Mapping for Investigations

Al Shaw
al.shaw@propublica.org

http://j.mp/foss4g14-shaw
Born in 2008
2 Pulitzer Prizes
Tools & Data
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.

---

**SPORTS**
- AP (PASSING)
- AP CLASSES
- GIFTED/TALENTED
- ADVANCED MATH
- PHYSICS
- CHEMISTRY

Most states have some AP enrollment. Alaska and Florida are a bit atypical, both having N/A in this column.

---

**AP PASS RATE**
- AP ENROLLMENT

**How States Compare**
- Alaska: 2% 1%
- Ariz.: 2% 1%
- Ark.: 4% 4%
- Calif.: 3% 1%
- Colo.: 4% 1%
- Conn.: 5% 1%
- Del.: 4% 1%
- Fla.: 4% 1%
- Ga.: 4% 1%
- Hawaii: 4% 1%
- Idaho: 4% 1%
- Ill.: 4% 1%
- Ind.: 4% 1%
- Iowa: 4% 1%
- Kan.: 4% 1%
- Ky.: 4% 1%
- La.: 4% 1%
- Maine: 4% 1%
- Mass.: 4% 1%
- Md.: 4% 1%
- Mich.: 4% 1%
- Minn.: 4% 1%

---

**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 Do Well In Idaho
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- 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
Is Your State Providing Equal Access to Education?

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.

How States Compare

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

AP ENROLLMENT

AP PASS RATE

<table>
<thead>
<tr>
<th>State</th>
<th>AP ENROLLMENT</th>
<th>AP PASS RATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ala.</td>
<td>1%</td>
<td>5%</td>
</tr>
<tr>
<td>Alaska</td>
<td>1%</td>
<td>5%</td>
</tr>
<tr>
<td>Ariz.</td>
<td>1%</td>
<td>5%</td>
</tr>
<tr>
<td>Ark.</td>
<td>1%</td>
<td>5%</td>
</tr>
<tr>
<td>Calif.</td>
<td>1%</td>
<td>5%</td>
</tr>
<tr>
<td>Colo.</td>
<td>1%</td>
<td>5%</td>
</tr>
<tr>
<td>Conn.</td>
<td>1%</td>
<td>5%</td>
</tr>
<tr>
<td>D.C.</td>
<td>1%</td>
<td>5%</td>
</tr>
<tr>
<td>Del.</td>
<td>1%</td>
<td>5%</td>
</tr>
<tr>
<td>Fla.</td>
<td>1%</td>
<td>5%</td>
</tr>
<tr>
<td>Ga.</td>
<td>1%</td>
<td>5%</td>
</tr>
<tr>
<td>Hawaii</td>
<td>1%</td>
<td>5%</td>
</tr>
<tr>
<td>Idaho</td>
<td>1%</td>
<td>5%</td>
</tr>
<tr>
<td>Ill.</td>
<td>1%</td>
<td>5%</td>
</tr>
<tr>
<td>Ind.</td>
<td>1%</td>
<td>5%</td>
</tr>
<tr>
<td>Iowa</td>
<td>1%</td>
<td>5%</td>
</tr>
<tr>
<td>Kan.</td>
<td>1%</td>
<td>5%</td>
</tr>
<tr>
<td>Ky.</td>
<td>1%</td>
<td>5%</td>
</tr>
<tr>
<td>La.</td>
<td>1%</td>
<td>5%</td>
</tr>
<tr>
<td>Maine</td>
<td>1%</td>
<td>5%</td>
</tr>
<tr>
<td>Mass.</td>
<td>1%</td>
<td>5%</td>
</tr>
<tr>
<td>Md.</td>
<td>1%</td>
<td>5%</td>
</tr>
<tr>
<td>Mich.</td>
<td>1%</td>
<td>5%</td>
</tr>
<tr>
<td>Miss.</td>
<td>1%</td>
<td>5%</td>
</tr>
</tbody>
</table>

Find a School

Your Address, ZIP, or school name

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

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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Source: U.S. Department of Education Office for Civil Rights
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Our latest data also includes AP pass rates and sports participation. Related: About the Data and Our Analysis »

How States Compare
...at providing students these programs across all income levels...

