USA TODAY's Approach to Visualization and Its Relevance to NHTS

Paul Overberg

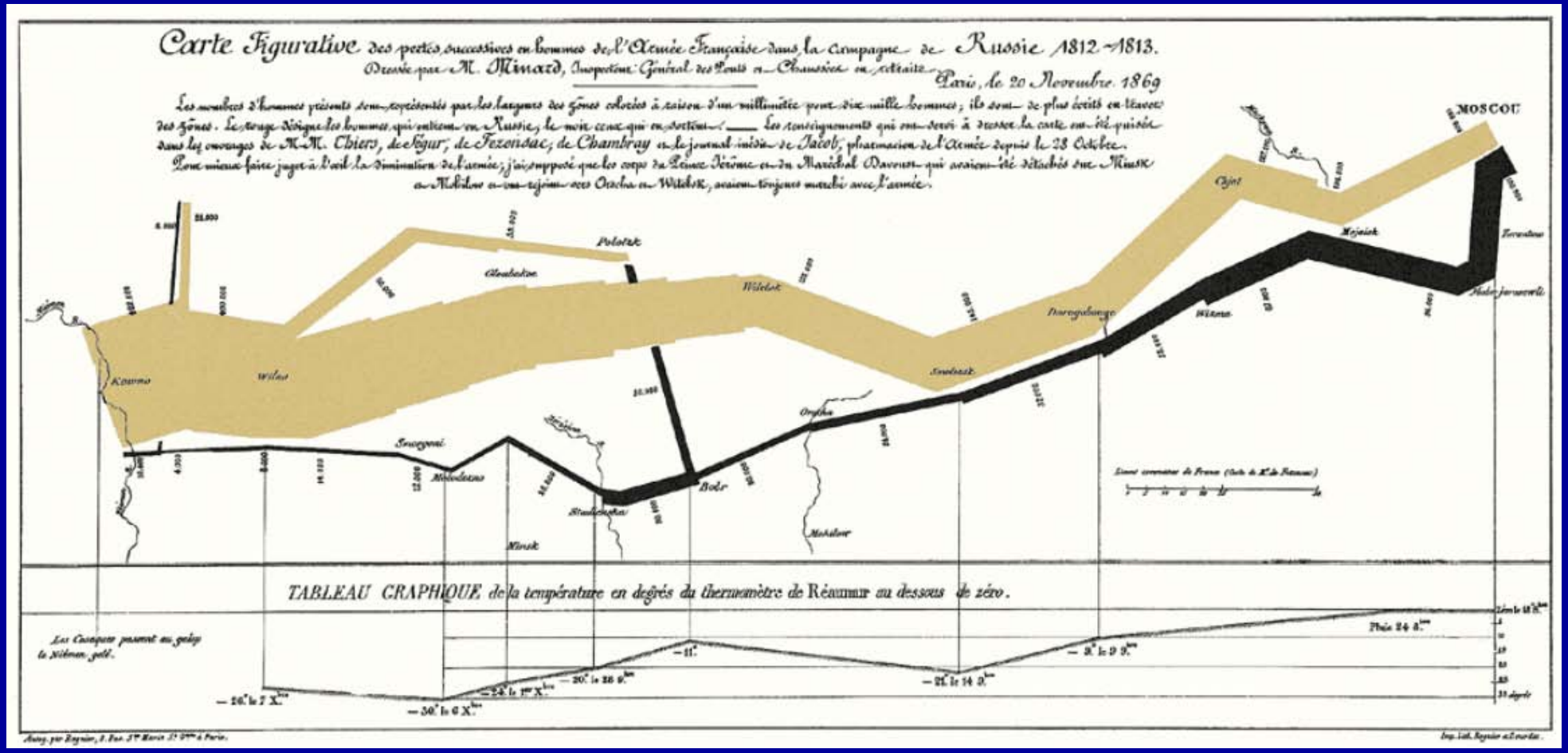
USA TODAY

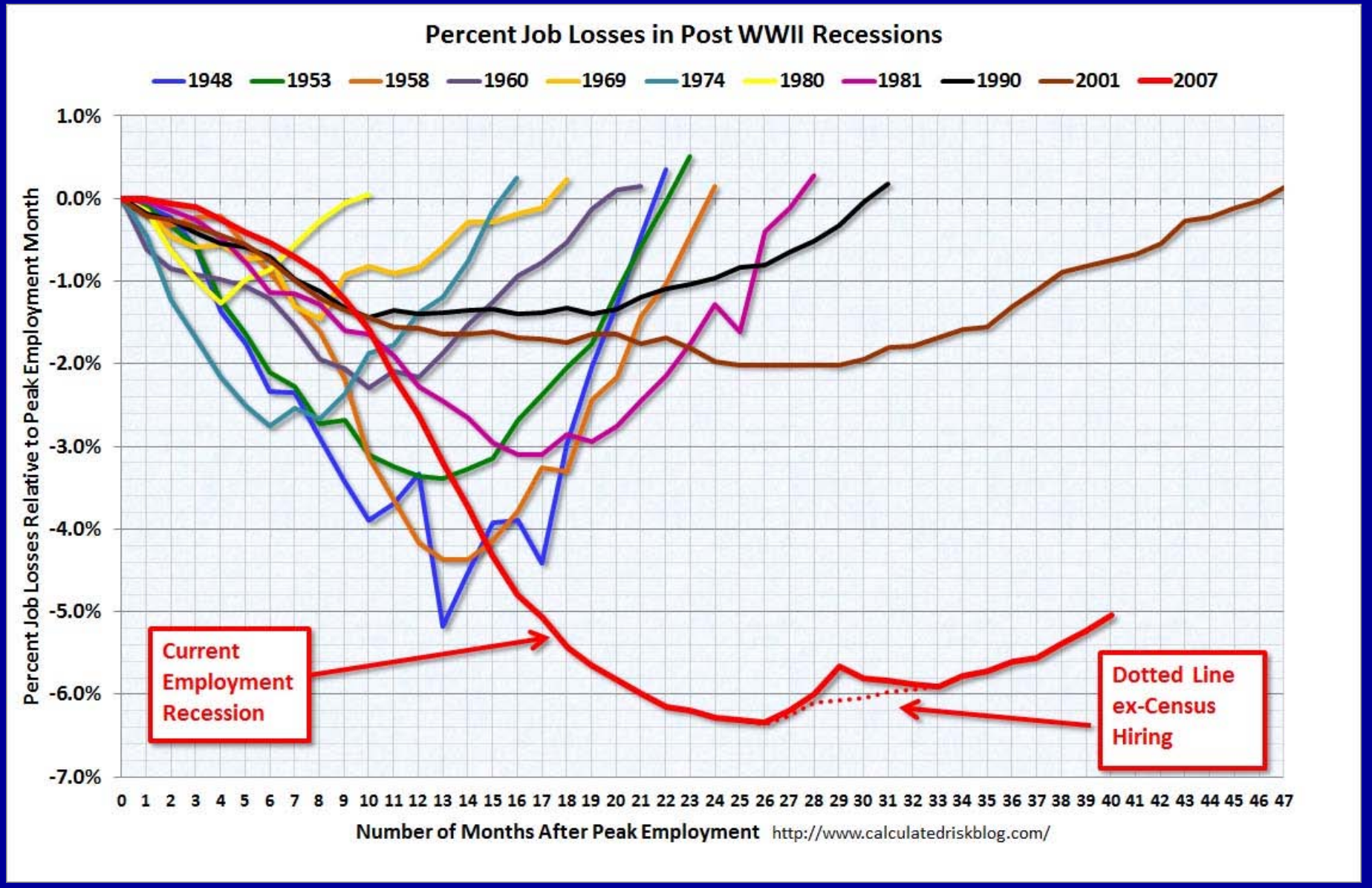
TRB Workshop

