

# Mapping for Investigations

**Al Shaw**

[al.shaw@propublica.org](mailto:al.shaw@propublica.org)

@A\_L

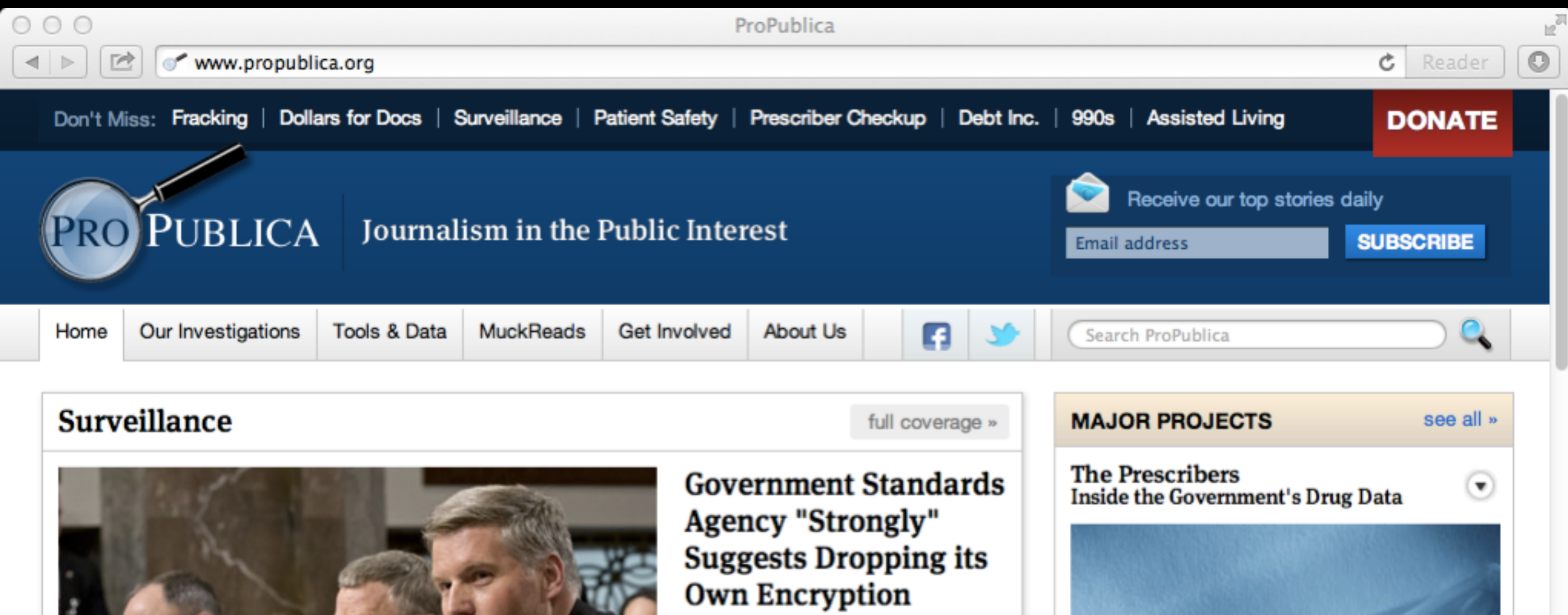
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**ProPublica**

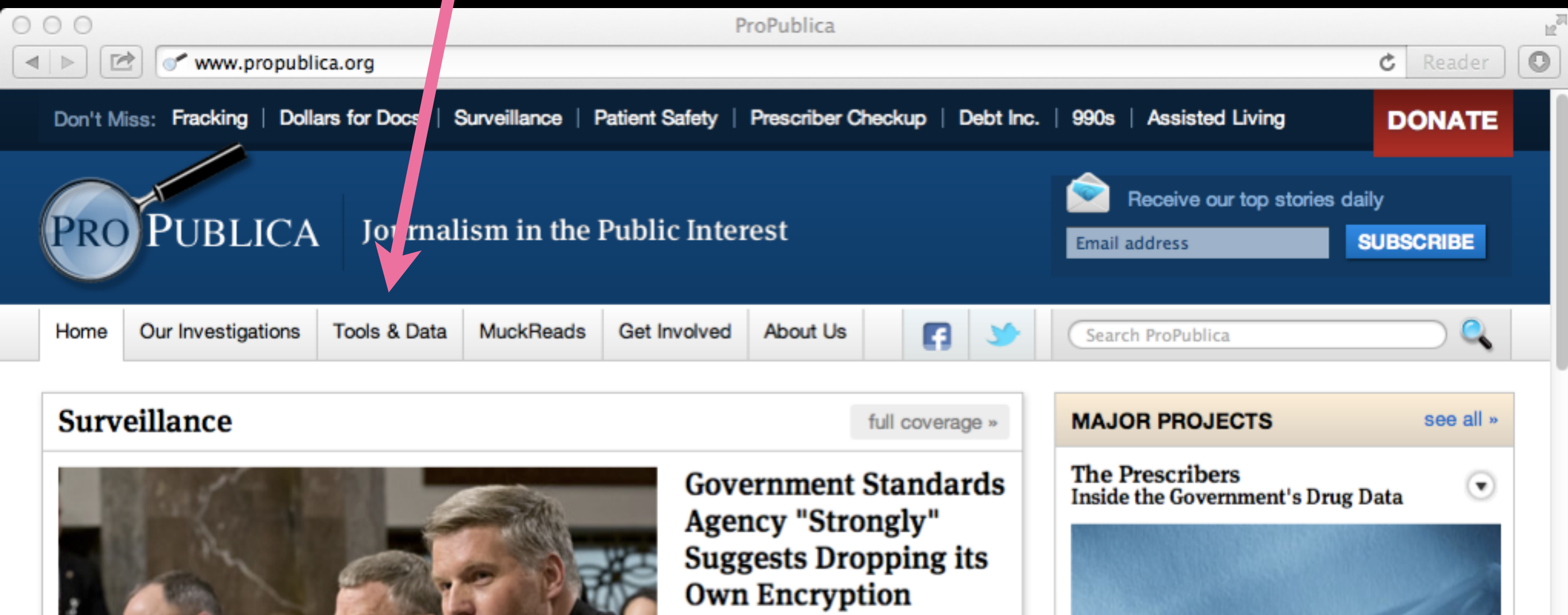


# Born in 2008

## 2 Pulitzer Prizes



# Tools & Data



The image is a screenshot of the ProPublica website. At the top, a large white text overlay reads "Tools & Data". A pink arrow points from this text down to the "Tools & Data" link in the website's navigation bar. The website's header includes a dark blue bar with the ProPublica logo (a magnifying glass over the word "PRO") and the tagline "Journalism in the Public Interest". To the right of the logo is a "DONATE" button and a subscription form with the text "Receive our top stories daily" and a "SUBSCRIBE" button. Below the header is a navigation bar with links: Home, Our Investigations, Tools & Data, MuckReads, Get Involved, and About Us. To the right of these links are social media icons for Facebook and Twitter, and a search bar labeled "Search ProPublica". The main content area features a "Surveillance" section with a "full coverage »" link and a featured article titled "Government Standards Agency 'Strongly' Suggests Dropping its Own Encryption". To the right of this is a "MAJOR PROJECTS" section with a "see all »" link and a featured project titled "The Prescribers Inside the Government's Drug Data".

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### Government Standards Agency "Strongly" Suggests Dropping its Own Encryption

## MAJOR PROJECTS [see all »](#)

### The Prescribers

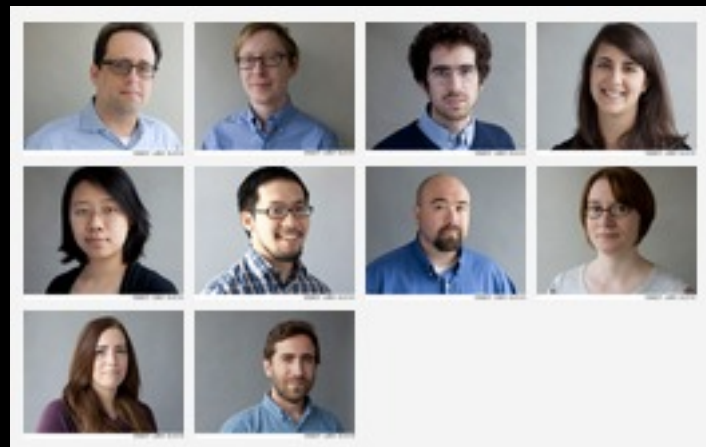
Inside the Government's Drug Data

# Data

Stories

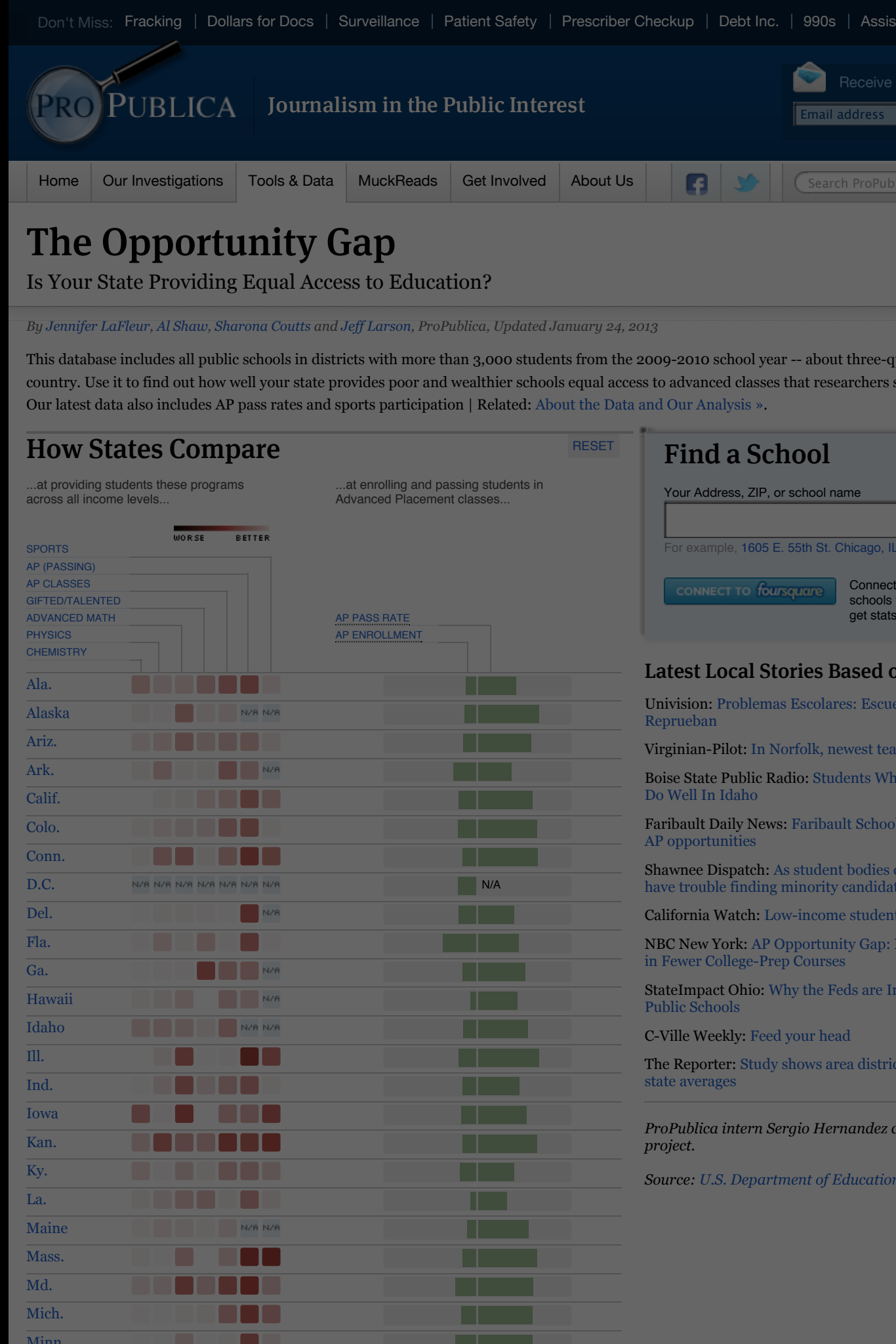
Graphics

News Apps



# News App

Telling a story  
with software  
instead of words  
and pictures





# The Opportunity Gap

## Is Your State Providing Equal Access to Education?

[Tweet](#) 128

By [Jennifer LaFleur](#), [Al Shaw](#), [Sharona Coutts](#) and [Jeff Larson](#), ProPublica, Updated January 24, 2013

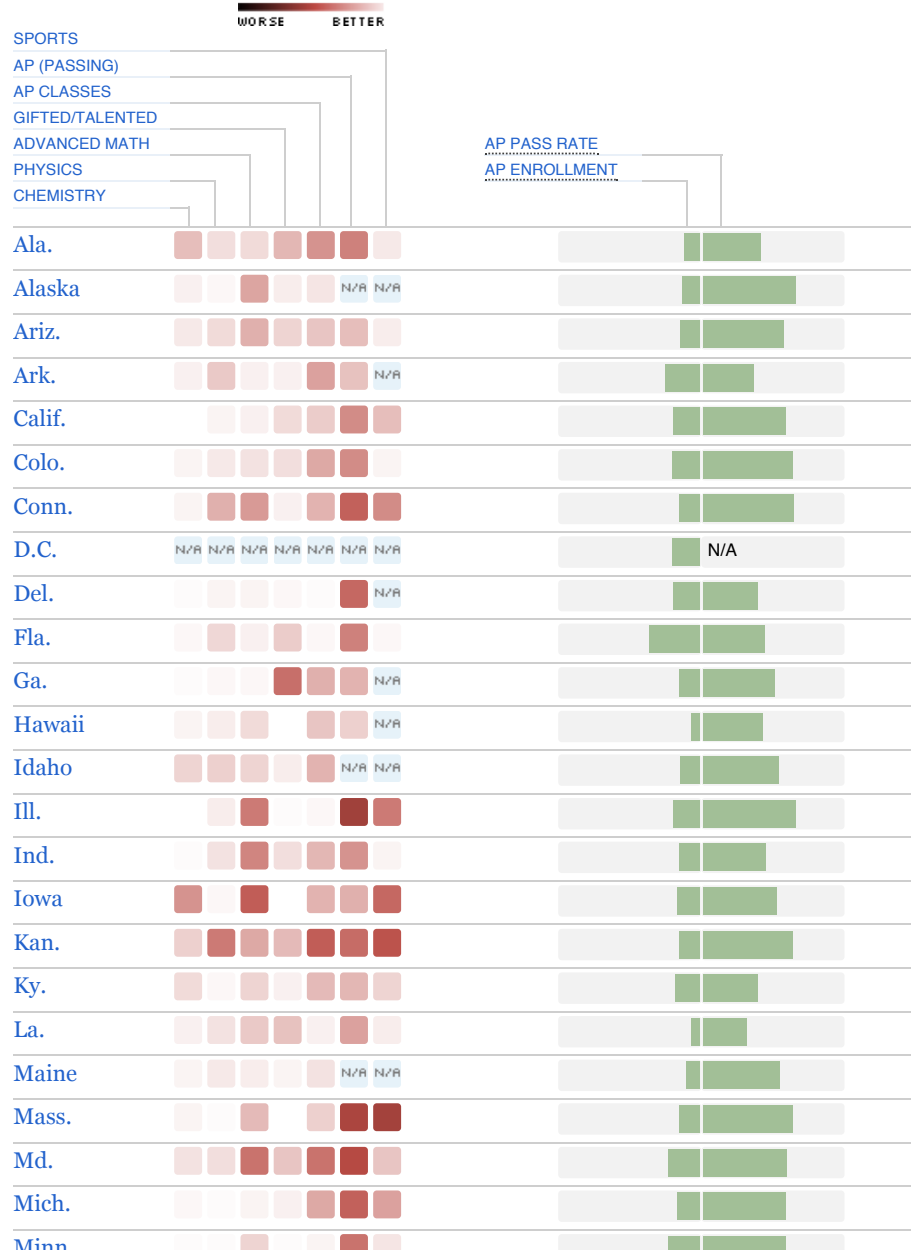
This database includes all public schools in districts with more than 3,000 students from the 2009-2010 school year -- about three-quarters of all such students in the country. Use it to find out how well your state provides poor and wealthier schools equal access to advanced classes that researchers say will help them later in life. | Our latest data also includes AP pass rates and sports participation | Related: [About the Data and Our Analysis](#) ».

### How States Compare

[RESET](#)

...at providing students these programs across all income levels...

...at enrolling and passing students in Advanced Placement classes...



### Find a School

Your Address, ZIP, or school name

[Submit](#)

For example, [1605 E. 55th St. Chicago, IL](#) or [77054](#) or [Stuyvesant High](#)

[CONNECT TO foursquare](#)

Connect your Foursquare account to find schools you've checked into, and instantly get stats about schools when you check in.

### Latest Local Stories Based on This Project

Univision: [Problemas Escolares: Escuelas en Philadelphia Reprueban](#)

Virginian-Pilot: [In Norfolk, newest teachers face tougher tasks](#)

Boise State Public Radio: [Students Who Take Advanced Courses Do Well In Idaho](#)

Faribault Daily News: [Faribault School District needs to improve AP opportunities](#)

Shawnee Dispatch: [As student bodies diversify, school districts have trouble finding minority candidates](#)

California Watch: [Low-income students score lower on AP tests](#)

NBC New York: [AP Opportunity Gap: NY's Poor Students Enroll in Fewer College-Prep Courses](#)

StateImpact Ohio: [Why the Feds are Investigating the Toledo Public Schools](#)

C-Ville Weekly: [Feed your head](#)

The Reporter: [Study shows area districts stack up well against state averages](#)

*ProPublica intern Sergio Hernandez contributed research to this project.*

*Source: [U.S. Department of Education Office for Civil Rights](#)*

Far

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## The Opportunity Gap

Is Your State Providing Equal Access to Education?

By [Jennifer LaFleur](#), [Al Shaw](#), [Sharona Coutts](#) and [Jeff Larson](#), ProPublica, Updated January 24, 2013

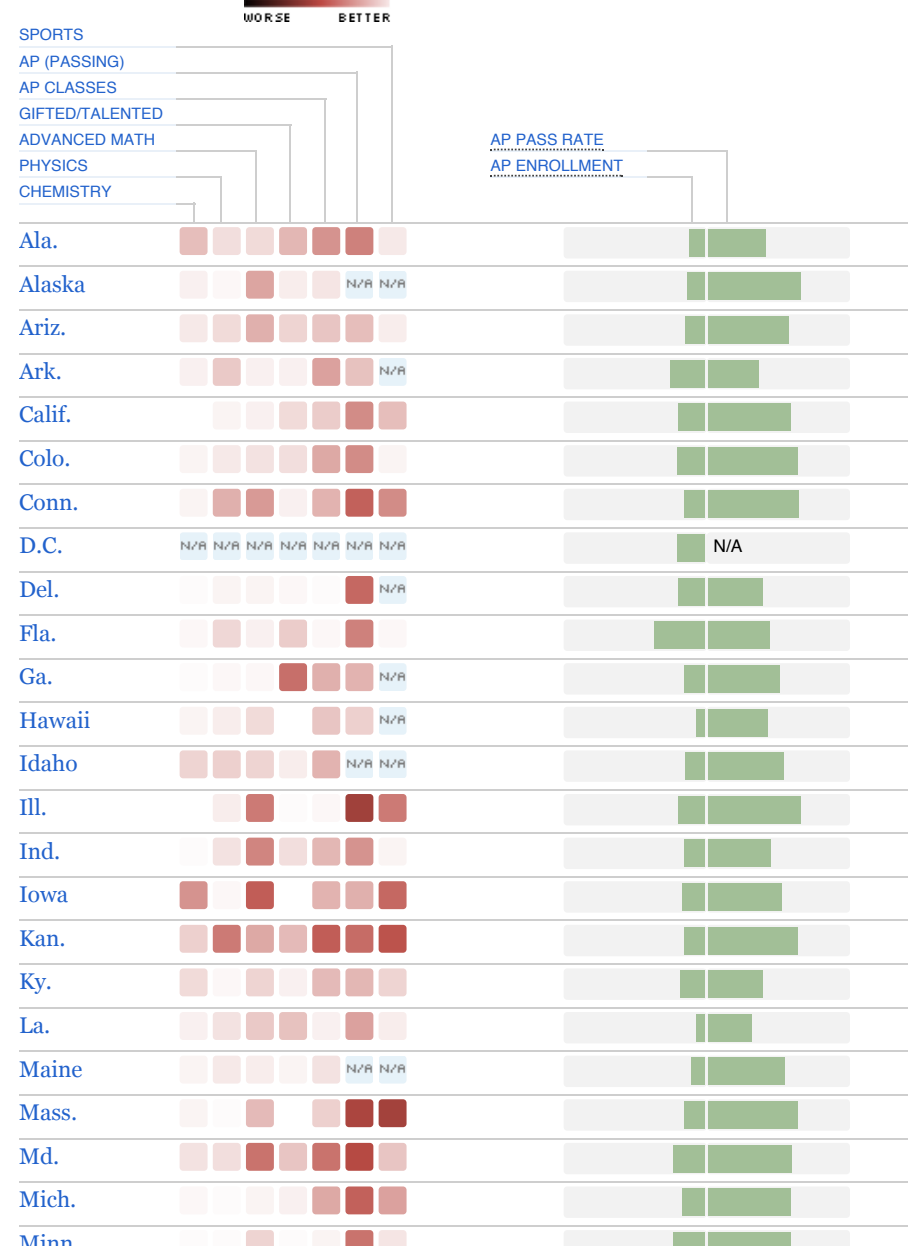
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### How States Compare

RESET

...at providing students these programs across all income levels...

...at enrolling and passing students in Advanced Placement classes...



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For example, 1605 E. 55th St. Chicago, IL

CONNECT TO foursquare

Connect schools to get stats

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Shawnee Dispatch: [As student bodies grow, schools have trouble finding minority candidates](#)

California Watch: [Low-income students](#)

NBC New York: [AP Opportunity Gap: Fewer College-Prep Courses](#)

StateImpact Ohio: [Why the Feds are Investing in Public Schools](#)

C-Ville Weekly: [Feed your head](#)

The Reporter: [Study shows area districts are below state averages](#)

ProPublica intern Sergio Hernandez on the project.

Source: [U.S. Department of Education](#)



## Quality Gap

## Equal Access to Education?

*a Coutts and Jeff Larson, ProPublica, Updated January 24, 2013*

schools in districts with more than 3,000 students from the 2009-2010 school year -- about three-quarters of all such students in the  
your state provides poor and wealthier schools equal access to advanced classes that researchers say will help them later in life. |  
s rates and sports participation | Related: [About the Data and Our Analysis](#) ».

 **Tweet** 128

re

RESET

...at enrolling and passing students in  
Advanced Placement classes...

AP PASS RATE  
AP ENROLLMENT

## Find a School

Your Address, ZIP, or school name

Submit

For example, 1605 E. 55th St. Chicago, IL or 77054 or Stuyvesant High

CONNECT TO **foursquare**

Connect your Foursquare account to find schools you've checked into, and instantly get stats about schools when you check in.

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Virginian-Pilot: [In Norfolk, newest teachers face tougher tasks](#)

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Faribault Daily News: [Faribault School District needs to improve AP opportunities](#)

## Shawnee Dispatch: As student bodies diversify, school districts have trouble finding minority candidates

California Watch: [Low-income students score lower on AP tests](#)

## NBC New York: AP Opportunity Gap: NY's Poor Students Enroll in Fewer College-Prep Courses

## StateImpact Ohio: Why the Feds are Investigating the Toledo Public Schools

C-Ville Weekly: [Feed your head](#)

**The Reporter:** Study shows area districts stack up well against state averages

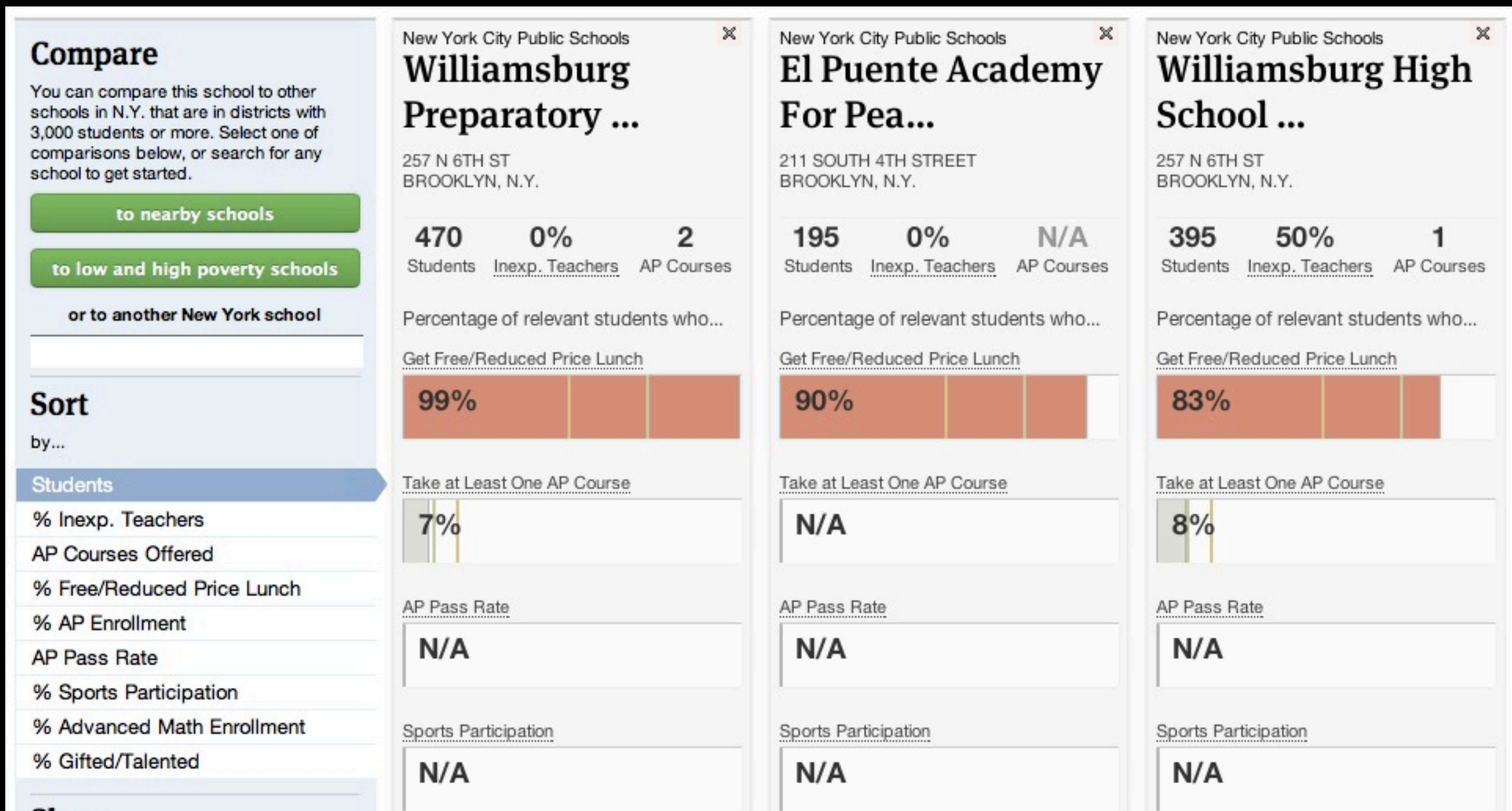
*ProPublica intern Sergio Hernandez contributed research to this project.*

Source: U.S. Department of Education Office for Civil Rights

# Near

# “Do something” box

# News apps generate stories





# News apps generate stories

## Latest Local Stories Based on This Project

Univision: [Problemas Escolares: Escuelas en Philadelphia Reprueban](#)

Virginian-Pilot: [In Norfolk, newest teachers face tougher tasks](#)

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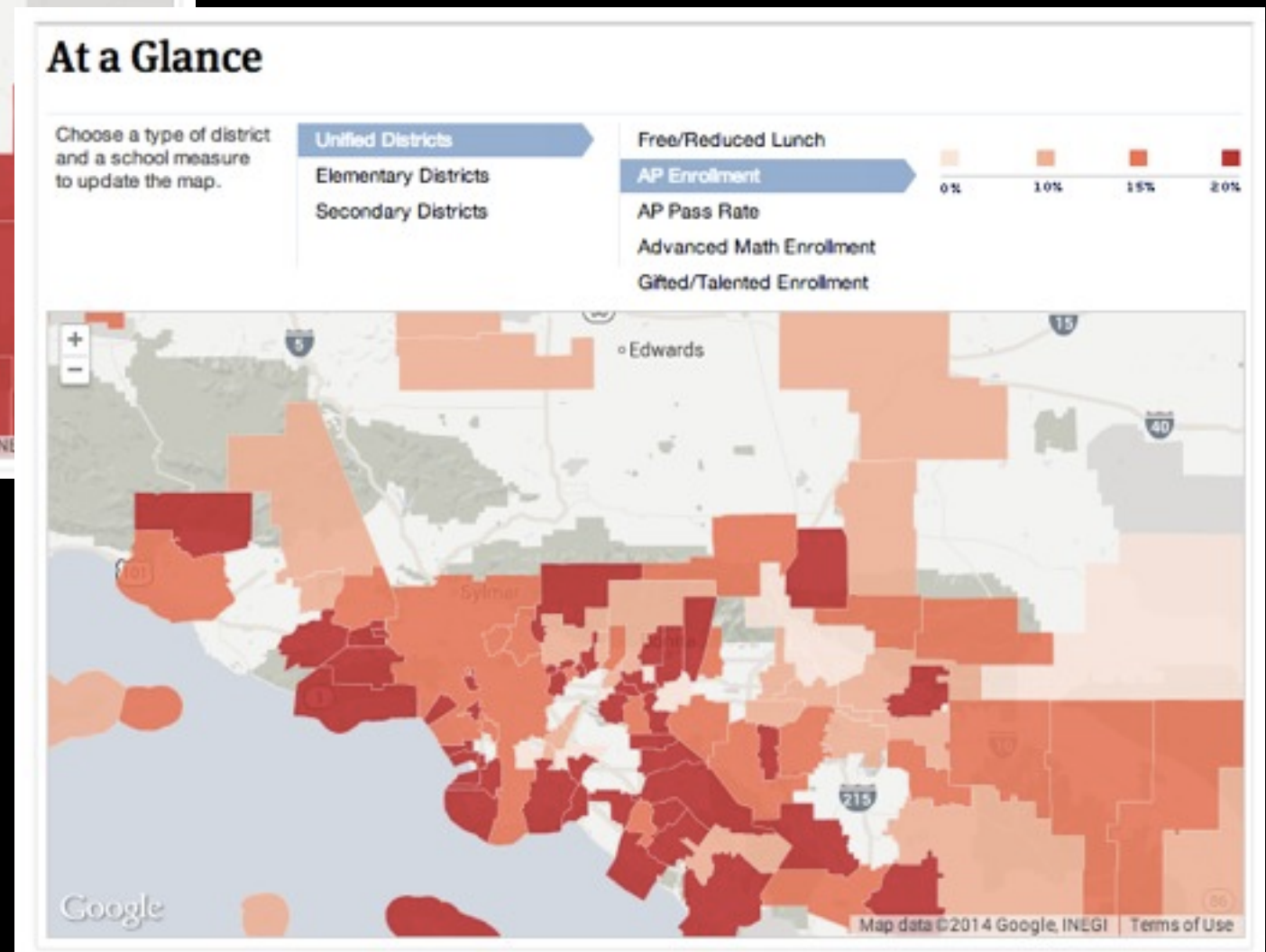
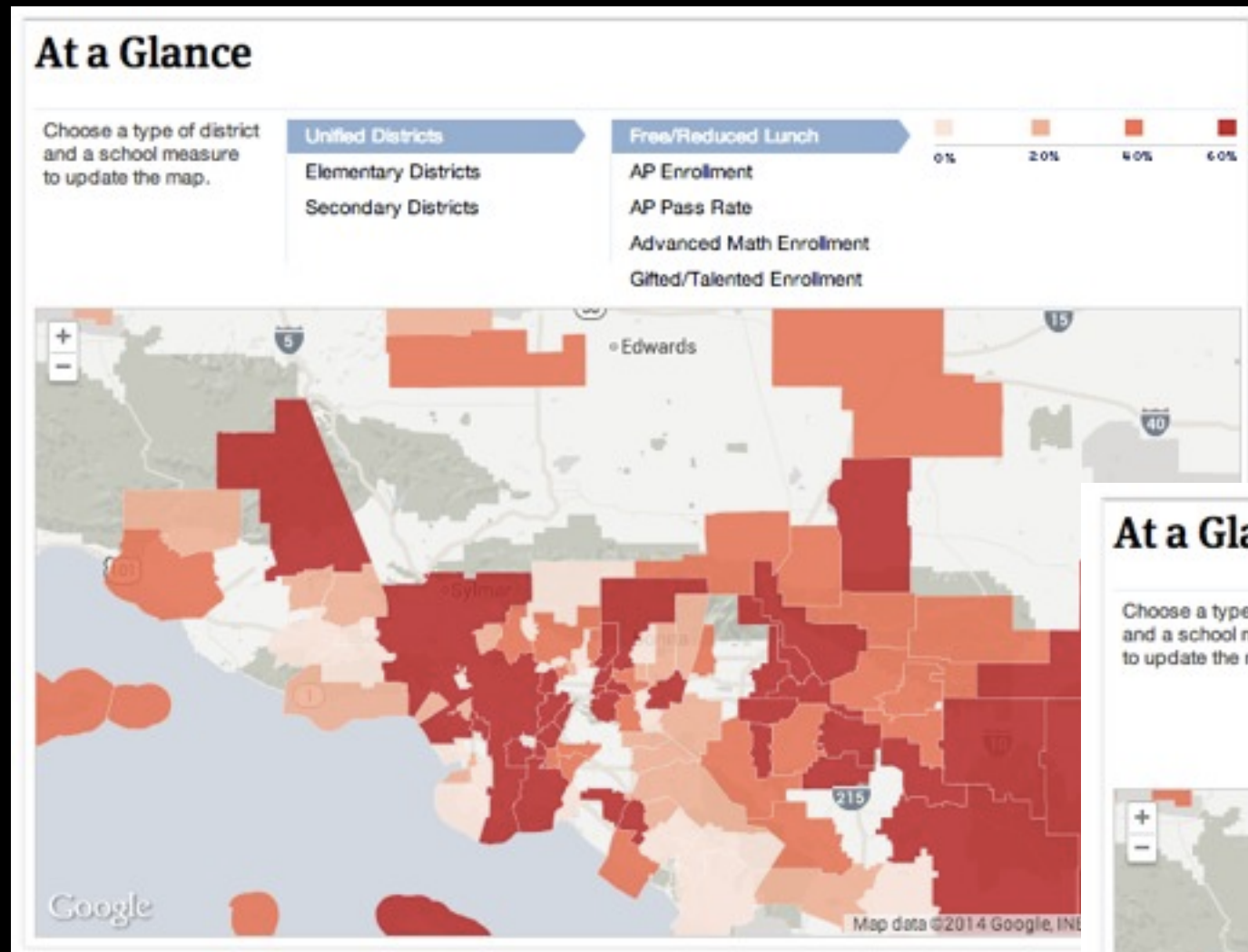
StateImpact Ohio: [Why the Fed's are Investigating the Toledo Public Schools](#)

C-Ville Weekly: [Feed your head](#)

The Reporter: [Study shows area districts stack up well against state averages](#)

New York City Public Schools				New York City Public Schools			
El Puente Academy For Pea...				Williamsburg High School ...			
211 SOUTH 4TH STREET BROOKLYN, N.Y.				257 N 6TH ST BROOKLYN, N.Y.			
2	195	0%	N/A	395	50%	1	
AP Courses	Students	Inexp. Teachers	AP Courses	Students	Inexp. Teachers	AP Courses	
Percentage of relevant students who...	Percentage of relevant students who...			Percentage of relevant students who...			
Get Free/Reduced Price Lunch	Get Free/Reduced Price Lunch			Get Free/Reduced Price Lunch			
	90%			83%			
Take at Least One AP Course	Take at Least One AP Course			Take at Least One AP Course			
	N/A			8%			
AP Pass Rate	AP Pass Rate			AP Pass Rate			
	N/A			N/A			
Sports Participation	Sports Participation			Sports Participation			
	N/A			N/A			

# Also, maps!



## Two views of Southern California



# Lots of maps!

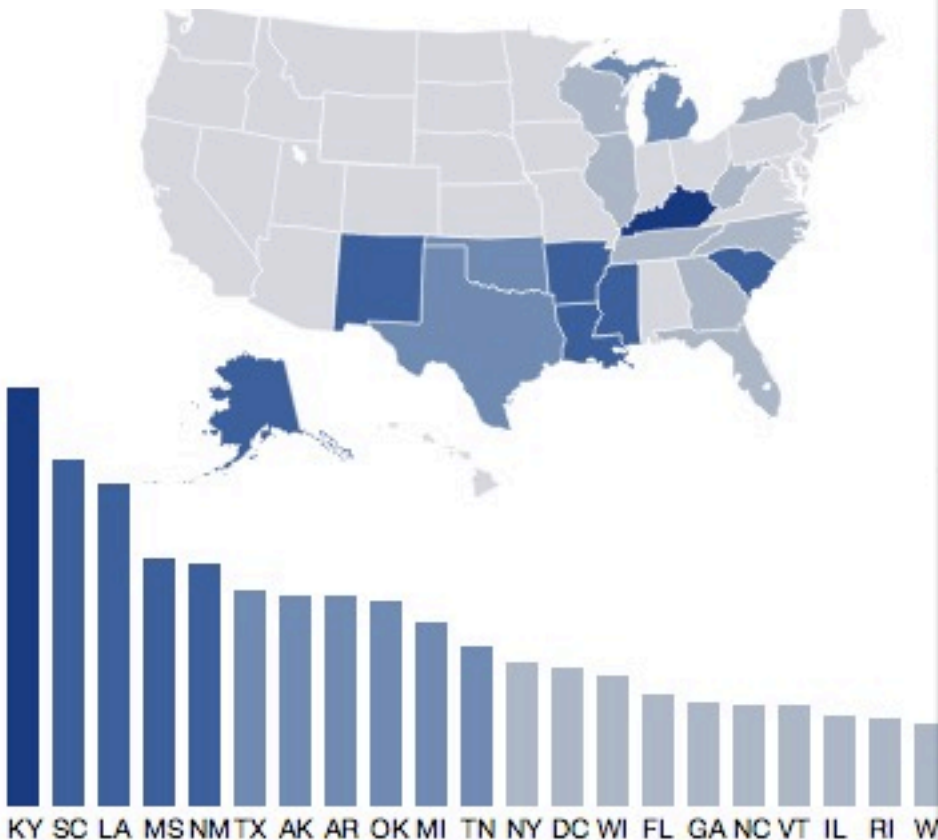
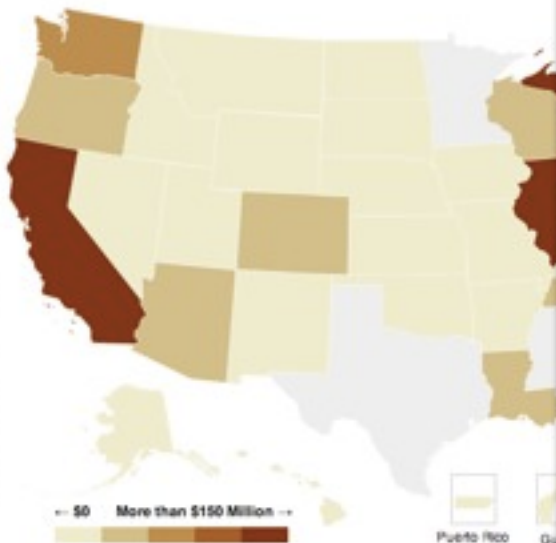
## Tobacco Bonds May Be Dangerous to Your State's Health

by *Cezary Podkul* and *Yue Qiu*, ProPublica  
August 7, 2014

After a bruising legal fight, tobacco companies agreed in 1998 to compensate 46 states, the District of Columbia and five U.S. territories for the health care costs of smoking. Wall Street helped turn their annual payments into upfront cash by selling bonds to investors. Some of the deals included appreciation bonds, which obligated governments to pay out billions of their tobacco income in the future. **Related:** [How Wall Street Turned Tobacco Settlements Into Billions in Toxic Debt](#)

### Compare states by

- Settlement money received in 2014
- Payments under the 1998 legal settlement are based on cigarette sales, which have declined. States and others have received \$100 billion from the settlement so far. (Florida, Minnesota, Texas and Mississippi settled tobacco lawsuits separately.)
- Amount traded to investors
- Who sold tobacco bonds?
- High-risk bonds: What states received
- High-risk bonds: What states agreed to pay
- State Smoking prevention



## A National Patchwork

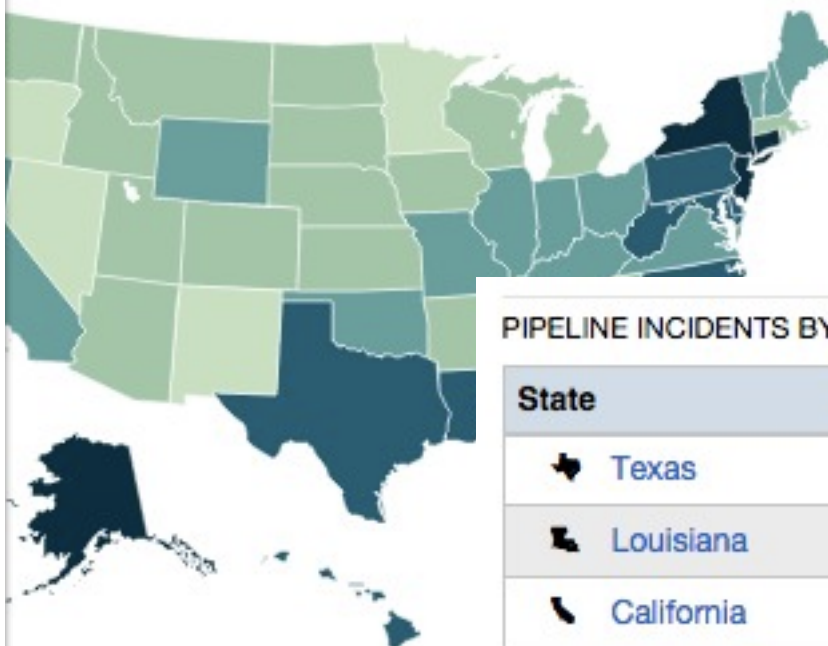
Coroner and medical examiner systems vary widely from state to state and even county to county. Hover over each state to see what forensics systems are in place there.