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

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Students Who Take Advanced Courses

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Source: U.S. Department of Education
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PHYSICS

ADVANCED MATH

GIFTED/TALENTED

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AP (PASSING)

SPORTS

across all income levels...

How States Compare

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state averages

The Reporter: Feed your head

Students Who Take Advanced Courses

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Do something

“Do something” box

Find a School

Email address

SUBSCRIBE

DONATE

Near

“Do something”, box
News apps generate stories

<table>
<thead>
<tr>
<th>Compare</th>
<th>Compare</th>
<th>Compare</th>
</tr>
</thead>
<tbody>
<tr>
<td>You can compare this school to other schools in N.Y. that are in districts with 3,000 students or more. Select one of comparisons below, or search for any school to get started.</td>
<td>New York City Public Schools</td>
<td>New York City Public Schools</td>
</tr>
<tr>
<td><strong>Williamsburg Preparatory</strong>...</td>
<td><strong>El Puente Academy For Pea</strong>...</td>
<td><strong>Williamsburg High School</strong>...</td>
</tr>
<tr>
<td>257 N 6TH ST BROOKLYN, N.Y.</td>
<td>211 SOUTH 4TH STREET BROOKLYN, N.Y.</td>
<td>257 N 6TH ST BROOKLYN, N.Y.</td>
</tr>
<tr>
<td>Students</td>
<td>Students</td>
<td>Students</td>
</tr>
<tr>
<td>470</td>
<td>195</td>
<td>395</td>
</tr>
<tr>
<td>Inexp. Teachers</td>
<td>Inexp. Teachers</td>
<td>Inexp. Teachers</td>
</tr>
<tr>
<td>0%</td>
<td>0%</td>
<td>50%</td>
</tr>
<tr>
<td>AP Courses</td>
<td>N/A</td>
<td>1</td>
</tr>
<tr>
<td>Percentage of relevant students who...</td>
<td>Percentage of relevant students who...</td>
<td>Percentage of relevant students who...</td>
</tr>
<tr>
<td>Get Free/Reduced Price Lunch</td>
<td>Get Free/Reduced Price Lunch</td>
<td>Get Free/Reduced Price Lunch</td>
</tr>
<tr>
<td>99%</td>
<td>90%</td>
<td>83%</td>
</tr>
<tr>
<td>Take at Least One AP Course</td>
<td>Take at Least One AP Course</td>
<td>Take at Least One AP Course</td>
</tr>
<tr>
<td>7%</td>
<td>N/A</td>
<td>8%</td>
</tr>
<tr>
<td>AP Pass Rate</td>
<td>AP Pass Rate</td>
<td>AP Pass Rate</td>
</tr>
<tr>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Sports Participation</td>
<td>Sports Participation</td>
<td>Sports Participation</td>
</tr>
<tr>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Sort by...

- Students
- % Inexp. Teachers
- AP Courses Offered
- % Free/Reduced Price Lunch
- % AP Enrollment
- AP Pass Rate
- % Sports Participation
- % Advanced Math Enrollment
- % Gifted/Talented
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C-Ville Weekly: Feed your head

The Reporter: Study shows area districts stack up well against state averages
Also, maps!

Two views of Southern California
Lots of maps!

Tobacco Bonds May Be Dangerous to Your State's Health

by Canary Podraad 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 years of tobacco use and smoking. Wall Street helped turn their annual payments into upfront cash by selling bonds to investors. Some of the deals included trust appreciation bonds, which obligated governments to pay out billions of their tobacco income in the future. Related: How Wall Street Turned Tobacco Into 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 $150 billion from the settlement so far (Florida, Minnesota, Texas and Mississippi settled tobacco lawsuits separately.)