June 6, 2011

Outline

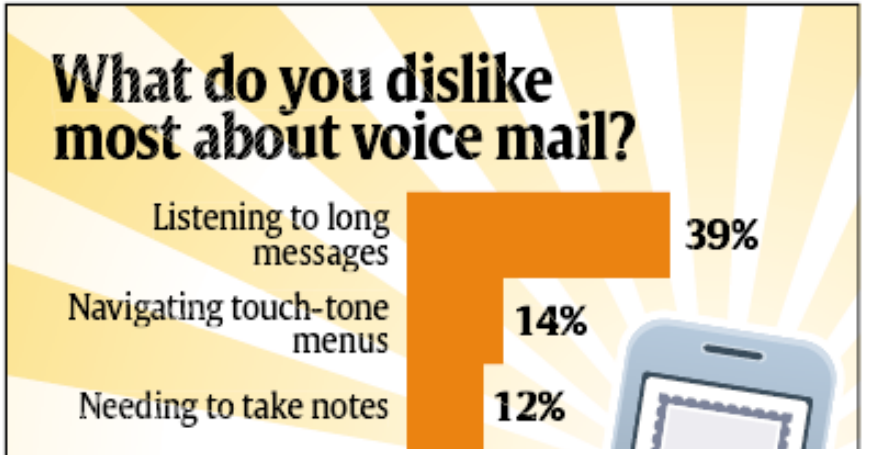
- “Data visualization”?
- USA TODAY examples
- How we think about info graphics
- Opening data for experimentation