- Some county coroners and some county medical examiners
- Some county justices of the peace and some county medical examiners
- County coroners
- State medical examiner
- State medical examiner and some county medical examiners
- County medical examiners
- State medical examiner and county coroners
- State medical examiner, some county medical examiners and some county coroners
- District medical examiners

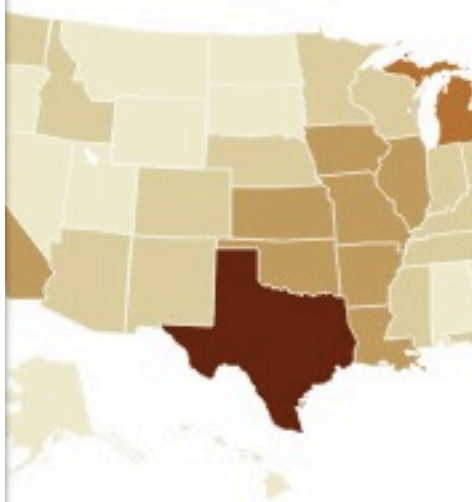
## How States Compare

Percent claims for name-brand drugs from primary care physicians, 2011. [See state by state data »](#)



Click on a state to see data

### PAYMENT SUSPENSIONS



Home  
0 .25 .5  
Efficiencies in each state (rated J, K or L)  
Number of Medicare-certified home health agencies

### PIPELINE INCIDENTS BY STATE

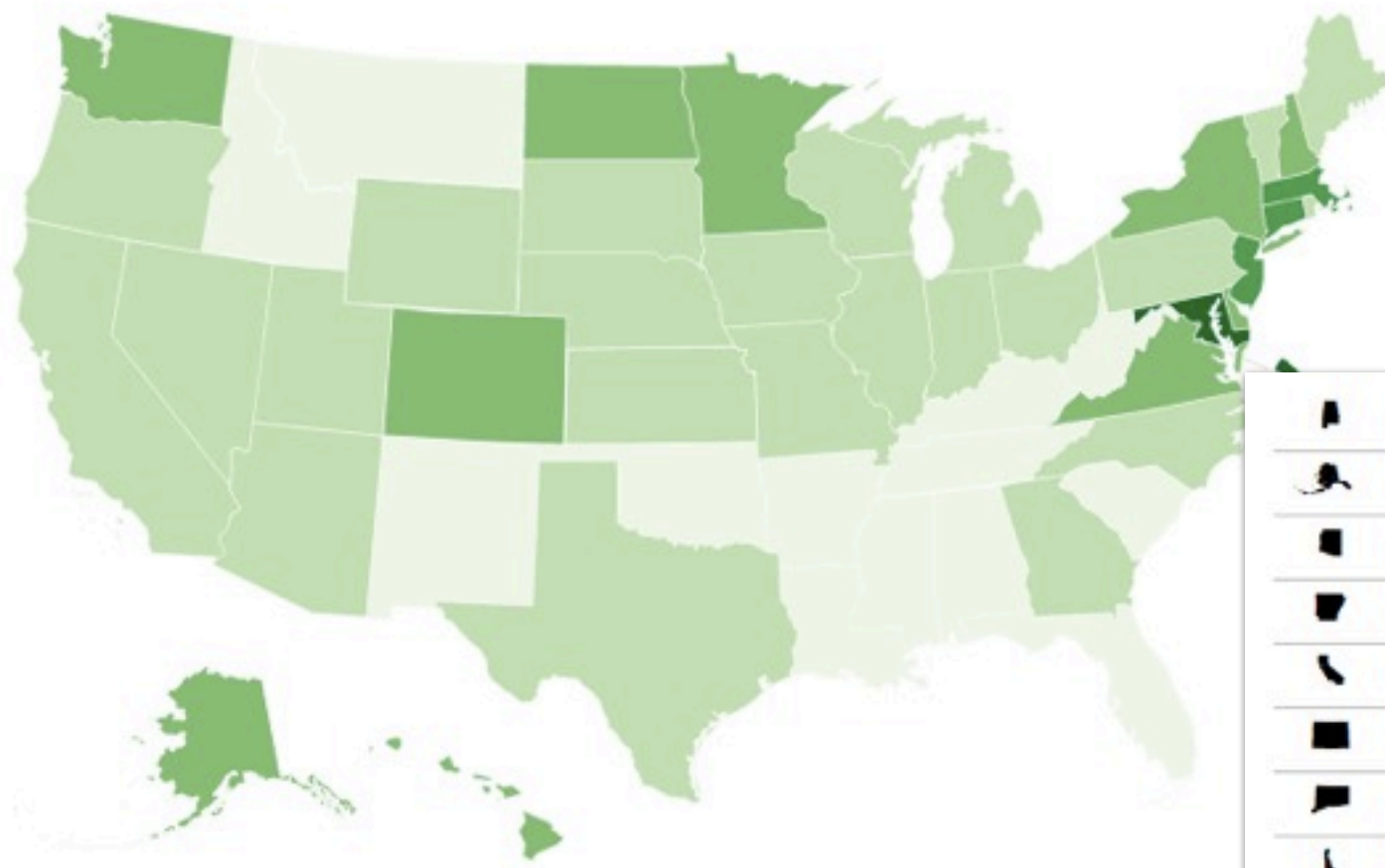
State	
Texas	
Louisiana	
California	
Oklahoma	
Illinois	
Kansas	
Not Specified	
Pennsylvania	
Ohio	
Michigan	
New Mexico	
Missouri	
Minnesota	
New York	
Iowa	
Wyoming	
Indiana	
Colorado	



# LANDLINE + STATELINE

Landline is a JavaScript library that creates SVG maps from GeoJSON. It comes with Stateline, which makes creating responsive U.S. state and county maps easy.






















































The source is at [Github](#). Please report issues or ask questions in the [issue tracker](#).



[See the code for this demo](#)

<http://propublica.github.io/stateface>

<http://propublica.github.io/landline>

	Ala.	B		La.	R		Okla.	j
	Alaska	A		Maine	U		Ore.	k
	Ariz.	D		Md.	T		Pa.	l
	Ark.	C		Mass.	S		P.R.	3
	Calif.	E		Mich.	V		R.I.	m
	Colo.	F		Minn.	W		S.C.	n
	Conn.	G		Miss.	Y		S.D.	o
	Del.	H		Mo.	X		Tenn.	p
	D.C.	y		Mont.	Z		Texas	q
	Fla.	I		Neb.	c		U.S.	z
	Ga.	J		Nev.	g		Utah	r
	Hawaii	K		N.H.	d		Vt.	t
	Idaho	M		N.J.	e		Va.	s
	Ill.	N		N.M.	f		Wash.	u
	Ind.	O		N.Y.	h		W.Va.	w
	Iowa	L		N.C.	a		Wis.	v
	Kan.	P		N.D.	b		Wyo.	x
	Ky.	Q		Ohio	i			

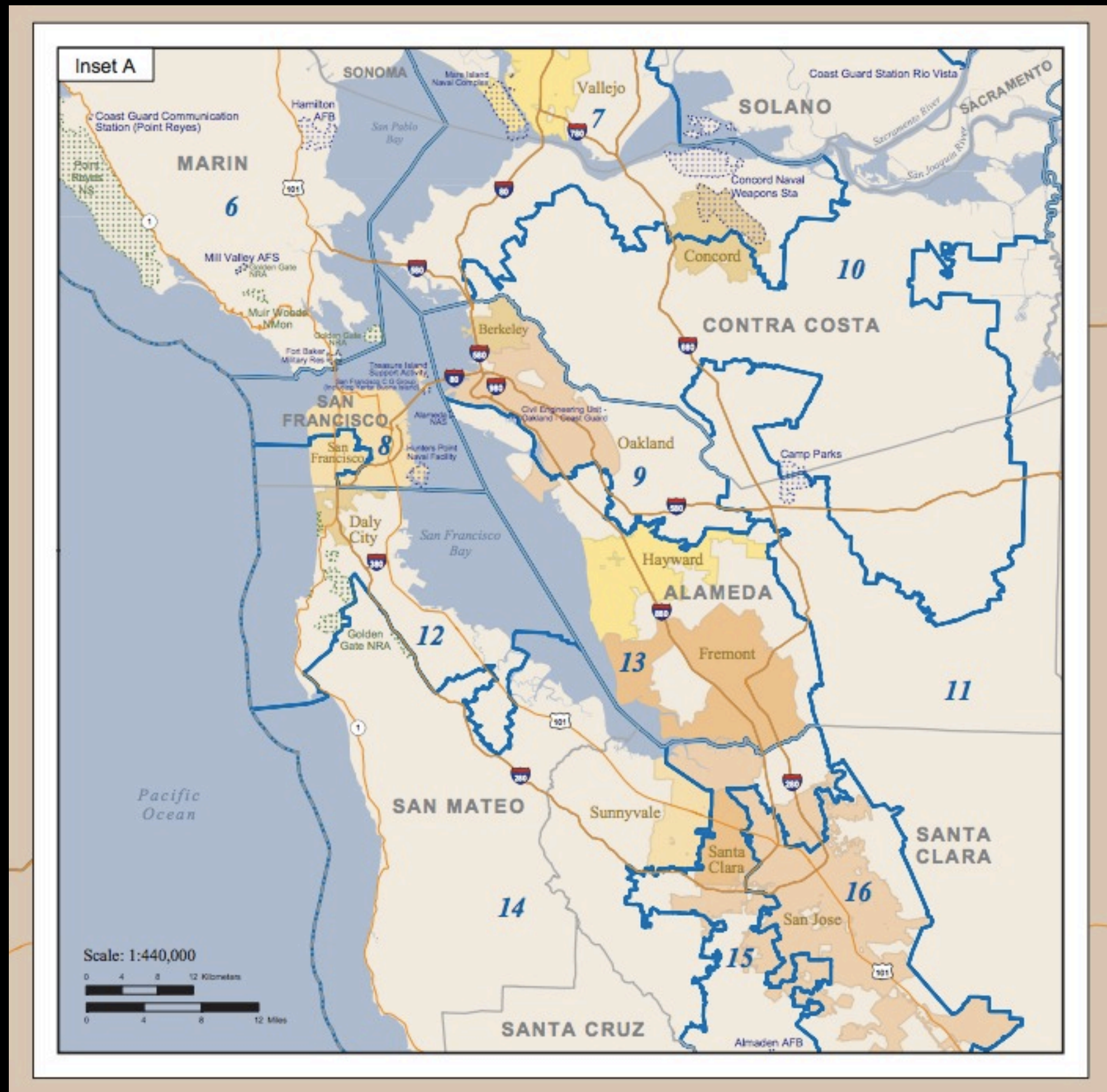
# 3 Stories

California, 2010

New York, 2012

Southeast Louisiana, 1927-2014

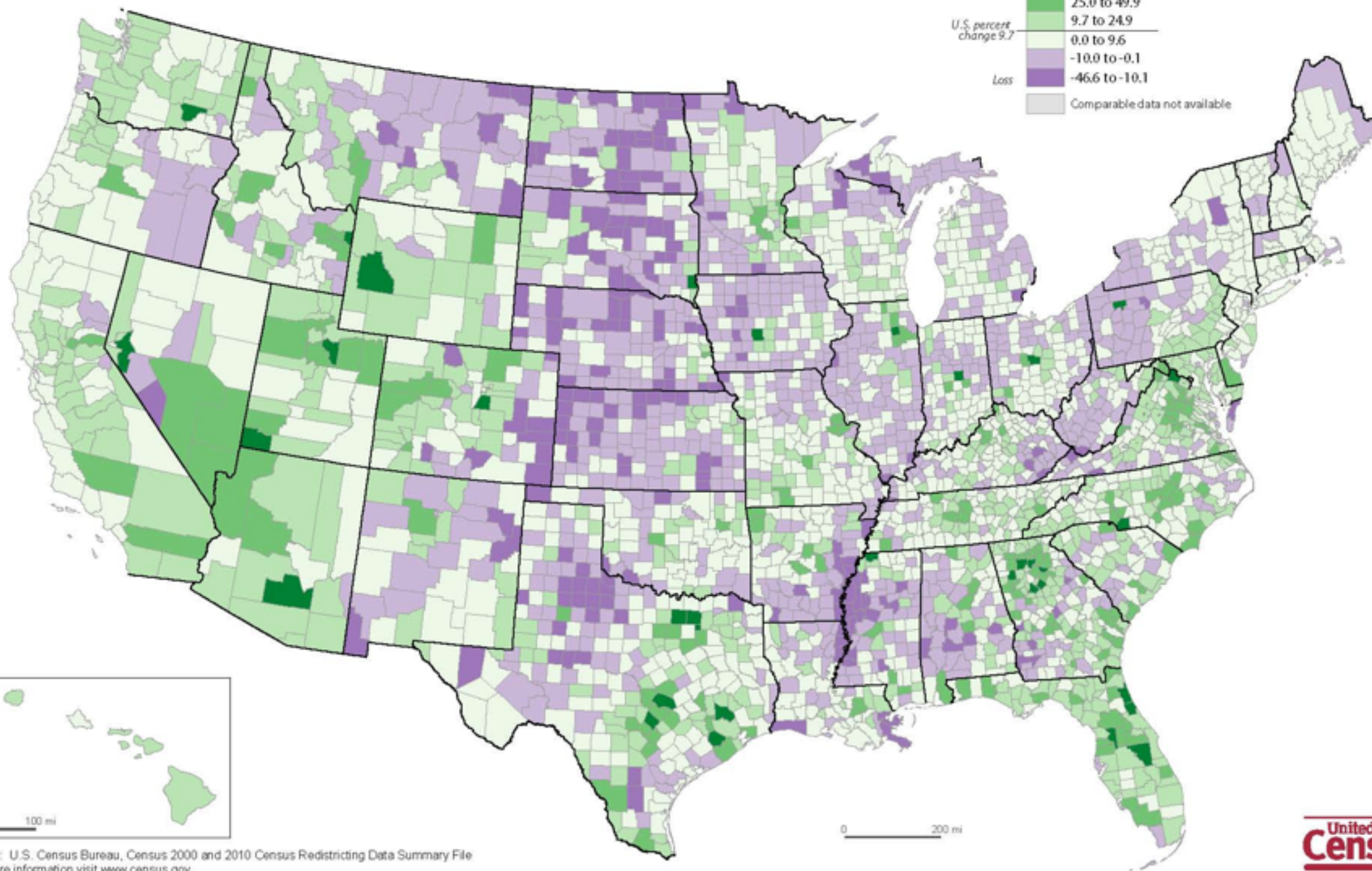
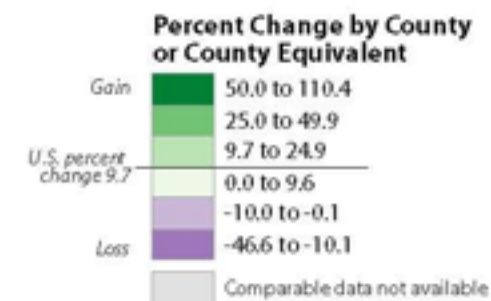
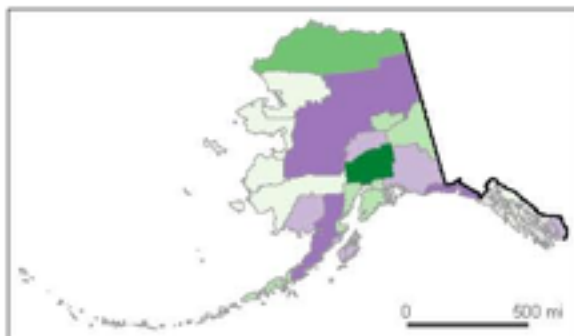
# California, 2010





# 2010 Census Results - United States

## Percent Change in Population: 2000 to 2010

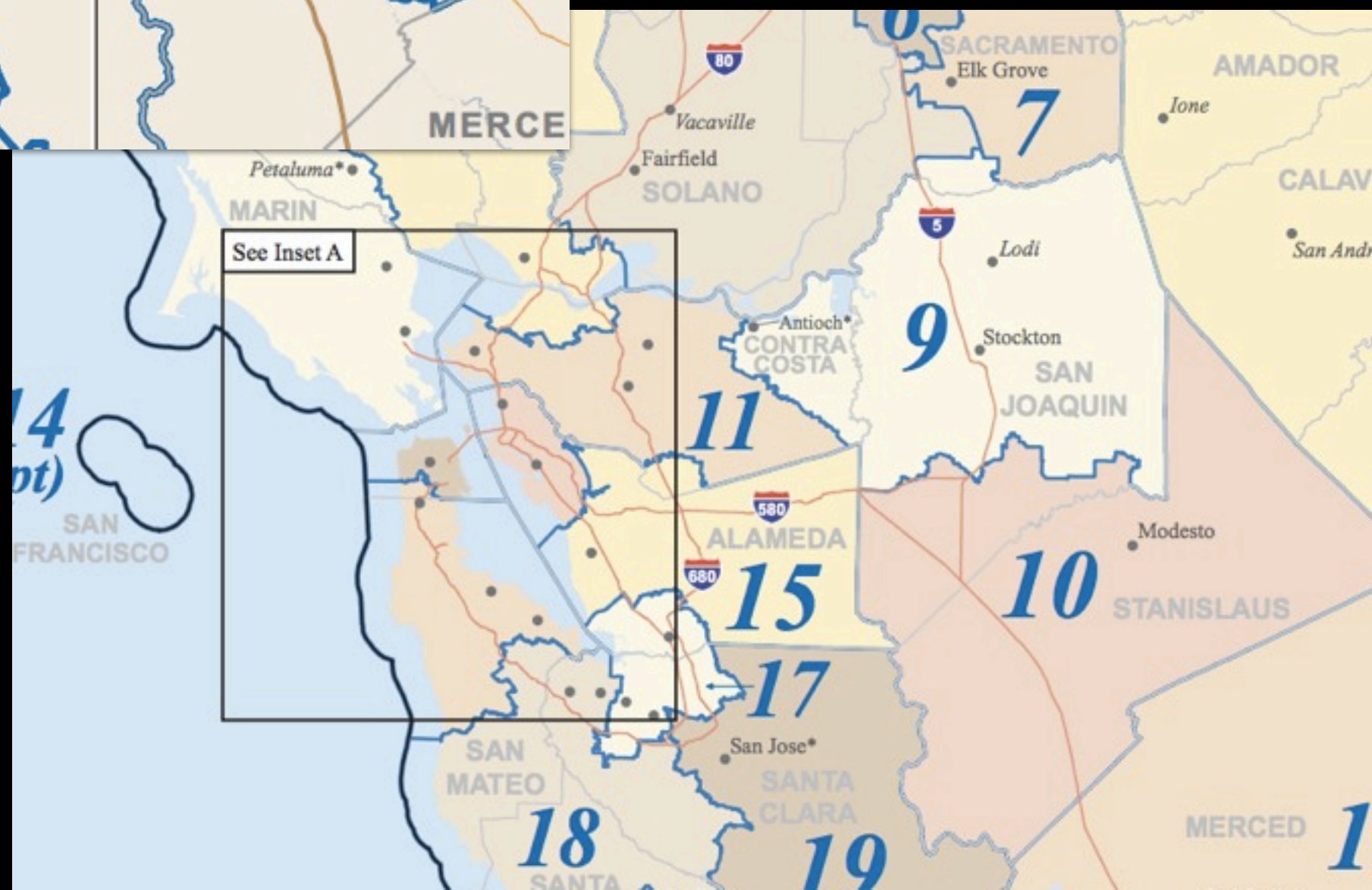


Source: U.S. Census Bureau, Census 2000 and 2010 Census Redistricting Data Summary File  
For more information visit [www.census.gov](http://www.census.gov).

United States  
**Census**  
Bureau

**Can we detect gerrymandering?**





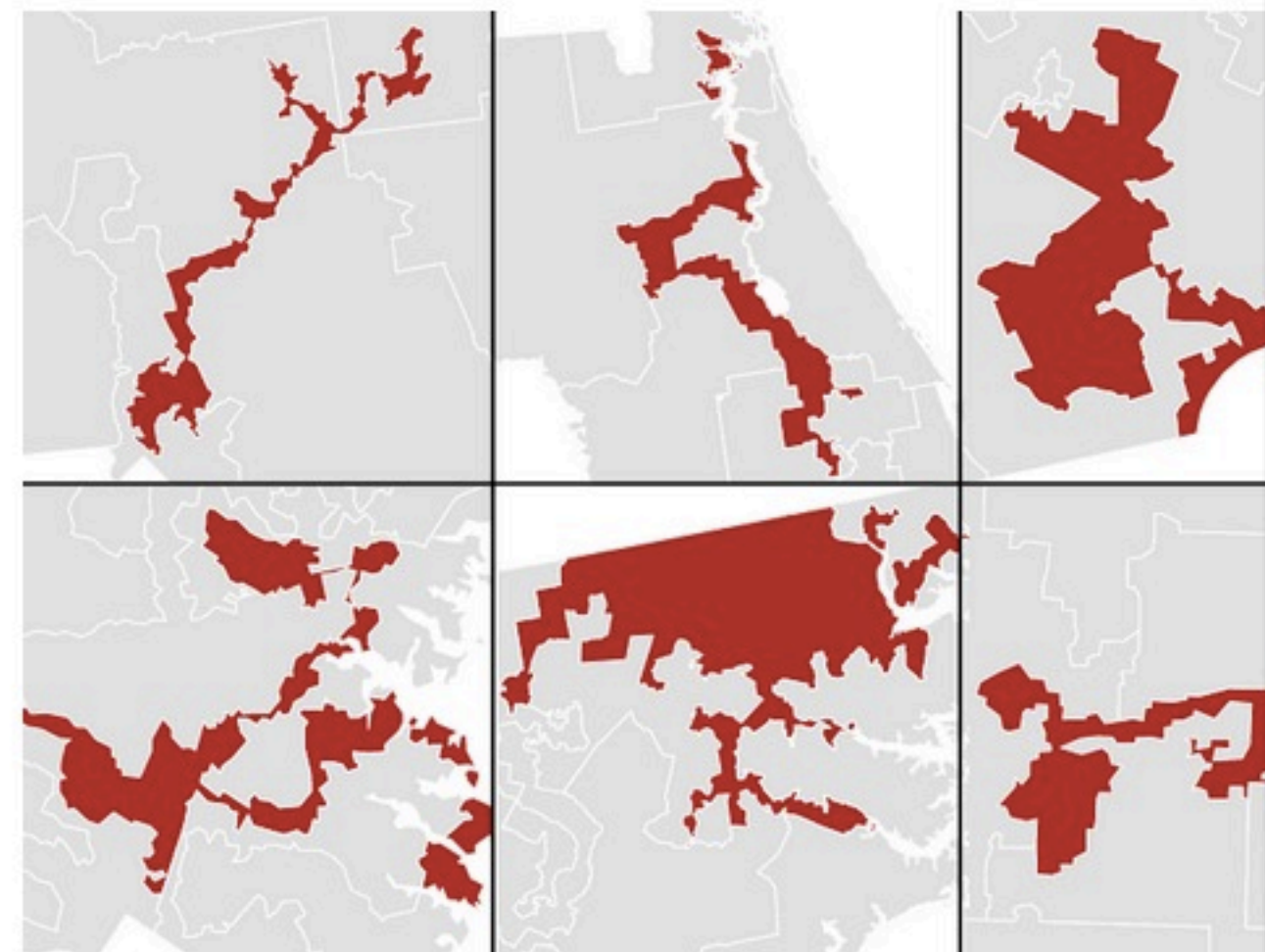


# America's most gerrymandered congressional districts

[f](#) [t](#) [e](#) [p](#) [527](#) [+](#) More



By **Christopher Ingraham** May 15 [Follow @cingraham](#)



Crimes against geography.

**Vox**

FRIDAY, AUGUST 15, 2014



XPRESS

## This is what America would look like without gerrymandering

Updated by Andrew Prokop on May 8, 2014, 2:00 p.m. ET [@awprokop](#) [andrew@vox.com](#)

[TWEET \(1,646\)](#) [SHARE \(9,895\)](#) [+1](#) [LINKEDIN \(45\)](#) [EMAIL](#) [PRINT](#)



Table 1. Compactness values for pictured shapes. ( $C = 4\pi a/p^2$ )

**Shape and Compactness Score**



1



.785



.589



.240



.071

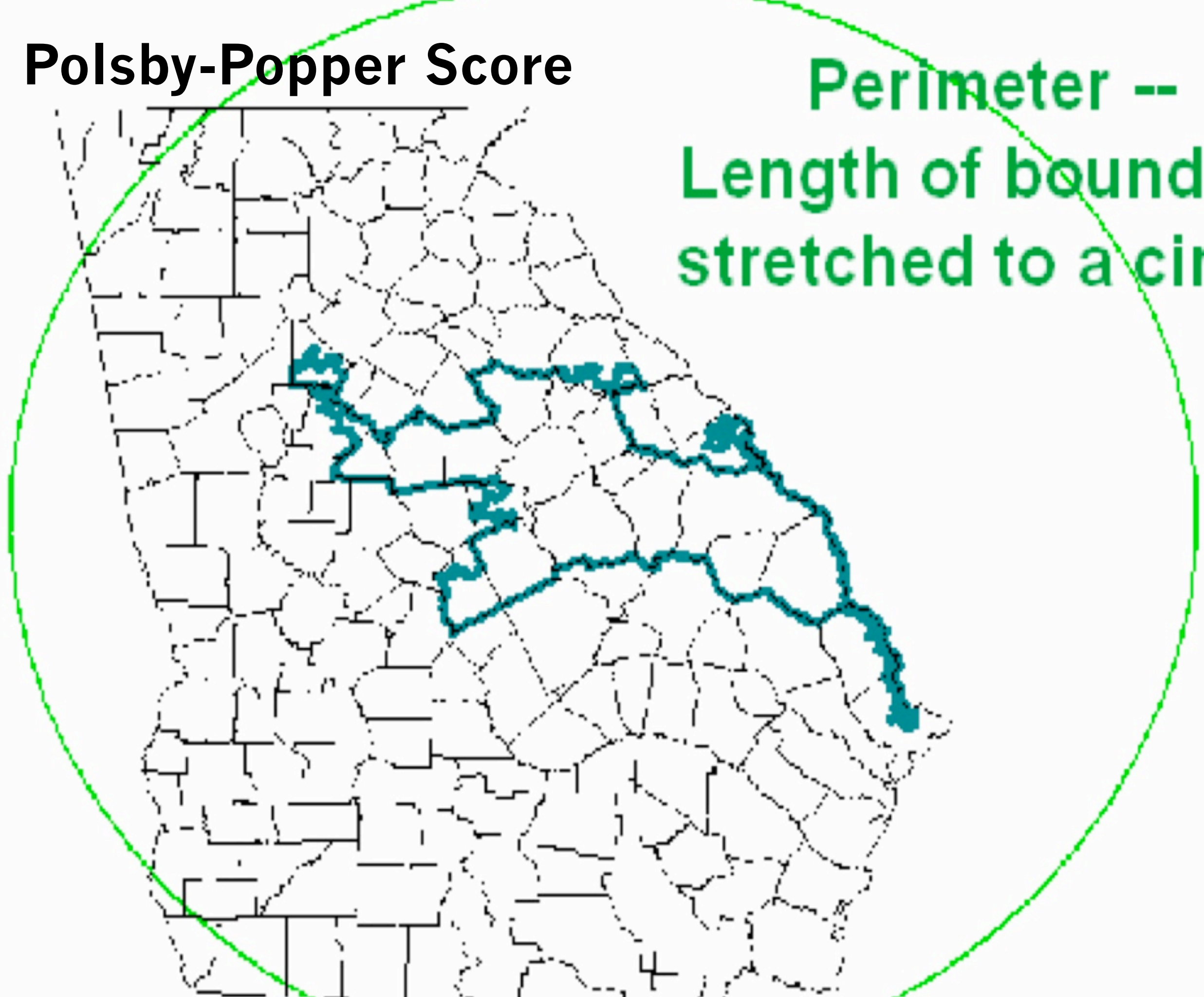
Azavea Gerrymandering Index

<http://j.mp/1s3i8sF>



**Polsby-Popper Score**

**Perimeter --  
Length of boundary  
stretched to a circle**



**8. New York, NY – District 32**

GI: 0.68 (Compactness: 9.98)

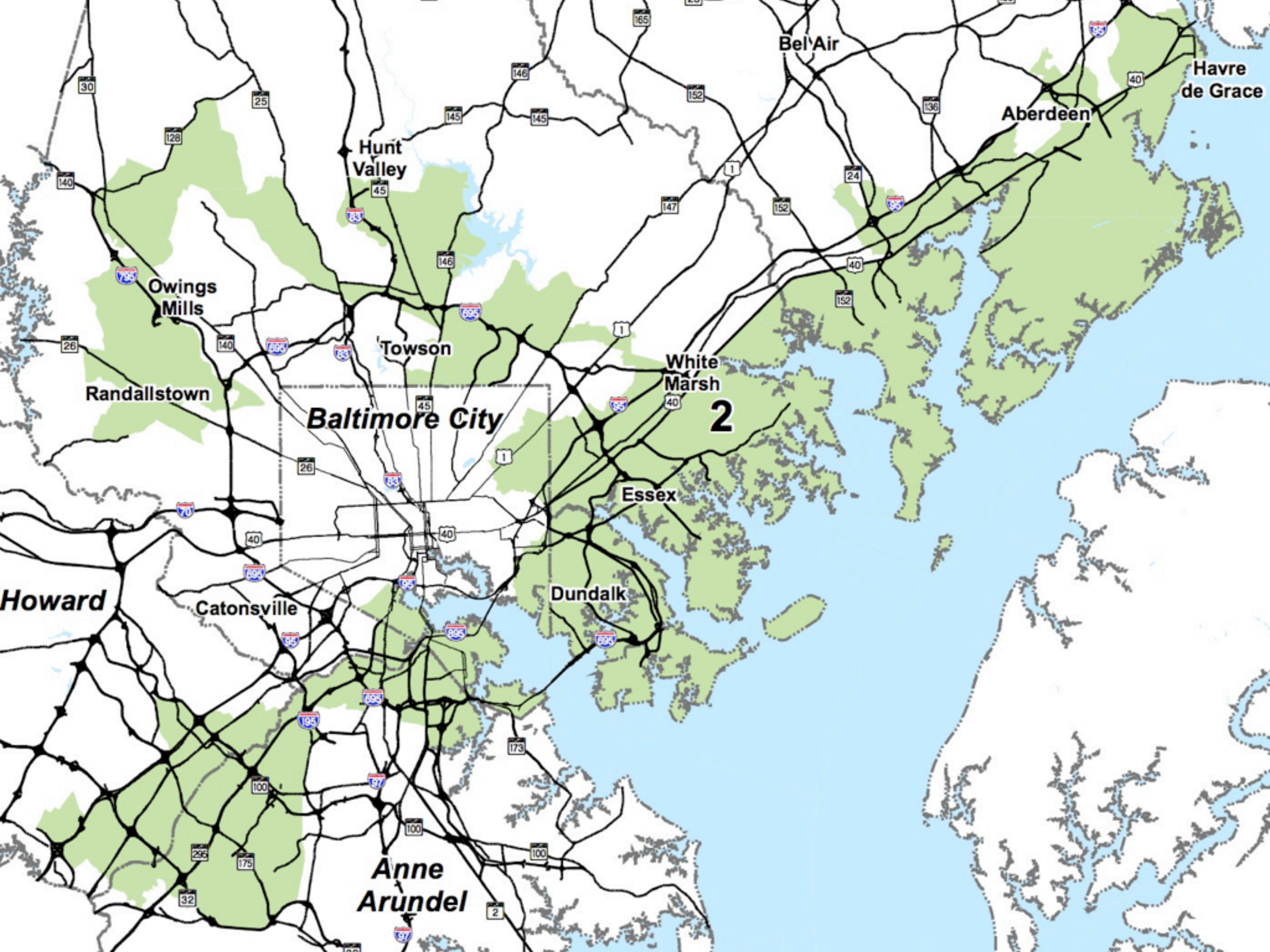


**5. Baltimore, MD - District 10**

GI: 0.46 (Compactness: 4.79)



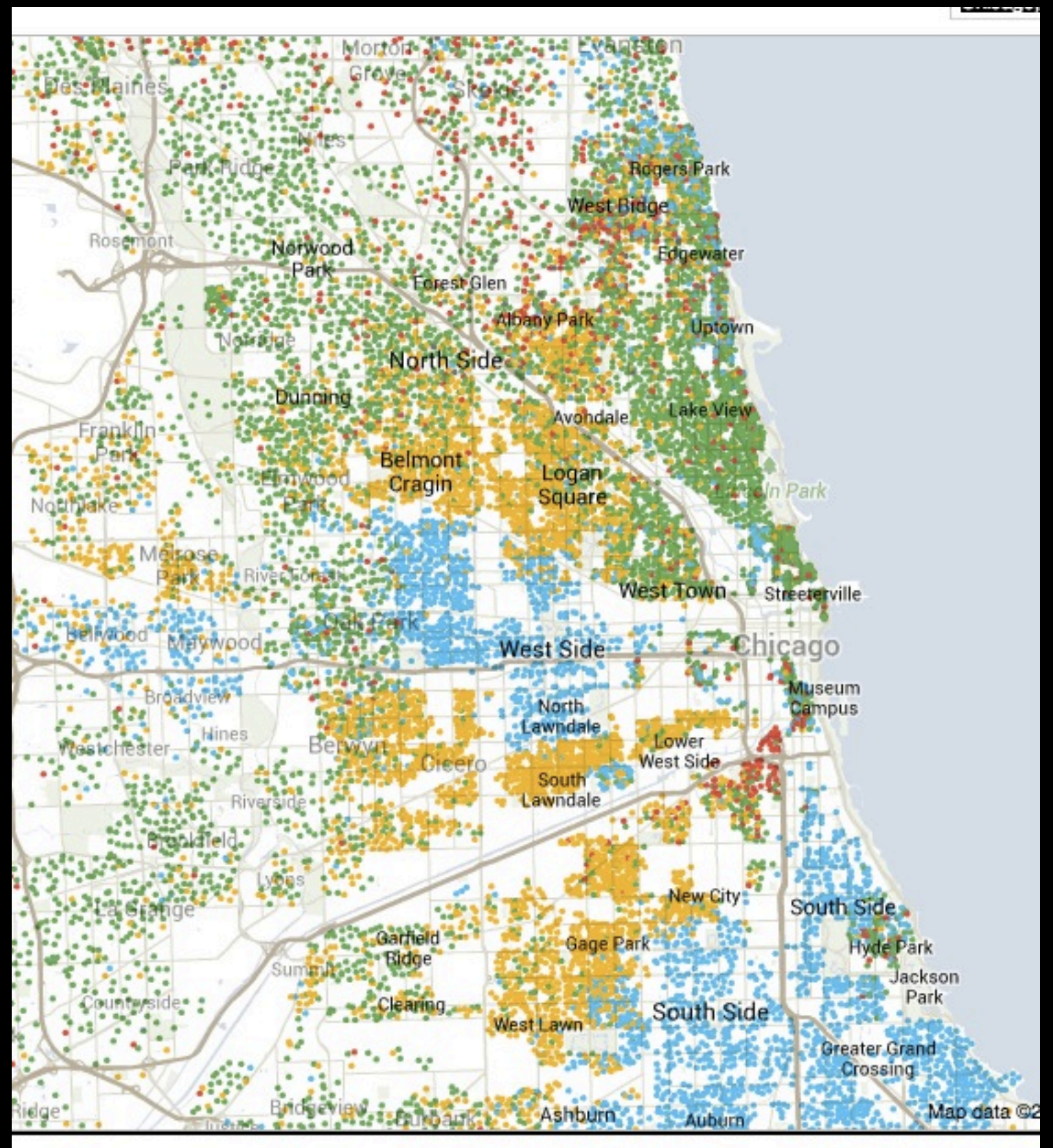
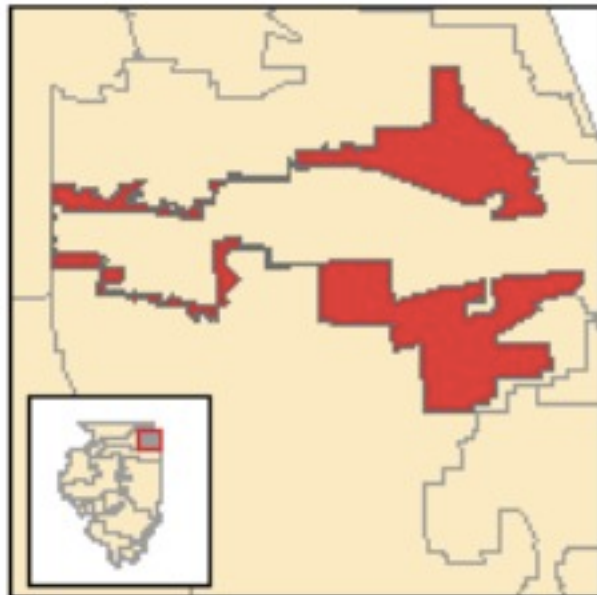






## 2. Illinois - District 4

GI: 0.08 (Compactness: 3.45)

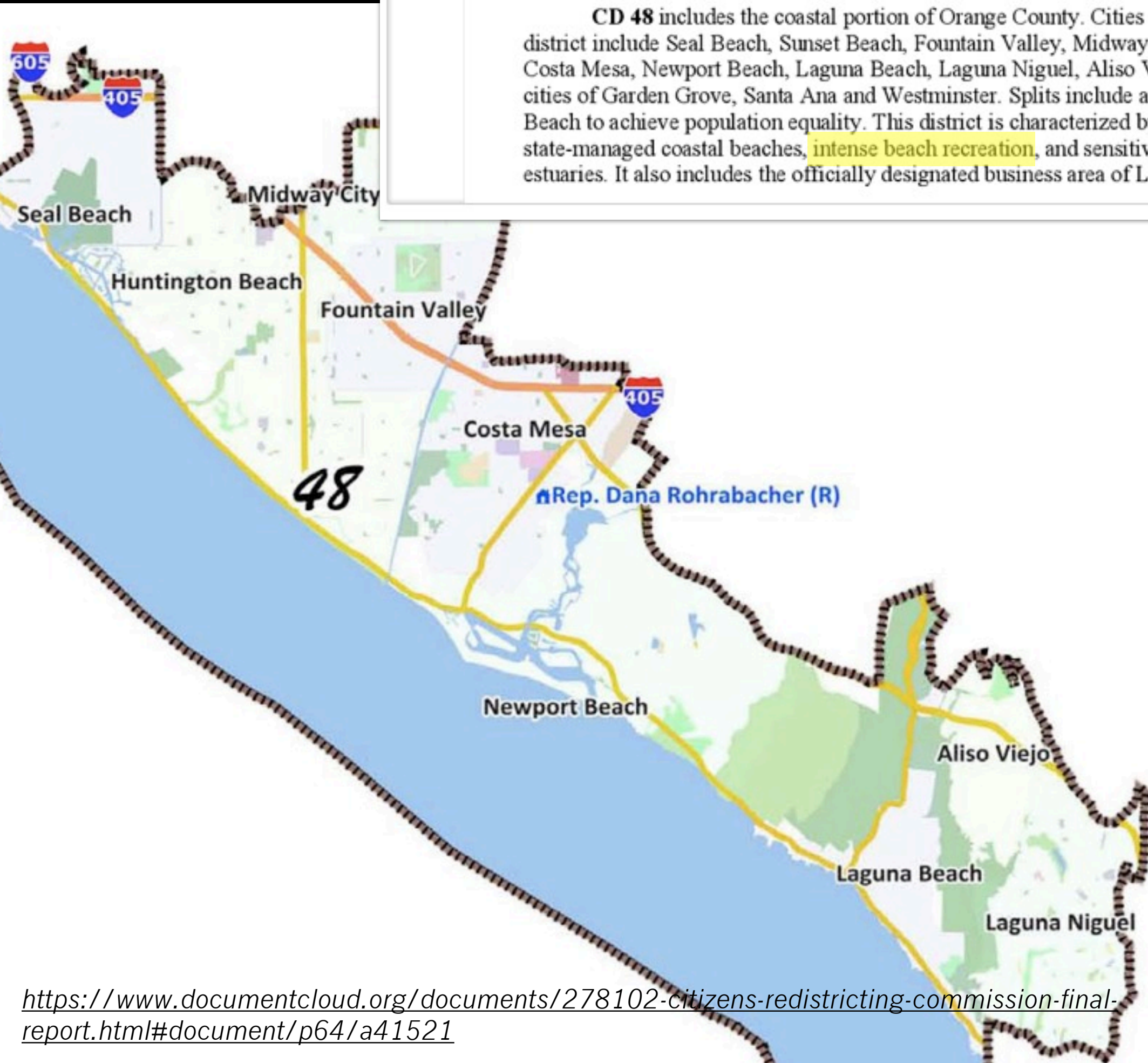


<http://projects.nytimes.com/census/2010/map>

**No.**

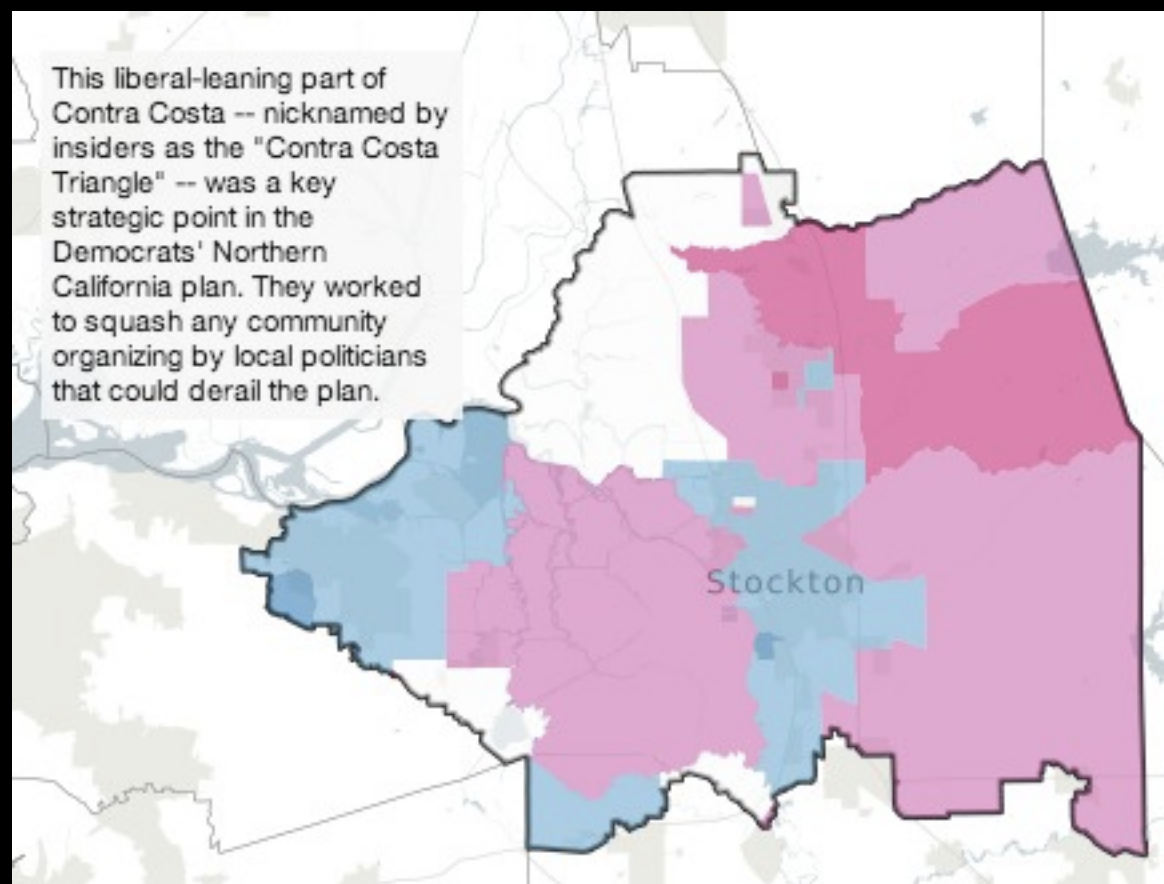


**CD 48** includes the coastal portion of Orange County. Cities and communities in this district include Seal Beach, Sunset Beach, Fountain Valley, Midway City, Huntington Beach, Costa Mesa, Newport Beach, Laguna Beach, Laguna Niguel, Aliso Viejo, and portions of the cities of Garden Grove, Santa Ana and Westminster. Splits include a portion of Huntington Beach to achieve population equality. This district is characterized by shared school districts, state-managed coastal beaches, **intense beach recreation**, and sensitive environmental coastal estuaries. It also includes the officially designated business area of Little Saigon.









<http://projects.propublica.org/redistricting-maps/mcnerney>

<http://www.propublica.org/article/how-democrats-fooled-californias-redistricting-commission>



State: District:		Full Name (Last, First, Middle Initial)	
<b>B. Redistricting Partners</b>		Mailing Address 2207 G Street	
City	State	Zip Code	
Sacramento	CA	95816	
Purpose of Disbursement Redistricting Data Consulting		Amount of Each Disbursement this Period 20000.00	
Candidate Name		Transaction ID : D294460	
Office Sought:	House Senate President	Disbursement For: 2012 <input checked="" type="checkbox"/> Primary <input type="checkbox"/> Other (specify)	
State:	District:	Full Name (Last, First, Middle Initial)	

## One San Joaquin

Stay informed - Email [onesanjoaquin@gmail.com](mailto:onesanjoaquin@gmail.com) or join our Google Group for more info  
<http://groups.google.com/group/onesanjoaquin>

Dear Neighbor:

San Joaquin County now has almost 700,000 residents after the 2010 census. That's enough population for one full State Senate seat, a Congressional representative, and two Assembly districts. These districts **must** be in San Joaquin County so that we have elected officials who focus on representing our needs.

San Joaquin County is currently split between four Assembly districts, two State Senate seats, and two Congressional districts. This shattered map dilutes our power at the State and Federal level. In fact, we have **no** elected officials in either legislature that live in the county. Whether you're a Republican or a Democrat, we can all agree that San Joaquin County deserves representation in Sacramento and Washington.