- Amount pledged 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

Medicare patient claims for name-brand drugs from primary care physicians, 2011. See state by state data »

CLICK ON A STATE TO SEE:

PAYMENT SUSPENSIONS

PIPECICLE INCIDENTS BY STATE

State:
- Texas
- Louisiana
- California
- Oklahoma
- Illinois
- Kansas
- Pennsylvania
- Ohio
- Michigan
- 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/landline

http://propublica.github.io/stateface
3 Stories

California, 2010
New York, 2012
Southeast Louisiana, 1927-2014
Can we detect gerrymandering?
America’s most gerrymandered congressional districts

By Christopher Ingraham  May 15  Follow @cingraham

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

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

<table>
<thead>
<tr>
<th>Shape and Compactness Score</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Circle</td>
<td>1</td>
</tr>
<tr>
<td>Square</td>
<td>.785</td>
</tr>
<tr>
<td>Rectangle</td>
<td>.589</td>
</tr>
<tr>
<td>Four-leaf clover</td>
<td>.240</td>
</tr>
<tr>
<td>Hexagon</td>
<td>.071</td>
</tr>
</tbody>
</table>

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)

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
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 16th 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 16th 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.
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)
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 »

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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

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

— Amanda Cox, The New York Times
A large portion of Orlando's African American population is captured by the southern tail of the district, essentially "bleaching" the surrounding district, altering its racial composition to be more white.

At its narrowest point, Brown's district is only slightly wider than Highway 17.

Just north of Deltona, Florida, the district protrudes east about 4 miles to enclose a heavily populated African American neighborhood.
SimpleTiles