Carte Figurative des pertes successives en hommes de l'Armée Française dans la campagne de Russie 1812-1813.
Dressée par M. Minard, Inspecteur Général des Ponts et Chaussées en retraite.
Paris, le 20 Novembre 1869
Les nombres d'hommes présents sont représentés par les largeurs des zônes colorées à raison d'un millimètre pour dix mille hommes; ils sont de plus écrits en travers des zônes. Le rouge désigne les hommes qui entrent en Russie, le noir ceux qui en sortent. — Les renseignements qui ont servi à dresser la carte ont été puisés dans les ouvrages de MM. Thiers, de Ségur, de Fezensac, de Chambray et le journal inédit de Jacob, pharmacien de l'Armée depuis le 28 Octobre.
Pour mieux faire juger à l'œil la diminution de l'armée, j'ai supposé que les corps du Prince Jérôme et du Maréchal Davoust qui avaient été détachés sur Minsk et Mohilow et ont rejoint vers Orscha et Witebsk, avaient toujours marché avec l'armée.
MOSCOU
Polotzk
Gloubokoe
Witebsk
Kowno
Wilna
Smolensk
Dorogobouge
Wizma
Mojaisk
Chjat
Tarantino
Smorgoni
Molodezno
Studienska
Bobr
Orscha
Mohilow
Minsk
TABLEAU GRAPHIQUE de la température en degrés du thermomètre de Réaumur au dessous de zéro.
Les Cosaques passent au galop le Niémen gelé.
— 26° le 7 Xbre
— 30° le 6 Xbre
— 24° le 1er Xbre
— 20° le 28 9bre
— 11°
— 21° le 14 9bre
— 9° le 9 9bre
Pluie 24 8bre


Percent Job Losses in Post WWII Recessions
1948
1953
1958
1960
1969
1974
1980
1981
1990
2001
2007
1.0%
0.0%
-1.0%
-2.0%
-3.0%
-4.0%
-5.0%
-6.0%
-7.0%
Percent Job Losses Relative to Peak Employment Month
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47
Number of Months After Peak Employment
http://www.calculatedriskblog.com/
Current Employment Recession
Dotted Line ex-Census Hiring

USA TODAY Snapshots®

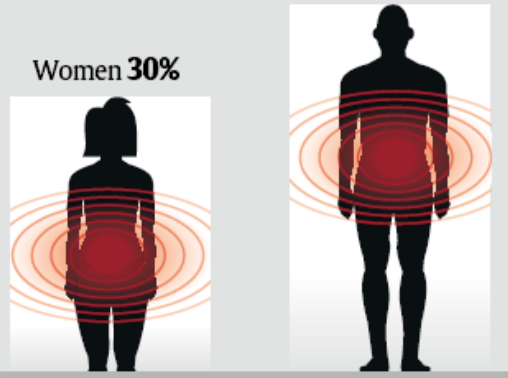
What do you dislike most about voice mail?



USA TODAY Snapshots®

Women misjudge colon cancer risk

This year more than 50,000 people in the USA will die from colon cancer. Men and women over 50 are equally likely to develop the disease, but only a percentage believe they are at risk.



Source: American Cancer Society

By Ashley Burrell and Sam Ward, USA TODAY

For many, a sealed fate …

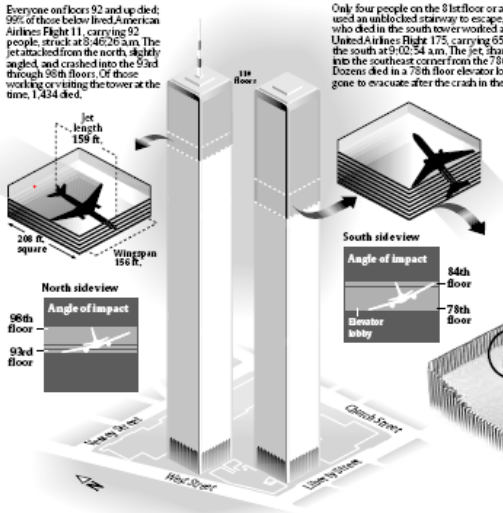
The fate of nearly everyone inside the World Trade Center was sealed the moment the hijacked jets struck on Sept 11. All but four people at or above the crash zones died. Nearly everyone below lived. Most people died in the north tower, which was hit first. But more than 1,000 people used the 16½-minute gap between the first and second crashes to evacuate the south tower's upper floors. Nearly 500 rescue workers lost their lives when the towers collapsed. Here's how the evacuation unfolded:

The north tower

Everyone on floors 92 and up died; 99% of those below lived. American Airlines Flight 11, carrying 92 people, struck at 8:46:26 a.m. The jet attacked from the north, slightly angled, and crashed into the 93rd through 98th floors. Of those working or visiting the tower at the time, 1,434 died.

The south tower

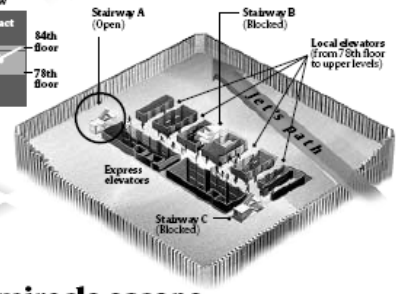
Only four people on the 81st floor or above survived; they used an unblocked stairway to escape. All but four of the 599 who died in the south tower worked above the impact zone. United Airlines Flight 175, carrying 65 people, struck from the south at 9:02:54 a.m. The jet, sharply angled, crashed into the southeast corner from the 78th through 84th floors. Dozens died in a 78th floor elevator lobby, where they had gone to evacuate after the crash in the other tower.



A narrow escape

Flight 175 destroyed two of the three stairways in the impact zone. But Stairway A, farthest from the crash, remained unobstructed from the top to the bottom of the south tower. A small number of people escaped down the stairway; several from the 78th floor elevator lobby, where dozens died, plus four from above. An unknown number of people climbed the stairs toward the roof in search of a helicopter rescue that never came.