We now have the chance to change our situation with the creation of the non-partisan Citizens Redistricting Commission – a new citizen's panel that will draw lines for our elected officials. We can fight for **OUR** shared community by emailing the commission and attending an upcoming public meeting. Fourteen non-partisan members of the commission will be listening and making decisions about redistricting based on San Joaquin County's community input.

I urge you to join **One San Joaquin**, a local, **non-partisan**, group of San Joaquin supporters who are dedicated to fighting for our best interests. Please join us by taking the following actions:

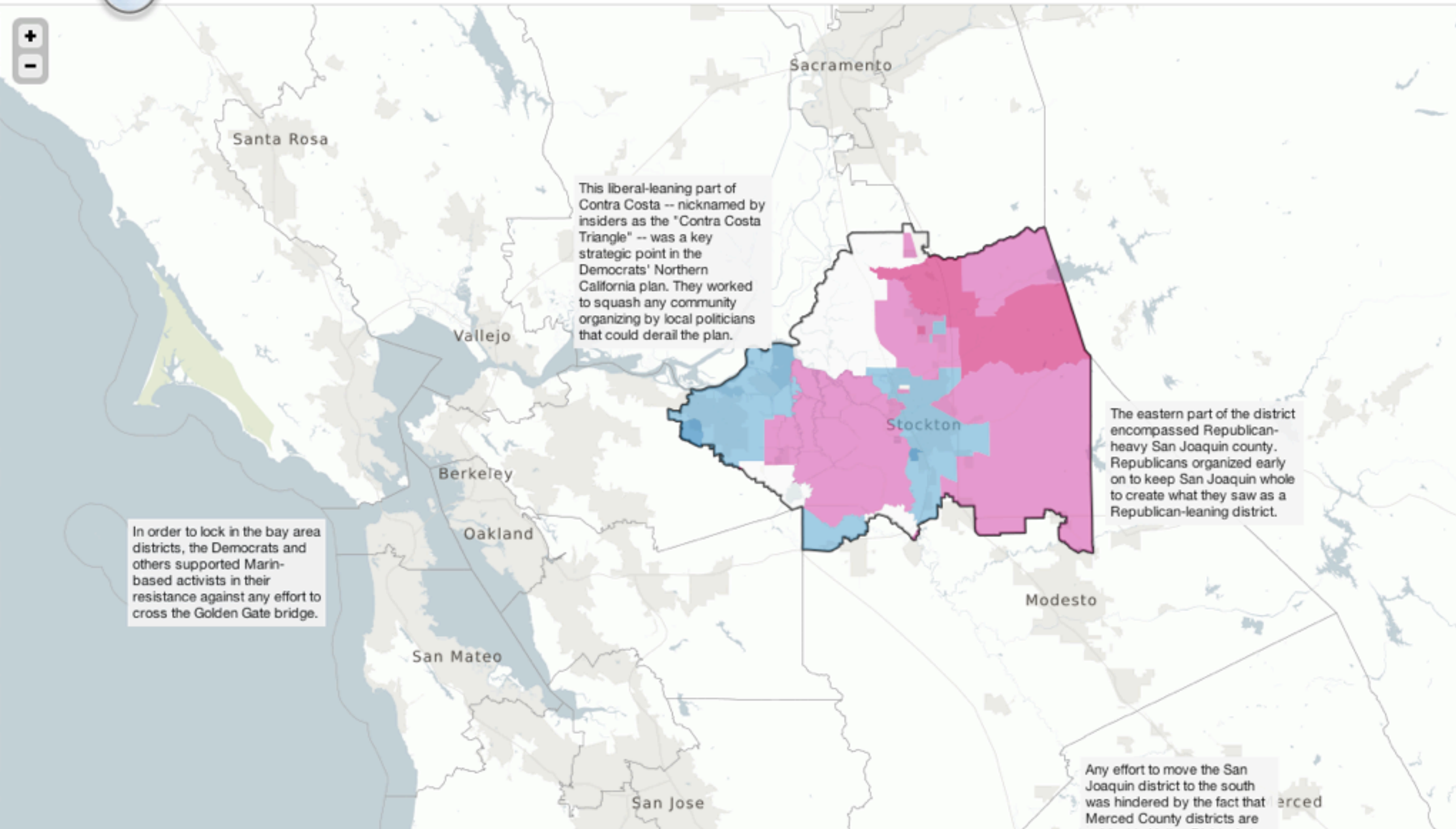
- Send an email before April 16<sup>th</sup> urging the commission to keep San Joaquin County together as one community. Be sure to send in your map of San Joaquin County and the outlying area.
- **Attend a public meeting on Saturday, April 16<sup>th</sup> from 2:00 p.m. – 5:00 p.m. at the Merced County Administration Building, 2222 M Street, Merced, CA with the One San Joaquin group.**
- Join the **One San Joaquin** Google Group at <http://groups.google.com/group/onesanjoaquin> so that you get the latest updates on our efforts.

# Rep. Jerry McNerney's District

By [Jeff Larson](#) and [Olga Pierce](#) ProPublica, Dec. 21, 2010

Democrats recognized that they could protect Jerry McNerney from being redistricted out of office by the Citizen's Redistricting Commission. In coordination local officials and aided by testimony by a front group called OneSanJoaquin, they helped convince the commission to draw a favorable district. [Related story »](#)

(Sources: U.S. Census and California Statewide Database. Additional research by Andrew Long)





109th Congress of the United States  
California - Congressional District 32



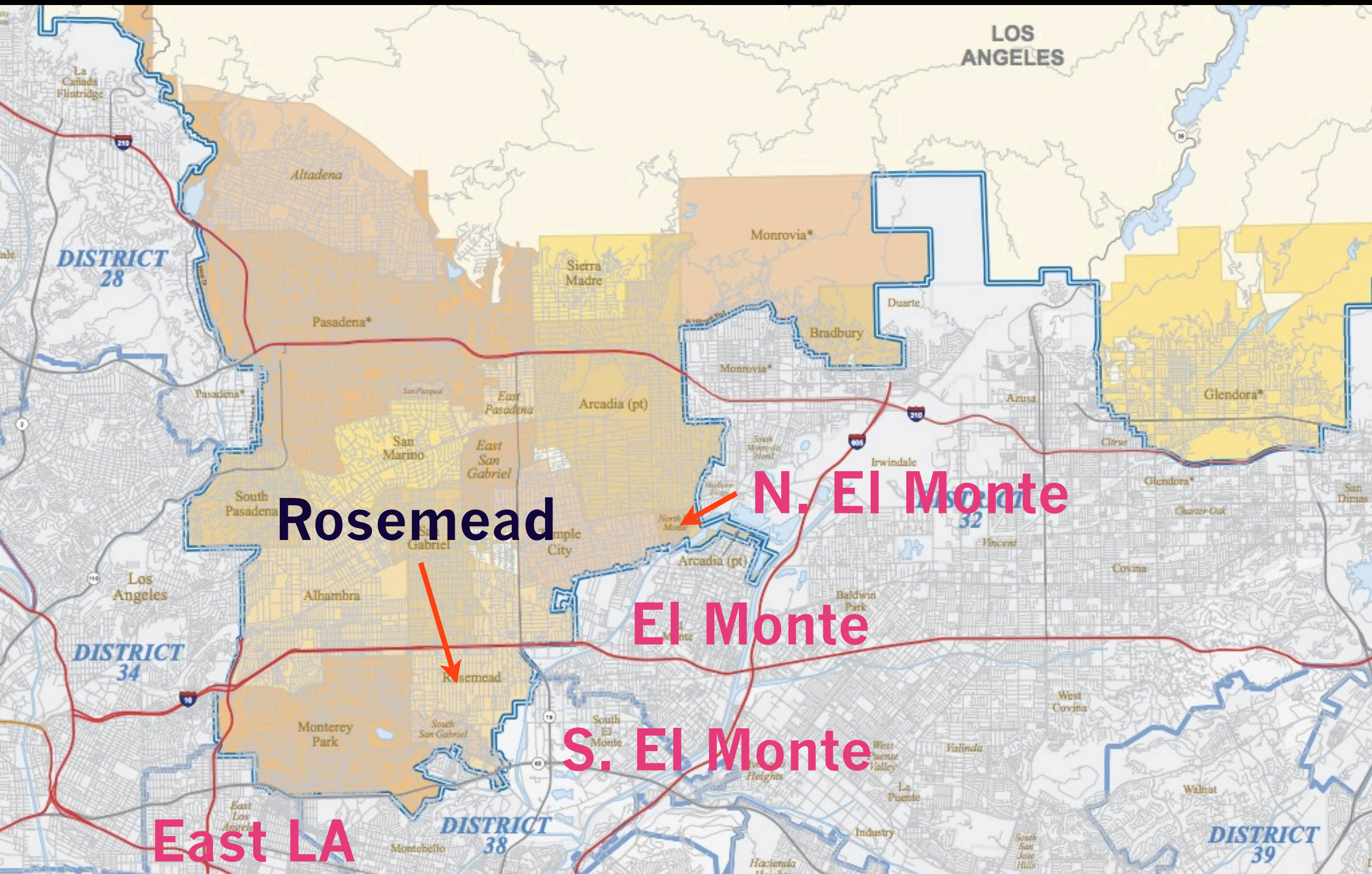
Rosemead

El Monte

S. El Monte









## Rep. Judy Chu's District

By [Jeff Larson](#) and [Olga Pierce](#) ProPublica, Dec. 21, 2010

The Asian American Education Institute, a group with ties to Congresswoman Judy Chu, testified before the California Citizen's Redistricting Commission, and helped persuade the commission to include Chu's stronghold of Rosemead in the district she planned to run in. Chris Chaffee, an employee of Redistricting Partners, provided maps, and Jennifer Wada, a lobbyist hired by the institute, who lives in Sacramento and who has never lived near the area, provided "community of interest" testimony. [Related story »](#)

(Sources: U.S. Census and California Statewide Database. Additional research by Andrew Long)



CHAFFEE PLAN

FINAL MAPS

MAP TOOLS

Rosemead

Monterey Park

The Asian American Education Institute's maps include Rosemead in the south west.



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By [Jeff Larson](#) and [Olga Pierce](#) ProPublica, Dec. 21, 2010

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(Sources: U.S. Census and California Statewide Database. Additional research by Andrew Long)

PRO PUBLICA

CHAFFEE PLAN

FINAL MAPS

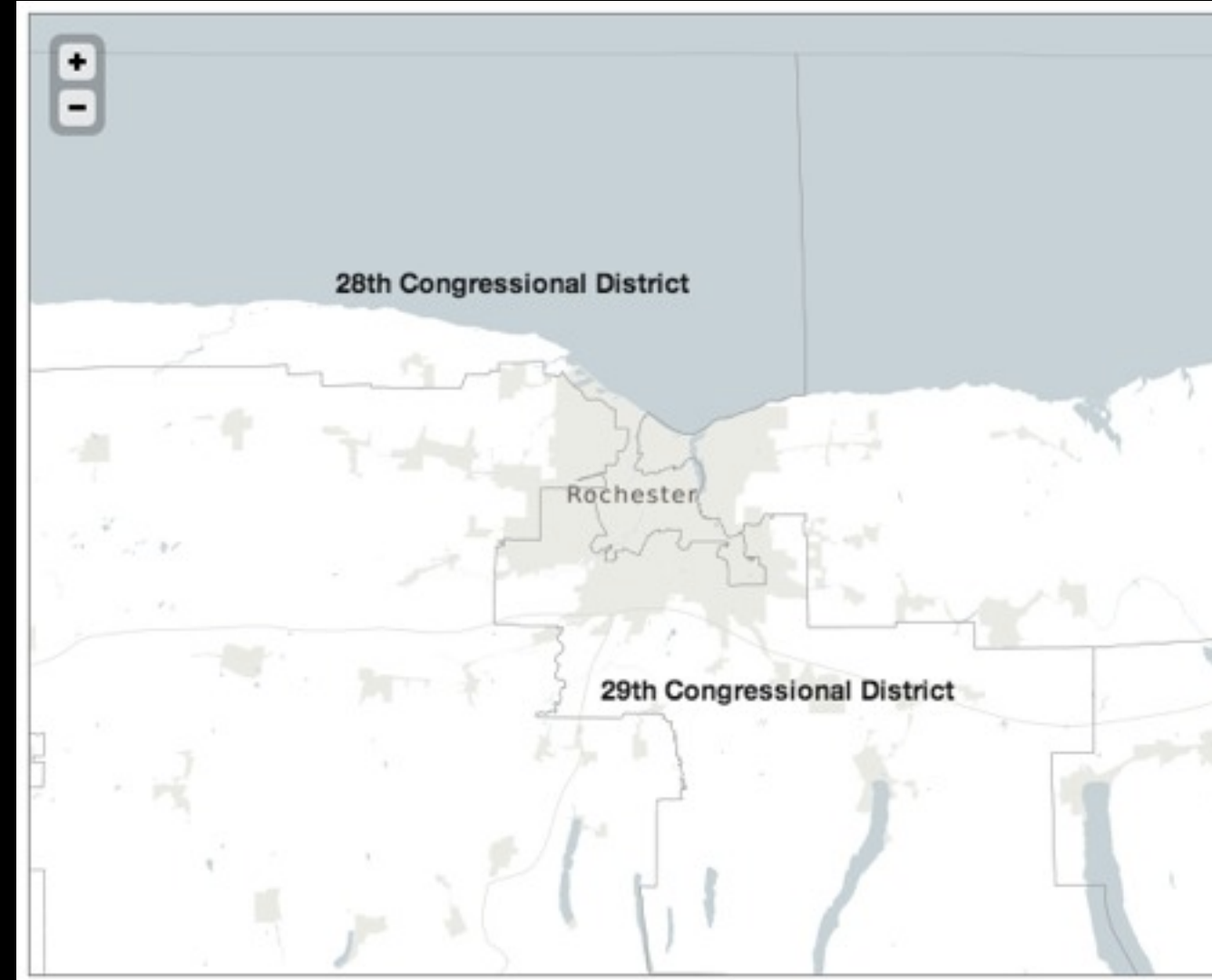
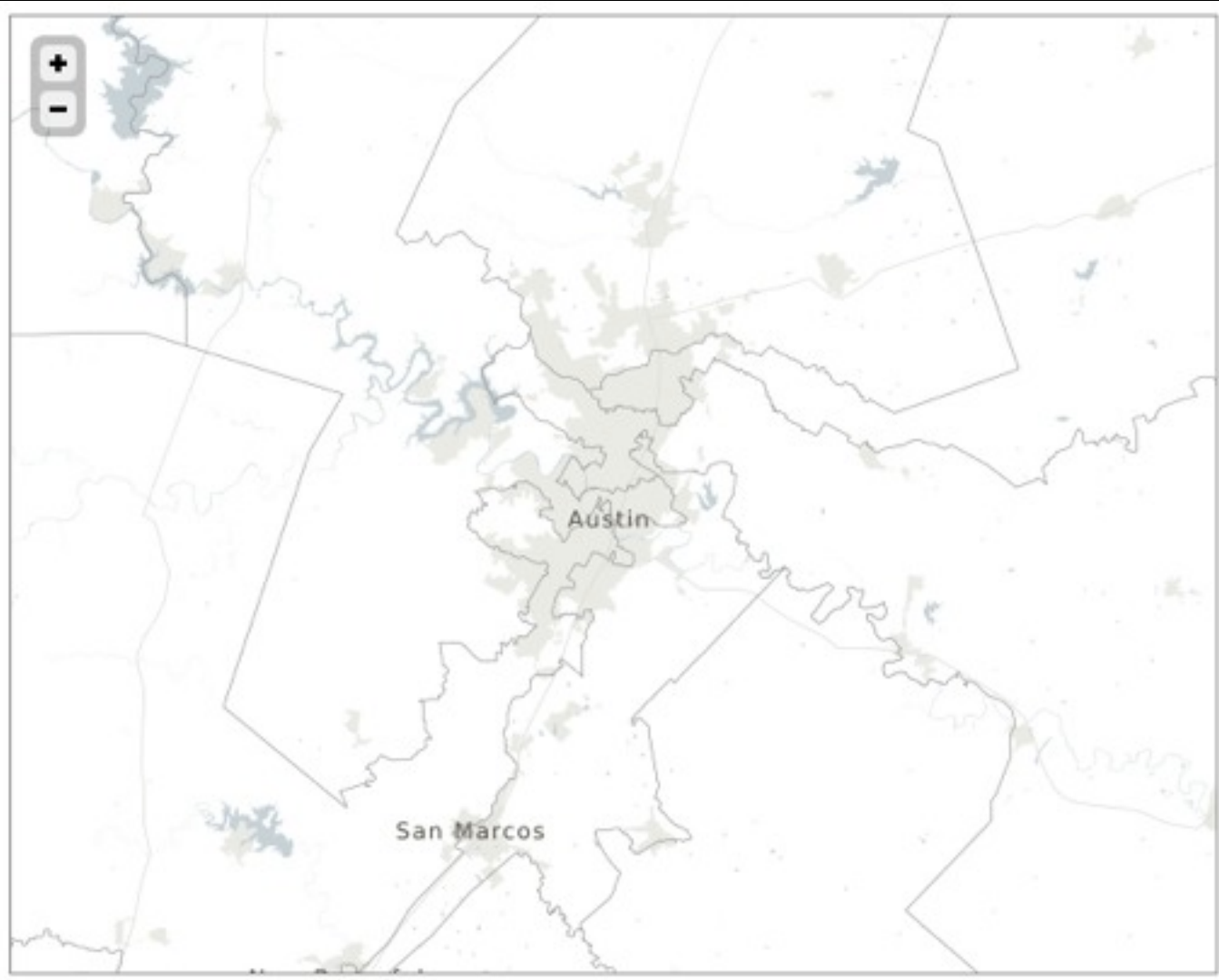
MAP TOOLS

Rosemead

Monterey Park

The commission's final maps include Rosemead.

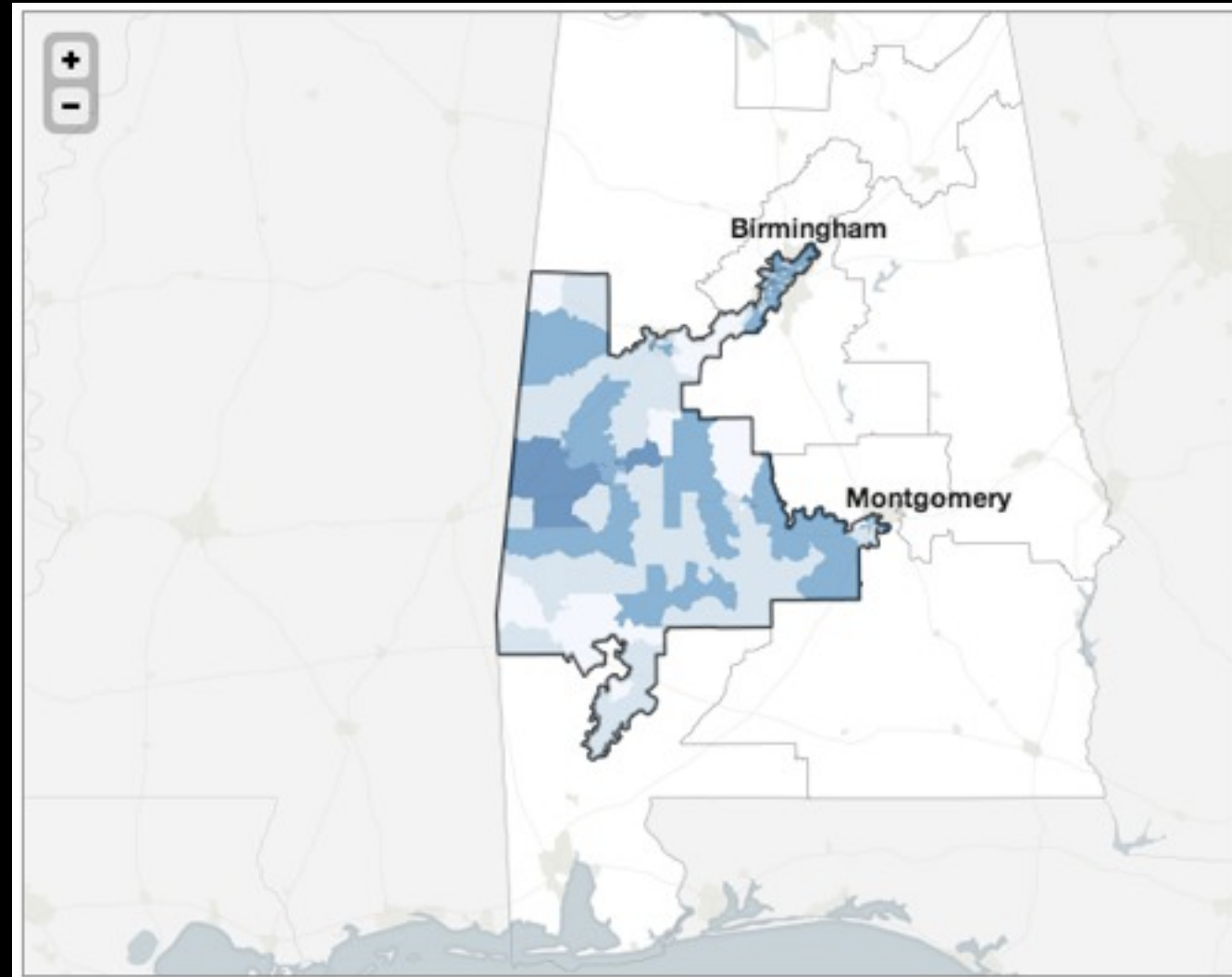
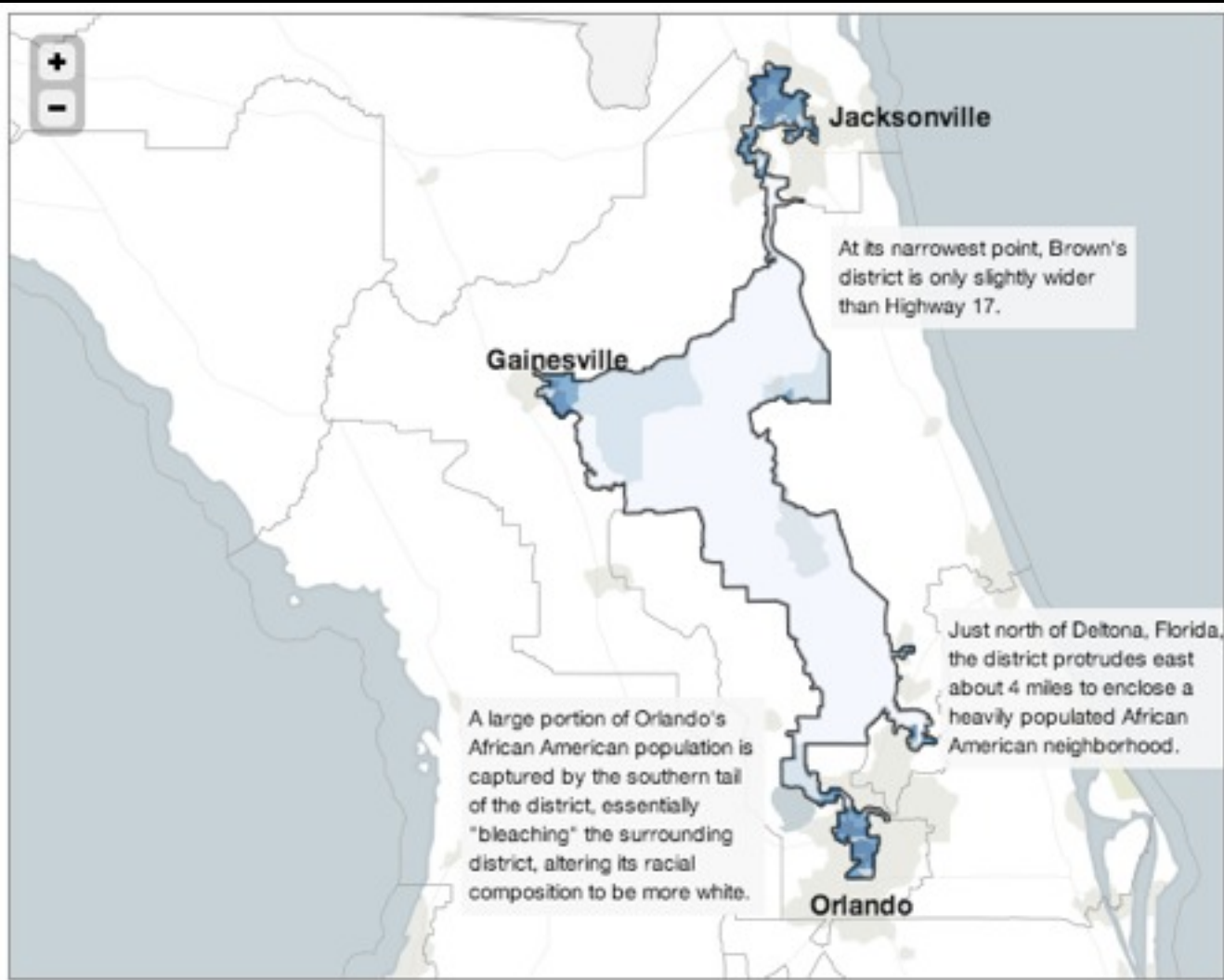
# Cracking



<http://www.propublica.org/article/redistricting-a-devils-dictionary>

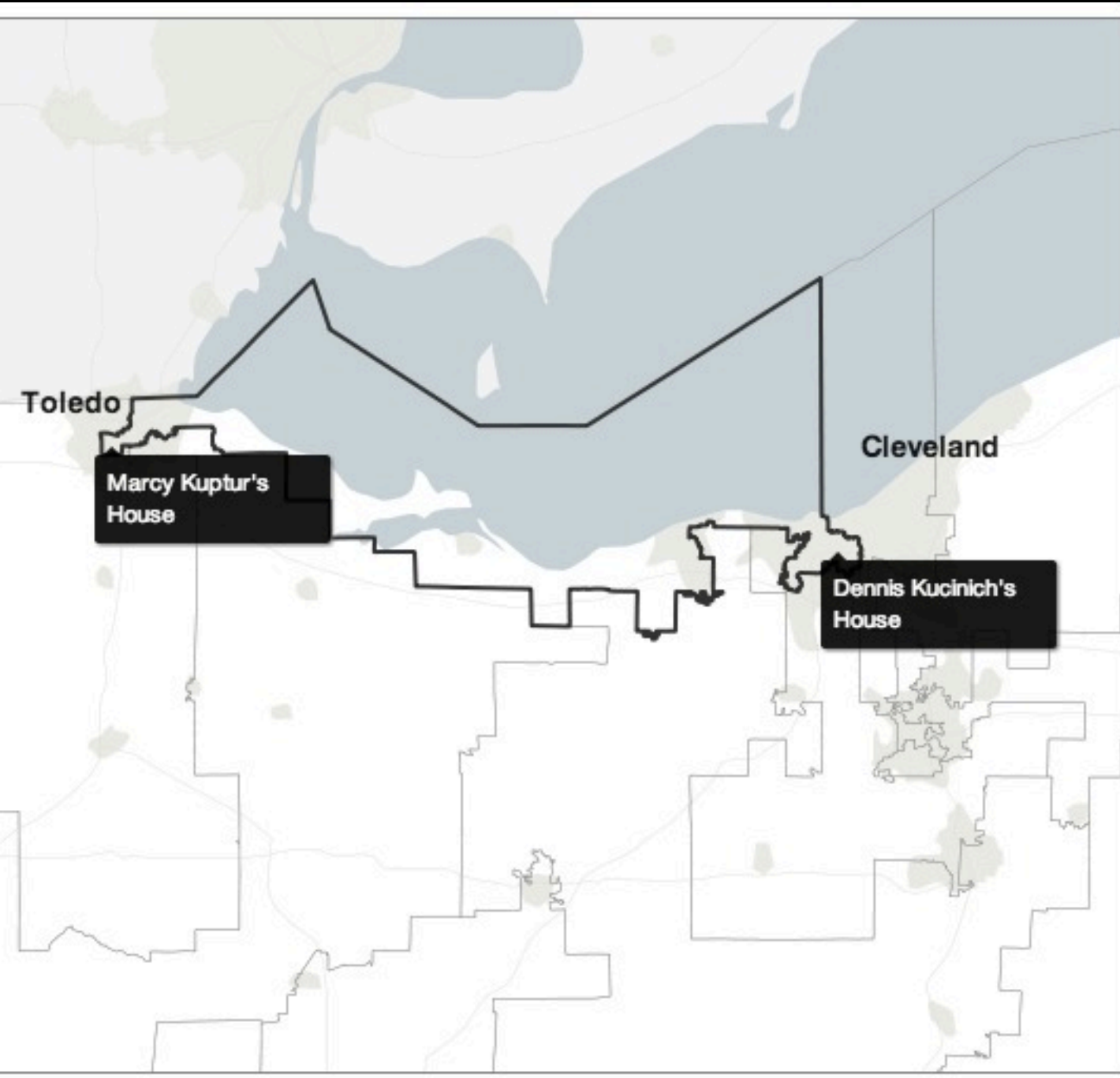


# Packing



<http://www.propublica.org/article/redistricting-a-devils-dictionary>

# Hijacking



# Kidnapping

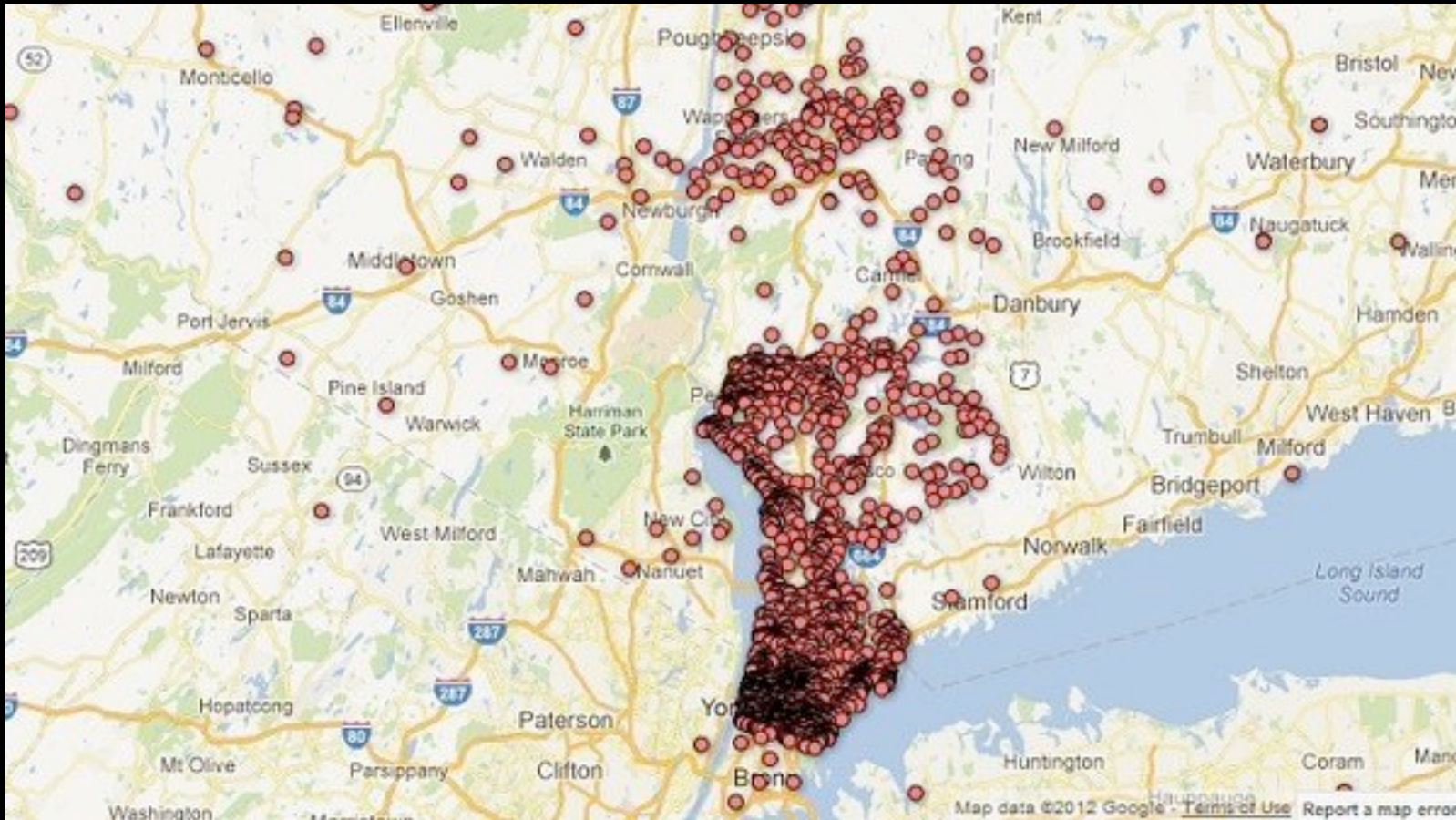


<http://www.propublica.org/article/redistricting-a-devils-dictionary>



**But what about the maps?**

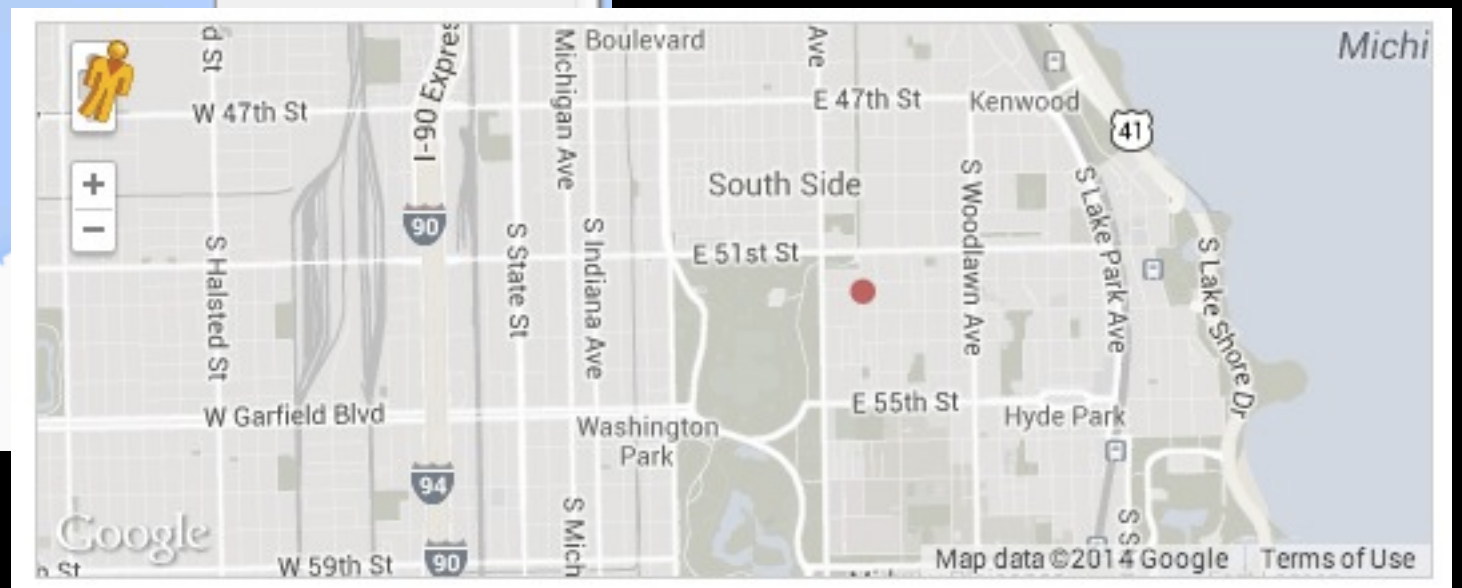
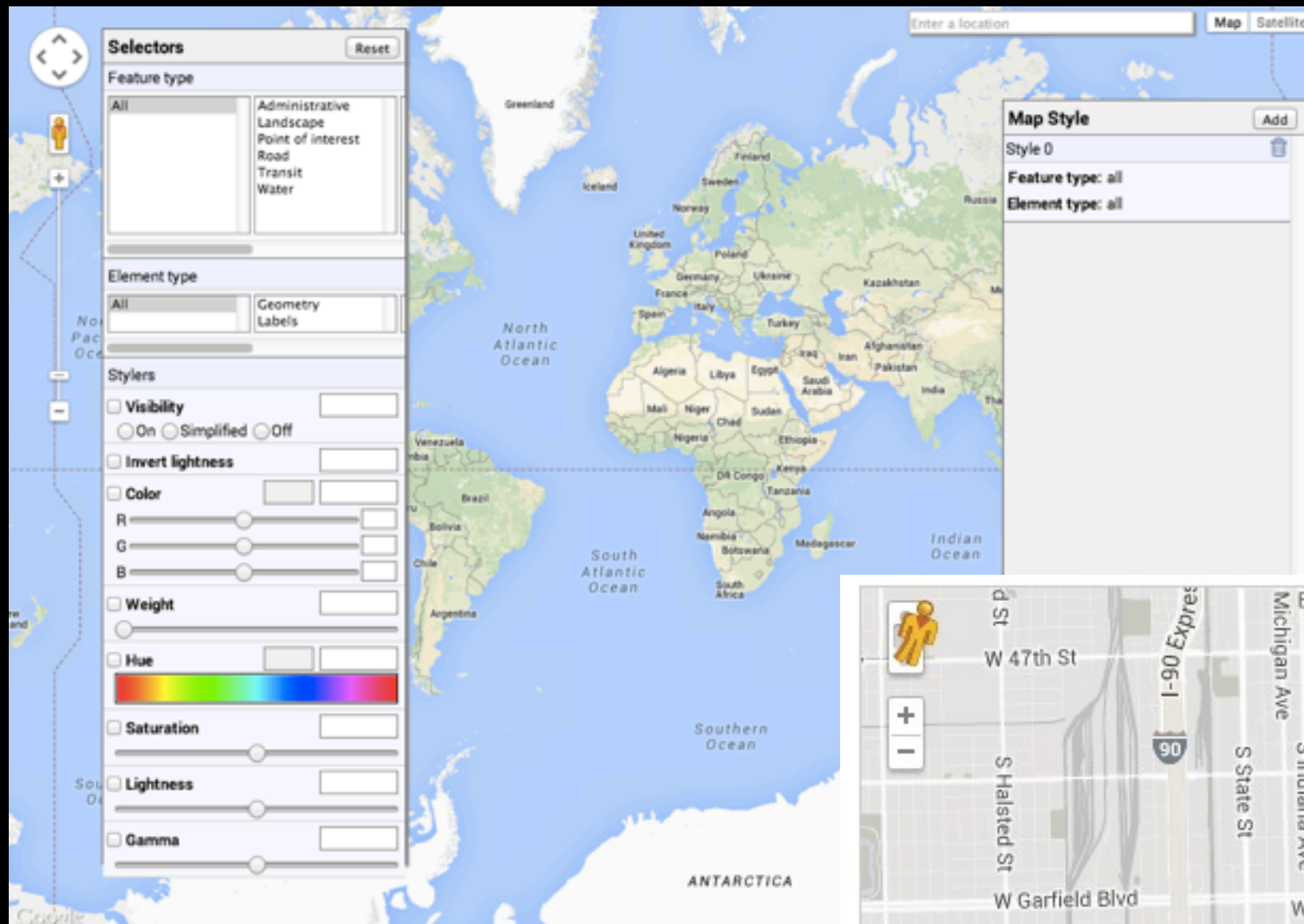
# Online mapping in news ca. 2011



*LoHud.com gun permit map*

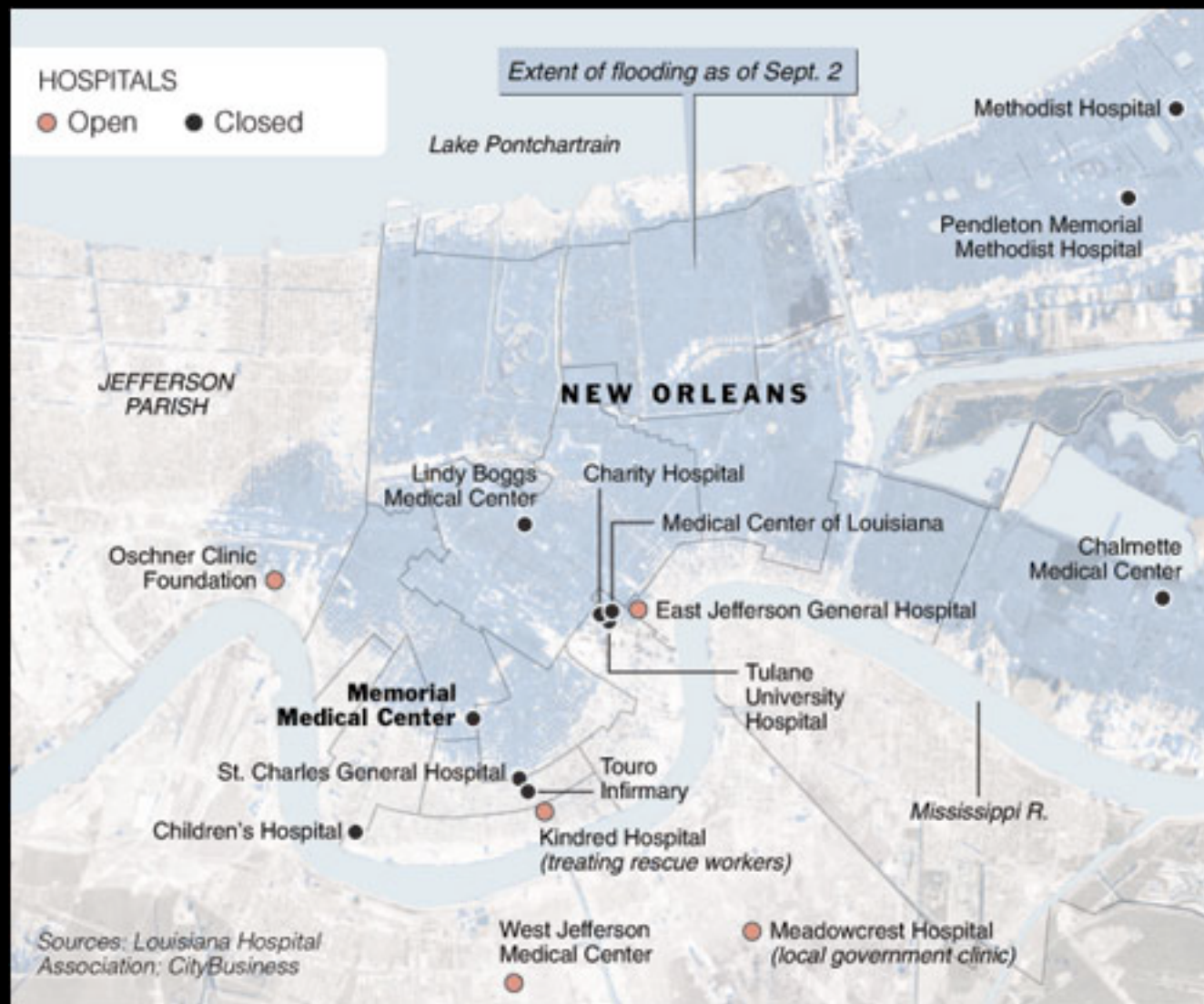


# Erm, desaturate and limit features?



<http://projects.propublica.org/dialysis>

# The Goal

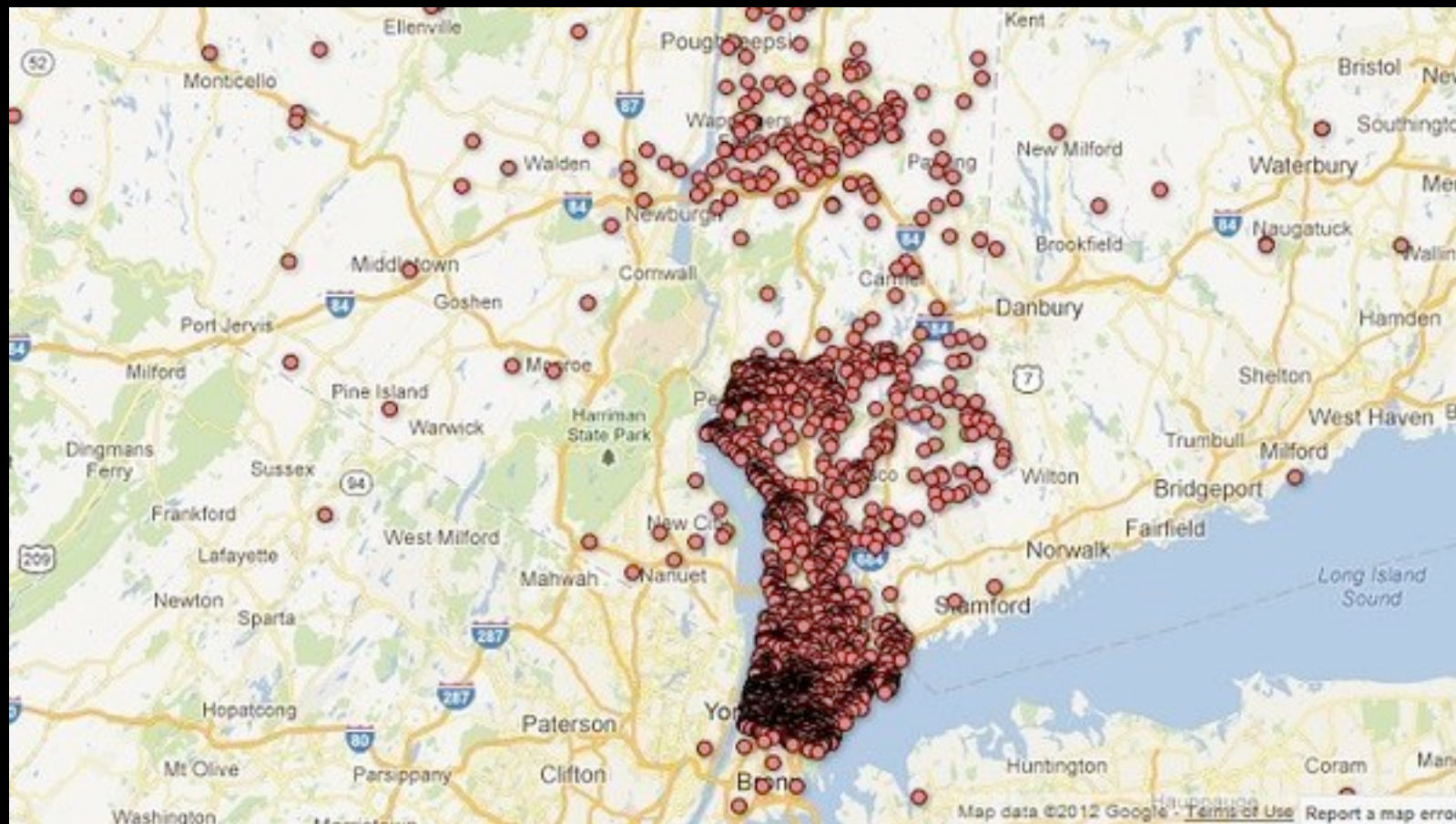


<http://www.nytimes.com/imagepages/2005/09/13/business/20050914hospital-map.html>