SimplerTiles

http://propublica.github.io/simple-tiles/
#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

```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/
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 »

A large portion of Orlando's African American population is captured by the southern tail of the district, essentially “bleaching” the surrounding district, altering its racial composition to be more white.

At its narrowest point, Brown's district is only slightly wider than Highway 17.

Just north of Deltona, Florida, the district protrudes east about 4 miles to enclose a heavily populated African American neighborhood.
New York, 2012
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).
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.

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.\footnote{FEMA's \textit{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.} 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.

FEMA has ranked all 3,146 counties in the United States based on a number of factors, including, among others, population trends, housing units, existing flood insurance rates, previous flood disasters, and the number of properties affected by previous flood disasters. Our report provides guidance for selecting the appropriate flood maps based on risk level. FEMA has published a new set of minimum standards for all flood maps and has established mapping priorities. However, the指南 does not specify standards on the appropriate data to be used in flood mapping. The guidelines do not provide criteria for selecting the level of data collection and analysis that must be performed on each map. The standards are intended to set parameters for the review of new flood maps submitted to FEMA. According to the guidelines, FEMA will conduct a mid-course review of the Map Modernization initiative. The review will assess the progress of the initiative, identify any issues that need to be addressed, and make recommendations for future actions.

At the end of the 5-year period of FEMA’s Map Modernization initiative, 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.

2005 Letter from NYS Flood Chief to FEMA

New York State Department of Environmental Conservation
Division of Water
Bureau of Program Resources & Flood Protection, 4th Floor
625 Broadway, Albany, New York 12233-3507
Phone: (518) 402-8151 • FAX: (518) 402-9029
Website: www.dec.state.ny.us

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

Dear Mr. Maurstad:

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 fruitful relationship with FEMA in the areas of flood data management, hazard zoning, and loss reduction.

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.

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.

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How bad were the maps?

<table>
<thead>
<tr>
<th>Queens</th>
<th>Kings</th>
<th>Nassau</th>
</tr>
</thead>
<tbody>
<tr>
<td>54%</td>
<td>47%</td>
<td>89%</td>
</tr>
</tbody>
</table>

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 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.

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

https://gist.github.com/ashaw/ca13422545164ff5d033
Metacritic for flood maps!

http://projects.propublica.org/fema-nynj/
Metacritic for flood maps!

Queens County

54%
2007
Most recent flood map.

Dig Deeper: Reading the Flood Insurance Study

When FEMA releases new Flood Insurance Rate Maps, they also publish a document called a Flood Insurance Study, which details how the maps changed and what data went into them. These studies provide insights into the map’s accuracy. How to Read a Flood Insurance Study »
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.

https://gist.github.com/ashaw/312aafbb62e236db5afd
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;
  }
}

https://gist.github.com/ashaw/312aafbb62e236db5afd
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

NEW ORLEANS AREA HURRICANE PROTECTION

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.

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

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.

Previous river deltas
1. 7,250-6,200 years ago
2. 6,200 to 5,700
3. 5,700 to 400
4. 4,600 to 1,800
5. 3,500 to 400
6. Today

Gulf of Mexico
Louisiana
Atchafalaya River
Mississippi River
New Orleans

The 1927 Mississippi Flood

Areas overflowed

Scale of Miles

0
50
100

Mississippi

Arkansas

Louisiana

Alabama

 Texas

Gulf of Mexico

Barry, John, Rising Tide, p. 172
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 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 action. 

Theriot, James P., American Energy, Imperiled Coast: Oil and Gas Development in Louisiana’s Wetlands, fig. 15
First Line of Defense

1. Offshore Shelf
2. Barrier Island
3. Sound
4. Marsh Landbridge
5. Natural Ridge
6. Highway
7. Flood Gate
8. Levee
9. Pump Station

Salt Marsh  Brackish Marsh  Intermediate Marsh  Fresh Marsh

SALTWATER  WETLAND HABITAT  FRESHWATER  RIDGES
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.

Some of the many canals dug by the oil and gas industry on the eastern side of the Mississippi River.
Bobby Jindal signs bill to kill lawsuit against oil, gas companies

Louisiana House supports bill to nullify levee board lawsuit

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

August 5, 2014
“Wagon wheel,” Venice, La.
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

Investigative Space Journalism!
Landsat 8
Here's a picture of LA, just like an ordinary digital camera would take (if it had ten times as many megapixels and were in space). The image is only two weeks old, taken from Landsat 8, launched by NASA late this winter. Landsat 8 is already one of our favorite data sources – and not just ours: at State of the Map last weekend, it kept coming up in conversation with people from all kinds of backgrounds. More than just adding fresh true-color imagery from Landsat 8 to MapBox Satellite, we're investing in data services using the multispectral information that the satellite provides. Its non-visual bands let us analyze everything from terrain types to crop growth to natural disasters – all around the world, sometimes within hours. This post introduces some of Landsat 8's features, to give you a feel for what the world looks like through its lens.

Since its launch in February 2013, Landsat 8 has collected about 400 scenes of the Earth's surface per day. Each of these scenes covers an area of about 185 by 185 kilometers (115 by 115 miles)—34,200 square km (13,200 square miles)—for a total of 13,690,000 square km (5,290,000 square miles) per day. An area about 40% larger than the United States. Every day.
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

State capital
County seat names
Larger cities
Town or village
Railroads

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

Modified polyconic projection
North American datum
Creating “land”

Buras, La. land loss 1932 to present via USGS, over 2014 Landsat 8
Creating “land”

Buras, La. land loss 2009 via USGS, over 2014 Landsat 8
Creating “land”

http://pubs.usgs.gov/sim/3164/
Creating ‘land’