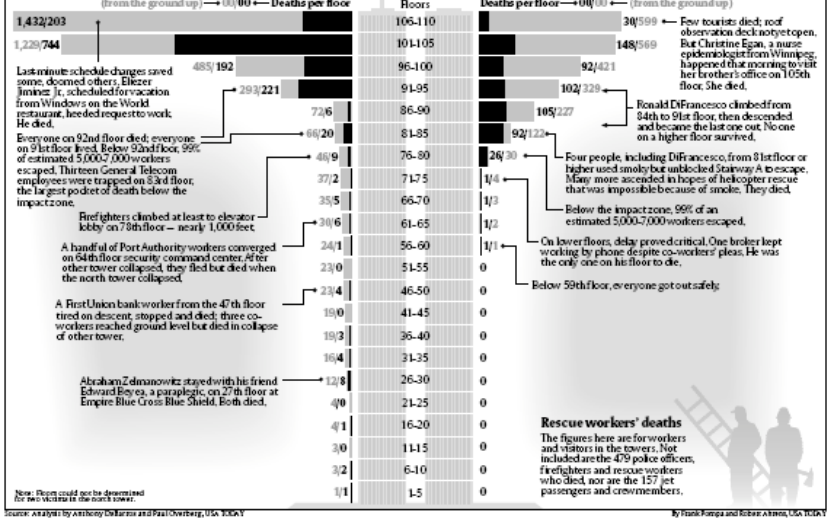
The layout of the 78th floor:



… for thousands of others, a miracle escape

More than 6,000 were feared to have died in the World Trade Center attacks, but that figure was based on missing-persons reports compiled by New York City police. A USA TODAY count shows the toll was fewer than 3,000, including 2,180 building occupants.

Where victims worked or were located:



Note: Floors could not be determined for two victims in the north tower.

Source: Analysis by Anthony DeBarros and Paul Overberg, USA TODAY

By Frank Pompa and Robert Ariens, USA TODAY

Rescue workers' deaths

The figures here are for workers and visitors in the towers. Not included are the 479 police officers, firefighters and rescue workers who died, nor are the 157 jet passengers and crew members.

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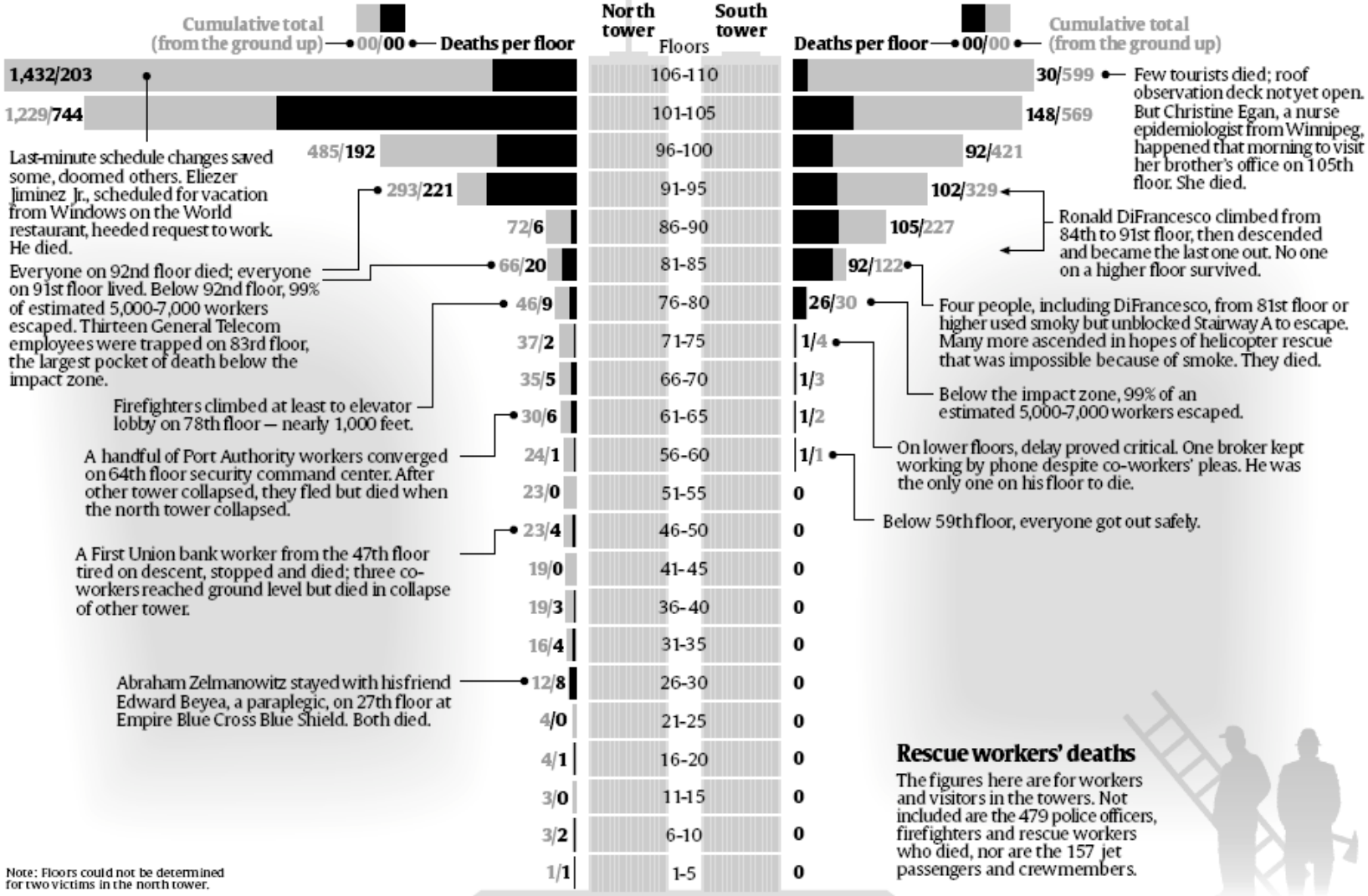