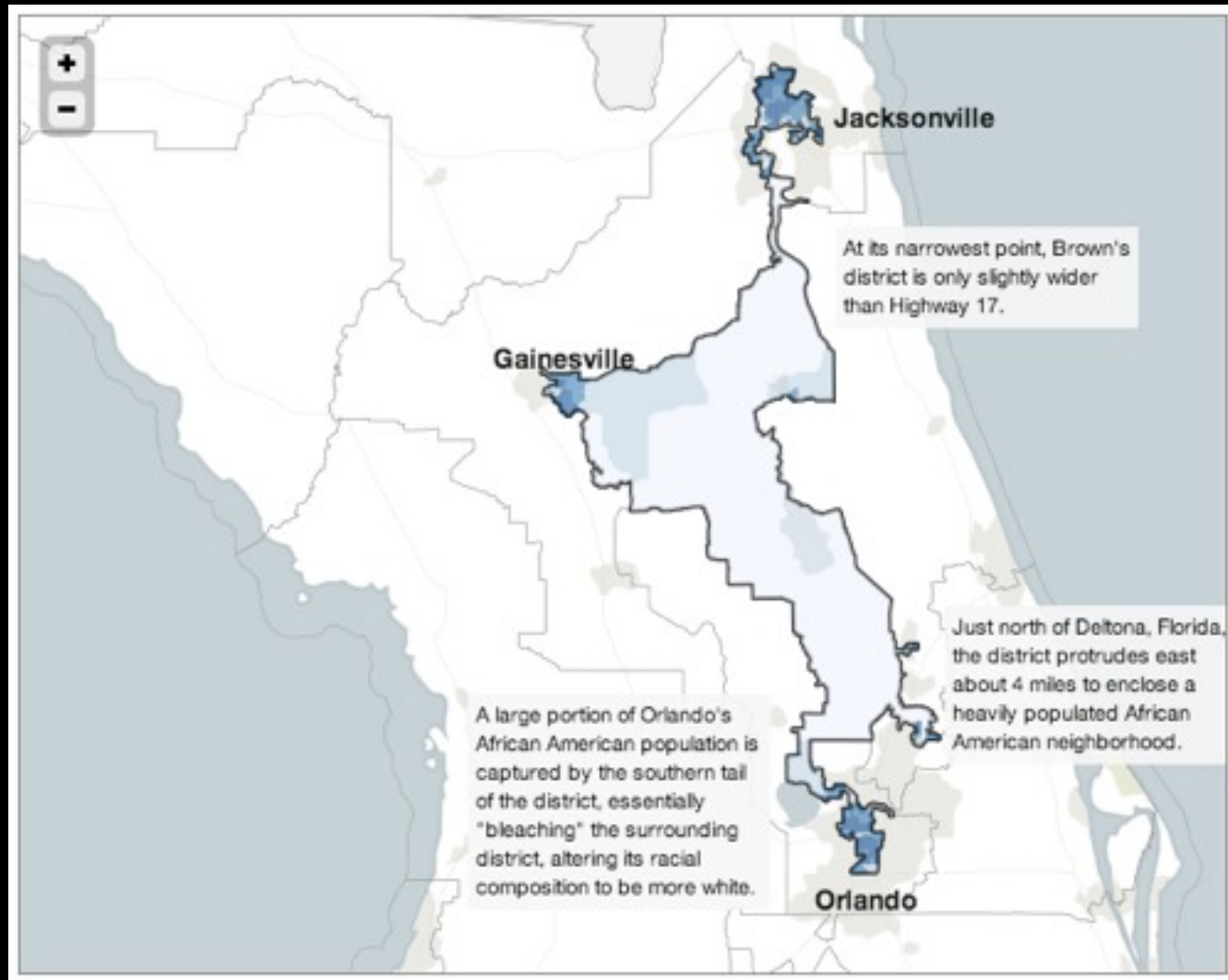


**“It should never be, ‘Here’s some data,  
see what you can find in it.’”**

*— Amanda Cox, The New York Times*



# Natural Earth Census Annotation Layer Limited Navigation





Simple

**SimpleTiles**



**SimplerTiles**



<http://propublica.github.io/simple-tiles/>

# The API

```
#include <simple-tiles/simple_tiles.h>

int
main(){
    simplet_map_t *map;
    if(!(map = simplet_map_new()))
        exit(1);

    simplet_map_set_slippy(map, 0, 0, 0);
    simplet_map_add_layer(map, "../data/ne_10m_admin_0_countries.shp");
    simplet_map_add_filter(map, "SELECT * from 'ne_10m_admin_0_countries'");
    simplet_map_add_style(map, "weight", "0.1");
    simplet_map_add_style(map, "fill", "#061F3799");
    if(simplet_map_is_valid(map))
        simplet_map_render_to_png(map, "./out.png");
    simplet_map_free(map);
}
```



# In Ruby

```
require 'simpler_tiles'

map = SimplerTiles::Map new do |m|
  m.slippy 0, 0, 0
  m.add_layer  "../data/ne_10m_admin_0_countries.shp"
  m.add_filter "SELECT * from 'ne_10m_admin_0_countries'"
  m.styles "weight" => "0.1",
           "fill"   => "#061F3799"
end
map.to_png
```

# How does it work?

`simplet_map_t`



`simplet_vector_layer_t`



`simplet_query_t`



`simplet_style_t`



# How does it work?

`simplet_map_t`

**Set bounds, SRS, etc.**



`simplet_vector_layer_t`

**Add OGR data to map**



`simplet_query_t`

**Filter OGR data**



`simplet_style_t`

**Style Cairo ctx**

# How does it work?

`simplet_map_t`



`simplet_raster_layer_t`



# How does it work?

`simplet_map_t`



`simplet_raster_layer_t`

**Anything GDAL can read**

**Reproject and draw  
to Cairo ctx**



# Raster Demo

<http://projects.propublica.org/nyc-raster-demo/>





# Raster map with Simpler Tiles & Sinatra

```
get '/tiles/:x/:y/:z.png' do
  # Let the browser know we are sending a png
  content_type 'image/png'

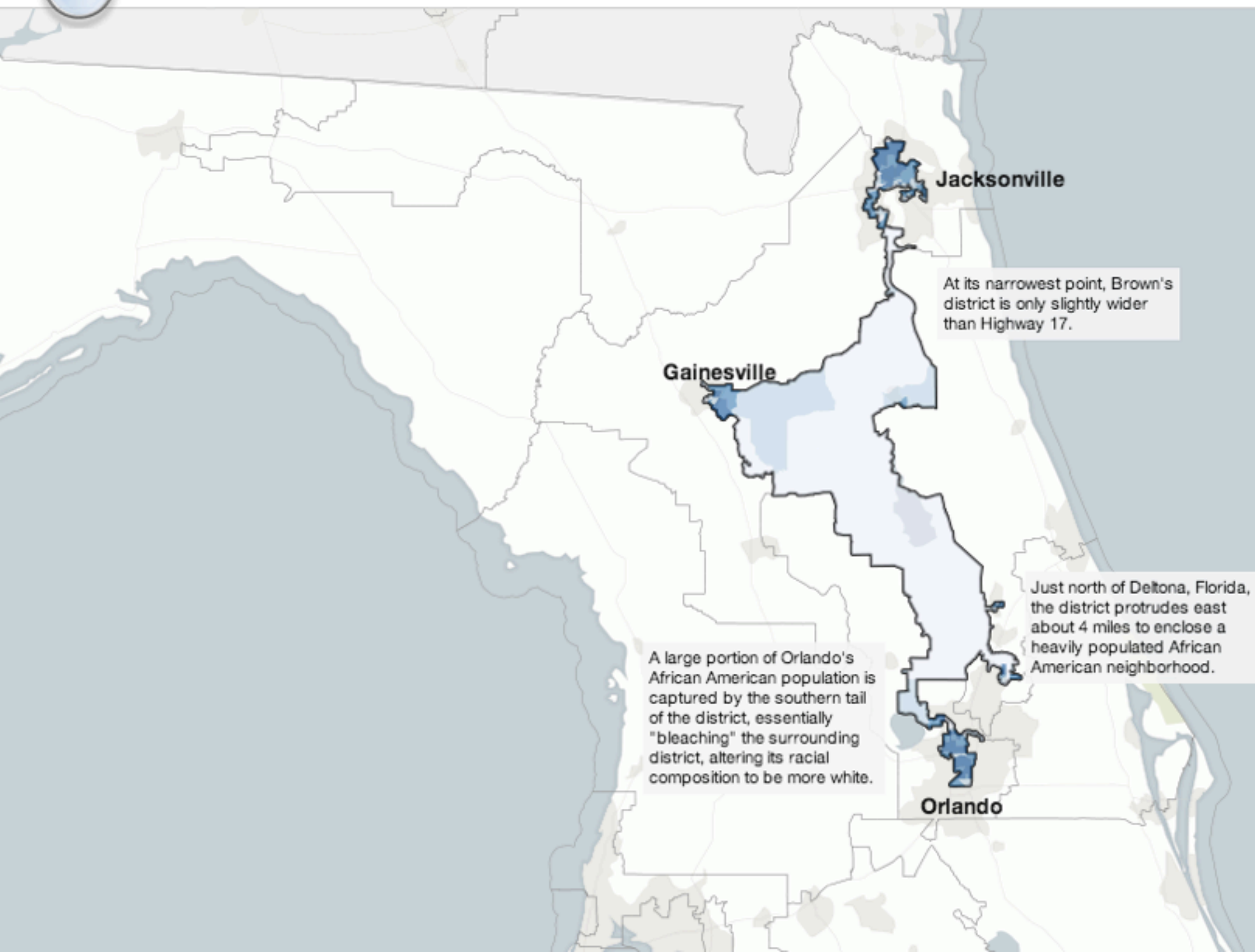
  # Create a Map object
  map = SimplerTiles::Map.new do |m|
    m.slippy params[:x].to_i, params[:y].to_i, params[:z].to_i
    m.raster_layer "path/to/raster.tif"
  end
  map.to_png
end
```



# Florida's 3rd Congressional District

By [Jeff Larson](#) and [Olga Pierce](#) ProPublica, Sep. 23, 2010

Congresswoman Corrine Brown, an African-American Democrat from Florida, represents one of the most irregularly shaped districts in the nation. It is made up of heavily African-American neighborhoods in Jacksonville, Gainesville and Orlando which are connected by a large, sparsely populated corridor that includes most of Ocala National Forest. To protect this district against a pair of anti-gerrymandering amendments, Brown served as African-American chairwoman of Protect Your Vote; a group funded in part by Honeywell and CSX Transportation. *(Population data via Census 2000)* [Related Story »](#)



## At a Glance

Choose a type of district and a school measure to update the map.

Unified Districts

Elementary Districts

Secondary Districts

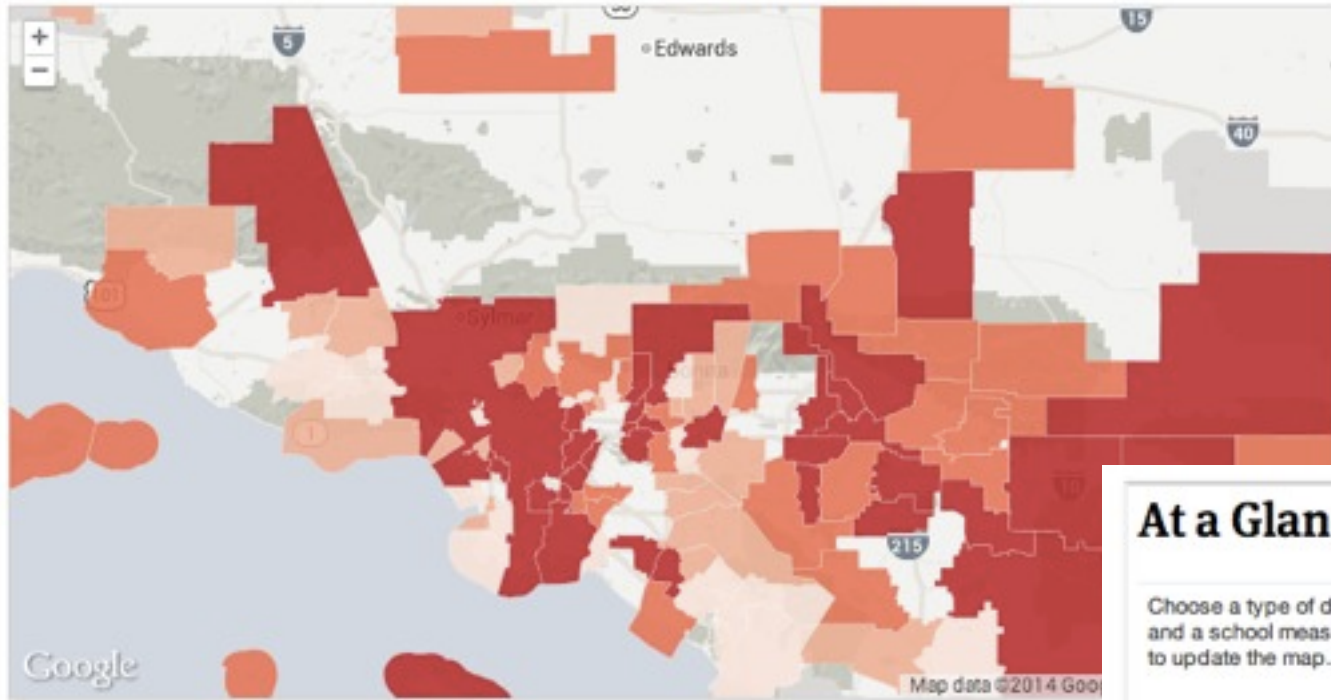
Free/Reduced Lunch

AP Enrollment

AP Pass Rate

Advanced Math Enrollment

Gifted/Talented Enrollment



## At a Glance

Choose a type of district and a school measure to update the map.

Unified Districts

Elementary Districts

Secondary Districts

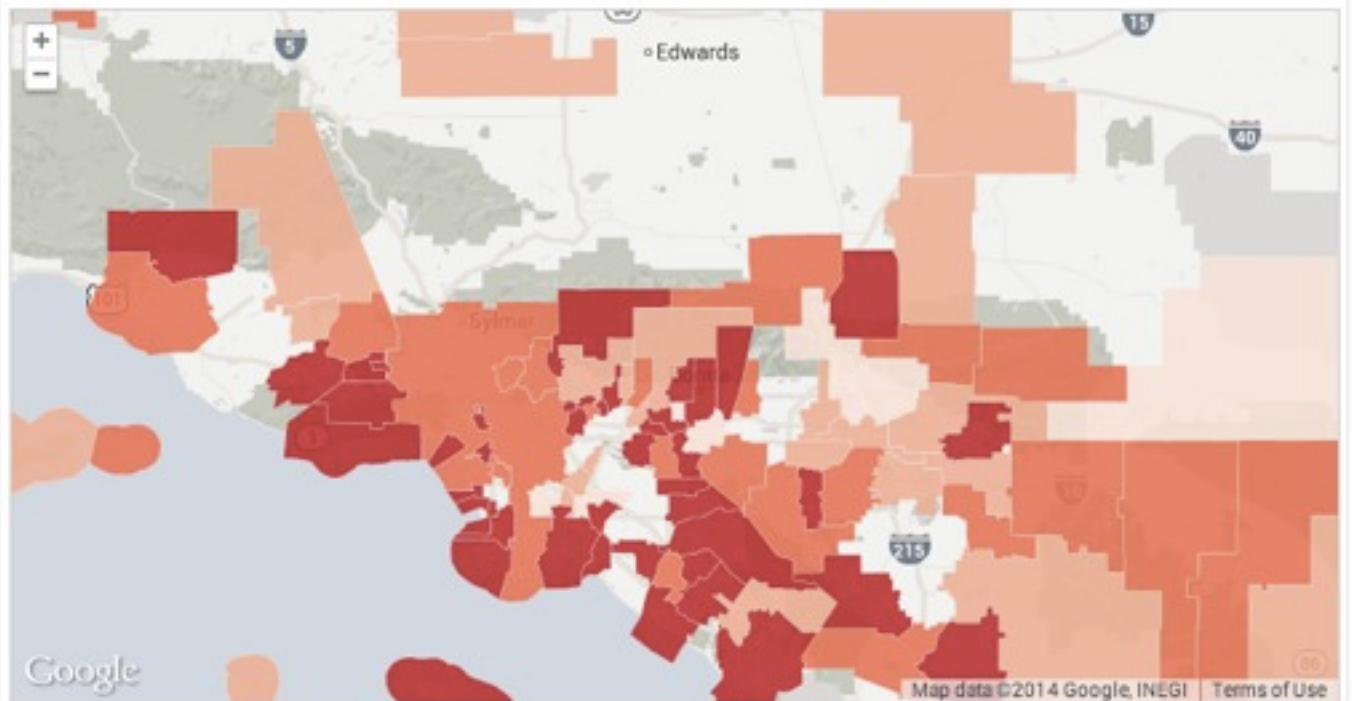
Free/Reduced Lunch

AP Enrollment

AP Pass Rate

Advanced Math Enrollment

Gifted/Talented Enrollment





**New York, 2012**



NASA



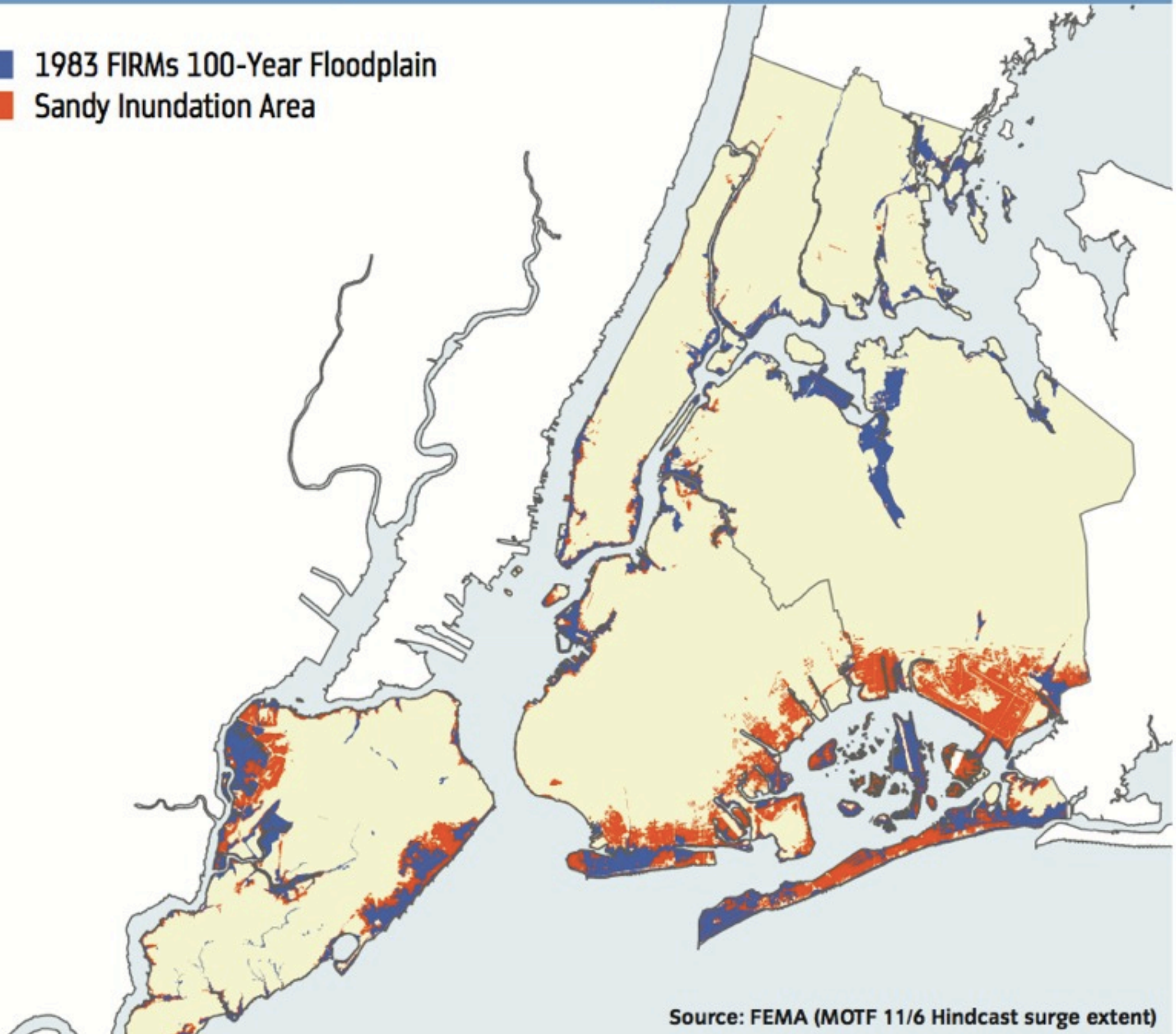
# New York, 2012





## 1983 FEMA FIRMs and Sandy Inundation Area Comparison

- 1983 FIRMs 100-Year Floodplain
- Sandy Inundation Area



Source: FEMA (MOTF 11/6 Hindcast surge extent)

# FLOOD INSURANCE STUDY



**CITY OF  
NEW YORK,  
NEW YORK  
BRONX COUNTY,  
RICHMOND COUNTY  
NEW YORK COUNTY,  
QUEENS COUNTY,  
KINGS COUNTY**



REVISED:  
SEPTEMBER 5, 2007

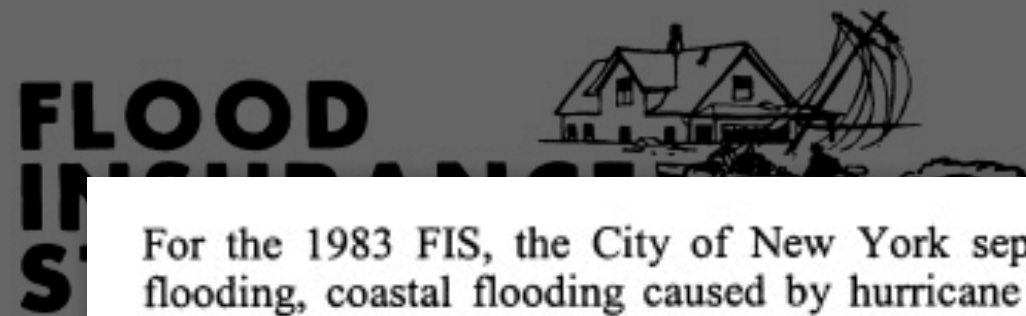


**Federal Emergency Management Agency**

FLOOD INSURANCE STUDY NUMBER  
360497V000A







For the 1983 FIS, the City of New York separately examined the impact of fluvial flooding, coastal flooding caused by hurricane surges, and coastal flooding caused by northeasters. Since the causes of flooding are independent, the separate results were combined in a probabilistic sense. A wave height analysis was also performed to account for the inclusion of short-period, wave-induced waves. The extensive hydrologic and hydraulic analyses necessary to accomplish this study have been documented in a series of reports prepared for the New York State Department of Environmental Conservation (NYSDEC) (Camp, Dresser and McKee, 1983, 1979, 1982, April 1981, 1980, December 1981, November 1981, Total Stillwater Elevations; November 1981, Wave Crest Analysis).

**CITY OF  
NEW YORK,  
NEW YORK  
BRONX COUNTY,  
RICHMOND COUNTY  
NEW YORK COUNTY,  
QUEENS COUNTY,  
KINGS COUNTY**



REVISED:

SEPTEMBER 5, 2007



**Federal Emergency Management Agency**

FLOOD INSURANCE STUDY NUMBER  
360497V000A

# 2010 GAO Report (for background)

Traditionally, flood maps were created and stored in paper format. In the early 1990s, however, some of the data and information FEMA collected to develop flood maps started becoming available in digital format. In 1997, FEMA developed its initial flood Map Modernization plan that outlined the steps necessary to update the nation's flood maps to digital format and streamline FEMA's operations in raising public awareness of the importance of the maps and responding to requests to revise them.

FEMA's initial flood Map Modernization plan was to fully digitize all flood maps in the nation, first, by identifying those maps that required engineering updates and converting them to a digital format. FEMA's initial goal was to convert approximately 80 percent of existing paper maps to a digital format, update 20 percent of the existing maps with new flood risk information while converting them to digital format, and add 13,700 completely new maps (also in digital format) to cover previously unmapped communities. Then, a planned maintenance phase would follow the Map Modernization initiative, whereby these maps would be updated with new engineering data.



# 2004 GAO Report

GAO

United States General Accounting Office

Report to the Chairman, Subcommittee  
on Housing and Community  
Opportunity, Committee on Financial  
Services, House of Representatives

## FLOOD MAP MODERNIZATION

### Program Strategy Shows Promise, but Challenges Remain

FEMA has ranked all 3,146 counties from highest to lowest based on a number of factors, including, among other things, population, growth trends, housing units, flood insurance policies and claims, repetitive loss properties, and flood disasters. On the basis of this ranking, FEMA established mapping priorities. However, FEMA has not yet established standards on the appropriate data and level of analysis required to develop maps based on risk level. FEMA has historically applied the same minimum standards for all flood maps and supporting data.<sup>13</sup> FEMA's *Guidelines and Specifications for Flood Hazard Mapping Partners* provides guidance for selecting the level of analysis and effort to produce flood hazard data and have generally been used on a case-by-case basis.<sup>14</sup> The guidelines do not specify standards to be used for all mapping projects within a given risk category. Without establishing standards for different categories of risk, FEMA cannot ensure that it uses the same level of data collection and analysis across all communities within the same risk category. These standards could also provide a consistent basis for estimating the costs of developing maps in each risk category. According to FEMA, the agency plans to develop standards that can be applied to different levels of flood risk as part of a 5-year map modernization implementation plan. FEMA expects this plan to be completed by the end of fiscal year 2004; however, at the time of our review, FEMA had not yet developed draft standards or incorporated this task into its implementation plan.

<https://www.documentcloud.org/documents/804397-2004-gao-report-flood-map-modernization-program.html>

# Flood Map Modernization Mid-Course Adjustment

March 30, 2006



# FEMA

At the end of the 5-year period of FEMA's Map Modernization initiative, with the course adjustment described above, the Nation can expect digital flood maps to cover 92 percent of the population of the United States and 65 percent of its land area. Overall, 75 percent of the mapped stream miles will meet the 2005 Floodplain Boundary Standard, meaning that the floodplain boundary on the maps is drawn using the best available topographic data. This covers 80 percent of the population. Of the stream miles mapped, 30 percent will be based on new, updated, or validated engineering analysis, covering 40 percent of the population.

FEMA will accomplish these final outcomes of the Map Modernization initiative provided that funding levels are maintained through FY 2008. No additional funding or schedule adjustments are required to meet FEMA's new targets as outlined in this report.

<https://www.documentcloud.org/documents/803311-fema-2006-flood-map-modernization-mid-course.html>



# 2005 Letter from NYS Flood Chief to FEMA

## New York State Department of Environmental Conservation

### Division of Water

Bureau of Program Resources & Flood Protection, 4<sup>th</sup> Floor  
625 Broadway, Albany, New York 12233-3507

**Phone:** (518) 402-8151 • **FAX:** (518) 402-9029

**Website:** [www.dec.state.ny.us](http://www.dec.state.ny.us)



Erin M. Crotty

Mr. David I. Maurstad  
Director, Mitigation Directorate  
Federal Emergency Management  
500 C. Street S.W.  
Washington, DC 20472

Dear Mr. Maurstad:

Until recently, FEMA Region II supported our point of view. However, they have received their marching orders. This month, we were told in no uncertain terms that the task at hand is to produce digital flood maps nation-wide. This means that in much of New York, and I imagine in most of the rest of the nation, there will be sufficient funding to do little more than digitize existing maps with perhaps better quality approximate studies. This is insufficient and will result in poor quality, but really good looking maps that fail to provide the data needed to adequately manage development in floodplains. Many errors on existing maps will continue to appear on the new maps. Funds will not be available to connect disconnected studies at community boundaries, to correct inaccurate hydrology, or to update out of date hydraulic studies where needed. Out of date studies will continue to appear on newly issued maps. This will lead to higher than necessary flood damages and more expenses placed on individuals and on FEMA for LOMAs and LOMRs. It will also create public and political opposition to the Map Modernization Program.

Thank you for the opportunity to comment on the Multi-Year Flood Hazard Identification Plan (MHIP), which establishes the outline for FEMA's ambitious Map Modernization Program. As one of FEMA's first state-wide Cooperating Technical Partners (CTP), we are strongly committed to supporting and undertaking the most advanced flood mapping in history. We have enjoyed a long and

<https://www.propublica.org/documents/item/808733-2005-mhip-ny-fema-letter>

# FLOOD INSURANCE STUDY



## NASSAU COUNTY, NEW YORK (ALL JURISDICTIONS)



Nassau County

COMMUNITY NAME	COMMUNITY NUMBER	COMMUNITY NAME	COMMUNITY NUMBER	COMMUNITY NAME	COMMUNITY NUMBER
ATLANTIC BEACH, VILLAGE OF	360458	ISLAND PARK, VILLAGE OF	360471	PLANDOME, VILLAGE OF	360484
BAXTER ESTATES, VILLAGE OF	360459	KENSINGTON, VILLAGE OF	360472	PLANDOME HEIGHTS, VILLAGE OF	360485
BAYVILLE, VILLAGE OF	360460	KINGS POINT, VILLAGE OF	360473	PLANDOME MANOR, VILLAGE OF	360486
BELLEROSE, VILLAGE OF	360461	LAKE SUCCESS, VILLAGE OF	361582	PORT WASHINGTON NORTH, VILLAGE OF	361552
BROOKVILLE, VILLAGE OF	360462	LATTINGTOWN, VILLAGE OF	360474	ROCKVILLE CENTRE, VILLAGE OF	360488
CEDARHURST, VILLAGE OF	360463	LAUREL HOLLOW, VILLAGE OF	360475	ROSLYN, VILLAGE OF	360489
CENTRE ISLAND, VILLAGE OF	360464	LAWRENCE, VILLAGE OF	360476	ROSLYN ESTATES, VILLAGE OF	361540
COVE NECK, VILLAGE OF	360465	LONG BEACH, CITY OF	360477	ROSLYN HARBOR, VILLAGE OF	361535
EAST HILLS, VILLAGE OF	360466	LYMBROOK, VILLAGE OF	360478	RUSSELL GARDENS, VILLAGE OF	361533
EAST ROCKAWAY, VILLAGE OF	360467	MALVERNE, VILLAGE OF	361533	SADDLE ROCK, VILLAGE OF	360491
EAST WILLISTON, VILLAGE OF	361628	MANORHAVEN, VILLAGE OF	360479	SANDS POINT, VILLAGE OF	360492
FARMINGDALE, VILLAGE OF	361629	MASSAPEQUA PARK, VILLAGE OF	360480	SEA CLIFF, VILLAGE OF	360493
FLORAL PARK, VILLAGE OF	361630	MATINECOCK, VILLAGE OF	361634	SOUTH FLORAL PARK, VILLAGE OF	361541
FLOWER HILL, VILLAGE OF	361634	MILL NECK, VILLAGE OF	360481	STEWART MANOR, VILLAGE OF	361542
FRESHPORT, VILLAGE OF	360464	MINGOLA, VILLAGE OF	361535	THOMASTON, VILLAGE OF	360494
GARDEN CITY, VILLAGE OF	361631	MUNSEY PARK, VILLAGE OF	361536	UPPER BROOKVILLE, VILLAGE OF	361543
GLEN COVE, CITY OF	360465	MUTTONTOWN, VILLAGE OF	361537	VALLEY STREAM, VILLAGE OF	360495
GREAT NECK, VILLAGE OF	361519	NORTH HEMPSTEAD, TOWN OF	360482	WESTBURY, VILLAGE OF	361544
GREAT NECK ESTATES, VILLAGE OF	360466	NORTH HILLS, VILLAGE OF	361508	WILLISTON PARK, VILLAGE OF	361545
GREAT NECK PLAZA, VILLAGE OF	361632	NEW HYDE PARK, VILLAGE OF	361538	WOODSHIRE, VILLAGE OF	360496
HEMPSTEAD, TOWN OF	360487	OLD BROOKVILLE, VILLAGE OF	361546		
HEMPSTEAD, VILLAGE OF	361547	OLD WESTBURY, VILLAGE OF	361539		
HEWLETT BAY PARK, VILLAGE OF	360468	OYSTER BAY, TOWN OF	360483		
HEWLETT HARBOR, VILLAGE OF	360469	OYSTER BAY COVE, VILLAGE OF	361488		
HEWLETT NECK, VILLAGE OF	360470				

\*Non-flood-prone community

REVISED:  
SEPTEMBER 11, 2009

REVISED:  
SEPTEMBER 11, 2009



Federal Emergency Management Agency

FLOOD INSURANCE STUDY NUMBER  
36059CV000A



# FLOOD INSURANCE STUDY

## NASSAU AND SUFFOLK COUNTIES NEW YORK (ALL JURISDICTIONS)



For this revision, a new coastal storm surge analysis was incorporated for the Atlantic Ocean and bays. In addition the stillwater elevations for the Long Island Sound and bay areas were updated. Finally, for both the Atlantic Ocean and Long Island Sound, overland wave height analyses were performed. This work was accomplished by Leonard Jackson Associates and Dewberry for FEMA under Contract No.EMN-2002-RP-0018 and completed in March 2008. Digital base map information was provided by the New York State Office of Cyber Security and Critical Infrastructure Coordination. The digital FIRM was produced with a horizontal projection of State Plane New York Long Island East, feet referenced to the North American Datum of 1983.

COMMUNITY NAME	COMMUNITY NUMBER	COMMUNITY NAME	COMMUNITY NUMBER	COMMUNITY NAME	COMMUNITY NUMBER
ATLANTIC BEACH, VILLAGE OF	360458	ISLAND PARK, VILLAGE OF	360471	PLANDOME, VILLAGE OF	360484
BAXTER ESTATES, VILLAGE OF	360459	KENSINGTON, VILLAGE OF	360472	PLANDOME HEIGHTS, VILLAGE OF	360485
BAYVILLE, VILLAGE OF	360460	KINGS POINT, VILLAGE OF	360473	PLANDOME MANOR, VILLAGE OF	360486
BELLEROSSE, VILLAGE OF	360461	LAKE SUCCESS, VILLAGE OF	361582	PORT WASHINGTON NORTH, VILLAGE OF	361552
BROOKVILLE, VILLAGE OF	360462	LATTINGTOWN, VILLAGE OF	360474	ROCKVILLE CENTRE, VILLAGE OF	360488
CEDARHURST, VILLAGE OF	360463	LAUREL HOLLOW, VILLAGE OF	360475	ROSLYN, VILLAGE OF	360489
CENTRE ISLAND, VILLAGE OF	360464	LAWRENCE, VILLAGE OF	360476	ROSLYN ESTATES, VILLAGE OF	361540
COVE NECK, VILLAGE OF	360465	LONG BEACH, CITY OF	360477	ROSLYN HARBOR, VILLAGE OF	361536
EAST HILLS, VILLAGE OF	360466	LYMBROOK, VILLAGE OF	360478	RUSSELL GARDENS, VILLAGE OF	361533
EAST ROCKAWAY, VILLAGE OF	360467	MALVERNE, VILLAGE OF	361533	SADDLE ROCK, VILLAGE OF	360491
EAST WILLISTON, VILLAGE OF	361628	MANORHAVEN, VILLAGE OF	360479	SANDS POINT, VILLAGE OF	360492
FARMINGDALE, VILLAGE OF	361629	MASSAPEQUA PARK, VILLAGE OF	360480	SEA CLIFF, VILLAGE OF	360493
FLORAL PARK, VILLAGE OF	361630	MATINECOCK, VILLAGE OF	361634	SOUTH FLORAL PARK, VILLAGE OF	361541
FLOWER HILL, VILLAGE OF	361634	MILL NECK, VILLAGE OF	360481	STEWART MANOR, VILLAGE OF	361542
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GARDEN CITY, VILLAGE OF	361631	MUNSEY PARK, VILLAGE OF	361536	UPPER BROOKVILLE, VILLAGE OF	361543
GLEN COVE, CITY OF	360469	MUTTONTOWN, VILLAGE OF	361537	VALLEY STREAM, VILLAGE OF	360495
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GREAT NECK PLAZA, VILLAGE OF	361632	NEW HYDE PARK, VILLAGE OF	361539	WOODBURGH, VILLAGE OF	360496
HEMPSTEAD, TOWN OF	360467	OLD BROOKVILLE, VILLAGE OF	361546		
HEMPSTEAD, VILLAGE OF	361547	OLD WESTBURY, VILLAGE OF	361539		
HEWLETT BAY PARK, VILLAGE OF	360468	OYSTER BAY, TOWN OF	360483		
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HEWLETT NECK, VILLAGE OF	360470				

\*Non-flood-prone community

REVISED:  
SEPTEMBER 11, 2009



Federal Emergency Management Agency

FLOOD INSURANCE STUDY NUMBER  
36059CV000A

# How bad were the maps?

## Queens

54%

Of Sandy flood area  
predicted by flood  
maps

## Kings

47%

Of Sandy flood area  
predicted by flood  
maps

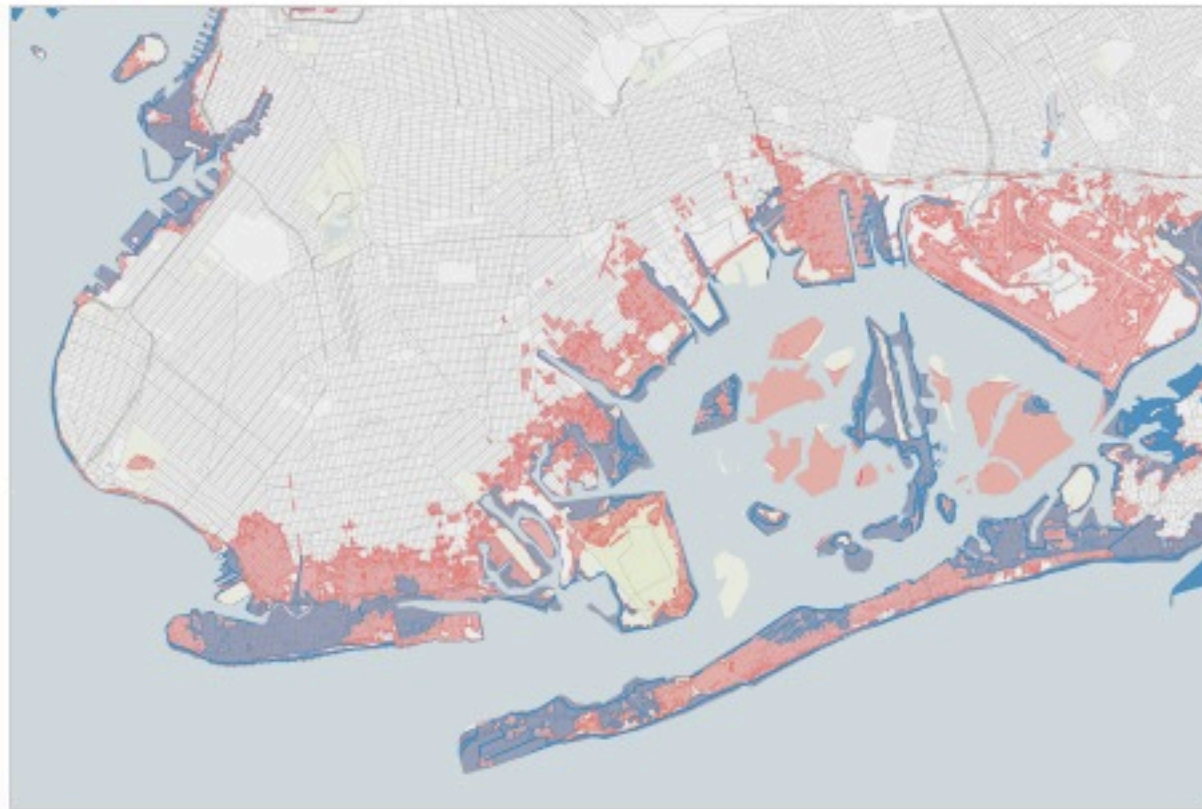
New York City's flood insurance maps, released by FEMA in 2007, are based on older technology and an older storm-surge model. ...

## Nassau

89%

Of Sandy flood area  
predicted by flood  
maps

... Nassau County got new flood maps in 2009, using lidar data and a new storm surge analysis. These maps were better at predicting the area Sandy flooded than the New York City maps.