```
colors = {
    "1932-1956-gain" : "rgba(0,66,0,1)",
    "1956-1973-gain" : "rgba(28,102,0,1)",
    "1973-1975-gain" : "rgba(51,135,5,1)",
    "1975-1977-gain" : "rgba(76,168,10,1)",
    "1977-1985-gain" : "rgba(102,201,15,1)",
    "1985-1988-gain" : "rgba(109,165,28,1)",
    "1988-1990-gain" : "rgba(109,150,33,1)",
    "1990-1995-gain" : "rgba(107,135,38,1)",
    "1995-1998-gain" : "rgba(102,119,40,1)",
    "1998-1999-gain" : "rgba(96,107,45,1)",
    "1999-2002-gain" : "rgba(112,114,45,1)",
    "2002-2004-gain" : "rgba(135,132,43,1)",
    "2004-2006-gain" : "rgba(147,117,43,1)",
    "2006-2008-gain" : "rgba(153,104,43,1)",
    "2008-2009-gain" : "rgba(104,79,33,1)",
    "2009-2010-gain" : "rgba(114,79,33,1)",
    "1932-1956-loss" : "rgba(137,0,0,1)",
    "1956-1973-loss" : "rgba(239,71,84,1)",
    "1973-1975-loss" : "rgba(211,94,43,1)",
    "1975-1977-loss" : "rgba(219,132,35,1)",
    "1977-1985-loss" : "rgba(229,165,25,1)",
    "1985-1988-loss" : "rgba(255,198,17,1)",
    "1988-1990-loss" : "rgba(244,242,10,1)",
    "1990-1995-loss" : "rgba(168,255,255,1)",
    "1995-1998-loss" : "rgba(2,191,201,1)",
    "1998-1999-loss" : "rgba(5,163,229,1)",
    "1999-2002-loss" : "rgba(10,130,234,1)",
    "2002-2004-loss" : "rgba(76,30,242,1)",
    "2004-2006-loss" : "rgba(198,153,239,1)",
    "2006-2008-loss" : "rgba(168,38,204,1)",
    "2008-2009-loss" : "rgba(130,51,137,1)",
    "2009-2010-loss" : "rgba(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:`
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 comes from wells in more than a thousand feet of water. U.S. Gulf oil reserves are estimated at 41.9 billion barrels, but the Deepwater Horizon disaster showed that the challenges of deep drilling are formidable.
DAY 1
Milngavie to Drymen

5 Hours / 19 km  419 m  307 m

Looking at the map, the first couple of hours of the West Highland Way may not look that promising. The first day the trail keeps close to roads and buildings of all sorts. Please, don't trust this first impression. Most of the time, the West Highland Way cleverly avoids the bustle of the outskirts of Glasgow. It also feels right. You're leaving Milngavie behind and with it the routines and hassle - or maybe even stress - of your daily life.

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...
Louisiana is drowning, quickly.

In just 80 years, some 2,000 square miles of its coastal landscape have turned to open water, wiping places off maps, bringing the Gulf of Mexico to the back door of New Orleans and posing a lethal threat to an energy and shipping corridor vital to the nation’s economy.

And it’s going to get worse, even quicker.

Scientists now say one of the greatest environmental and economic disasters in the nation’s history is rushing toward a catastrophic conclusion over the next 50 years, so far unabated and largely unnoticed.

At the current rates that the sea is rising and land is sinking, National Oceanic and Atmospheric Administration scientists say by 2100 the Gulf of Mexico could rise as much as 43 feet across this landscape, which has an average elevation of about 3 feet. If that happens, everything outside the protective levees — most of Southeast Louisiana — would be underwater.

1922

Over 7,000 years, the deltas of the Mississippi River created all of southern Louisiana, including vast coastal wetlands covering 6,000 square miles — the Amazon of North America. In the 1930s, coastal Louisiana was about 25% bigger than it is now. About 1,883 square miles are gone, according to the USGS.
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Source: NASA/USGS Landsat

2014

Today, residents of Southeast Louisiana face a losing equation: They live on narrow slices of high ground that are sinking as the Gulf rises. The state has an ambitious plan that could balance that equation by 2060, but it doesn’t have the $50 billion to pay for it.

Explore Delacroix, La.
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Canals

The sinking that started with the levees went into overdrive after more than 10,000 miles of canals were dredged to reach oil and gas wells. Researchers say this vast spiderweb of canals, only a portion of which is shown here due to the lack of available data, is responsible for up to 60 percent of the wetlands lost since the 1930s.

Source: A. Tweet, Louisiana State University, 2013

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projects.propublica.org/louisiana

Buras
Fishing in the land of used-to-be's

As late as 2013, those heading to the Gulf of Mexico from Buras would have to boat across Bay Pomme D'Or, English Bay, Bay Jacquin, Cyprien Bay and Scofield Bay before reaching his destination.
That ProPublica/The Lens report on the sinking Louisiana coastline makes me want to curl up in a ball and die, honestly.

#LosingGround
Geographic accountability

- Queens: 54% of Sandy flood area predicted by flood maps
- Kings: 47% of Sandy flood area predicted by flood maps
- Nassau: 89% 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 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.

Stockton
Thank you!

al.shaw@propublica.org  @A_L

http://j.mp/foss4g14-shaw