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By Frank Pompa and Robert Ahrens, USA TODAY

Forces behind Katrina's fury

A combination of factors made Hurricane Katrina and its aftermath particularly devastating:

By David J. Phillip, AP

Flood wall repair continues Sunday.

► The storm swung southwest across Florida, then drew extra strength as it crossed an unusually warm current in the Gulf of Mexico.

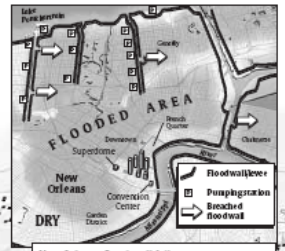
► Katrina's path carried it directly across a major source of U.S. crude oil and natural gas production, refining and distribution.

► By slamming head-on into the Gulf Coast just east of New Orleans, Katrina funneled its fury into several bays where water rose with deadly effects.

► Finally, Katrina's path allowed its winds to roar south across swollen Lake Pontchartrain. That piled water against the most vulnerable flood-control barriers of a city situated largely below sea level.

Sources: National Weather Service, National Climatic Data Center, National Ocean Service, Minerals Management Service, Energy Department, Casino Association of Louisiana and Mississippi Gaming Commission.

Graphic research by Paul Overberg and April Umminger; graphics by Dave Merrill, Kari Geller and Robert A Iremi



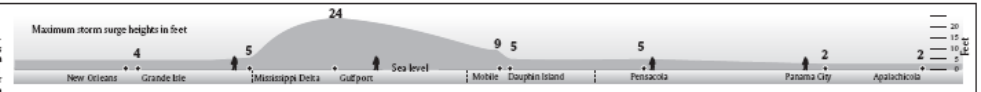
New Orleans flood wall failure

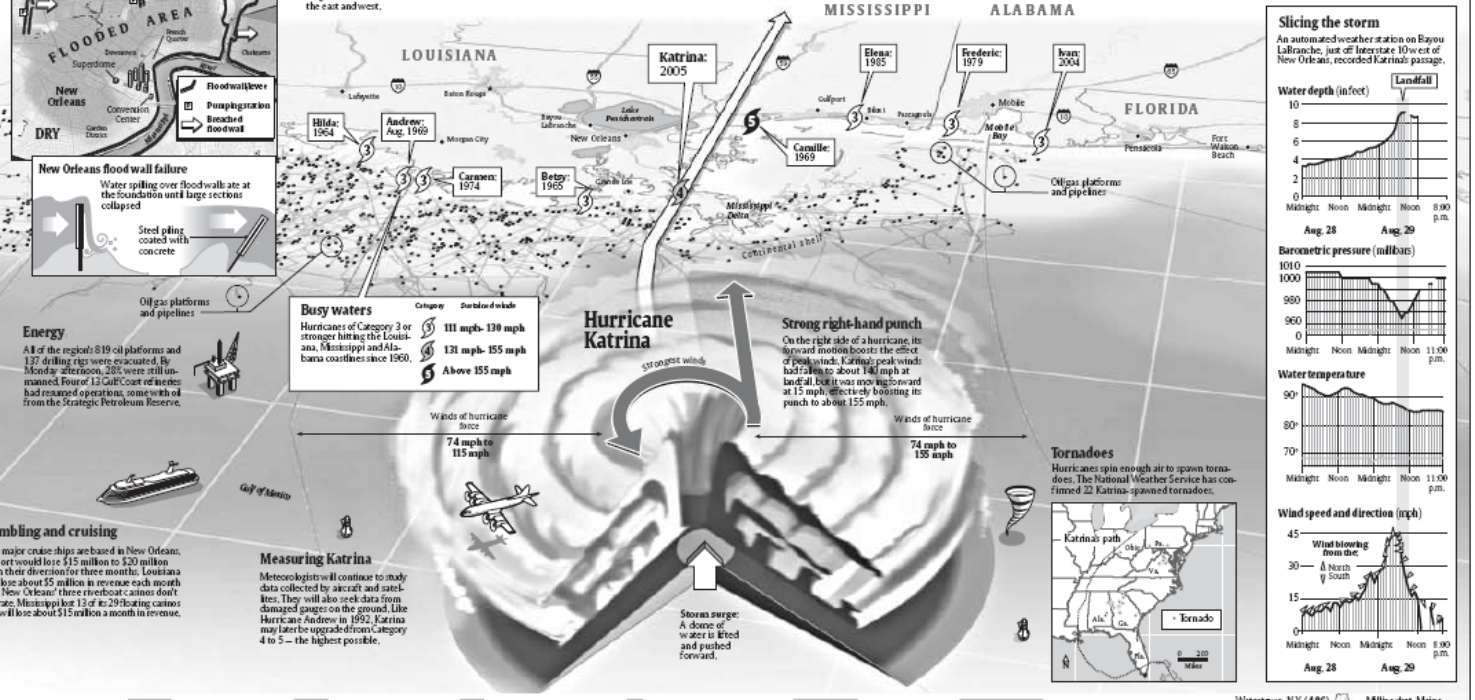
Water spilling over floodwalls ate at the foundation until large sections collapsed