Sandy Flood Area  
Existing Flood Hazard Zones

Source: FEMA

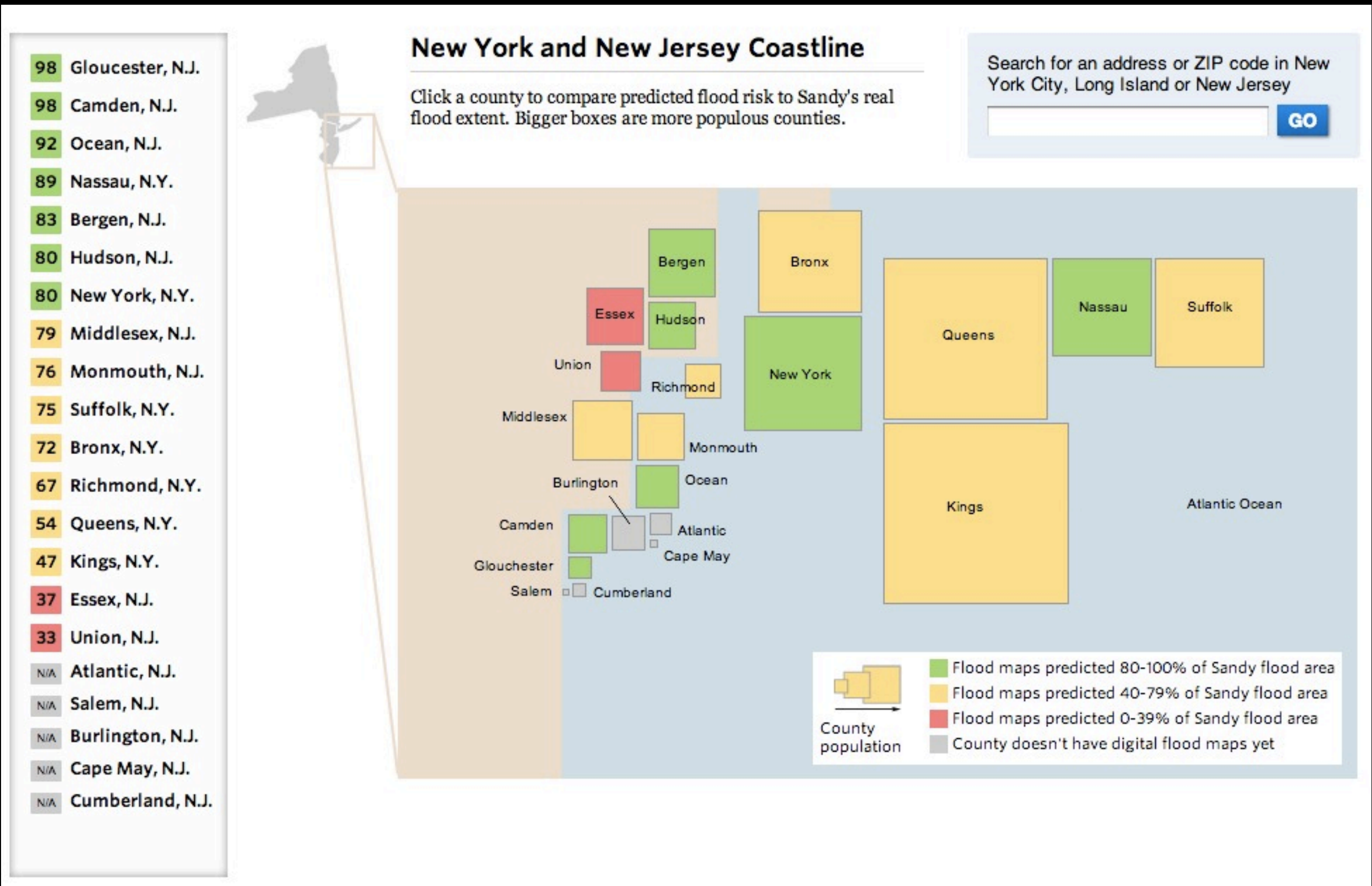


<http://www.propublica.org/article/federal-flood-maps-left-new-york-unprepared-for-sandy-and-fema-knew-it>

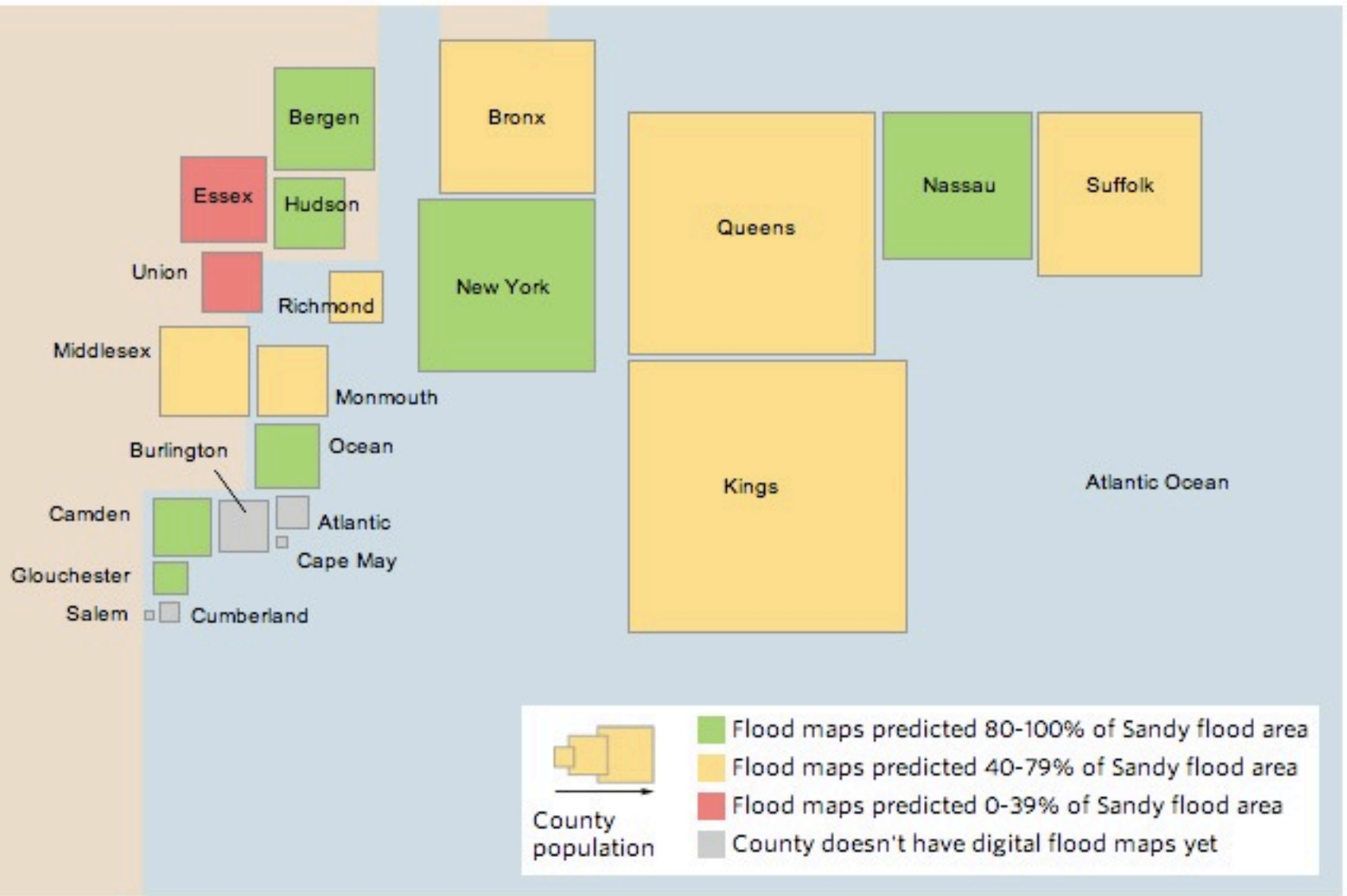


```
double intersectionArea = 0;
if (ctyExistingFeatMGeom->Intersects(ctySandyMGeom)) {
    OGRGeometry *intersectionGeom =
        ctyExistingFeatMGeom->Intersection(ctySandyMGeom);
    intersectionArea += intersectionMGeom->get_Area();
}
```

# Metacritic for flood maps!

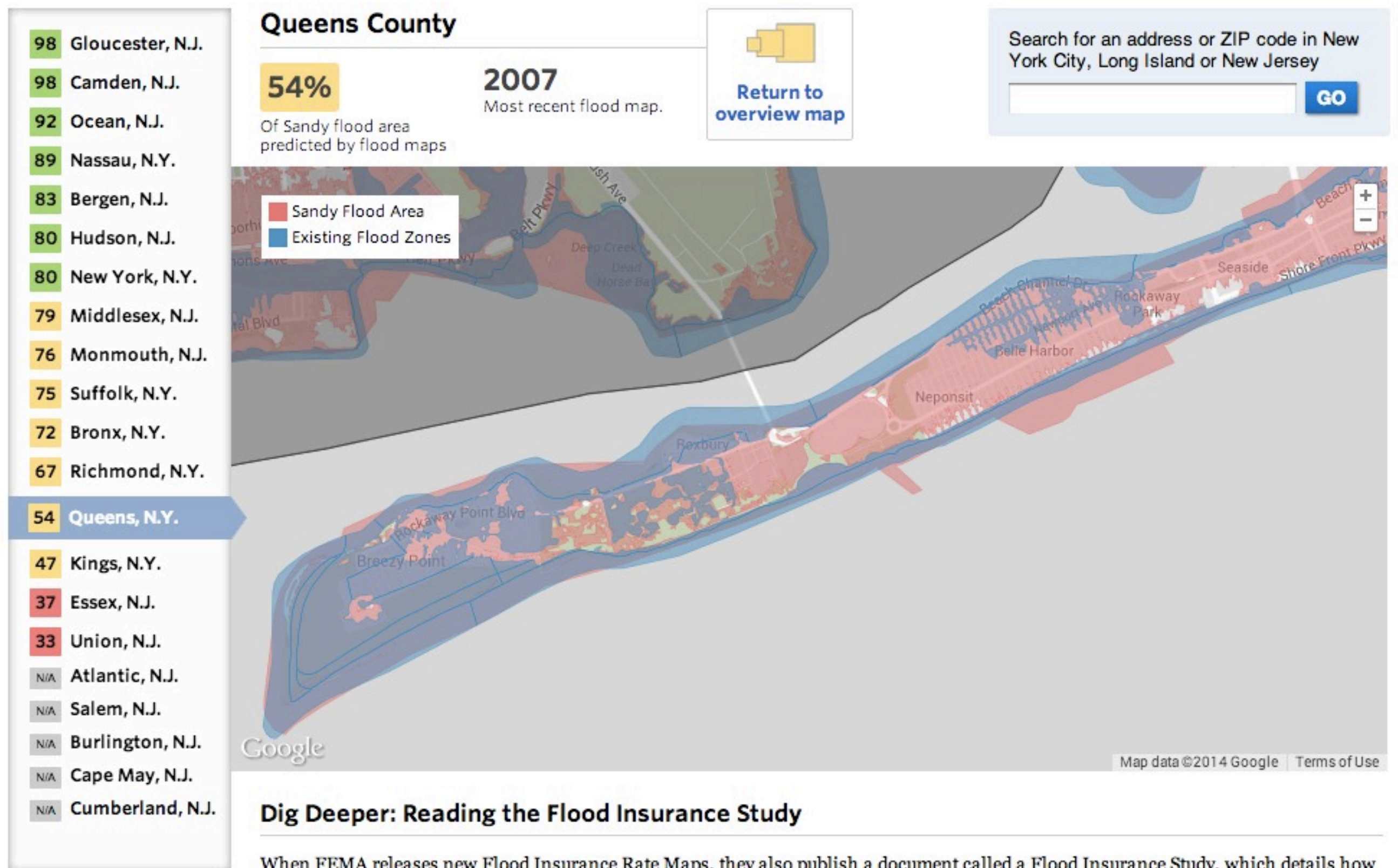


- 98 Gloucester, N.J.
- 98 Camden, N.J.
- 92 Ocean, N.J.
- 89 Nassau, N.Y.
- 83 Bergen, N.J.
- 80 Hudson, N.J.
- 80 New York, N.Y.
- 79 Middlesex, N.J.
- 76 Monmouth, N.J.
- 75 Suffolk, N.Y.
- 72 Bronx, N.Y.
- 67 Richmond, N.Y.
- 54 Queens, N.Y.
- 47 Kings, N.Y.
- 37 Essex, N.J.
- 33 Union, N.J.
- N/A Atlantic, N.J.
- N/A Salem, N.J.
- N/A Burlington, N.J.
- N/A Cape May, N.J.
- N/A Cumberland, N.J.

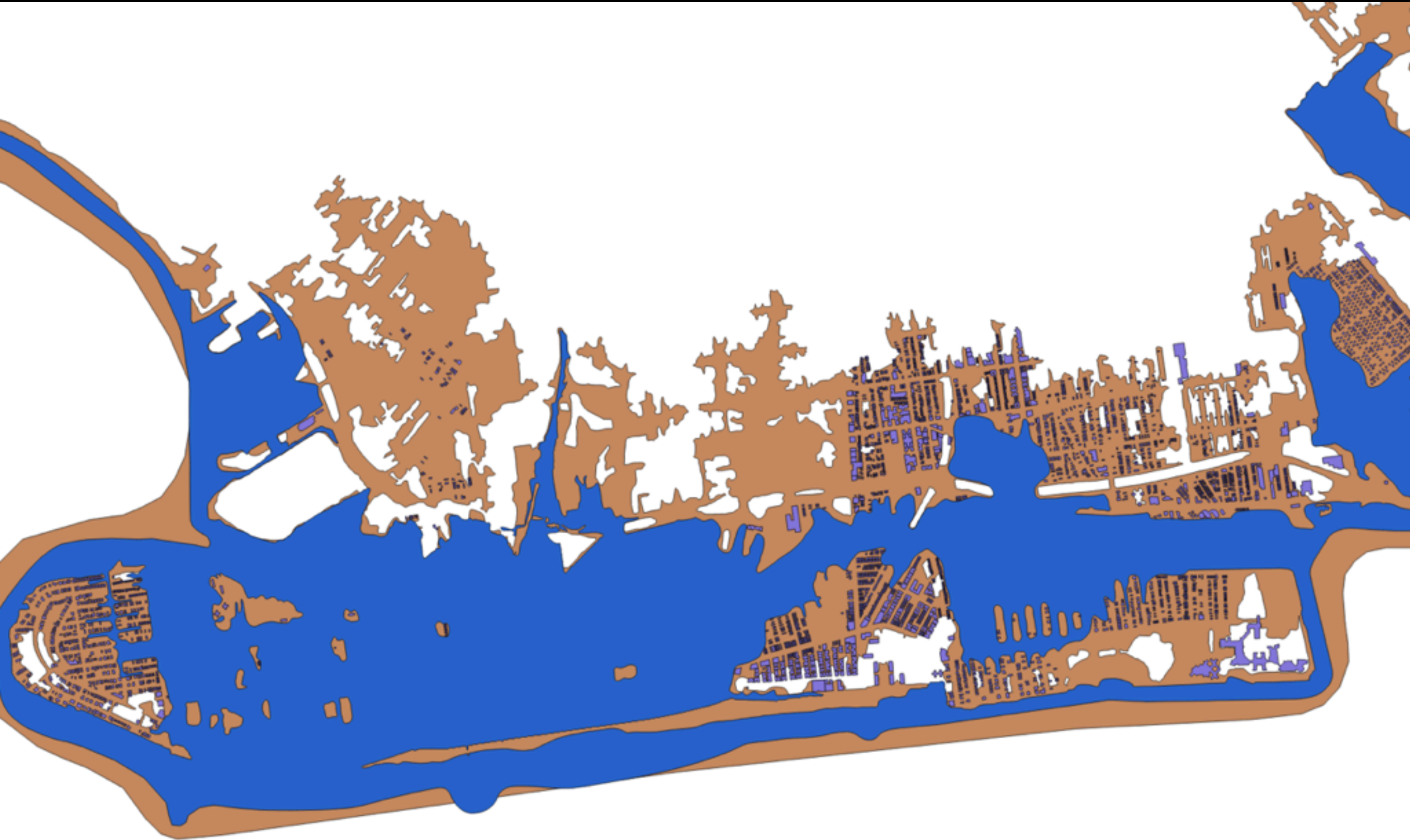




# Metacritic for flood maps!



# Finding sources with SCIENCE!





## Task:

Find buildings that are within the preliminary flood zone AND are not in the 2007 flood zone AND were built or altered during or after 2007.

```
while((buildingsFeat = buildingsLayer->GetNextFeature()) != NULL) {  
    OGRGeometry *buildingsGeom = buildingsFeat->GetGeometryRef();  
    if (buildingsGeom->Intersects(emlGeom)) {  
        // SKIP buildings that are in existing maps  
    } else if (buildingsGeom->Intersects(pwmGeom)) {  
        std::cout << "hit " << bldgCt << std::endl;  
    }  
}
```



```
const char *field = buildingsFeat->GetFieldAsString(i);
if (fieldName == std::string("yrb")    ||
    fieldName == std::string("yrb_rng") ||
    fieldName == std::string("yra1")    ||
    fieldName == std::string("yra1_rng") ||
    fieldName == std::string("yra2")    ||
    fieldName == std::string("yra2_rng")) {
    if (atoi(field) > 2006) {
        std::cout << "..... new bldg " << field << std::endl;
        bldg2007Ct++;
        break;
    }
}
```





**“We thought we might have a foot or two of water, so we put a sump pump in to avoid any small issues.”**

*— Patrice Morgan, Sheepshead Bay, Brooklyn*

<http://www.propublica.org/article/federal-flood-maps-left-new-york-unprepared-for-sandy-and-fema-knew-it>

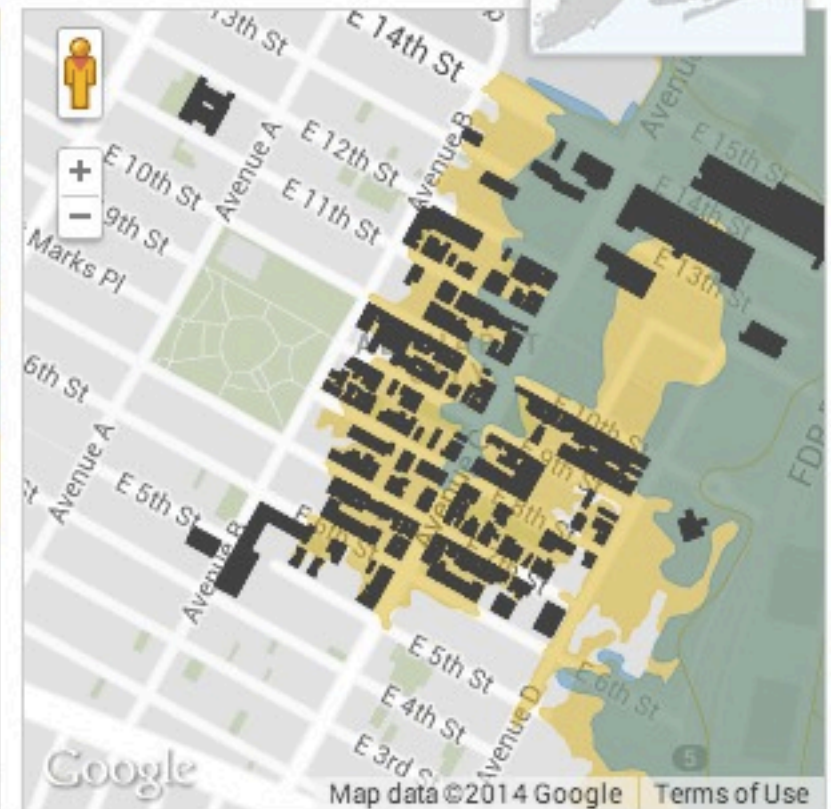
## Sheepshead Bay, Brooklyn



## Belle Harbor, Queens



## East Village, Manhattan



2013 Preliminary Flood Zones  
 2007 Flood Hazard Zones  
 Buildings damaged in Superstorm Sandy  
 Source: FEMA



After Katrina, Congress gave the Army Corps of Engineers \$14.6 billion to repair and improve hurricane and flood protection in New Orleans. About \$10 billion later, the 130-mile system of levees, walls and gates designed to keep out a 100-year storm surge is essentially complete. The corps says the city now is safe from flooding in a storm that has a 1 percent chance of hitting in any year, and the levee system also is designed to significantly reduce flooding from even larger storms. Interior drainage improvements designed to deal with heavy rainfall, however, are still under construction.

**Project:** The new boat was unfinished during cabinet war and was raised and strengthened, giving the east coast of the parish its first river production.

**Antenna feature:** The new wave breaks off a potential race over the surge to flow from the east through the 1,000 ft. bridge, to the river and then west into Jackson Parish.

**Left to be seen:** According



**Project:** Temporary gates and pumps block Lake Pontchartrain storm surge from invading the city.

**surface rupture:** The cables were snared west of the 17th Street Canal and were strengthened by injecting concrete into their foundations. That will allow the canal to take more rainwater than has been allowed.



**Project:** Boca Lagoon Polychlorinated-biphenyls, up to 100 feet, from flowing into the industrial Canal, as happened during Hurricane Andrew.

**Setback features:** when the gates close, the industrial Canal can store water lost & outflow the Lagoon Barge barge carrier during hurricanes.

**Cost:** to be some water work remains, but the gate already provides 100-year protection.



**Project:** Barry began with a kitchen, his room was redesigned, raised and strengthened, and the two west ends of Jefferson Parish and a small part of St. Charles Parish the same level of protection as other areas.



**Project:** Giant gates, protruding up to 10 ft, would seal off much of West Jefferson and Aiguers from surge from the marsh to the south. And huge pumps will dump west lake rainwater runoff from the reinforced Harvey and Aiguers canals to the gates. The project cost \$5 million.



**Project:** The dirt was not that clean in Kalamia, so using St. Bernard's Park, with scrapes away and rebuilt. Six very quiet and flowing access.

**Project:** A nearly two-mile-long, 26-foot-high wall was constructed to block the muddy surge from Lake Superior that ravages the lower St. Marys. Two gates used for barges and fishing boats are open except a storm breaks. The project cost \$1.1 million.

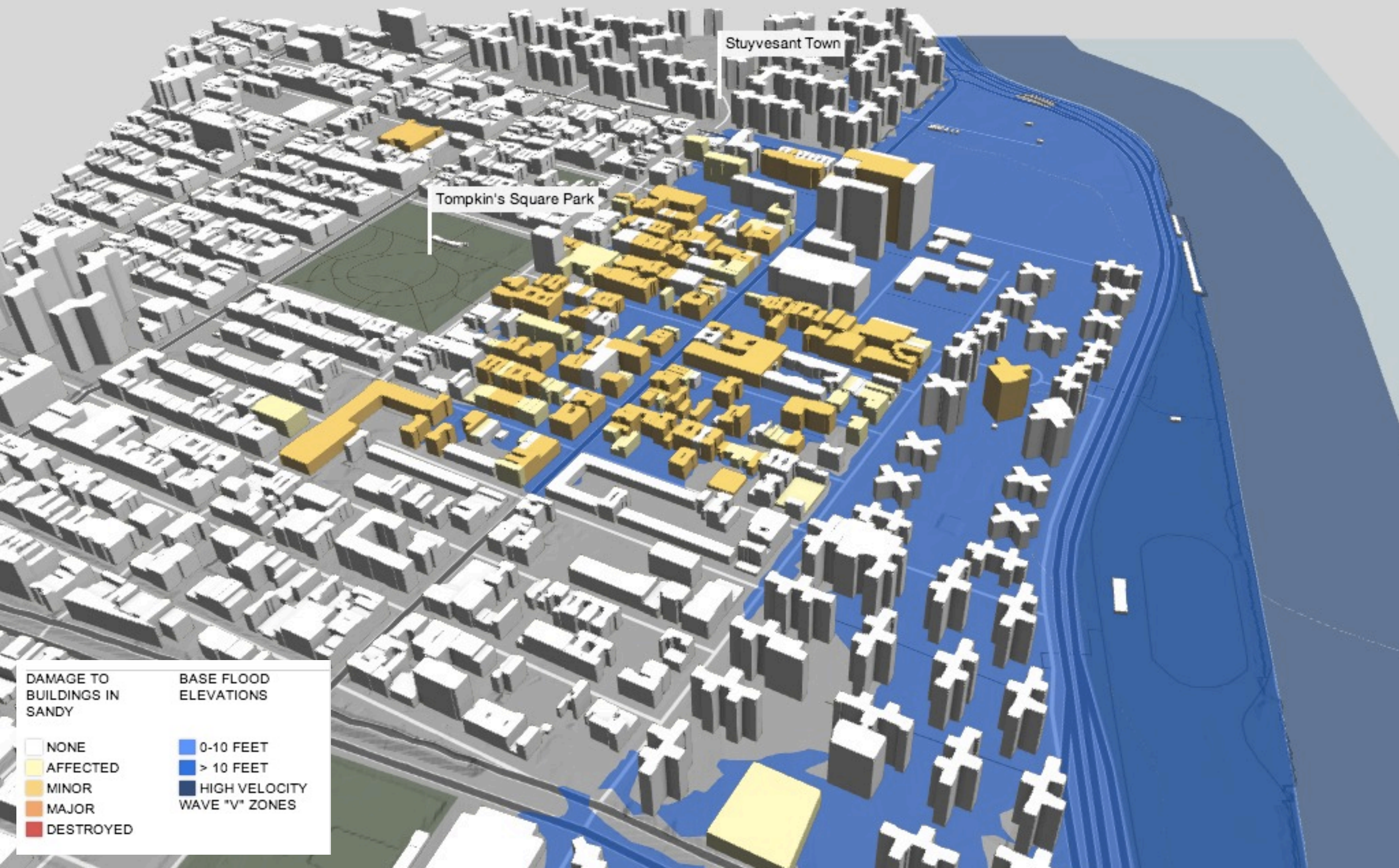


<http://media.nola.com/environment/photo/hurricane-protection-thumbnail2jpg-13fd63f42825feef.jpg>



# 3D Map!

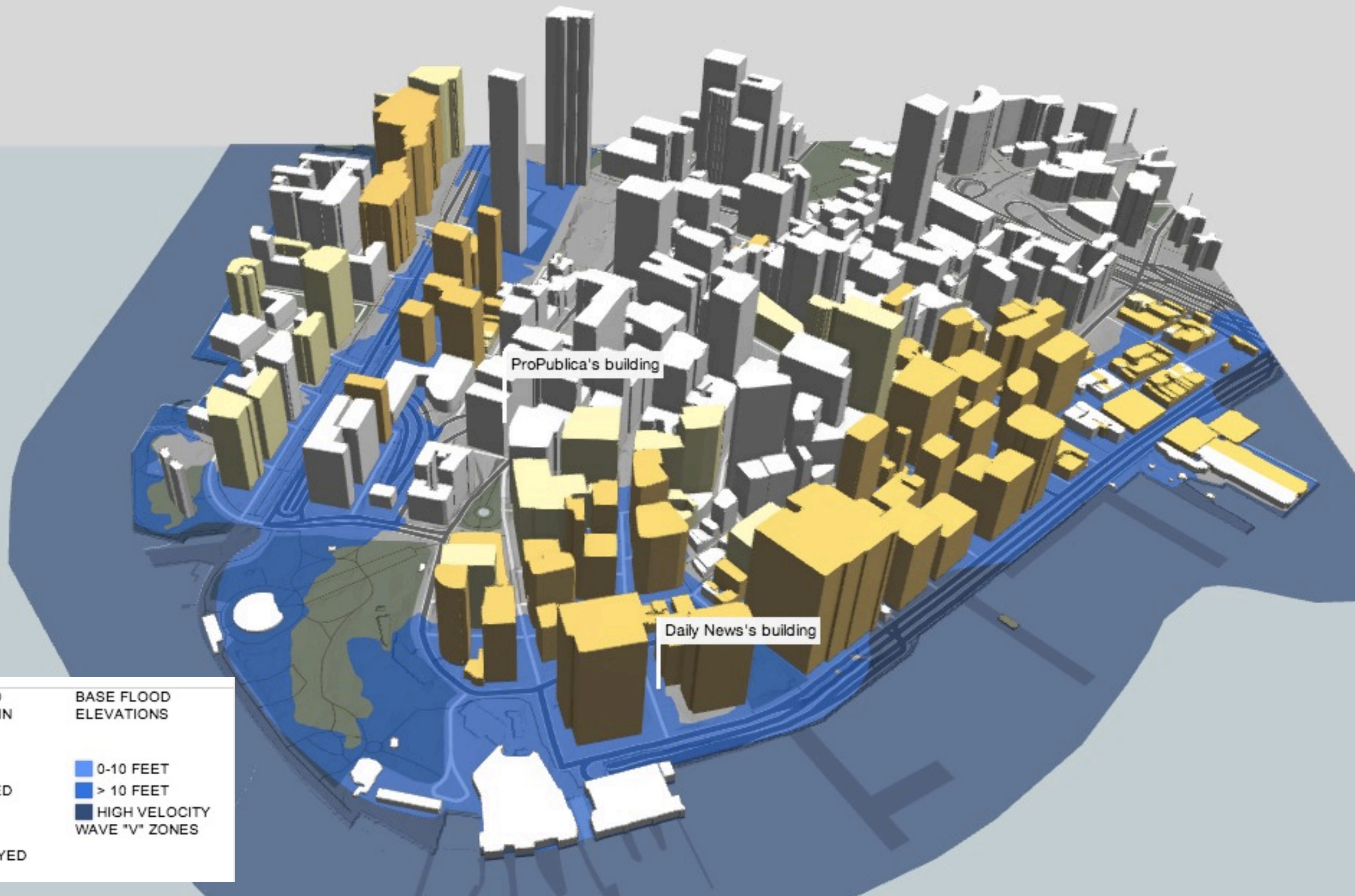
<http://projects.propublica.org/nyc-flood/>





# 3D Map!

<http://projects.propublica.org/nyc-flood/>



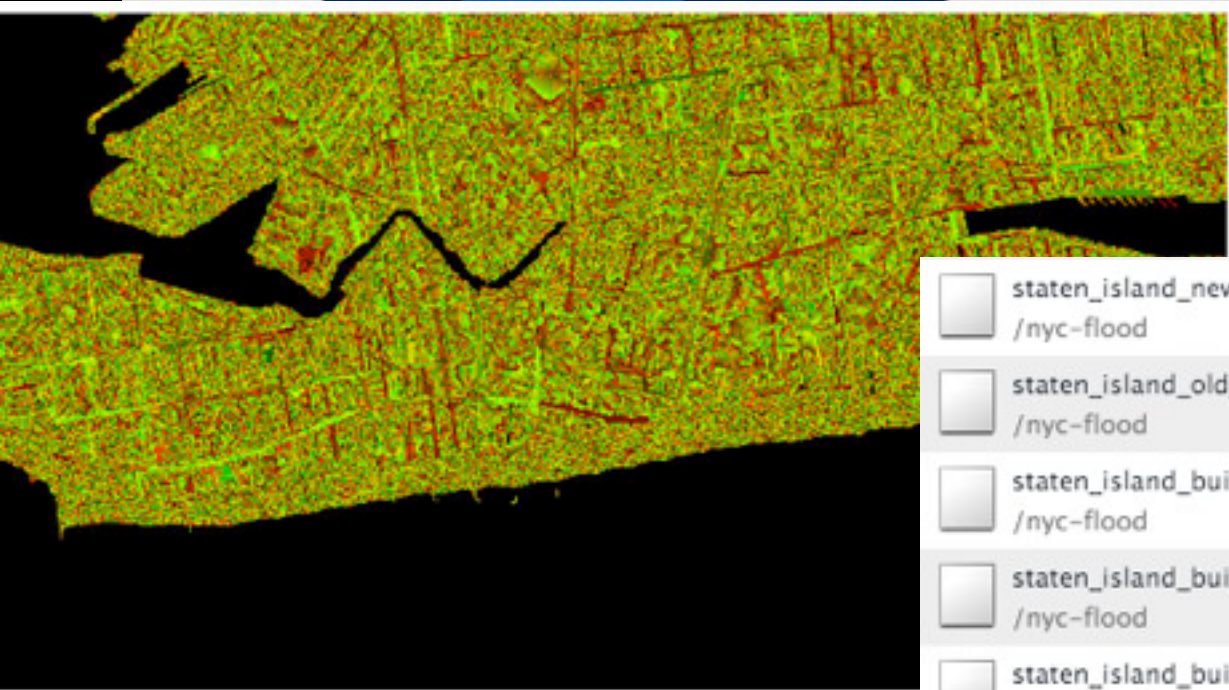
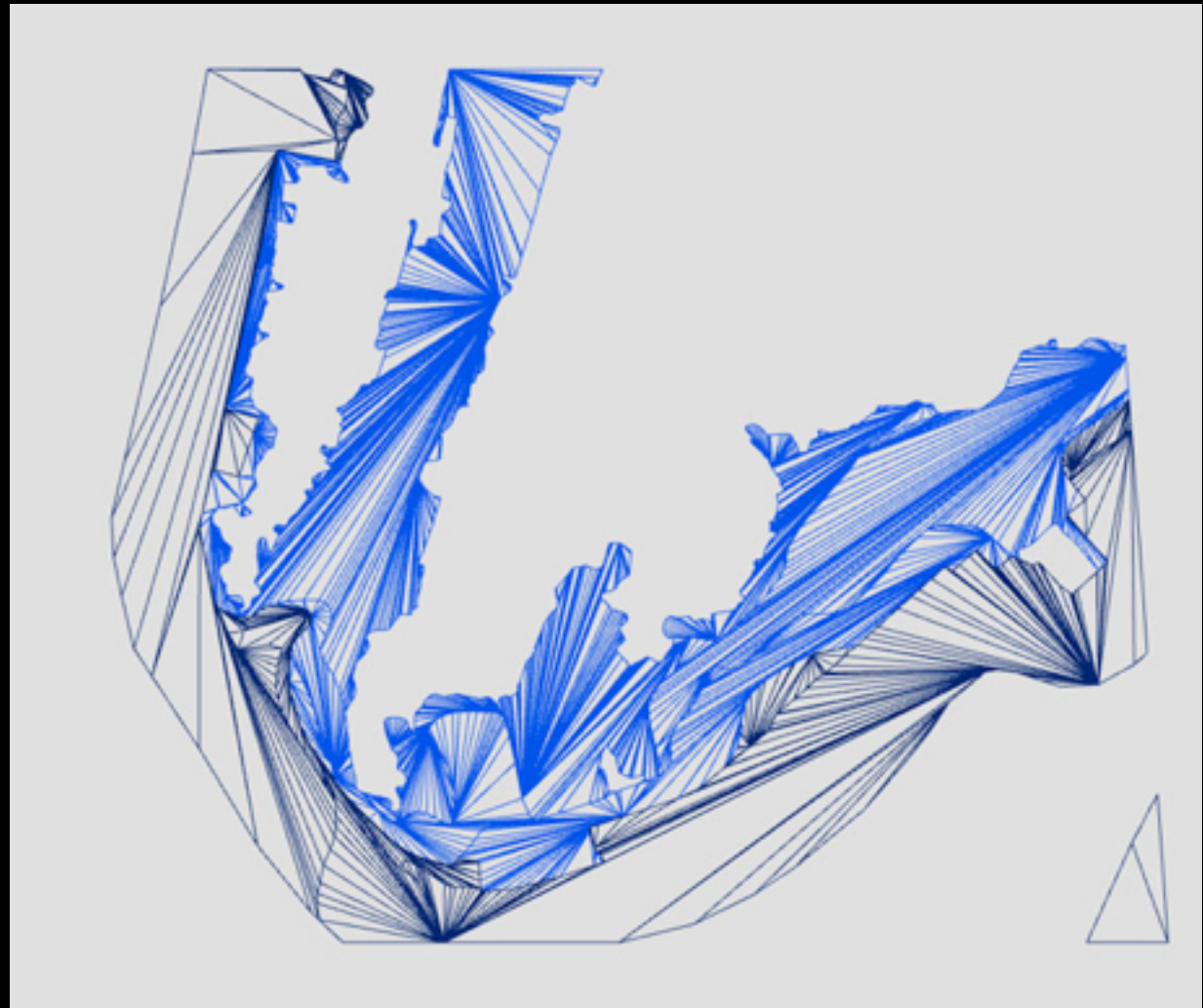
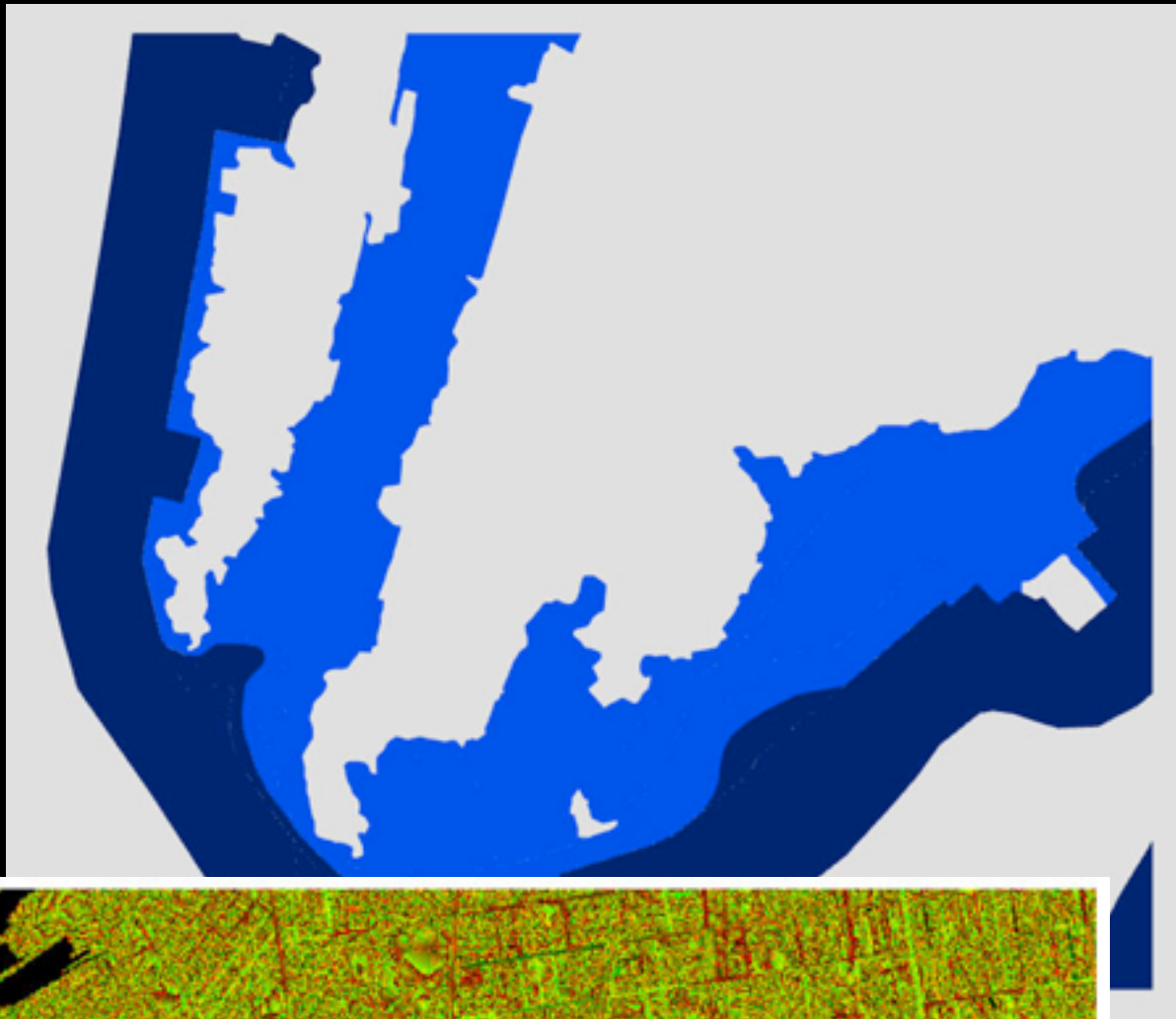
DAMAGE TO  
BUILDINGS IN  
SANDY

☐ NONE  
☐ AFFECTED  
☐ MINOR  
☐ MAJOR  
☐ DESTROYED

BASE FLOOD  
ELEVATIONS

☐ 0-10 FEET  
☐ > 10 FEET  
☐ HIGH VELOCITY  
WAVE "V" ZONES





<input type="checkbox"/>	staten_island_new_fz_32011.shp.jeff?endian=LE /nyc-flood	GET	304 Not Mo	appli...	<a href="#">scene.is?b...</a> Script	404 B 117 KB	59 ms 57 ms
<input type="checkbox"/>	staten_island_old_fz_32011.shp.jeff?endian=LE /nyc-flood	GET	304 Not Mo	appli...	<a href="#">scene.is?b...</a> Script	404 B 88.1 KB	86 ms 83 ms
<input type="checkbox"/>	staten_island_buildings_32011.shp.jeff?endian=LE /nyc-flood	GET	304 Not Mo	appli...	<a href="#">scene.is?b...</a> Script	404 B 388 KB	78 ms 75 ms
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<input type="checkbox"/>	staten_island_buildings_damaged-Minor_32011.shp.jeff?endian=LE /nyc-flood	GET	304 Not Mo	appli...	<a href="#">scene.is?b...</a> Script	404 B 79.0 KB	94 ms 92 ms
<input type="checkbox"/>	staten_island_buildings_damaged-Major_32011.shp.jeff?endian=LE /nyc-flood	GET	304 Not Mo	appli...	<a href="#">scene.is?b...</a> Script	404 B 156 KB	94 ms 92 ms
<input type="checkbox"/>	staten_island_buildings_damaged-Destroyed_32011.shp.jeff?endian=LE /nyc-flood	GET	304 Not Mo	appli...	<a href="#">scene.is?b...</a> Script	402 B 1.1 KB	106 ms 105 ms

<http://www.propublica.org/nerds/item/how-we-made-the-3-d-new-york-city-flood-map>





# Southeast Louisiana, 1927-2014

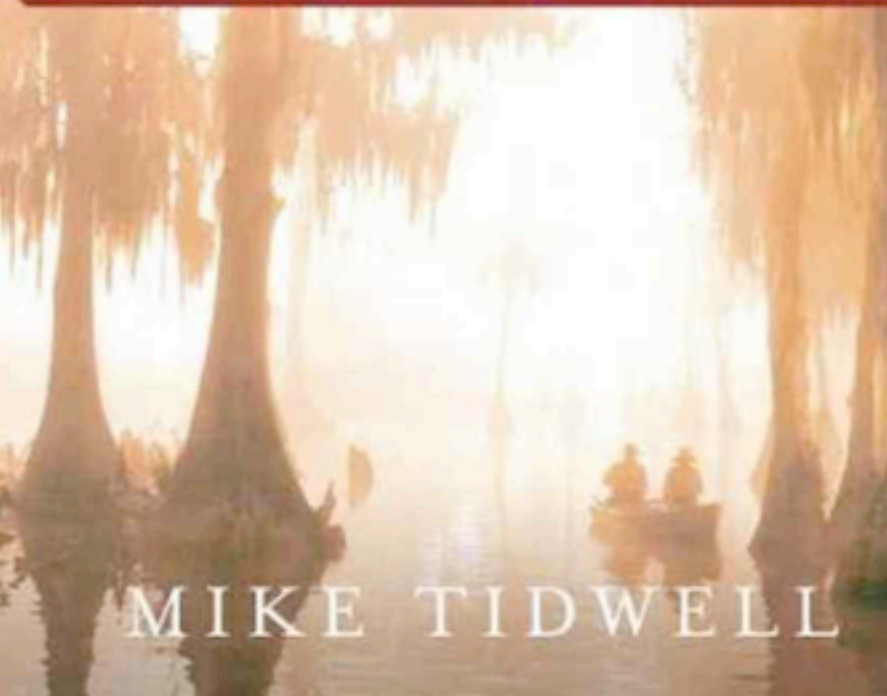


"Stunning, beautifully written, the best book on Louisiana I have ever read. Tidwell has captured the soul and heart of the Cajun people." —James Lee Burke

