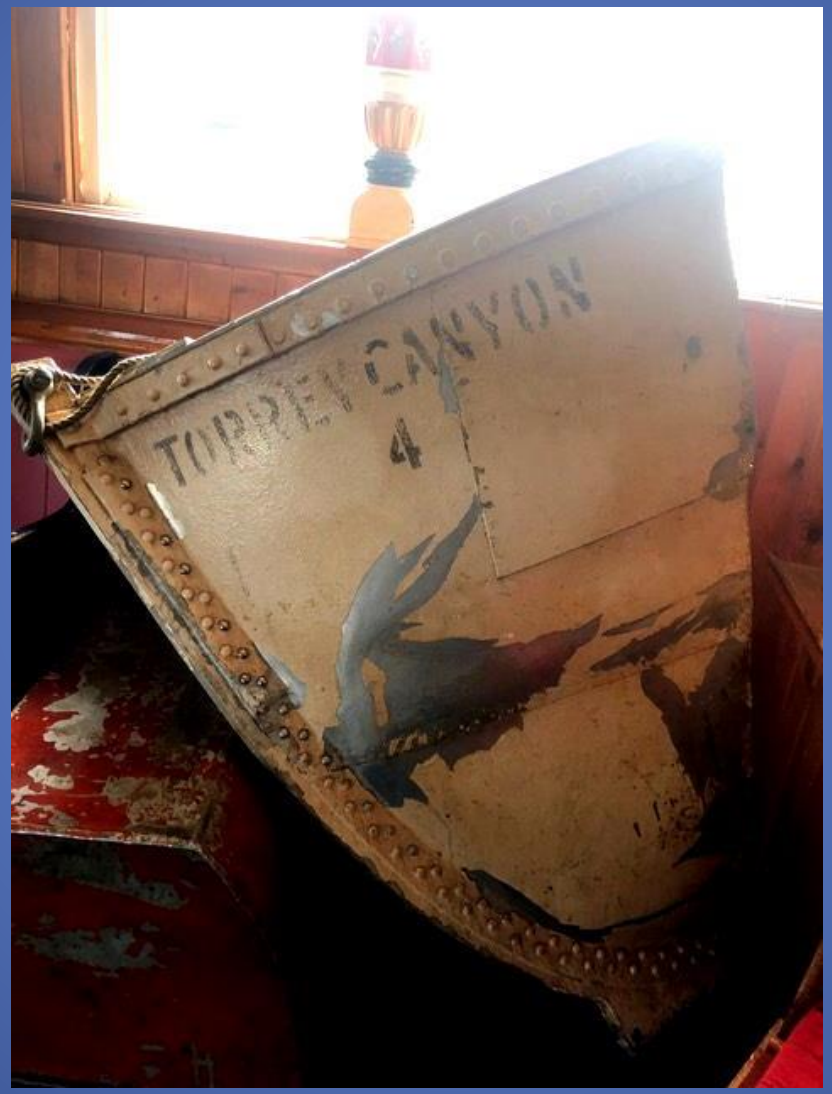


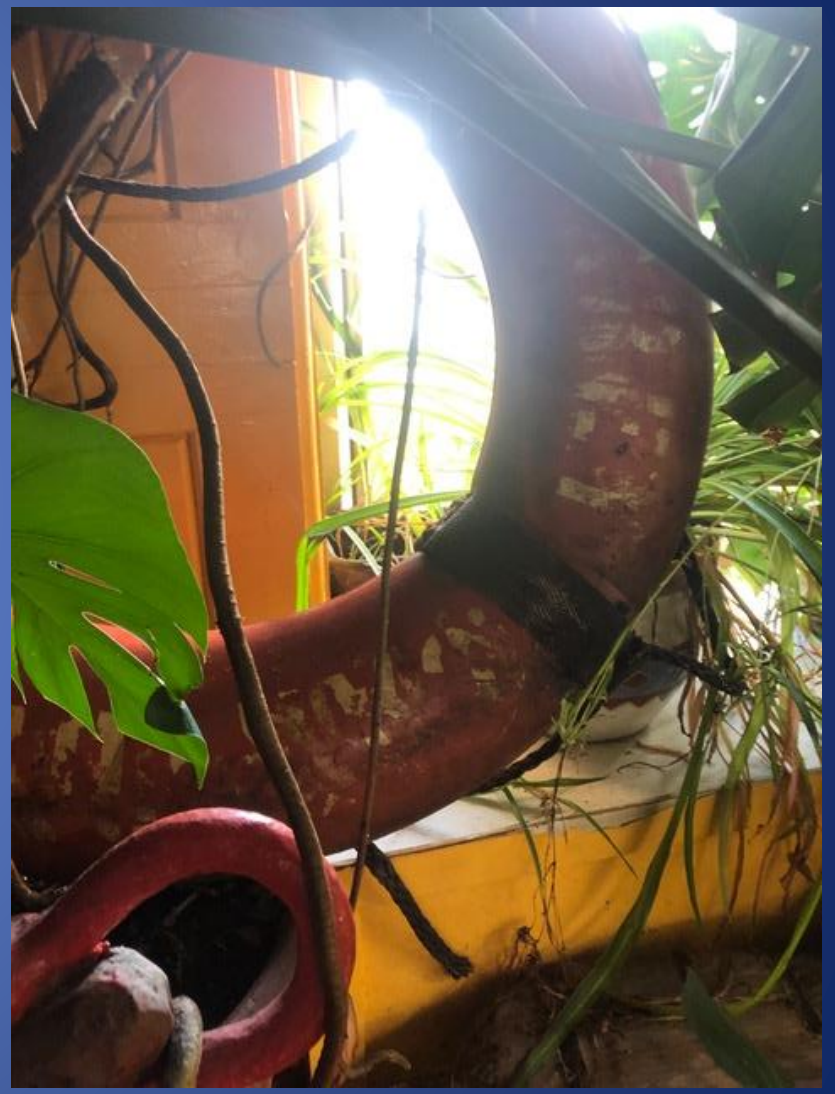
Look and Learn, used with permission

Jane Bown/The Observer

BBC/Britain's Secret Seas, 2011

Where Are They Now? *Torrey Canyon*





Thanks to Christopher Morgan, The Admiral Benbow Pub, Penzance, Cornwall

Where Are They Now? *Exxon Valdez*

Me

Where Are They Now? *Exxon Valdez*

Where Are They Now? *Exxon Valdez*

1989...

2018...


EXXON VALDEZ
WILMINGTON DEL.