Steel piling coated with concrete

Storm surge

By creating low atmospheric pressure, a hurricane lifts the sea level. This dome of water rises to destructive heights at landfall. Katrina's storm surge peaked at more than 20 feet near Biloxi and Gulfport, Miss., not including waves. Lesser surges were measured more than 100 miles to the east and west.





Busy waters

Category	Sustained winds
3	111 mph- 130 mph
4	131 mph- 155 mph
5	Above 155 mph

Hurricanes of Category 3 or stronger hitting the Louisiana, Mississippi and Alabama coastlines since 1960.

Energy

All of the region's 819 oil platforms and 127 drilling rigs were evacuated. By Monday afternoon, 28% were still unmanned. Four of 13 Gulf Coast refineries had resumed operations, some with oil from the Strategic Petroleum Reserve.

Strong right-hand punch

On the right side of a hurricane, its forward motion boosts the effect of peak winds. Katrina's peak winds had fallen to about 140 mph at landfall, but it was moving forward at 15 mph, effectively boosting its punch to about 155 mph.

Gambling and cruising

Two major cruise ships are based in New Orleans. Its port would lose $15 million to $20 million from their diversion for three months. Louisiana will lose about $5 million in revenue each month that New Orleans' three riverboat casinos don't operate. Mississippi lost 13 of its 29 floating casinos and will lose about $15 million a month in revenue.

Measuring Katrina

Meteorologists will continue to study data collected by aircraft and satellites. They will also seek data from damaged gauges on the ground. Like Hurricane Andrew in 1992, Katrina may later be upgraded from Category 4 to 5 -- the highest possible.

Tornadoes

Hurricanes spin enough air to spawn tornadoes. The National Weather Service has confirmed 22 Katrina-spawned tornadoes.

Slicing the storm

An automated weather station on Bayou LaBranche, just off Interstate 10 west of New Orleans, recorded Katrina's passage.