# BAYOU FAREWELL

THE RICH LIFE AND TRAGIC DEATH  
OF LOUISIANA'S CAJUN COAST

WITH A NEW INTRODUCTION ABOUT THE EFFECTS  
OF THE DEEPWATER HORIZON OIL SPILL



MIKE TIDWELL

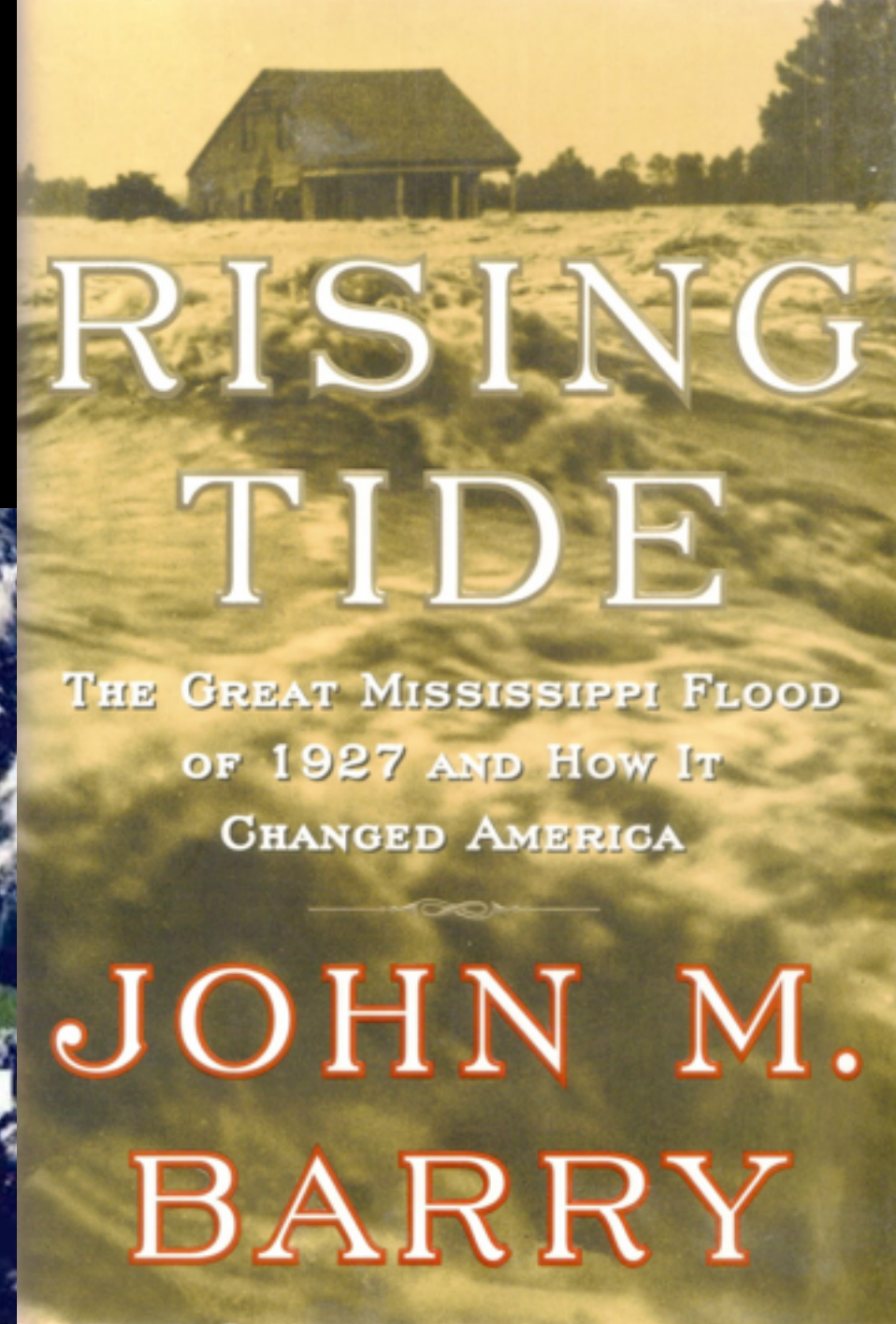


# PATH OF DESTRUCTION

THE DEVASTATION OF NEW ORLEANS  
AND THE COMING AGE OF SUPERSTORMS

John McQuaid and Mark Schleifstein

Winners of the Pulitzer Prize



# RISING TIDE

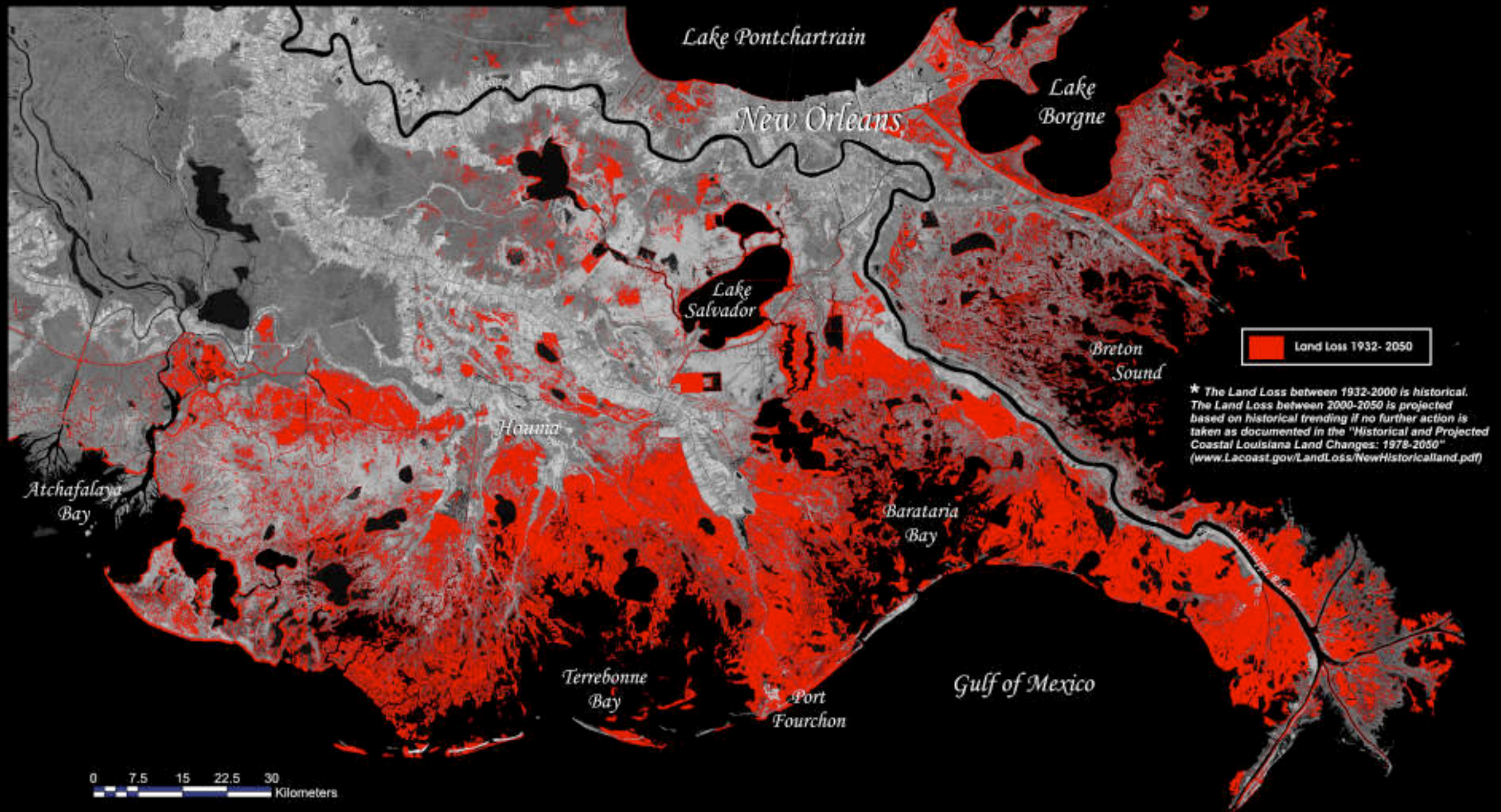
THE GREAT MISSISSIPPI FLOOD  
OF 1927 AND HOW IT  
CHANGED AMERICA

JOHN M.  
BARRY



# Southeast Louisiana Land Loss

*\*Historical and Projected Land Loss in the Deltaic Plain*



# Why?



Under nature's scenario, with many distributaries spreading the floodwaters left and right across the big deltaic plain, visually the whole region would be covered—with fresh sediments as well as water. In an average year, some **two hundred million tons** of sediment are in transport in the river. This is where the foreland Rockies go, the western Appalachians. Southern Louisiana is a very large lump of **mountain butter**, eight miles thick where it rests upon the continental shelf, half that under New Orleans, a mile and a third at Old River. It is the nature of unconsolidated sediments to compact, condense, and crustally sink. So the whole deltaic plain, a **superhimalaya** upside down, is to varying extents subsiding, as it has been for thousands of years.

*John McPhee, "Atchafalaya," The New Yorker, 1987*

# A Less Mighty Mississippi

During the past 7,000 years, much of the Louisiana coast was created as the mouth of the Mississippi River meandered across the region filling the coastline with sediment. Now, levees and dams are preventing much of that sediment from replenishing the coast.

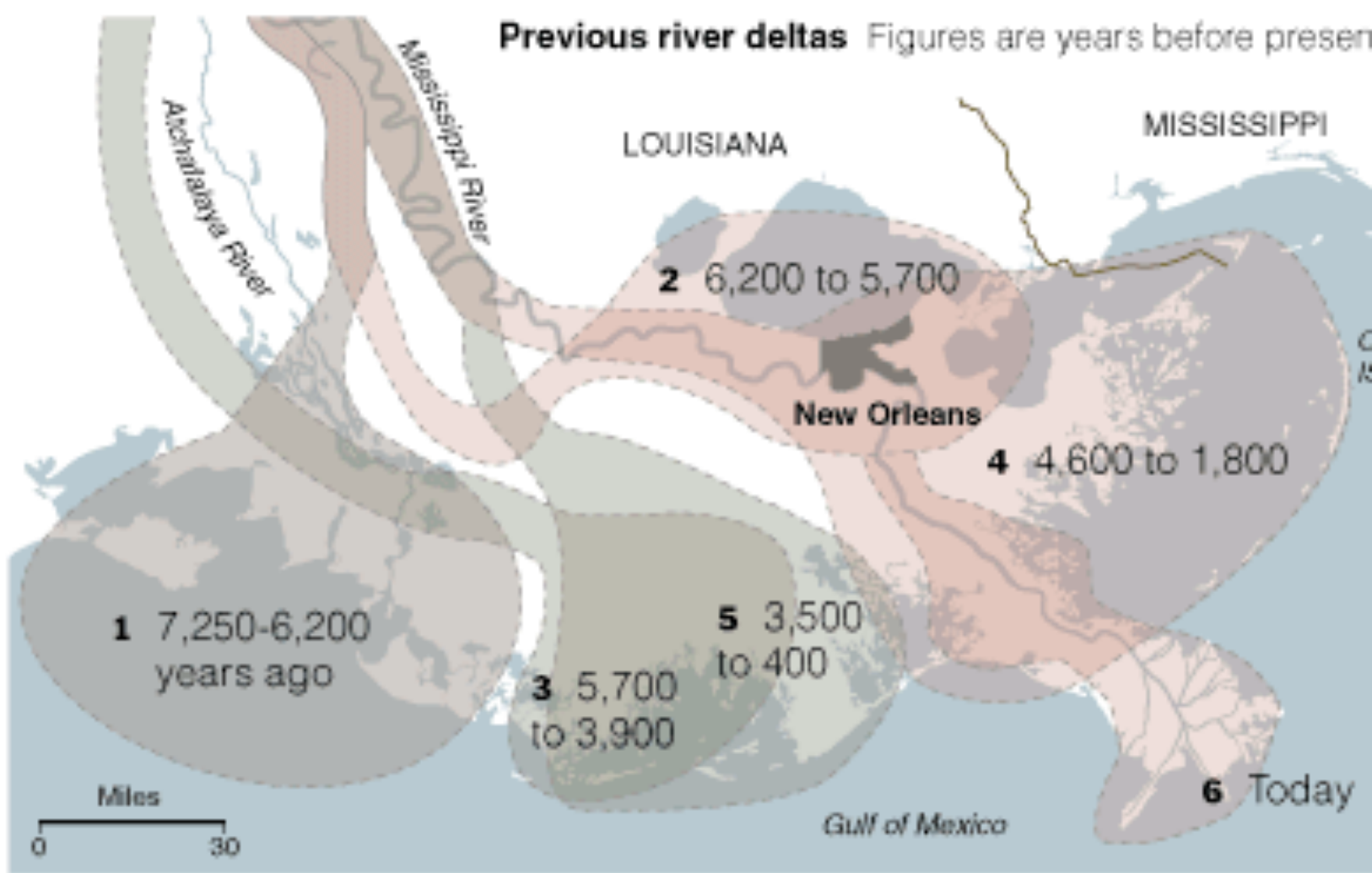
## DRAINAGE BASIN

The Mississippi drains more than 40 percent of the continental United States.



## MISSISSIPPI'S MANY DELTAS

The Mississippi has always meandered but levees are preventing the river from making its next move, most likely to the Atchafalaya River.





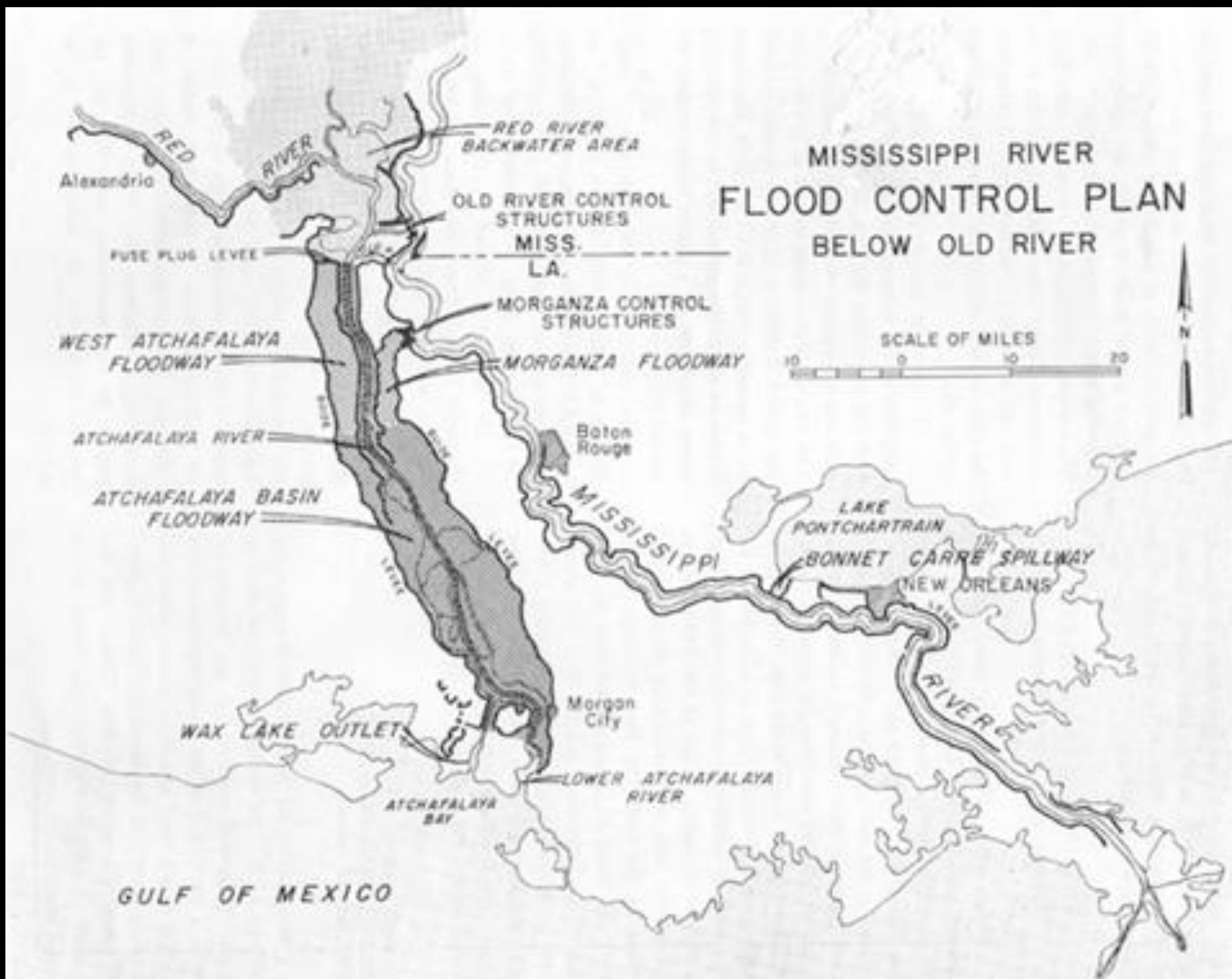




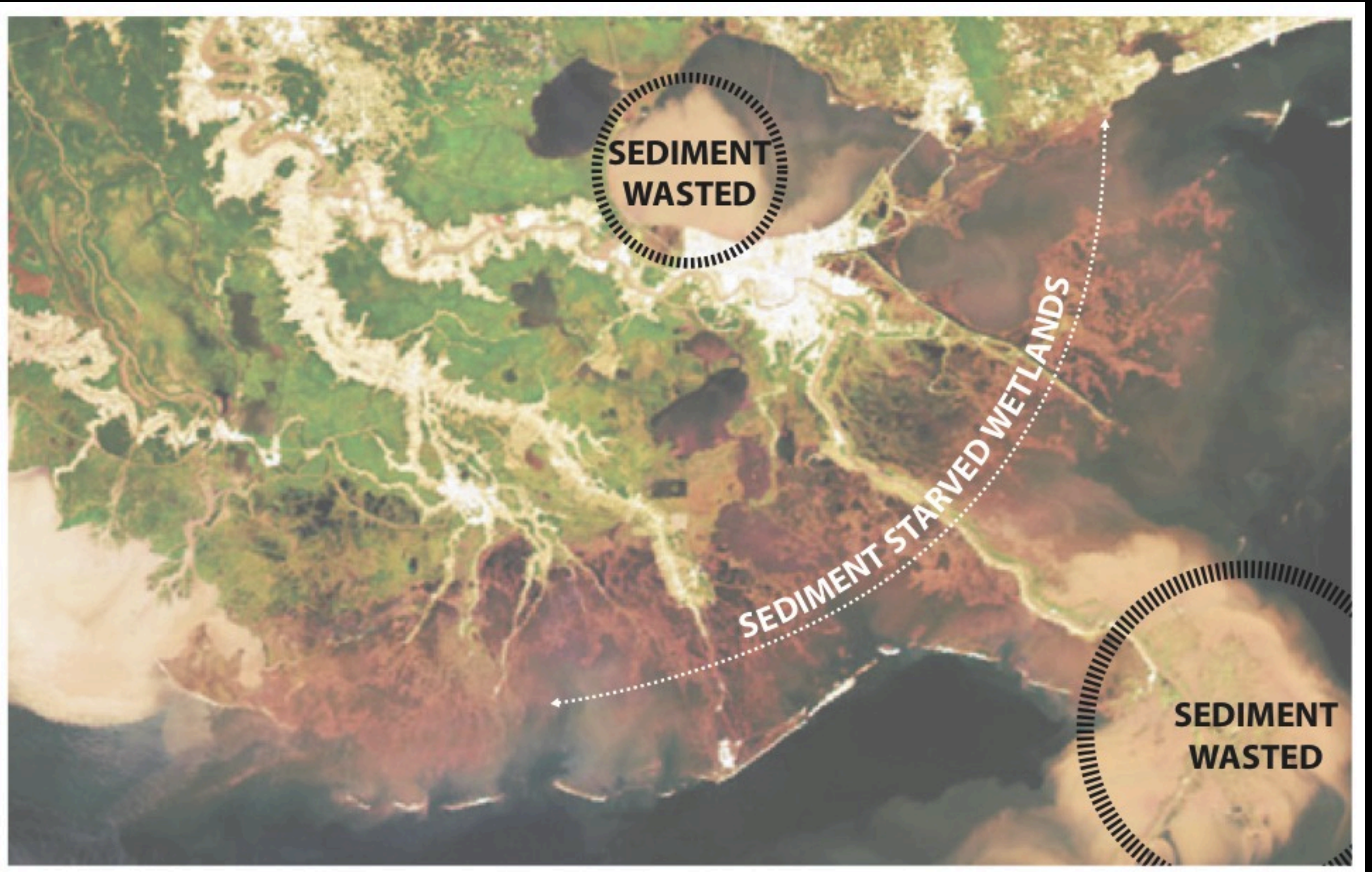




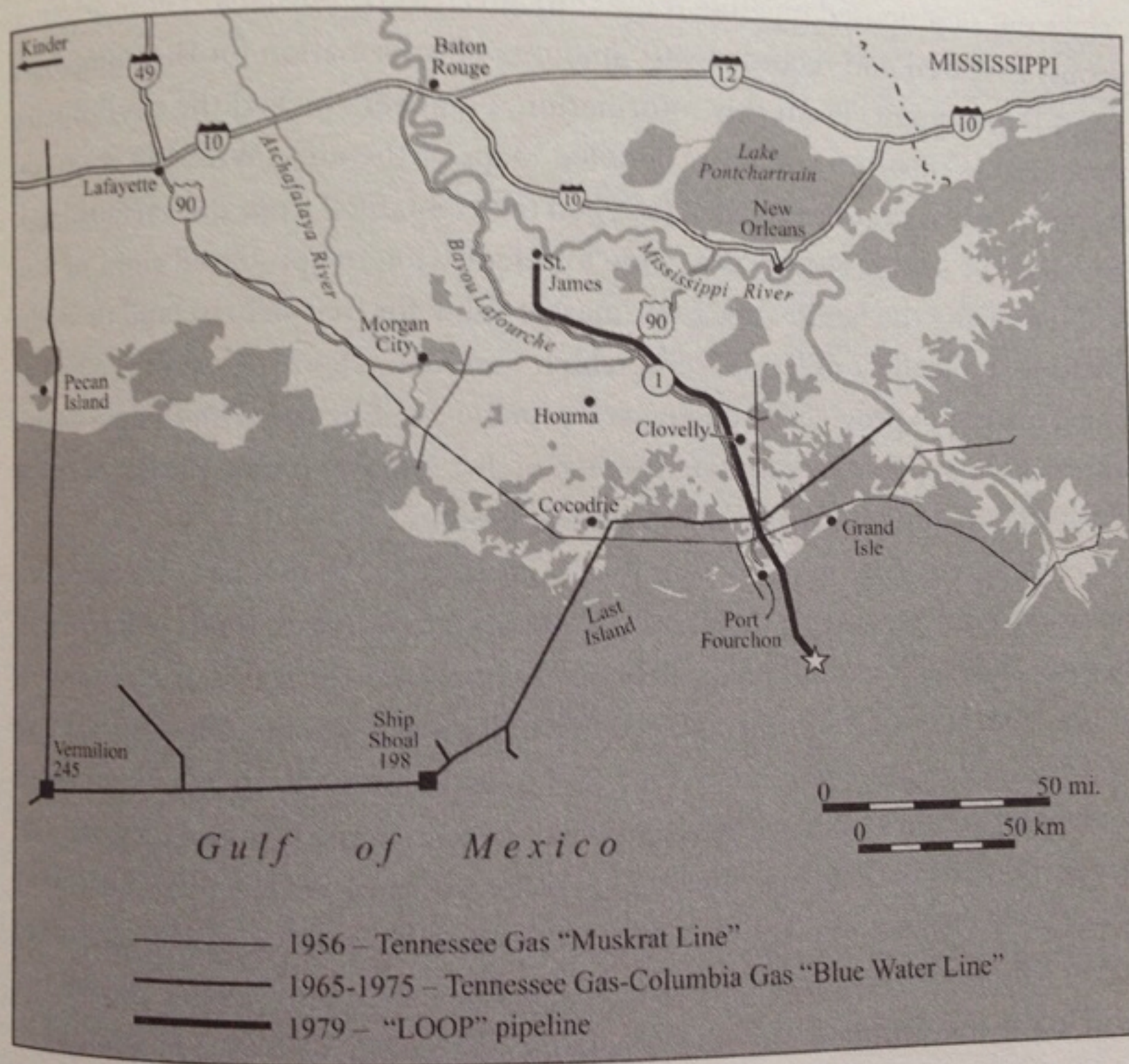
# MISSISSIPPI RIVER FLOOD CONTROL PLAN BELOW OLD RIVER





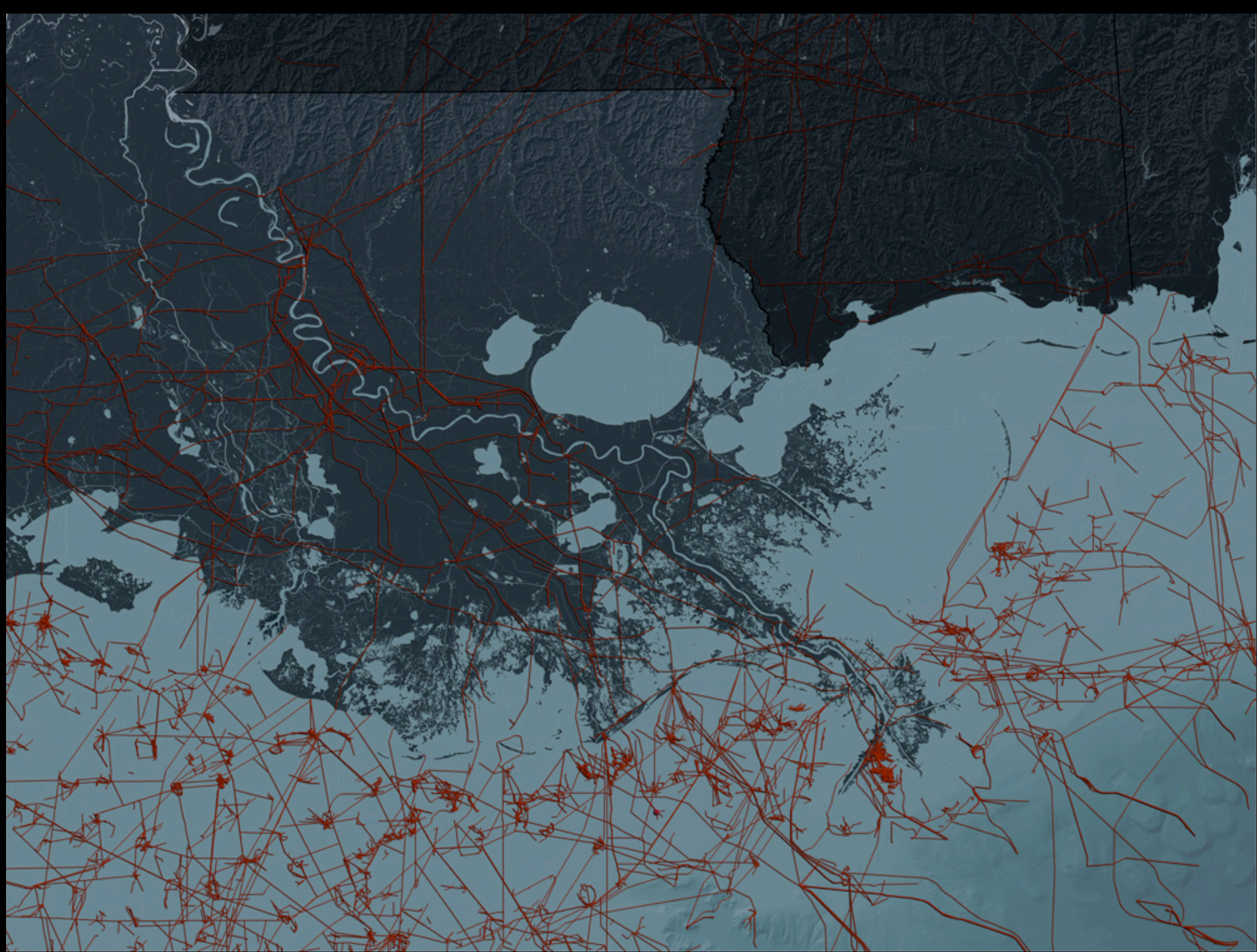






Map 3. Three of the largest pipeline systems ever built in coastal Louisiana: (a) Tennessee Gas Muskrat Line through the Mississippi delta, (b) Tennessee Gas-Columbia Gulf Blue Water offshore pipeline, and (c) the Louisiana Offshore Oil Port (LOOP) pipeline through Lower Lafourche Parish. (Mary Lee Eggart, 2013)







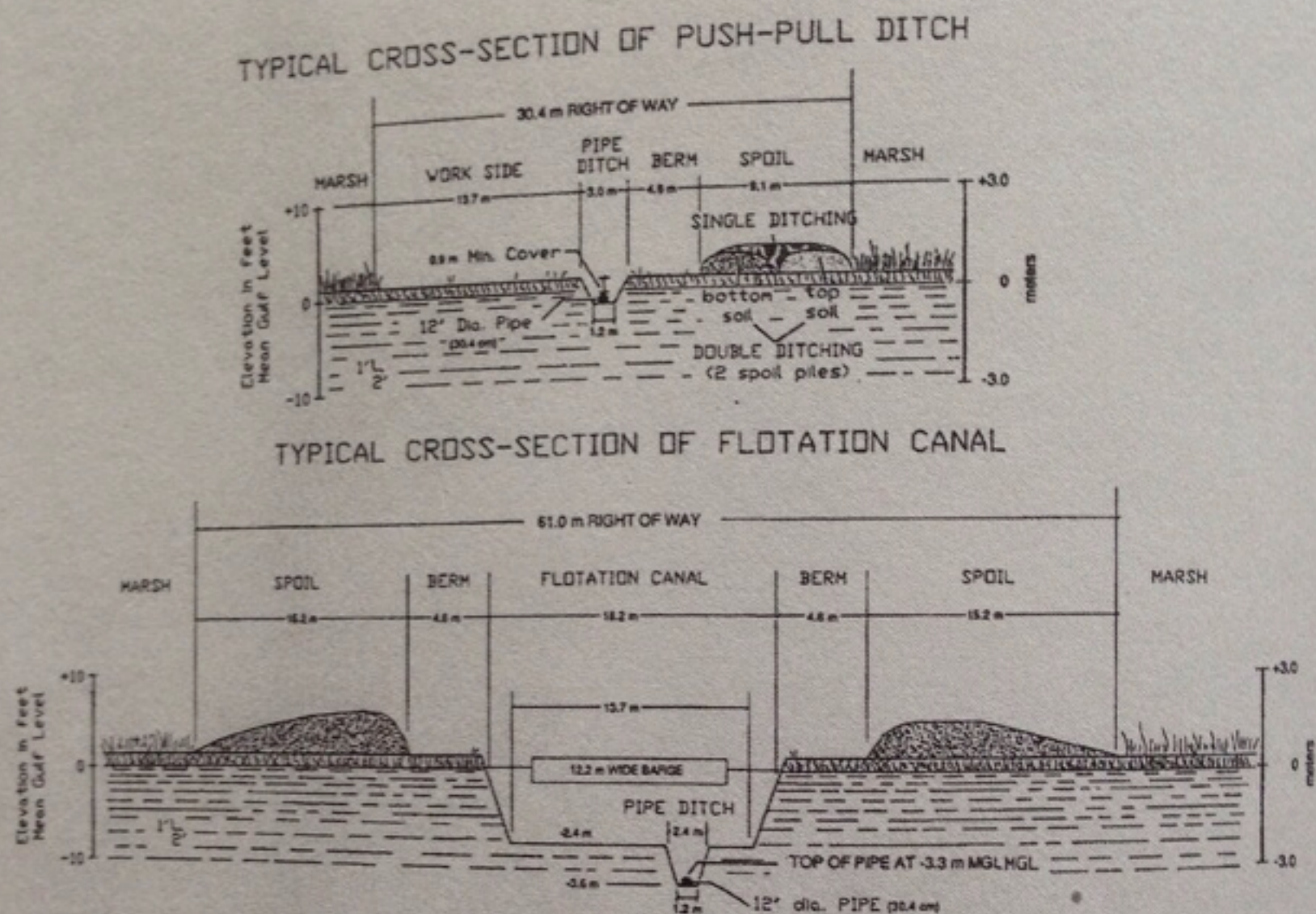
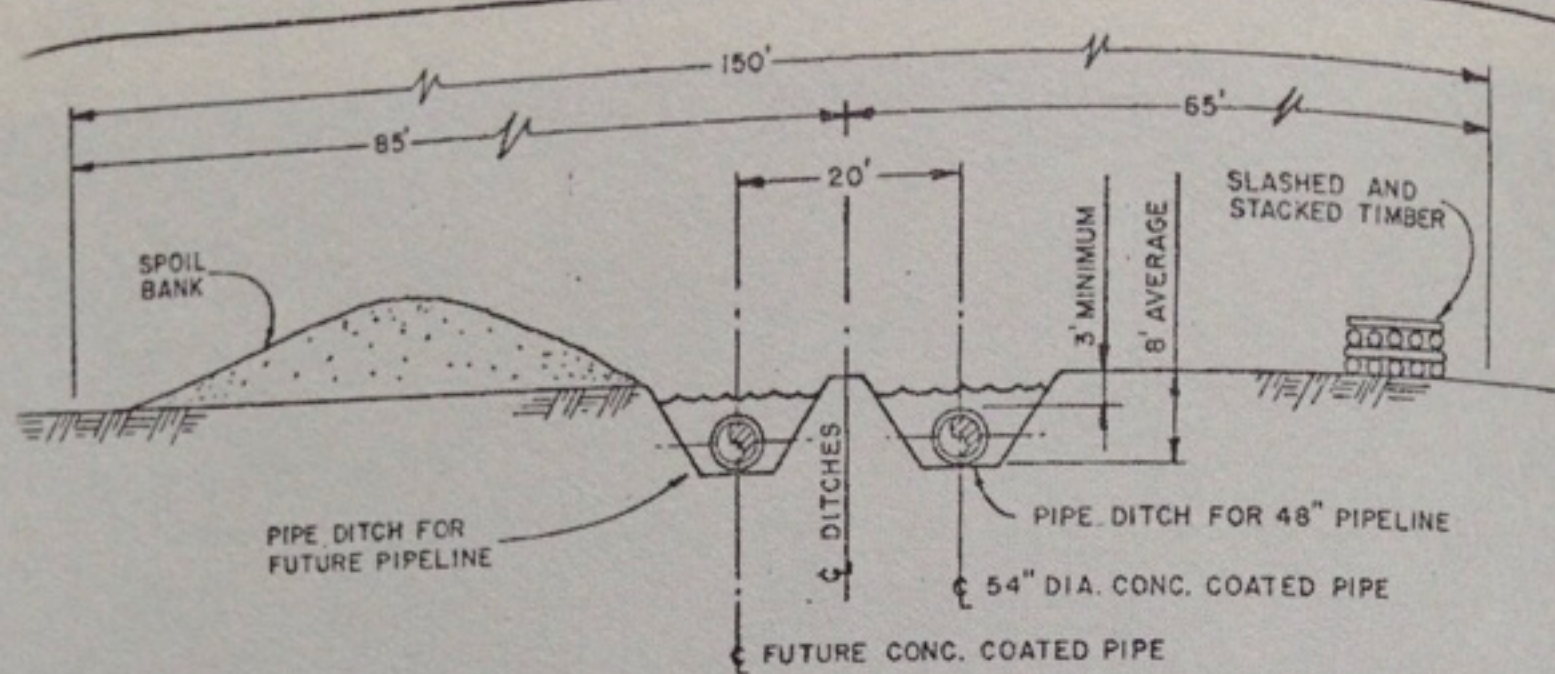


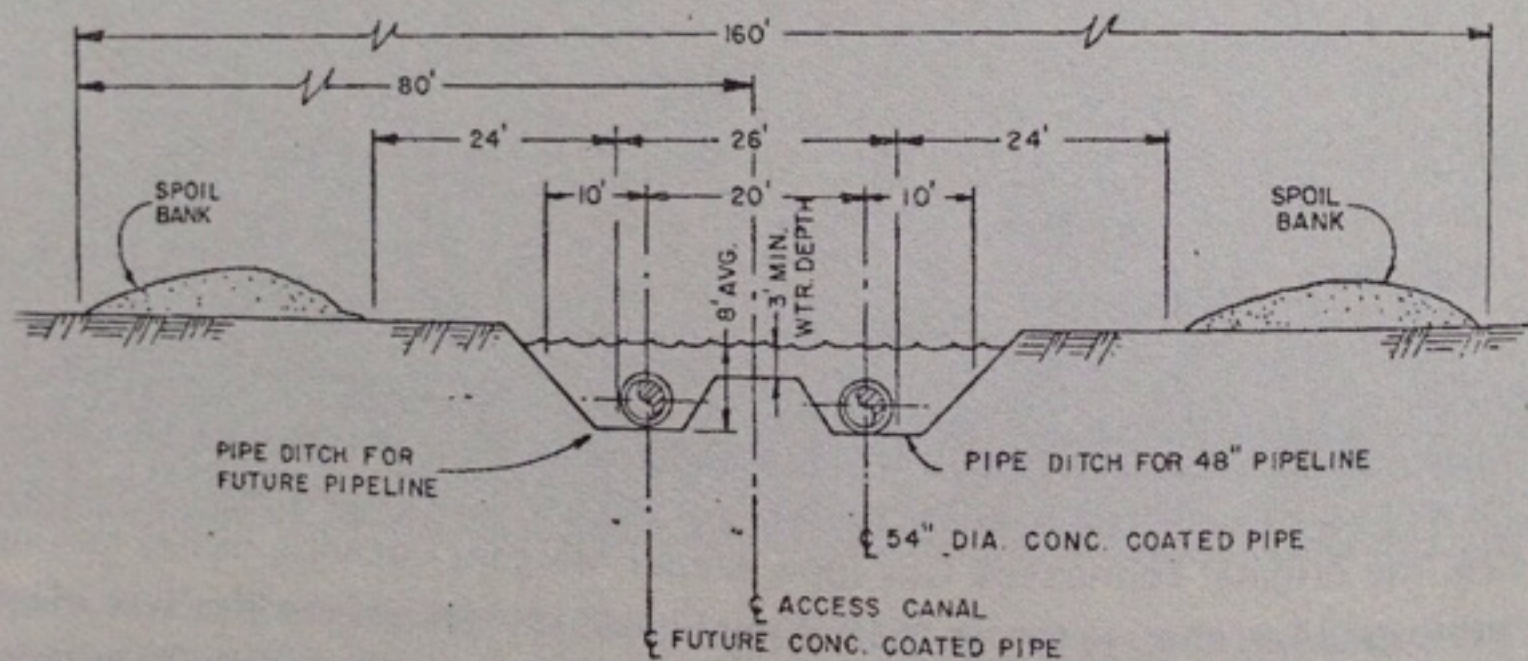
Figure 2.6. Comparison of typical cross sections for a push-pull ditch and a flotation canal.

Figure 15. Diagram of canal construction using the flotation canal method for large-diameter pipelaying operations in the wetlands. The narrow pipe trench in which the pipeline was permanently set was covered and protected with mud, rocks, and other material. The larger flotation canal, however, was rarely, if ever, backfilled with the spoil until regulations began requiring such.





TYPICAL CROSS SECTION FOR PUSH DITCH



TYPICAL CROSS SECTION FOR PUSH AND ACCESS CANAL

NOTE: THE ENTIRE LENGTH OF LINE WILL BE BACKFILLED WITH AVAILABLE SPOIL AFTER THE PIPELINES ARE INSTALLED.

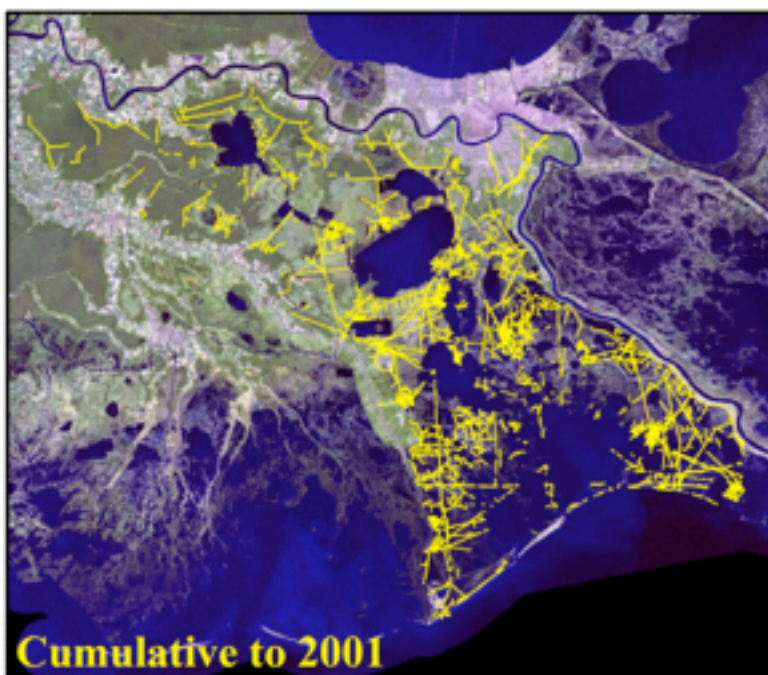
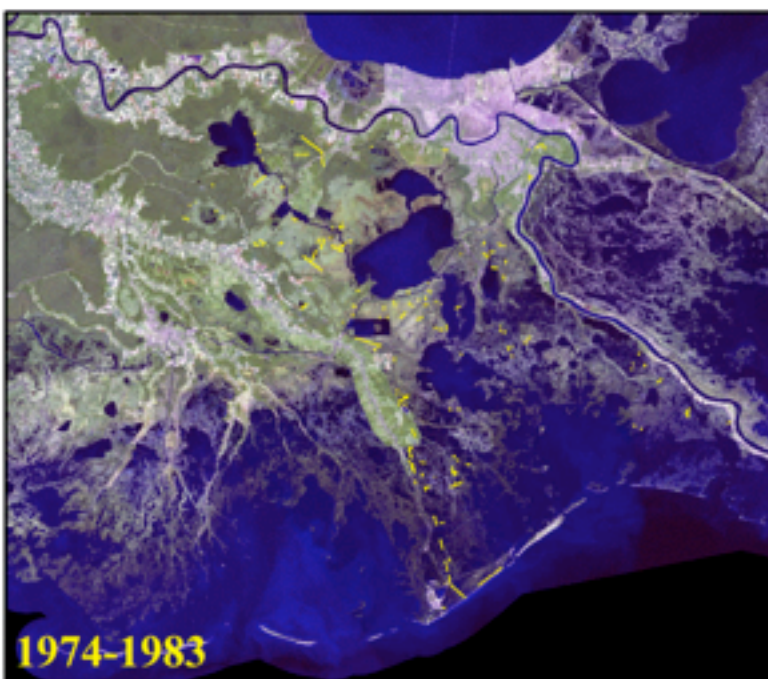
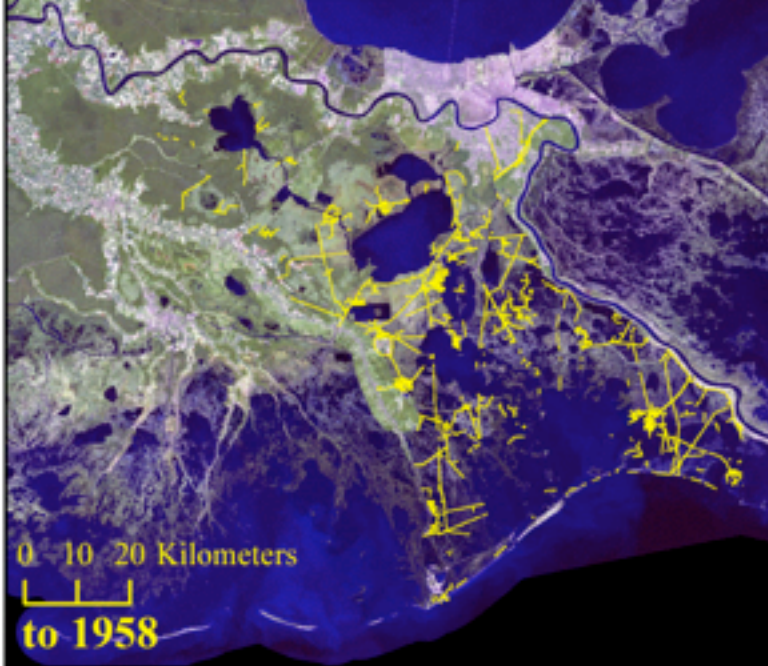
LOOP INC.