EXXON VALDEZ
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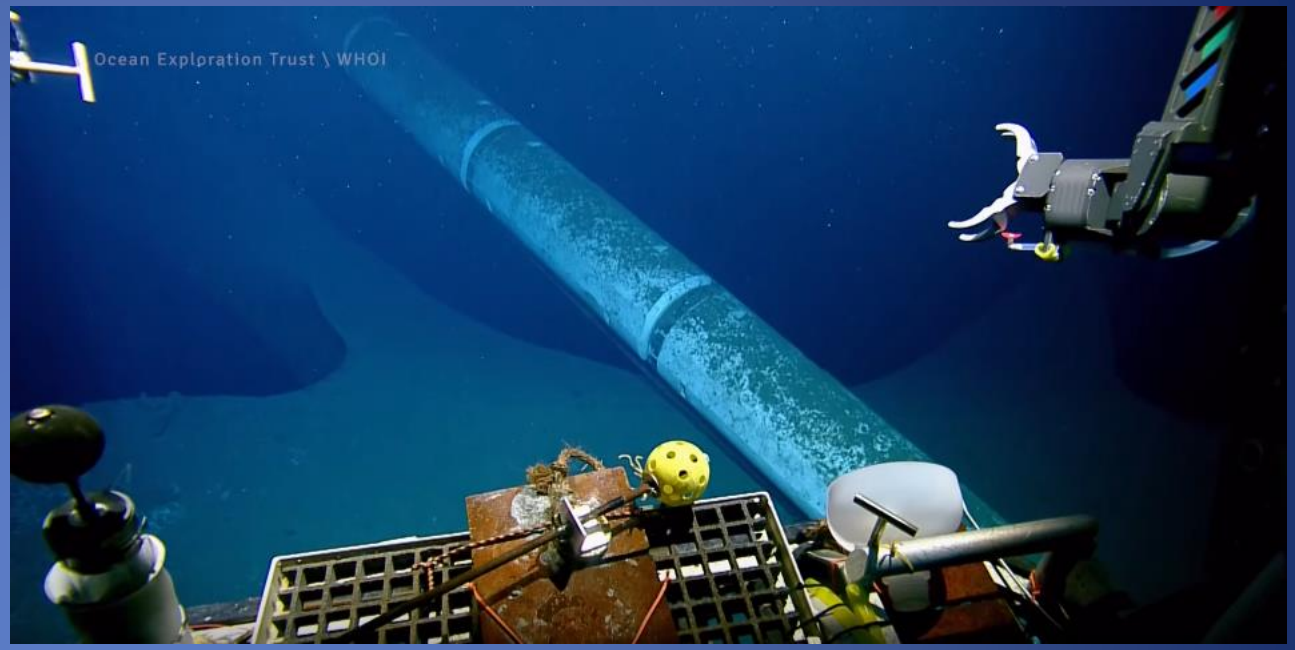
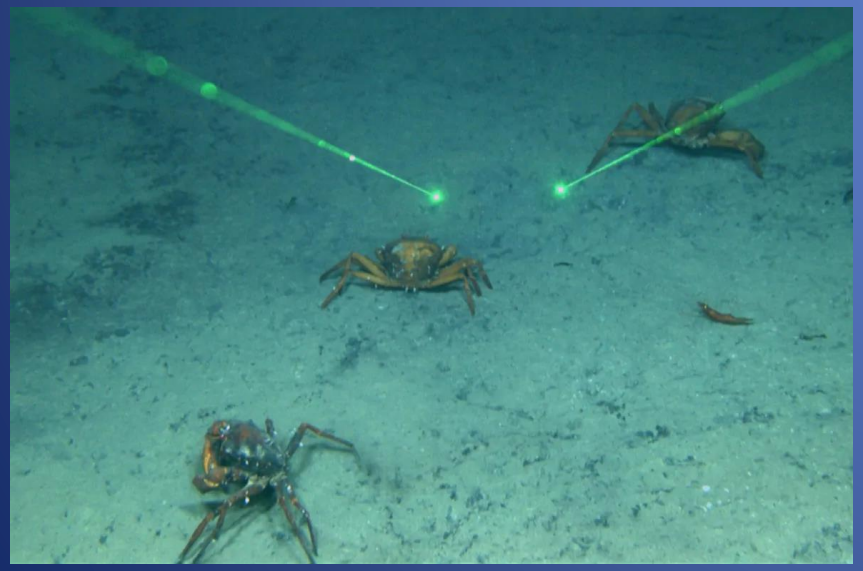
VESTDAVIT

Where Are They Now?






IN MEMORY
E DEEP WATER

History of Oil Spills:
True Dat #9

- *Remains of oil spill wrecks and pieces of artifacts persist, generally outlasting the impacts from the oil involved*
- *The most durable and profound legacies of the many spills we've experienced are not always tangible*

History of Oil Spills:
True Dat #10

“What is past is prologue.”

William Shakespeare, The Tempest, Act II Scene I

“Life can only be understood backwards; but it must be lived forwards.”

Søren Kierkegaard, Journals, 1843

“Those who ignore the past are condemned to repeat it.”

George Santayana, The Life of Reason, 1905

The Ominous Future: FSO *Safer*

- *FSO = "Floating Storage & Offloading" unit*
- *Anchored off Yemen for over 30 years*
- *Loaded with 1 million bbl (159 million litres) crude oil*

Holm Akhdar

The Ominous Future: FSO *Safer*

Shipboard photos by I.R. Consilium

try some delicious and healthy snacks
at our concession stand

Intermission