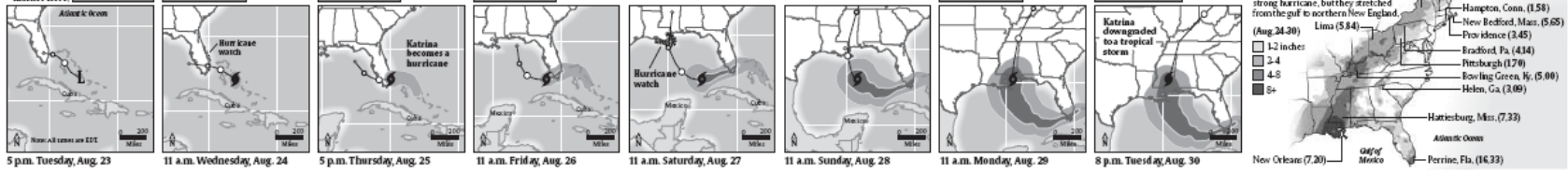
Tracking the storm

Forecast position: 72 hours, 48 hours, 24 hours

Hurricane

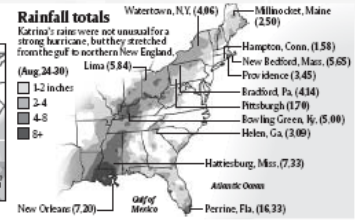
Tropical storm

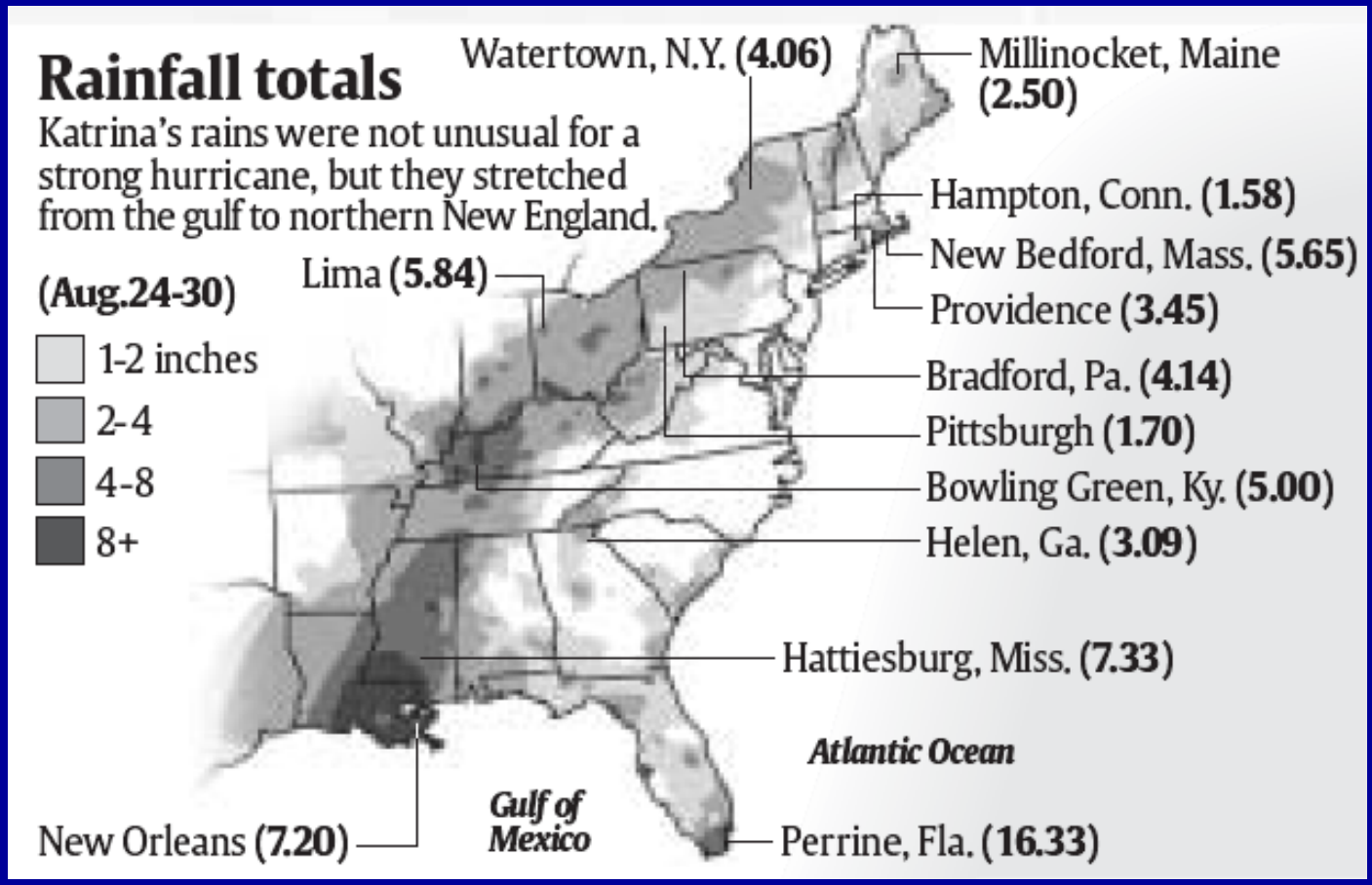
Wind swath: Above 73 mph; 39 mph -73 mph