TYPICAL CROSS SECTIONS  
FOR  
ST. JAMES PIPELINES

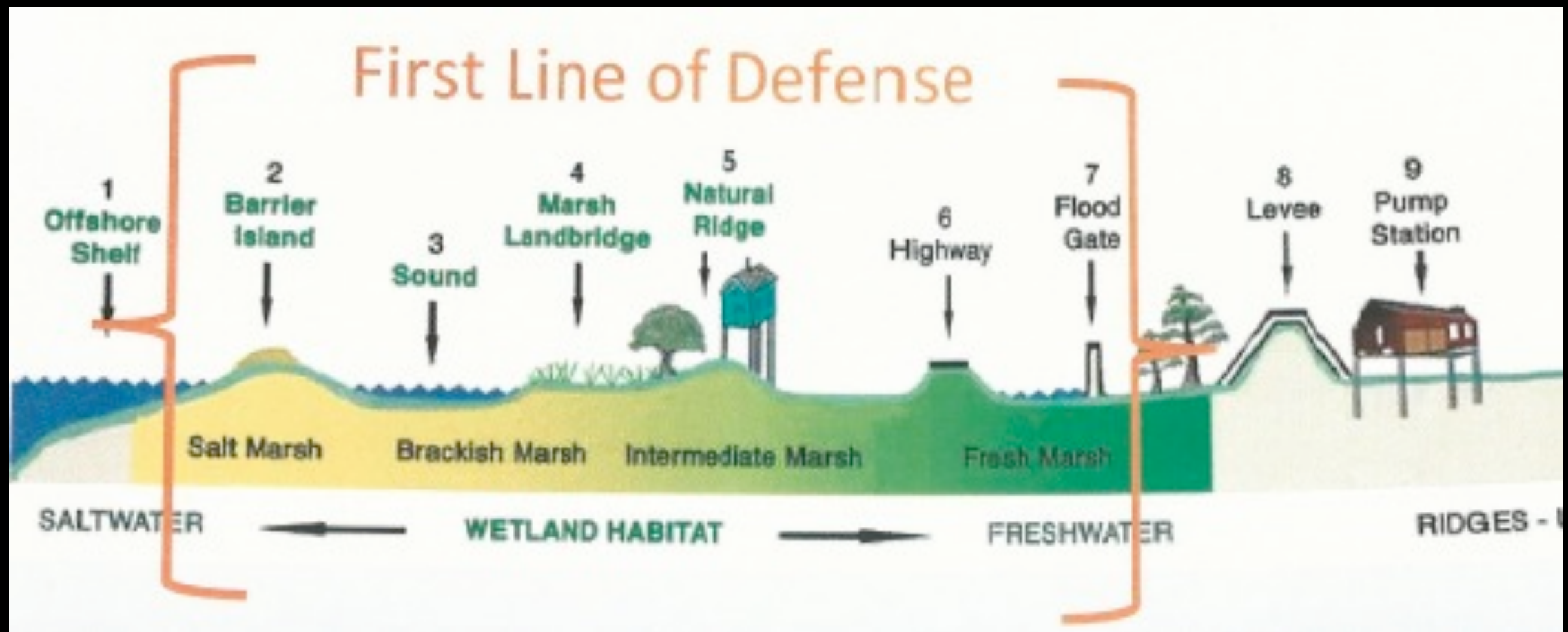














NO. 13-6911

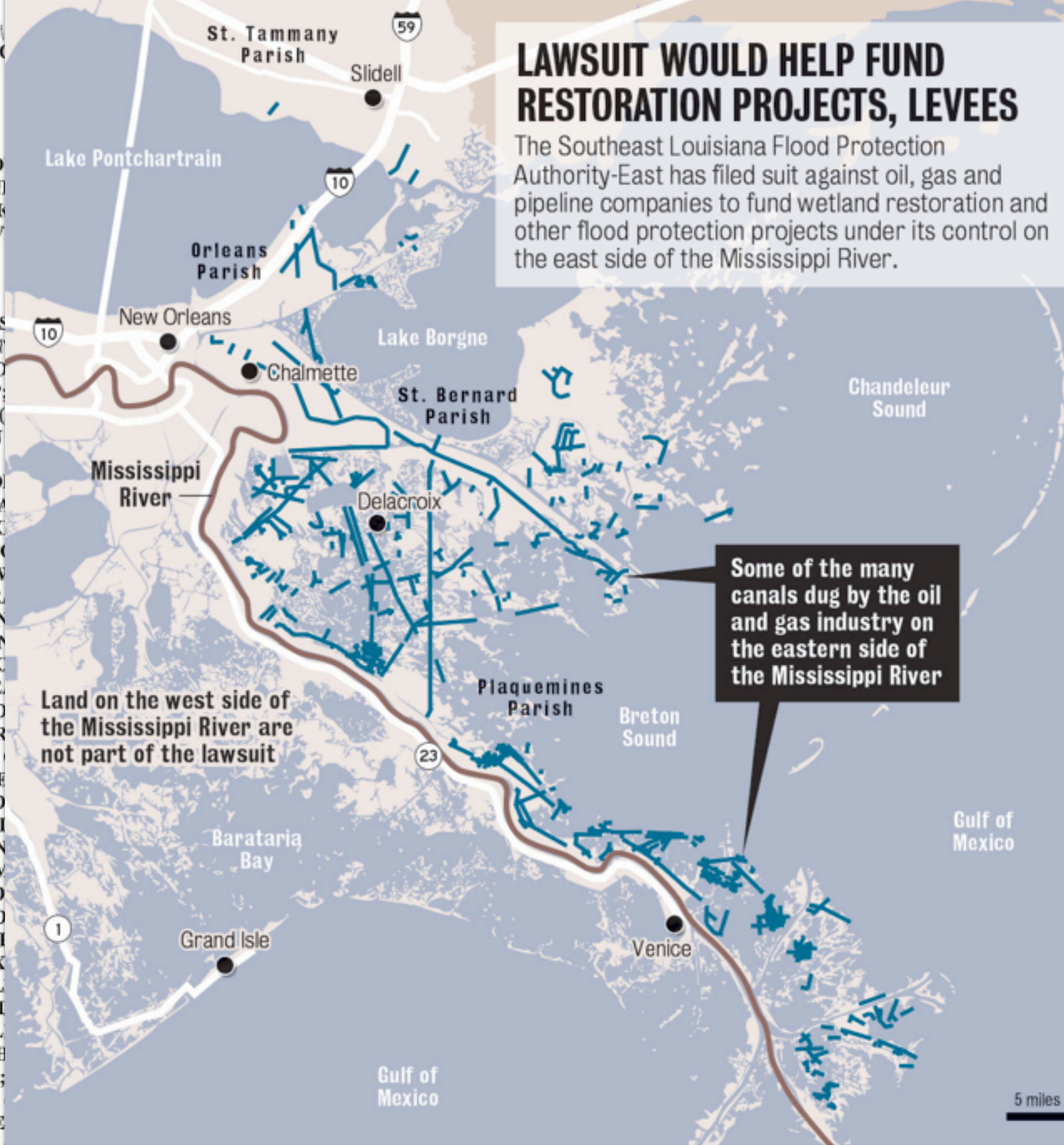
BOARD OF COMMISSIONERS OF THE SOUTHEAST LOUISIANA  
FLOOD PROTECTION AUTHORITY – EAST, INDIVIDUALLY AND  
JOINTLY, GOVERNING THE ORLEANS LEVEE DISTRICT, THE LAKE  
BORGNE LEVEE DISTRICT, AND THE EAST JEFFERSON LEVEE

V.

TENNESSEE GAS PIPELINE COMPANY, LLC; ALTA MESA  
ANADARKO E&P ONSHORE, LLC; APACHE CORP.; ATLANTIC  
BEP CO, LP; BHP BILLITON PETROLEUM (KCS RESOURCES)  
BOARDWALK PIPELINE PARTNERS, LP; BOPCO, LP;  
PRODUCTION CO.; BP OIL PIPELINE CO.; BP-PIPELINES (U.S.)  
INC.; CALLON OFFSHORE PRODUCTION, INC.; CALLON  
CASKIDS OPERATING CO.; CASTEX ENERGY, INC.;  
CENTERPOINT ENERGY RESOURCES CORP.; CHEVRON  
CHEVRON U.S.A., INC.; CHROMA OPERATING, INC.; CLARK  
ENERGY, INC.; CLOVELLY OIL CO., LLC; COASTAL EXPLORATION  
PRODUCTION, LLC; COLLINS PIPELINE CO.; CONOCO  
CONTINENTAL OIL CO.; COX OPERATING, LLC; CRAVENS  
OPERATING CO.; CROSSTEX LIG, LLC; DALLAS EXPLORATION  
OIL CO.; DEVON ENERGY PRODUCTION CO., LP; ENERGEN  
ENTERPRISE INTRASTATE, LLC; EOG RESOURCES, INC.;  
MANAGEMENT, LLC; ESTATE OF WILLIAM G. HELIS; EXXON  
EXXONMOBIL PIPELINE CO.; FLASH GAS & OIL NORTHEAST  
ROYALTY, LTD.; GREKA AM, INC.; GULF PRODUCTION CO.  
PIPELINE CO., LP; HARVEST OIL & GAS, LLC; HELIS ENERGY  
& GAS CO., LLC; HESS CORPORATION, A DELAWARE  
HILLIARD OIL & GAS, INC.; HKN, INC.; INTEGRATED ENERGY  
PRODUCTION, LLC; J.C. TRAHAN DRILLING CONTRACTOR  
CORP.; KENMORE OIL CO., INC.; KEWANEE INDUSTRIES, INC.  
TEXAS, INC.; KOCH EXPLORATION CO., LLC; KOCH INDUSTRIES  
LIBERTY OIL & GAS CORP.; LLOG EXPLORATION CO.; MCMORAN  
CO.; MARATHON OIL CO.; MCMORAN EXPLORATION CO., LLC;  
MOSBACHER ENERGY CO.; MURPHY EXPLORATION CO.;  
NATURAL RESOURCES CORP. OF TEXAS; NEWFIELD ENERGY  
COAST, LLC; NOBLE ENERGY, INC.; O'MEARA, LLC; ORX  
P.R. RUTHERFORD; PLACID OIL CO.; PLAINS PIPELINE, L.P.  
CO., LLC; REPUBLIC MINERAL CORP.; RIPCO, LLC; ROZELLE  
PARISH OIL CO., INC.; SENECA RESOURCES CORP.; SHELCO  
PETROLEUM, INC.; SOUTHERN BAY ENERGY, LLC; SOUTHERN  
CO., LLC; STATOIL EXPLORATION (US), INC.; SUN OIL CO.,  
LP; THE LOUISIANA LAND AND EXPLORATION CO., LLC;  
MERIDIAN RESOURCE & EXPLORATION, LLC; THE PICKENS  
OIL CO. OF CALIFORNIA; VINTAGE PETROLEUM, LLC;  
OPERATING CO., LLC; WHITING OIL & GAS CORP.; WILLIAMS  
CO.; YUMA EXPLORATION AND PRODUCTION CO., INC.

## LAWSUIT WOULD HELP FUND RESTORATION PROJECTS, LEVEES

The Southeast Louisiana Flood Protection Authority-East has filed suit against oil, gas and pipeline companies to fund wetland restoration and other flood protection projects under its control on the east side of the Mississippi River.



DAN SWENSON / GRAPHICS REPORT



463 comments Bobby Jindal signs bill to kill lawsuit against oil, gas companies

49 comments Louisiana House supports bill to nullify levee board lawsuit

22 comments Levee authority asks federal judge to find new state law doesn't block suit against energy companies

238  
Tweet

Sponsored by: 

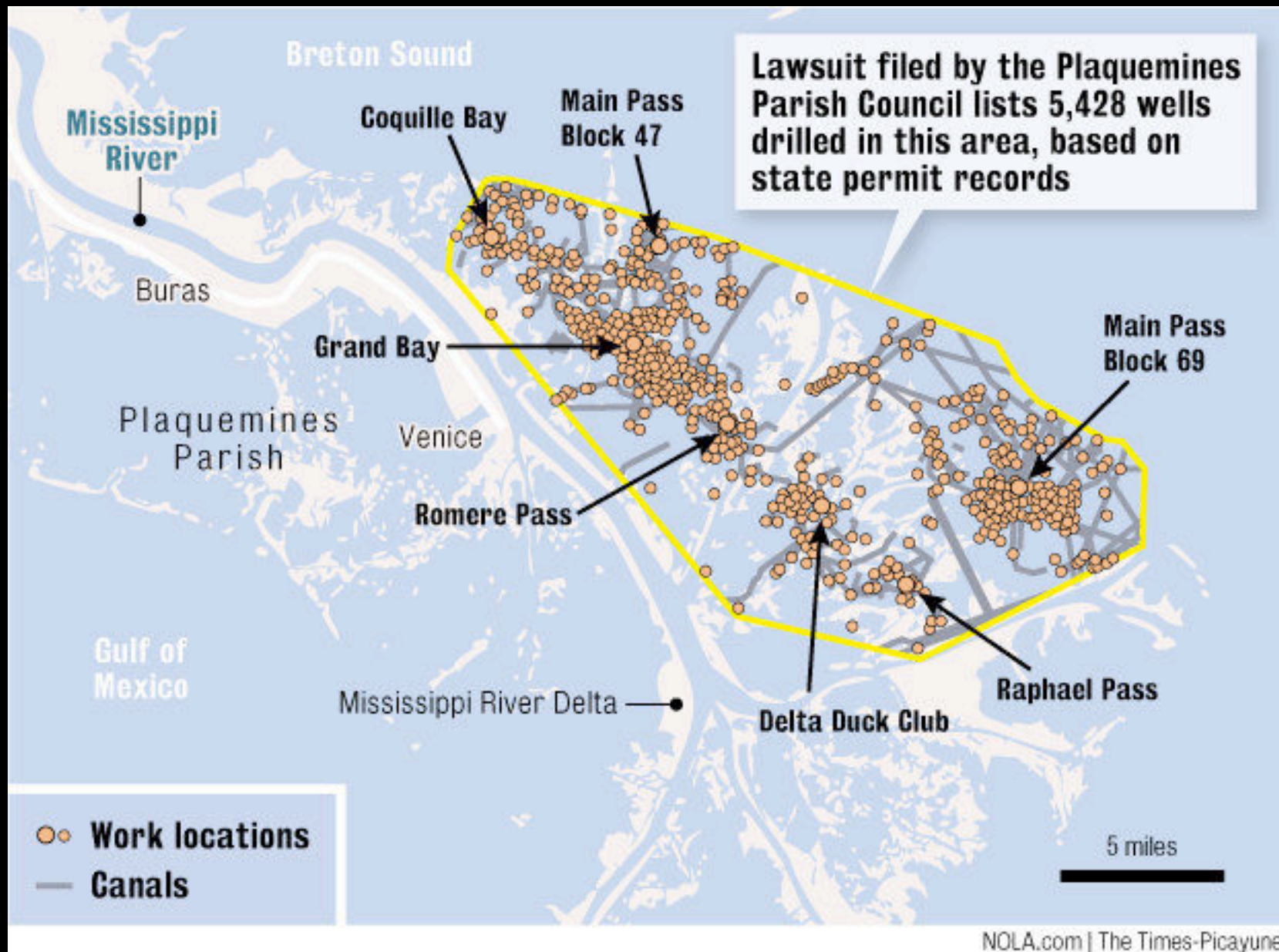
August 5, 2014

36  
Tweet  
604  
Like  
0





# Plaquemines Parish, La.



[http://www.nola.com/environment/index.ssf/2014/07/federal\\_judge\\_wont\\_rule\\_on\\_wha.html](http://www.nola.com/environment/index.ssf/2014/07/federal_judge_wont_rule_on_wha.html)





1956



1972



2013

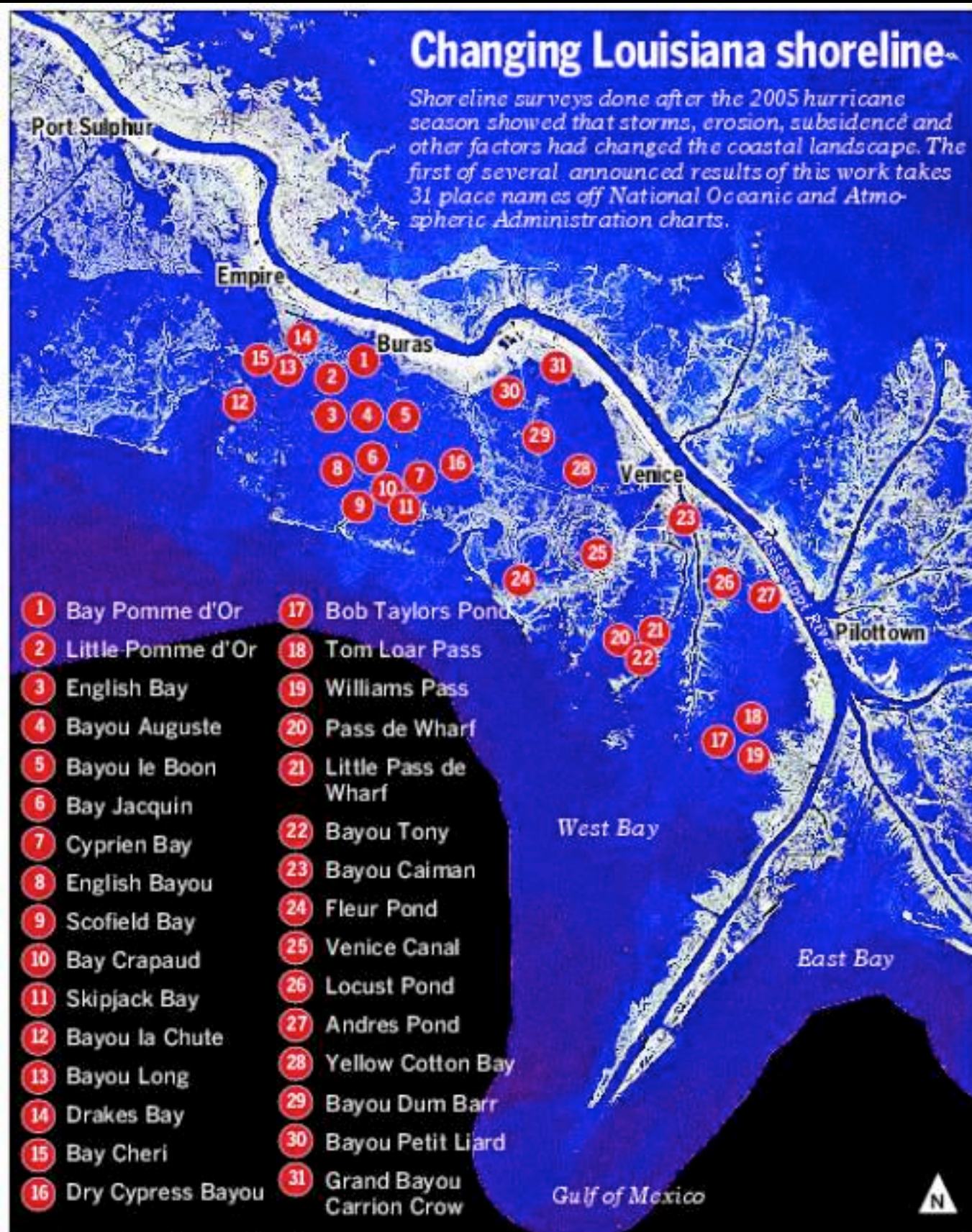
**“Wagon wheel,” Venice, La.**

*USGS Aerials*



## Changing Louisiana shoreline

Shoreline surveys done after the 2005 hurricane season showed that storms, erosion, subsidence and other factors had changed the coastal landscape. The first of several announced results of this work takes 31 place names off National Oceanic and Atmospheric Administration charts.



Source: NOAA, LSU Coastal Studies Institute

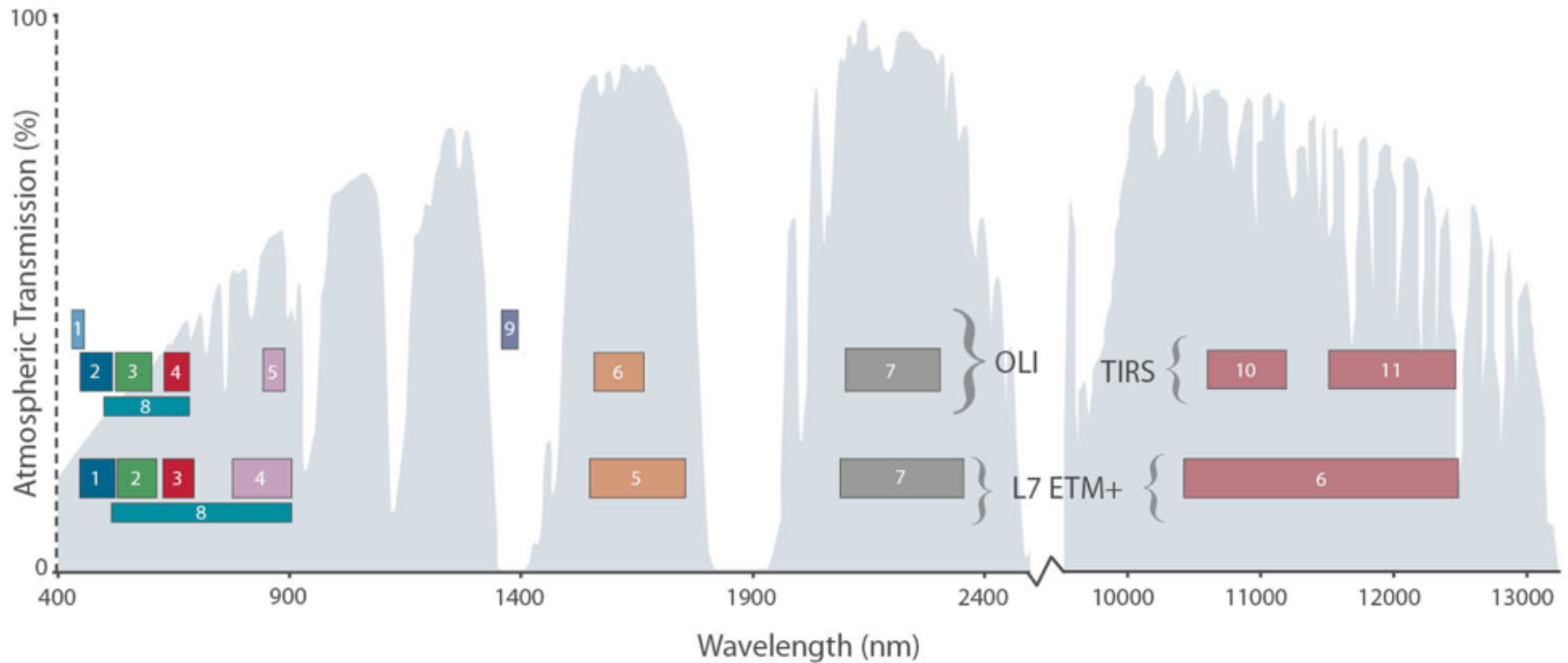
Advocate graphic



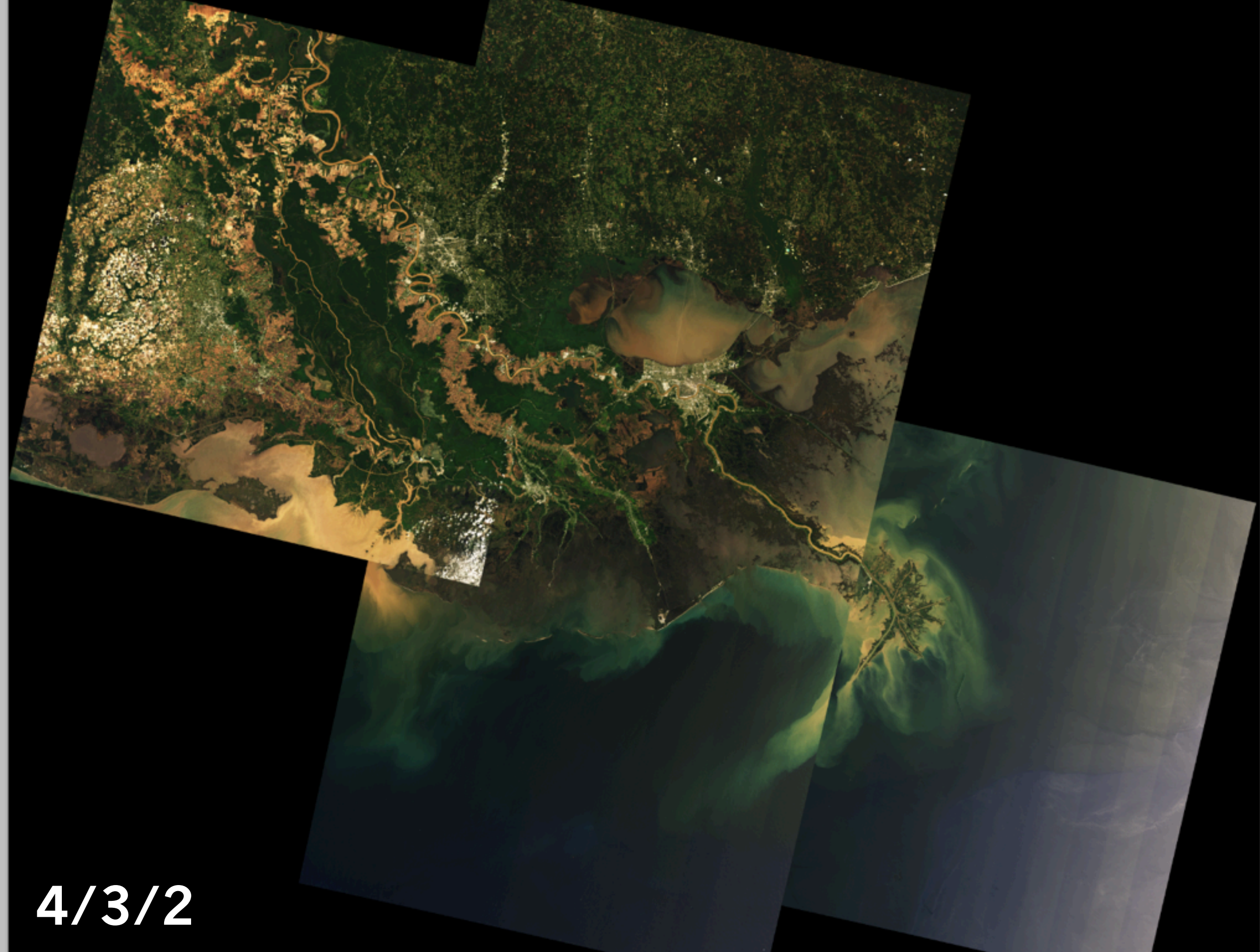
# Investigative Space Journalism!



# Landsat 8







4/3/2





7/5/3

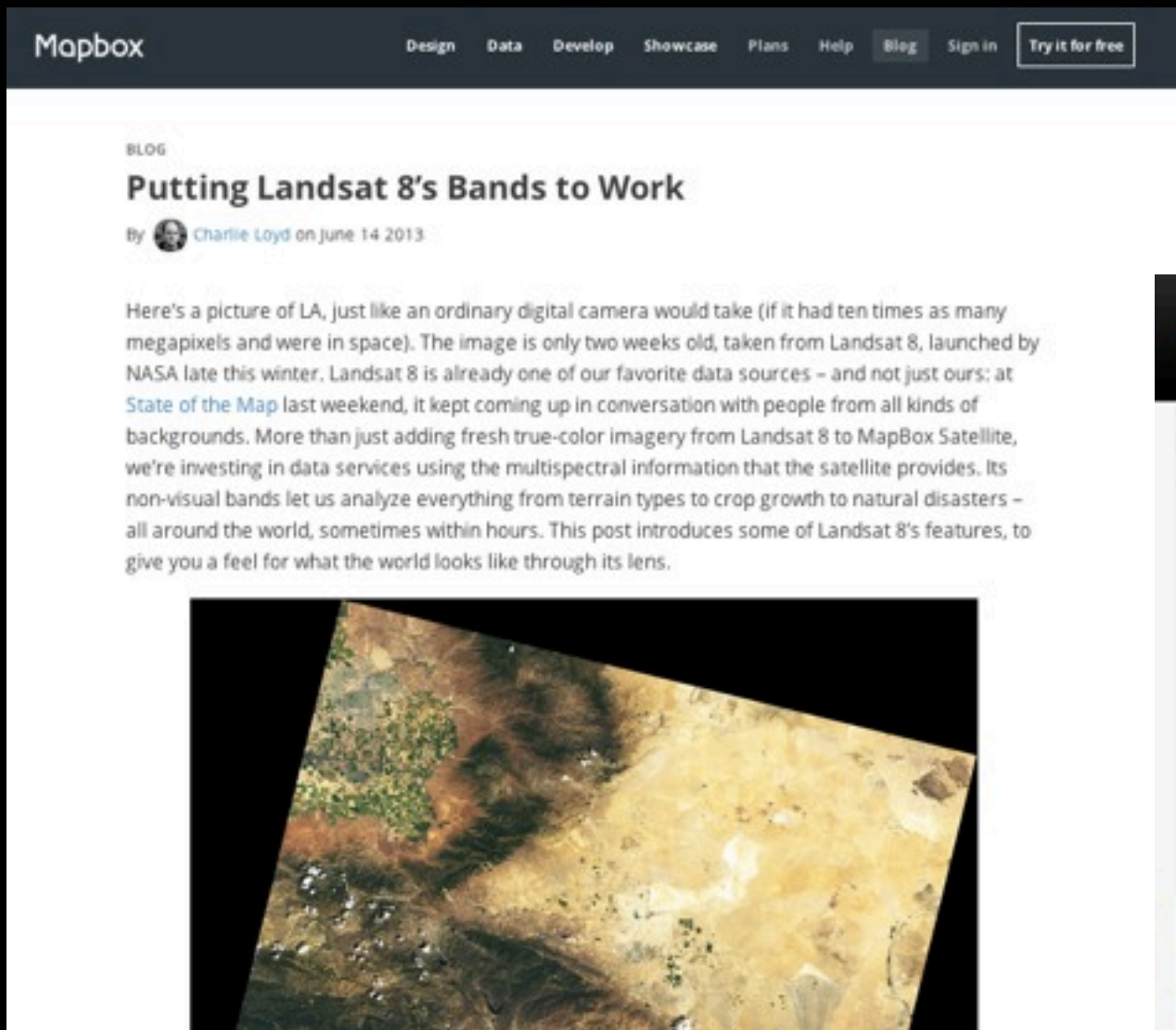




4/3/2 + 5 mask



<https://www.mapbox.com/blog/putting-landsat-8-bands-to-work/>



<http://earthobservatory.nasa.gov/blogs/elegantfigures/2013/10/22/how-to-make-a-true-color-landsat-8-image/>





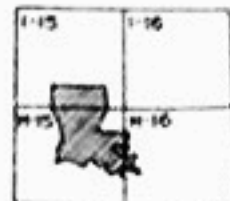
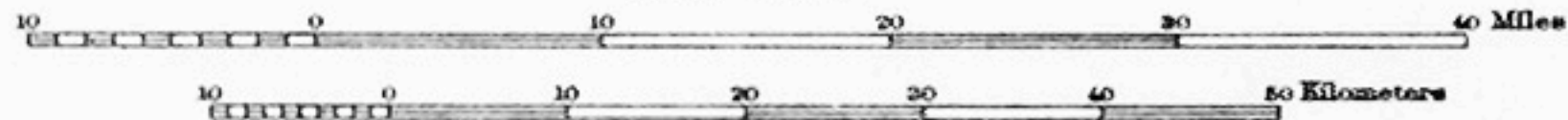
UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

# STATE OF LOUISIANA

A. F. Hassan, Cartographer

Compiled and published in 1922, reprinted 1948  
Compilation based on State map by the General Land Office

Scale 500,000



Relation of the State of Louisiana to  
sheets of the Map of the World on  
the scale of 1:1,000,000

- ☆ State capital
- MONROE County seat name
- Larger cities
- Town or village
- Railroads

Modified polyconic projection  
North American datum







30 km  
20 mi



# Creating “land”





# Creating “land”

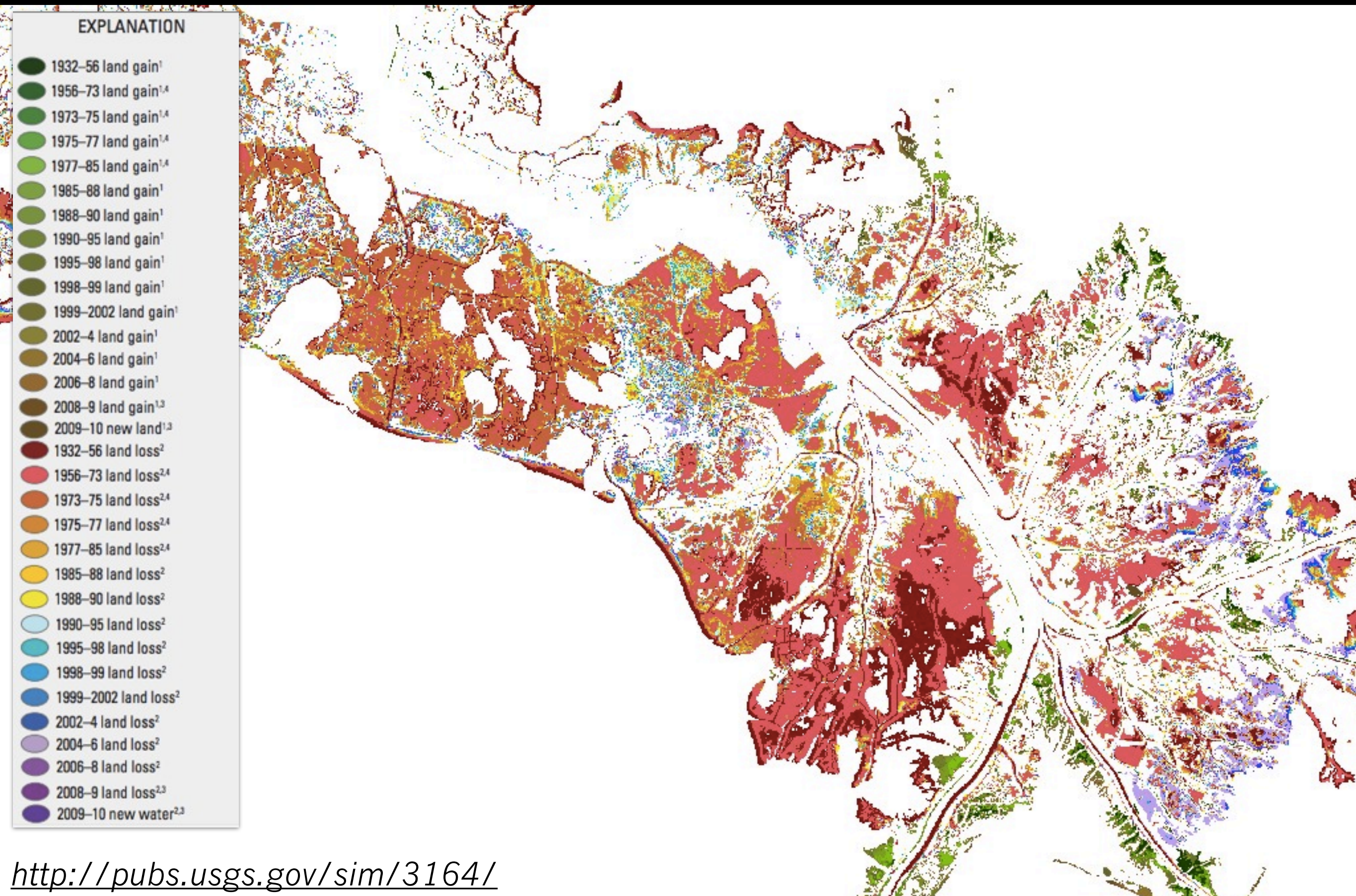








# Creating “land”





# Creating “land”

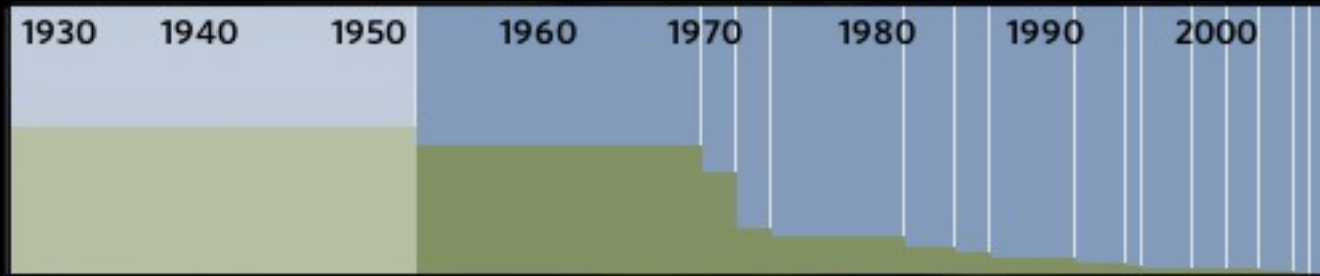
```
colors = {  
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  "1956-1973-gain"    => "srgba(28,102,0,1)",  
  "1973-1975-gain"    => "srgba(51,135,5,1)",  
  "1975-1977-gain"    => "srgba(76,168,10,1)",  
  "1977-1985-gain"    => "srgba(102,201,15,1)",  
  "1985-1988-gain"    => "srgba(109,165,28,1)",  
  "1988-1990-gain"    => "srgba(109,150,33,1)",  
  "1990-1995-gain"    => "srgba(107,135,38,1)",  
  "1995-1998-gain"    => "srgba(102,119,40,1)",  
  "1998-1999-gain"    => "srgba(96,107,45,1)",  
  "1999-2002-gain"    => "srgba(112,114,45,1)",  
  "2002-2004-gain"    => "srgba(135,132,43,1)",  
  "2004-2006-gain"    => "srgba(147,117,43,1)",  
  "2006-2008-gain"    => "srgba(153,104,43,1)",  
  "2008-2009-gain"    => "srgba(104,79,33,1)",  
  "2009-2010-gain"    => "srgba(114,79,33,1)",  
  "1932-1956-loss"    => "srgba(137,0,0,1)",  
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  "1999-2002-loss"    => "srgba(10,130,234,1)",  
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  "2004-2006-loss"    => "srgba(198,153,239,1)",  
  "2006-2008-loss"    => "srgba(168,38,204,1)",  
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  "2009-2010-loss"    => "srgba(107,7,168,1)"  
}
```



## Creating “land”

For each time period, create an image by combining land loss from the current period to the last period, and land gain from the first period to the current period

# Buras, La.: 1932-2014

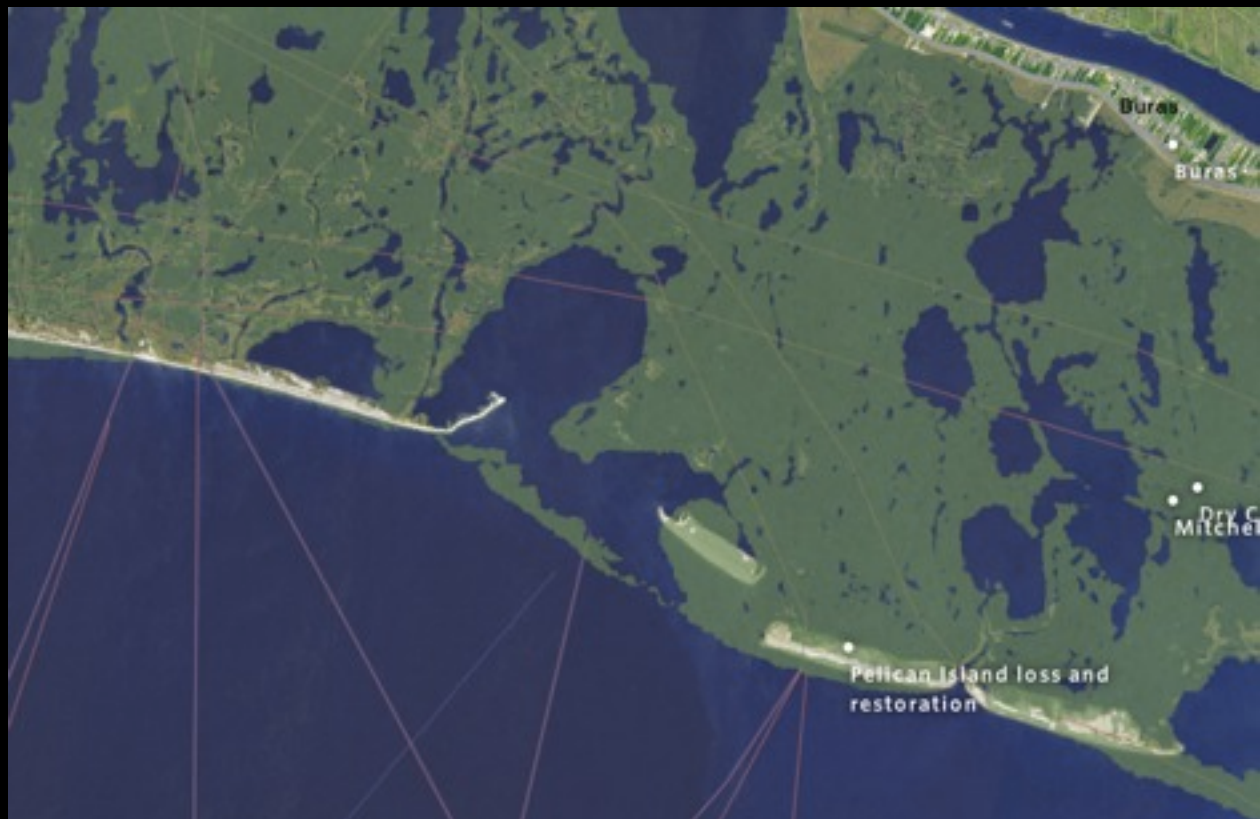


```
pixels = `convert #{file} -colorspace rgb -colors 10 -format "%c"
```

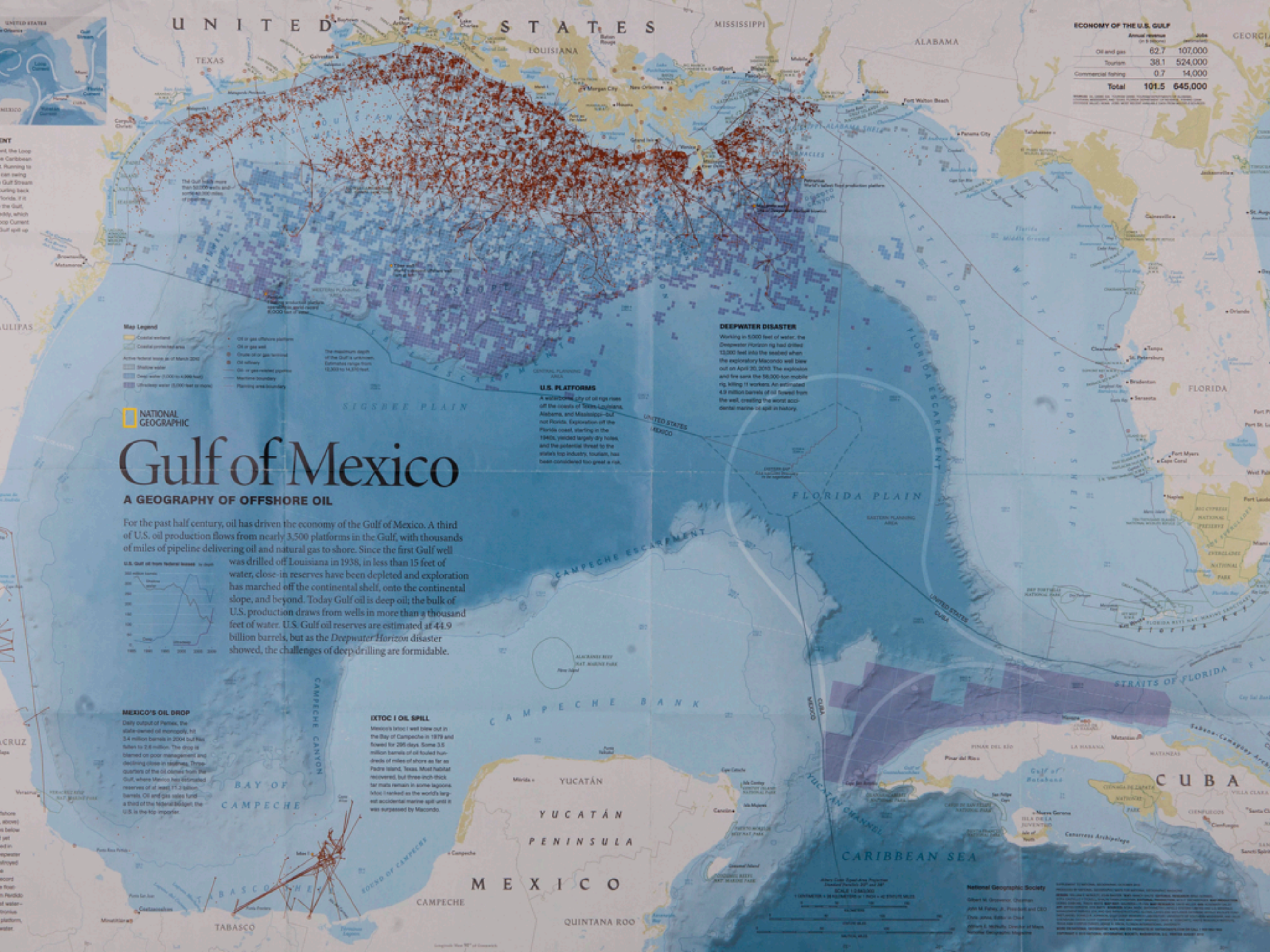
```
    histogram:info:`
```

```
transPixels = pixels.match(/^[^:]*\/)
```

```
transPct = `convert #{file} -format "%[fx:100*#{transPixels}/(w*h)]%" info:`
```







**ECONOMY OF THE U.S. GULF**

	Annual revenue (in \$ billions)	Jobs (millions)
Oil and gas	62.7	107,000
Tourism	38.1	524,000
Commercial fishing	0.7	14,000
<b>Total</b>	<b>101.5</b>	<b>645,000</b>

# Gulf of Mexico

## A GEOGRAPHY OF OFFSHORE OIL

For the past half century, oil has driven the economy of the Gulf of Mexico. A third of U.S. oil production flows from nearly 3,500 platforms in the Gulf, with thousands of miles of pipeline delivering oil and natural gas to shore. Since the first Gulf well was drilled off Louisiana in 1938, in less than 15 feet of water, close-in reserves have been depleted and exploration has marched off the continental shelf, onto the continental slope, and beyond. Today Gulf oil is deep oil; the bulk of U.S. production draws from wells in more than a thousand feet of water. U.S. Gulf oil reserves are estimated at 44.9 billion barrels, but as the *Deepwater Horizon* disaster showed, the challenges of deep drilling are formidable.



**MEXICO'S OIL DROP**  
Daily output of Pemex, the state-owned oil monopoly, hit 3.4 million barrels in 2004 but has fallen to 2.6 million. The drop is blamed on poor management and declining close-in reserves. Three-quarters of the oil comes from the Gulf, where Mexico has estimated reserves of at least 11.2 billion barrels. Oil and gas sales fund a third of the federal budget; the U.S. is the top importer.

**IXTOC 1 OIL SPILL**  
Mexico's Ixtoc 1 well blew out in the Bay of Campeche in 1979 and flowed for 295 days. Some 3.5 million barrels of oil leaked hundreds of miles of shore as far as Padre Island, Texas. Most habitat recovered, but three-inch-thick tar mats remain in some lagoons. Ixtoc 1 ranked as the world's largest accidental marine spill until it was surpassed by Macondo.

**U.S. PLATFORMS**  
A wall-to-wall city of oil rigs rises off the coasts of Texas, Louisiana, Alabama, and Mississippi—but not Florida. Exploration off the Florida coast, starting in the 1940s, yielded largely dry holes, and the potential threat to the state's top industry, tourism, has been considered too great a risk.

**DEEPWATER DISASTER**  
Working in 5,000 feet of water, the *Deepwater Horizon* rig had drilled 13,000 feet into the seabed when the exploratory Macondo well blew out on April 20, 2010. The explosion and fire sank the 56,000-ton mobile rig, killing 11 workers. An estimated 4.9 million barrels of oil flowed from the well, creating the worst accidental marine oil spill in history.


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Arthur B. McPhail, Director of Maps  
National Geographic Magazine

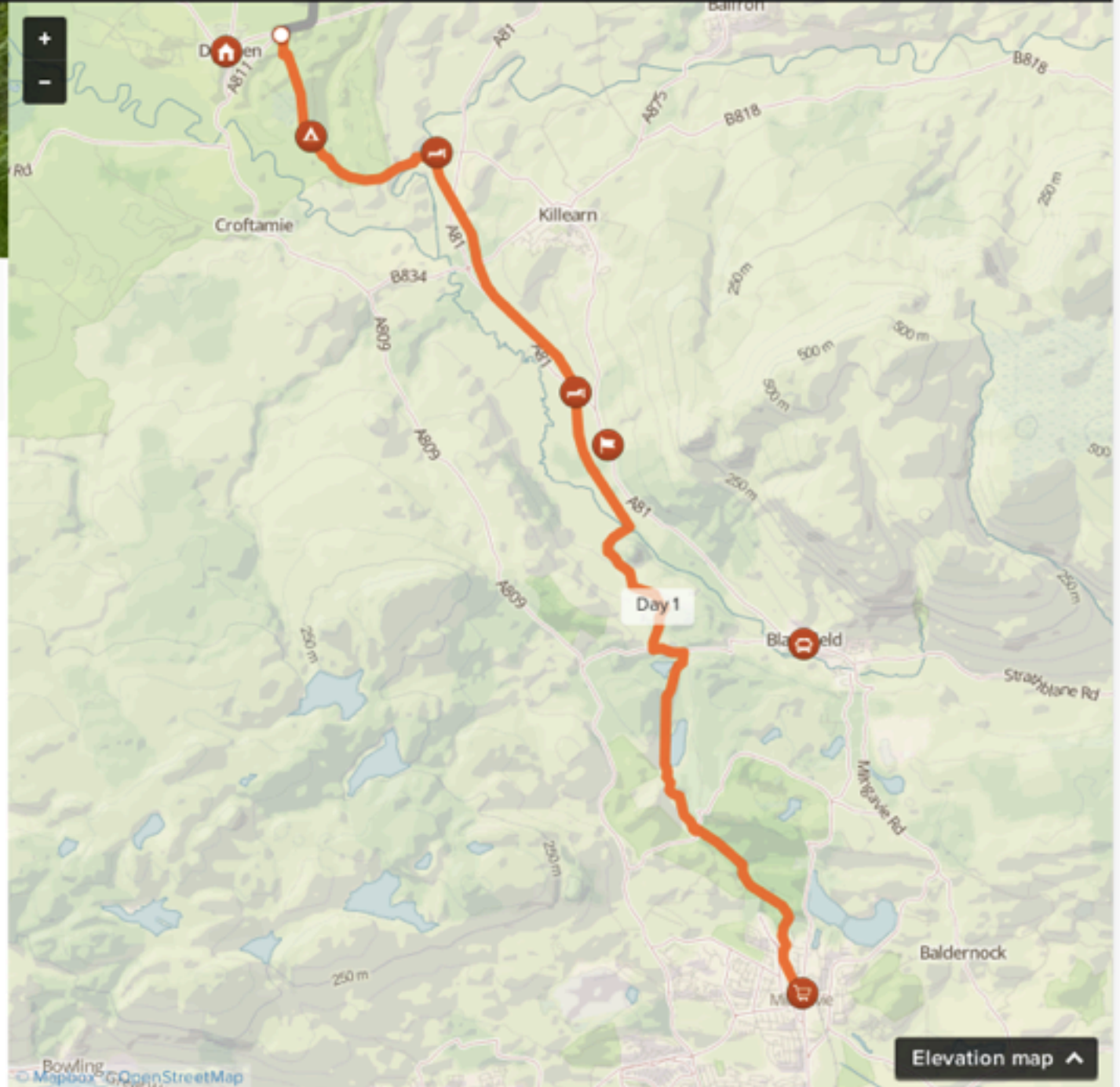




🕒 5 Hours / 19 km 📍 419 m 🏔️ 307 m

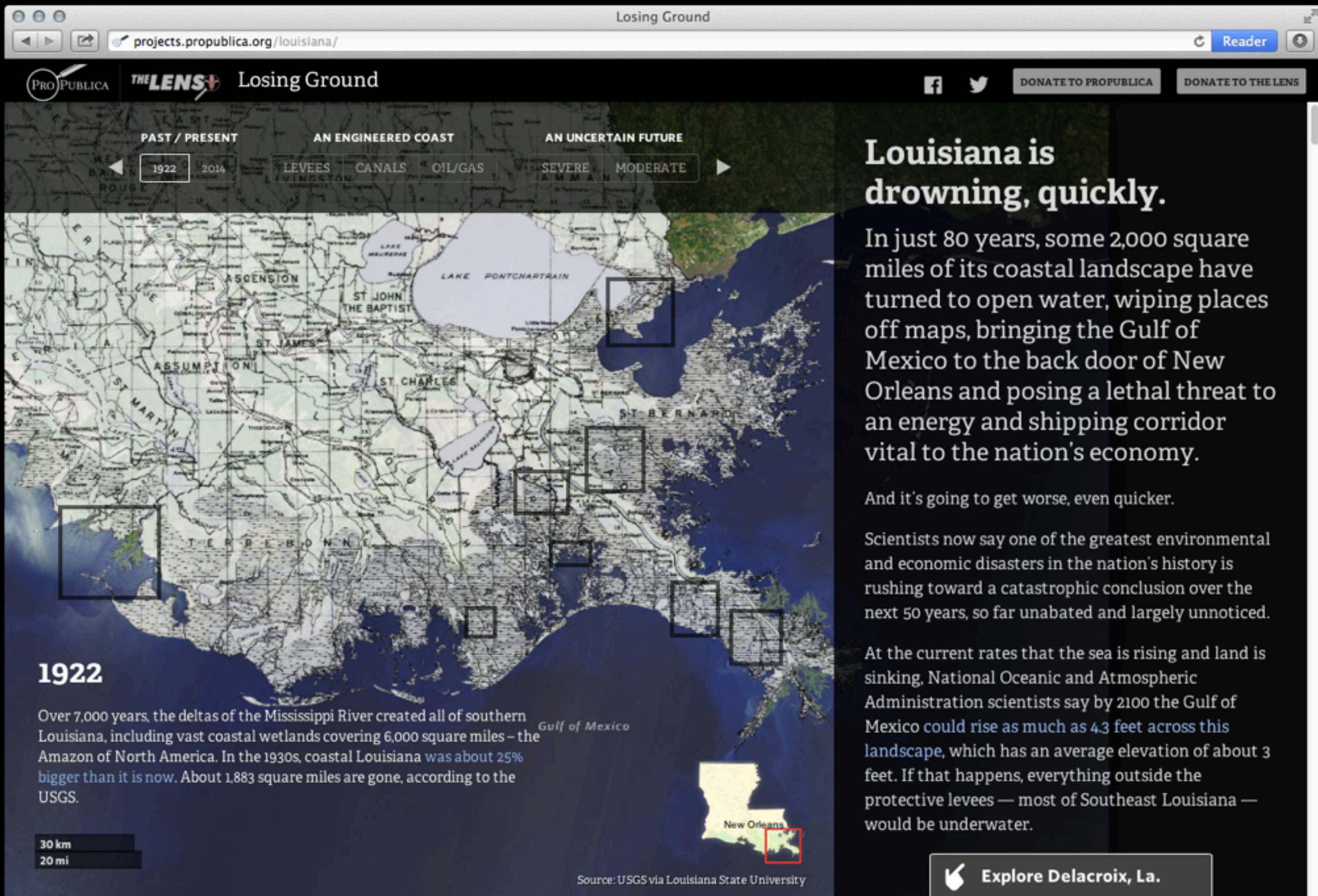
Today	Tomorrow	Wednesday	Thursday
			
14° / 11°	20° / 9°	20° / 10°	17° / 14°

If you need supplies (like I did coming straight from Glasgow Airport) head over to  The Iron Chef, a small hardware store just 50 meters



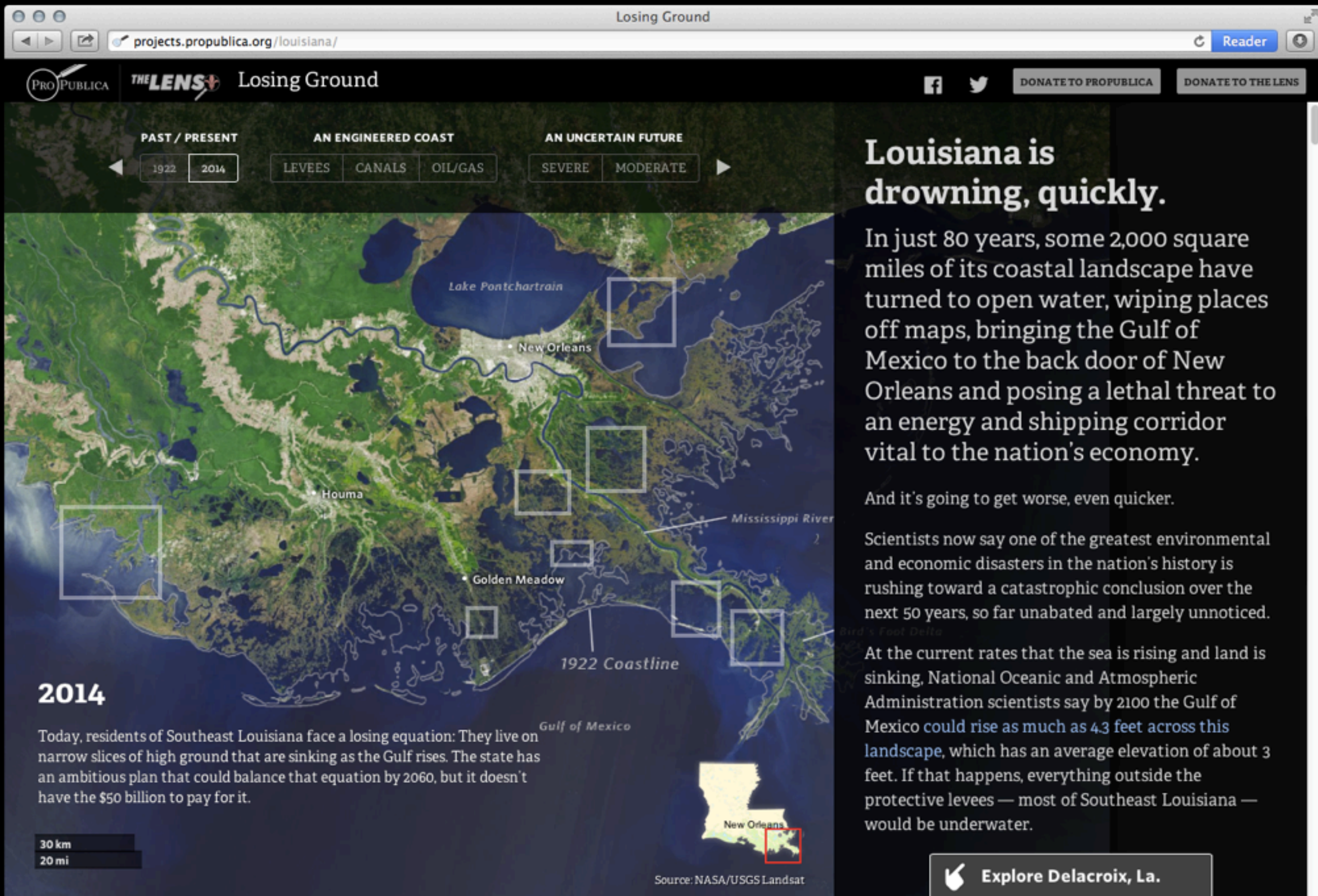


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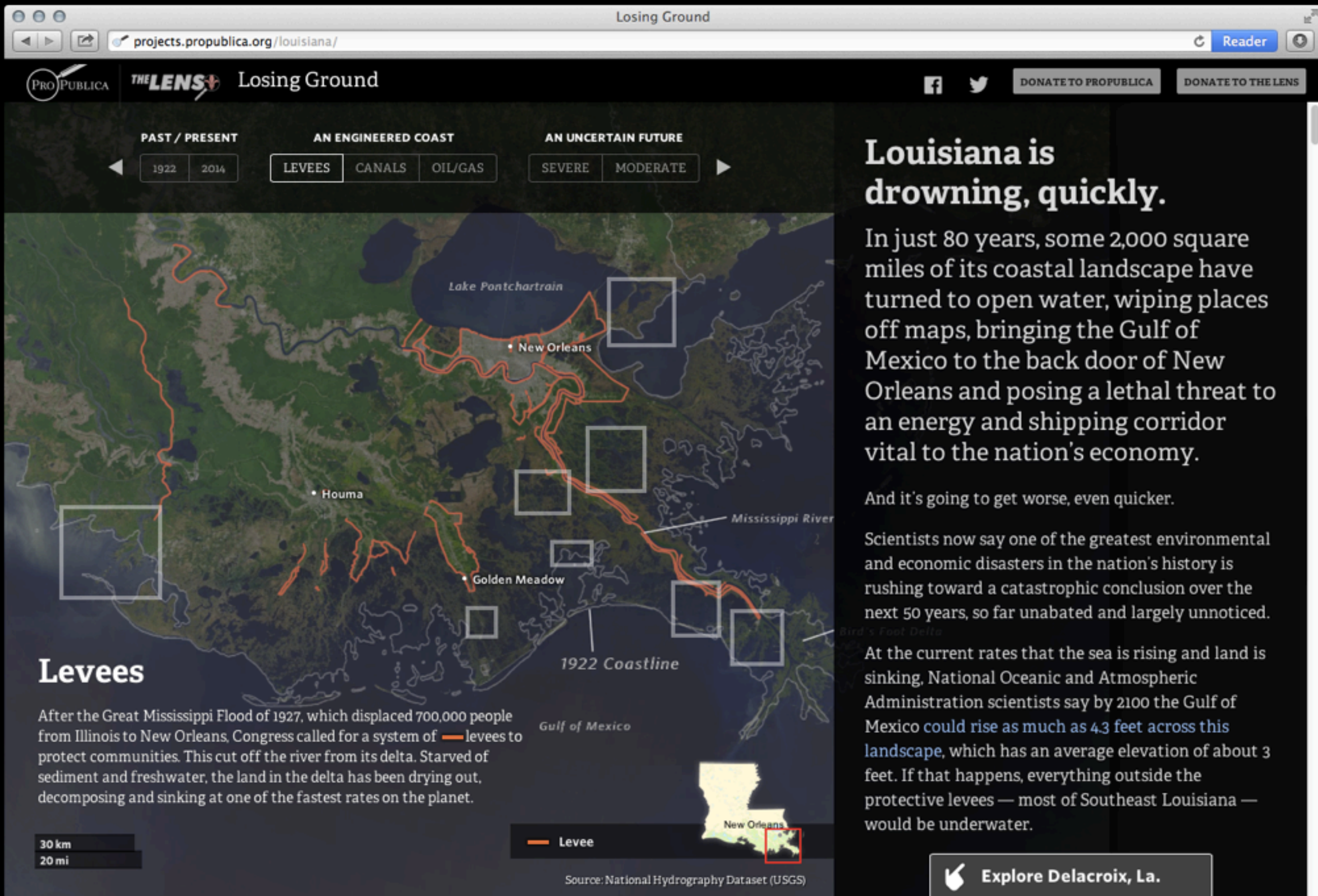


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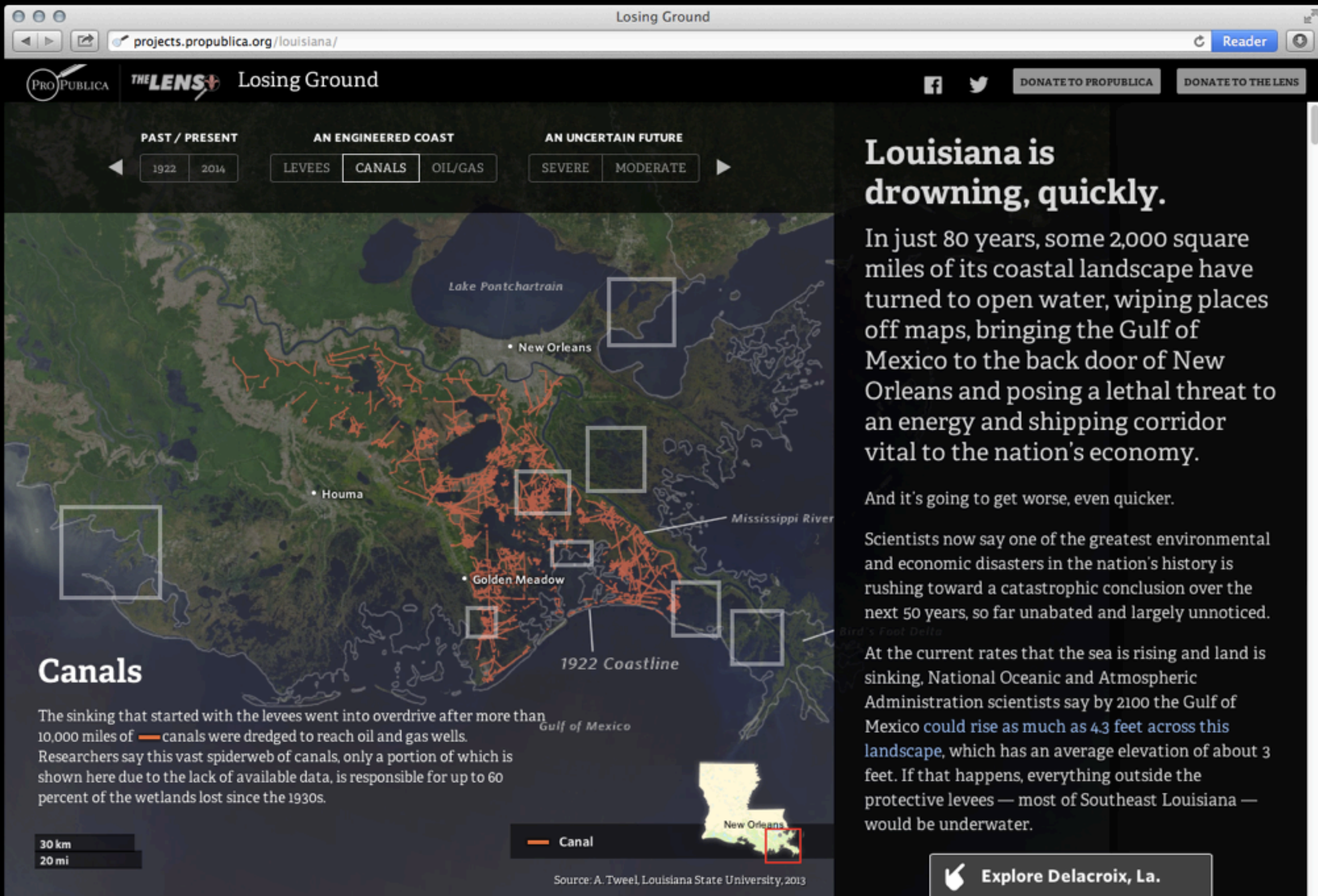


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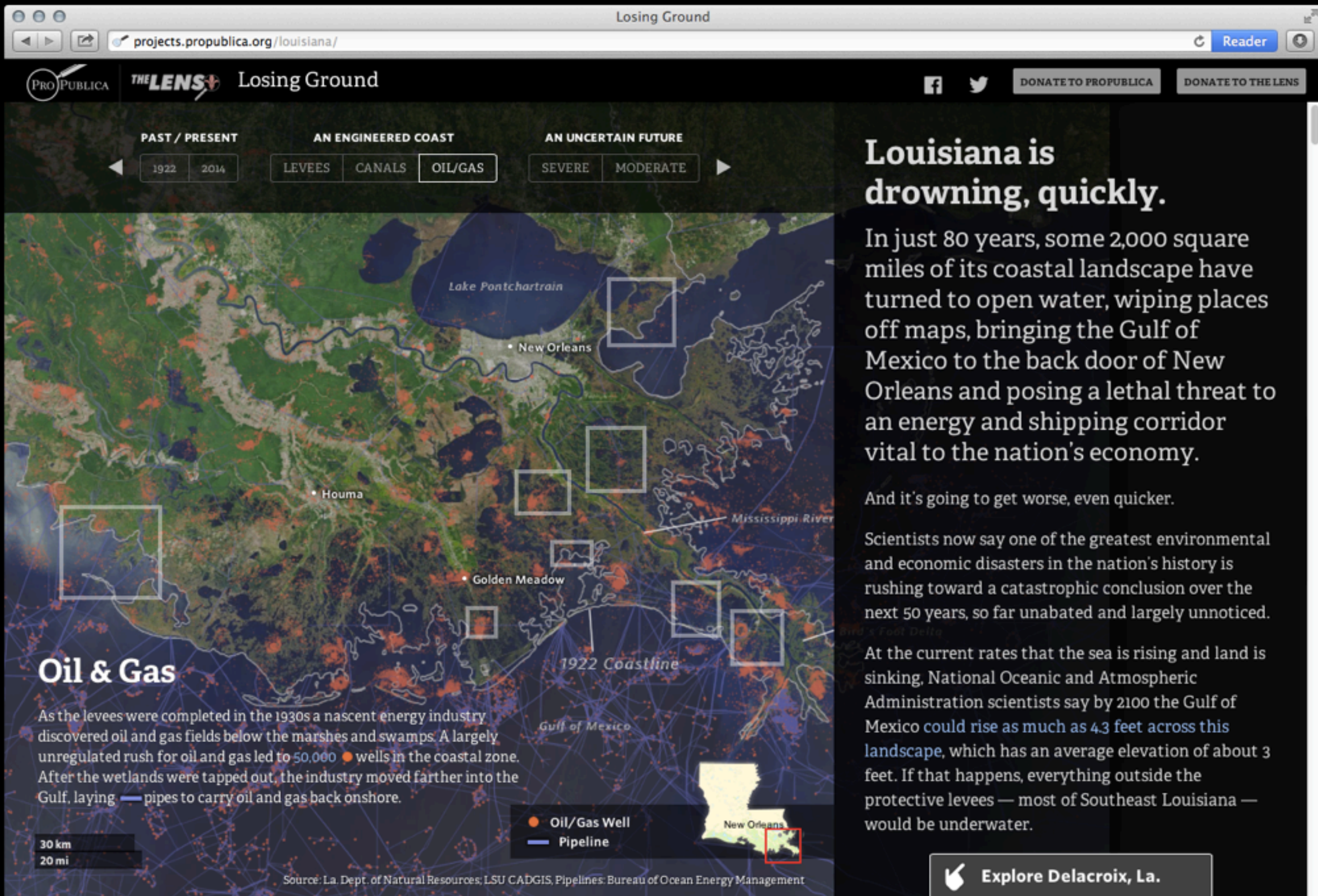


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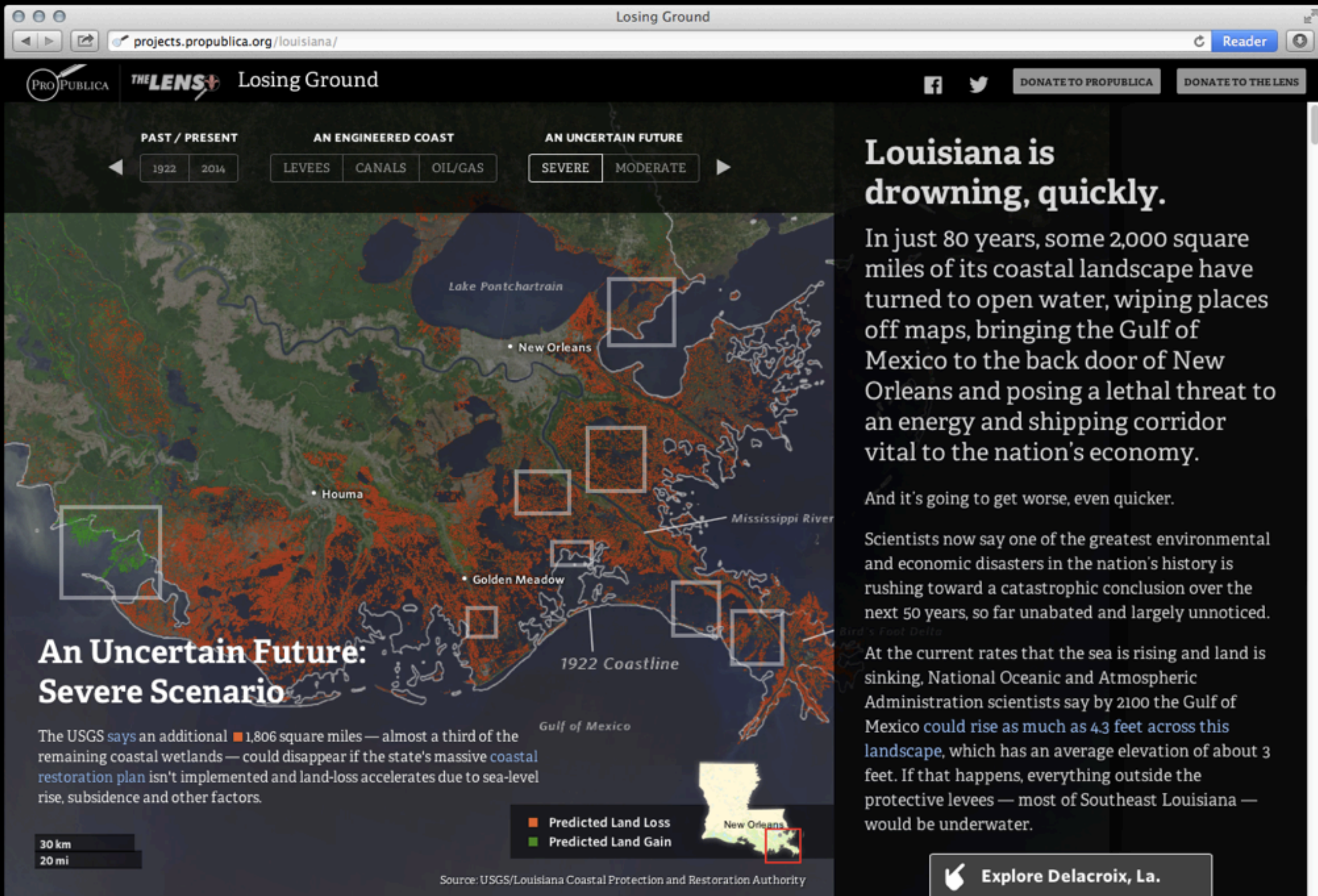


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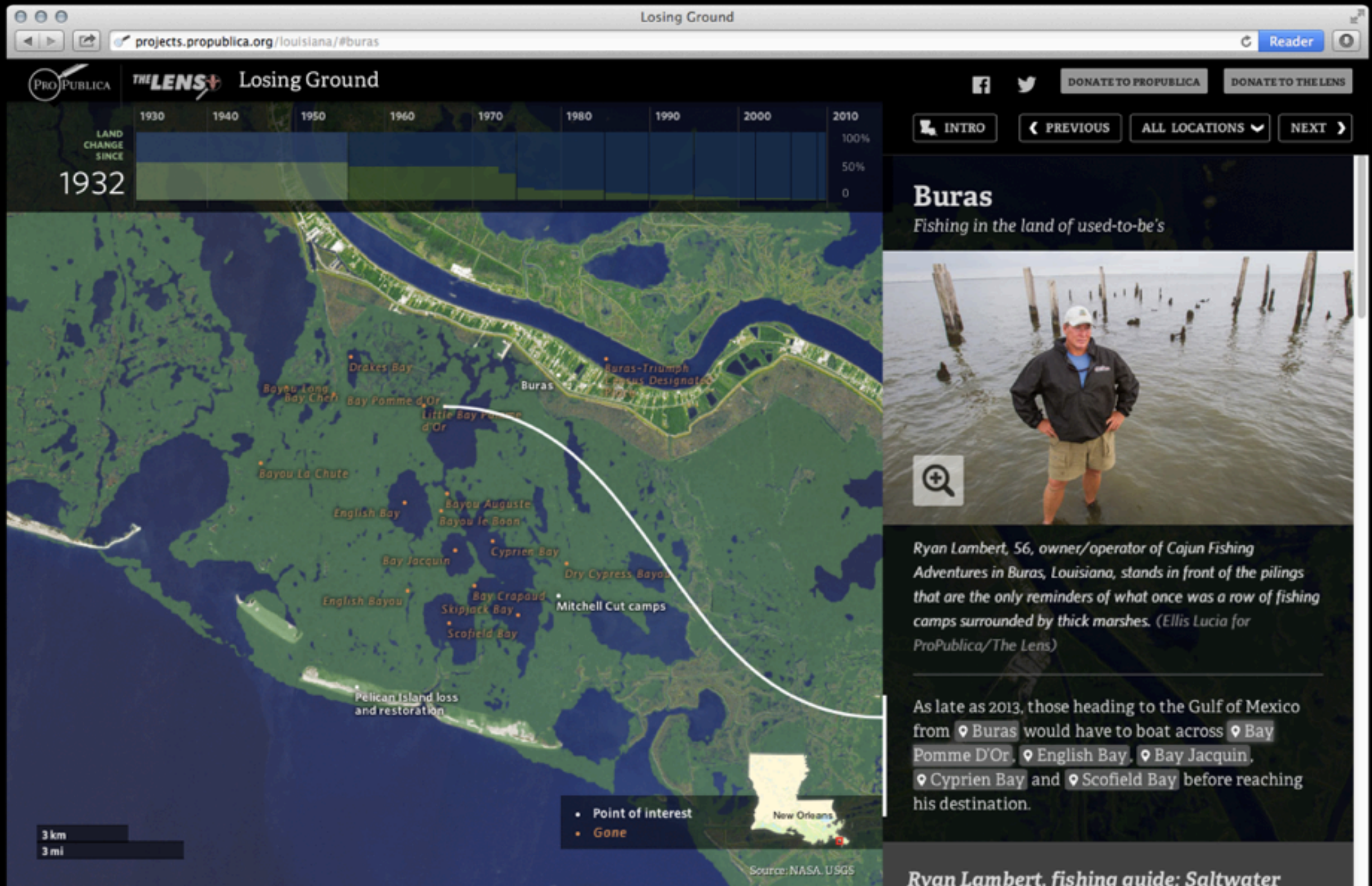


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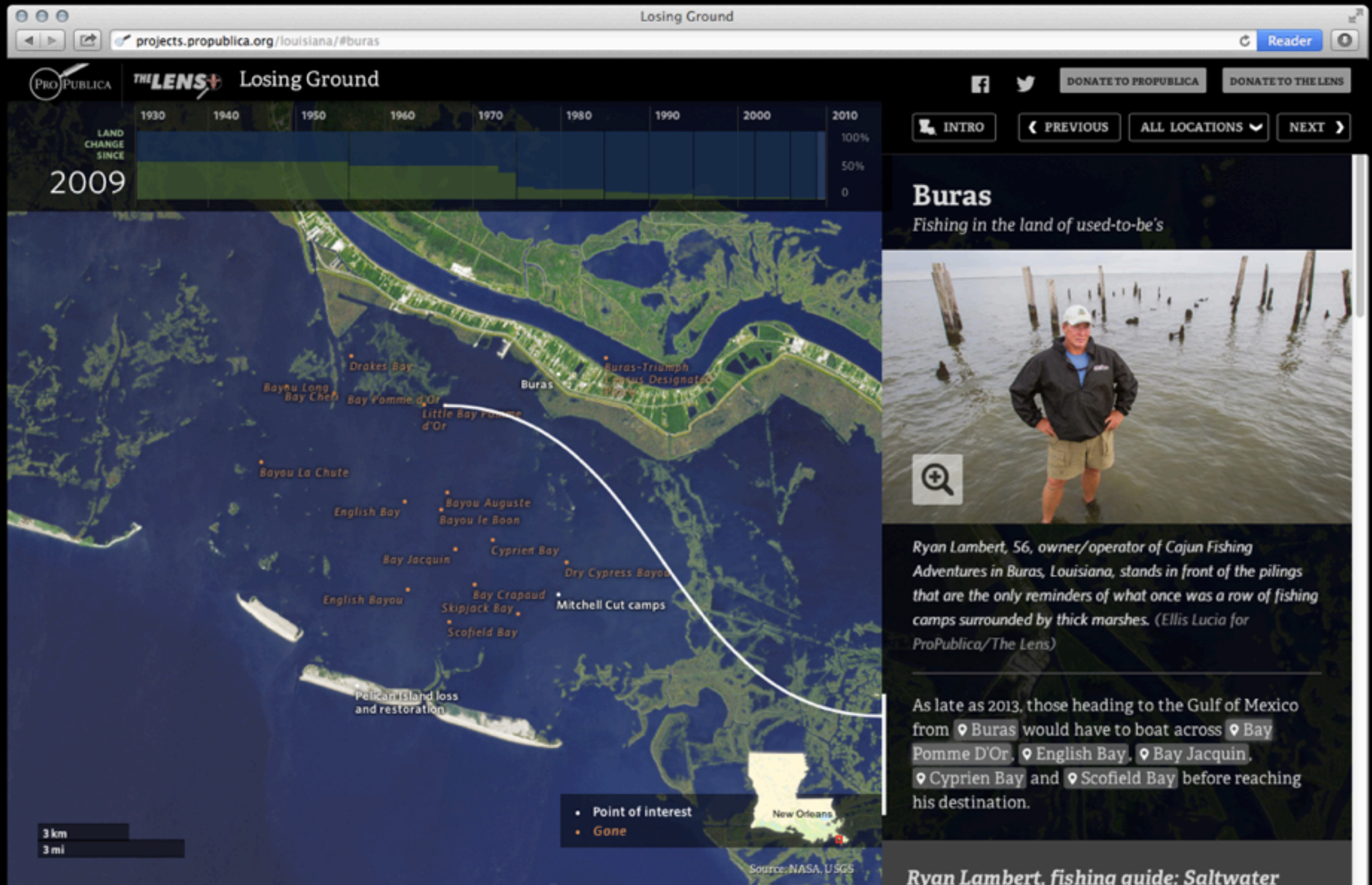


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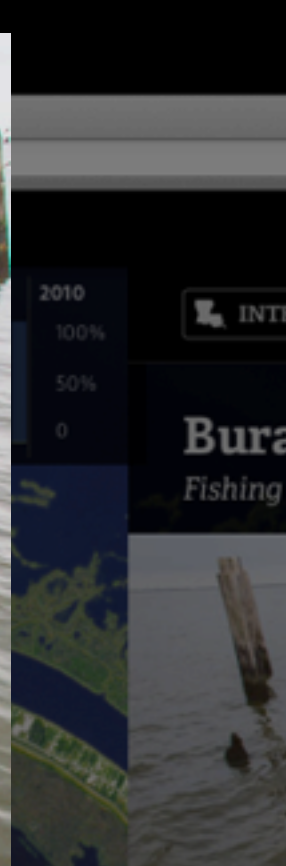


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Lambert, fishing guide: Saltwater





**Anthony Bejarano**  
@AntBejarano



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That ProPublica/The Lens report on the sinking Louisiana coastline makes me want to curl up in a ball and die, honestly.  
[#LosingGround](#)

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8:03 AM - 30 Aug 2014



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# Geographic accountability

## Queens

54%

Of Sandy flood area  
predicted by flood  
maps

## Kings

47%

Of Sandy flood area  
predicted by flood  
maps

New York City's flood insurance maps, released by FEMA in 2007, are based on older technology and an older storm-surge model. ...

## Nassau

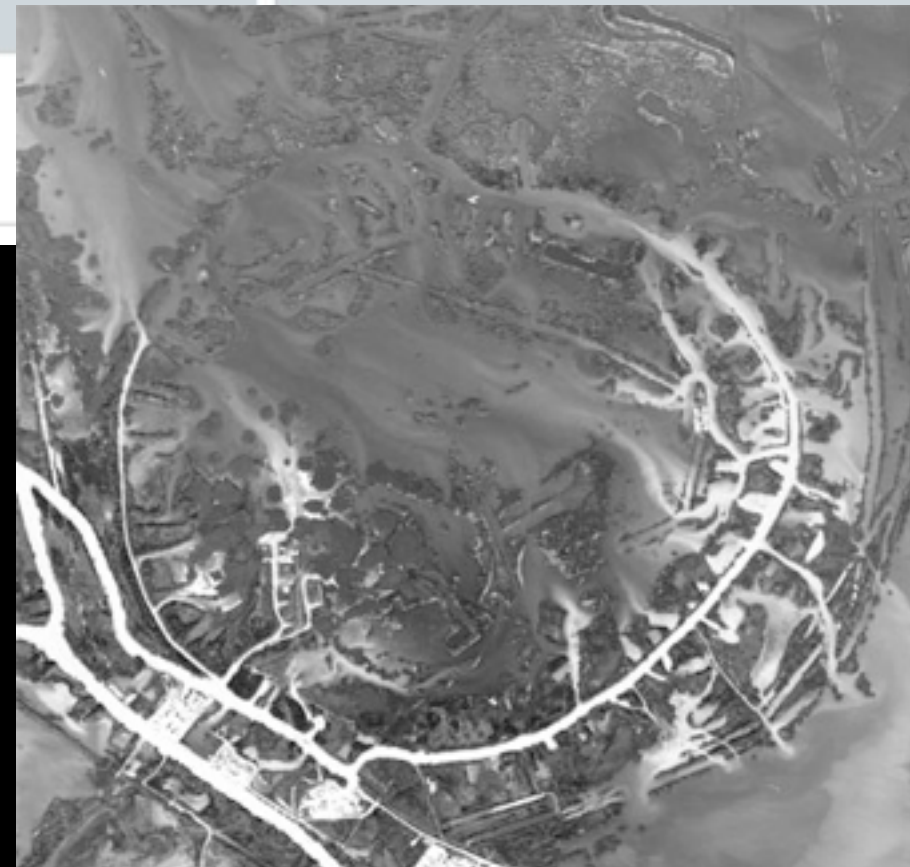
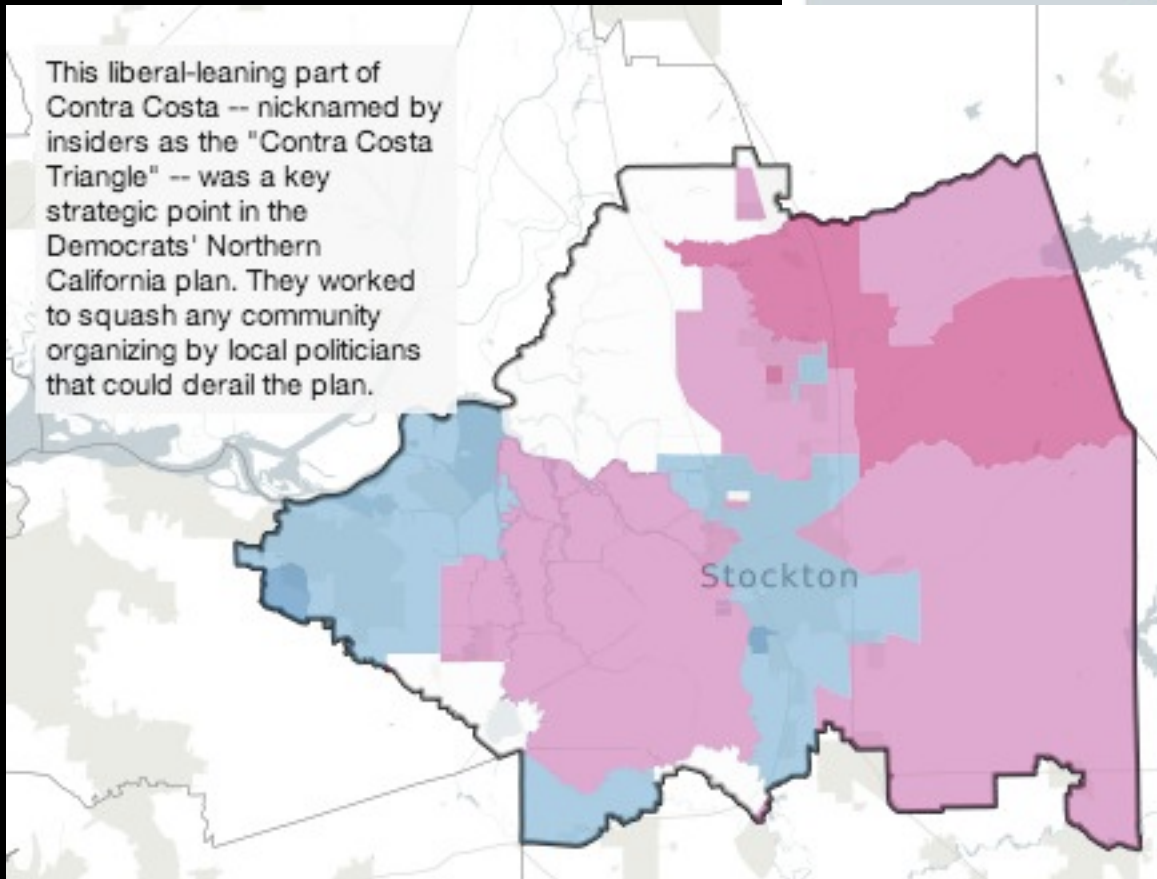
89%

Of Sandy flood area  
predicted by flood  
maps

... Nassau County got new flood maps in 2009, using lidar data and a new storm surge analysis. These maps were better at predicting the area Sandy flooded than the New York City maps.



This liberal-leaning part of Contra Costa -- nicknamed by insiders as the "Contra Costa Triangle" -- was a key strategic point in the Democrats' Northern California plan. They worked to squash any community organizing by local politicians that could derail the plan.





# Thank you!

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@A\_L

<http://j.mp/foss4g14-shaw>