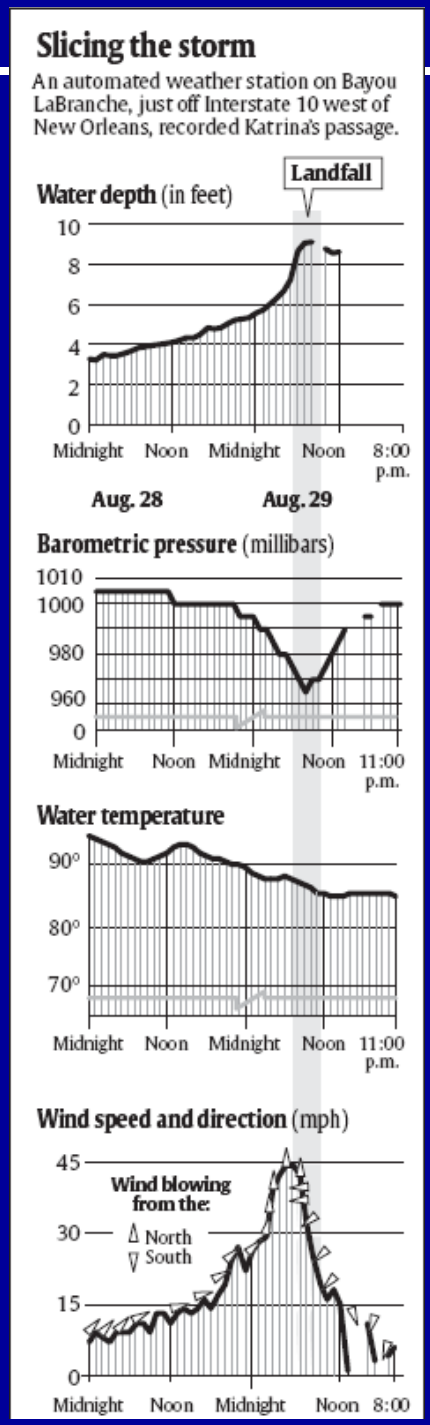
Rainfall totals

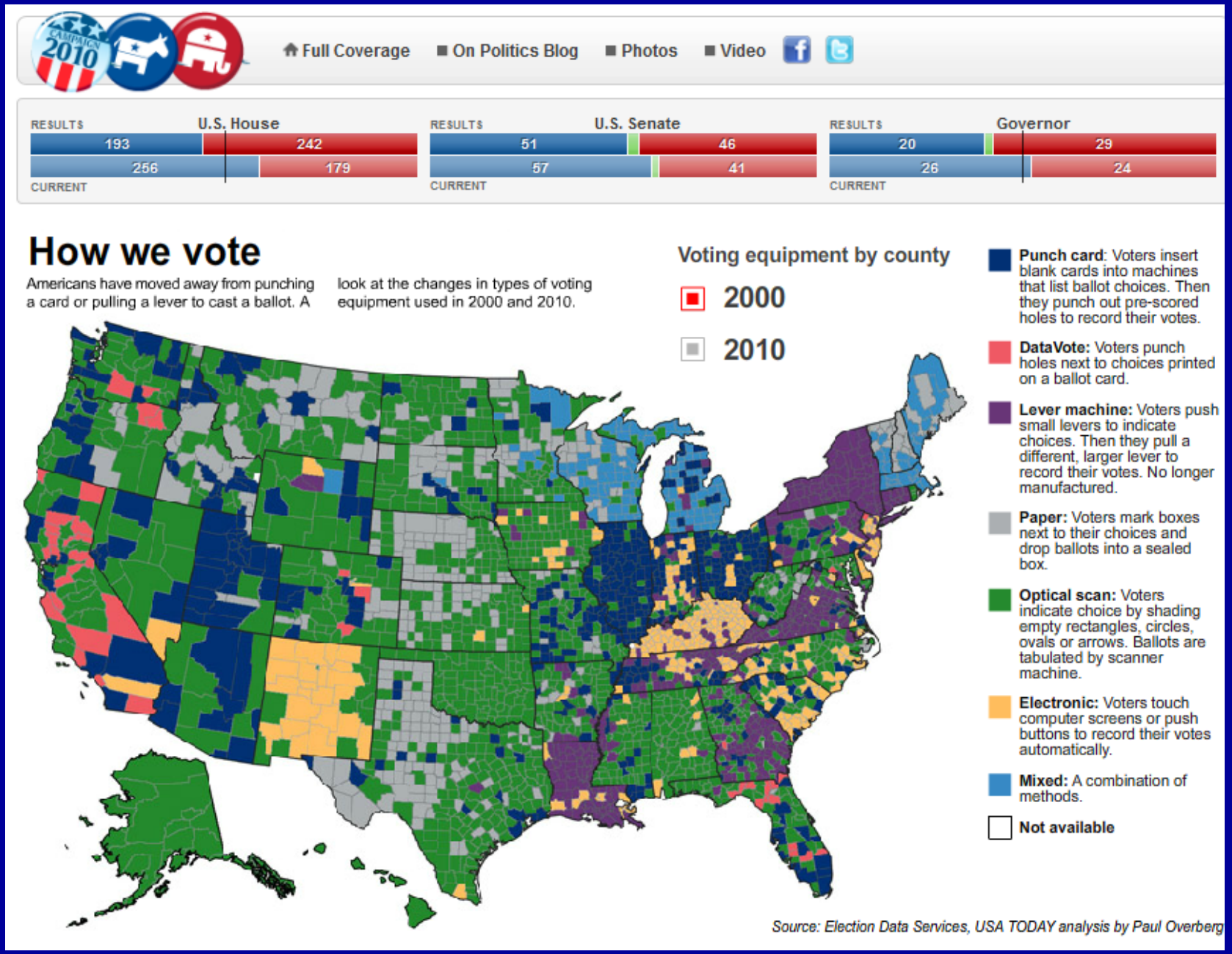
Katrina's rains were not unusual for a strong hurricane, but they stretched from the gulf to northern New England.




Rainfall totals
Katrina's rains were not unusual for a strong hurricane, but they stretched from the gulf to northern New England.
(Aug.24-30)
1-2 inches
2-4
4-8
8+
Watertown, N.Y. (4.06)
Millinocket, Maine (2.50)
Hampton, Conn. (1.58)
New Bedford, Mass. (5.65)
Providence (3.45)
Lima (5.84)
Bradford, Pa. (4.14)
Pittsburgh (1.70)
Bowling Green, Ky. (5.00)
Helen, Ga. (3.09)
Hattiesburg, Miss. (7.33)
Atlantic Ocean
Gulf of Mexico
New Orleans (7.20)
Perrine, Fla. (16.33)

Maximum storm surge heights in feet
24
4
5
9
5
Sea level
New Orleans
Grande Isle
Mississippi Delta
Gulfport
Mobile
Dauphin Island

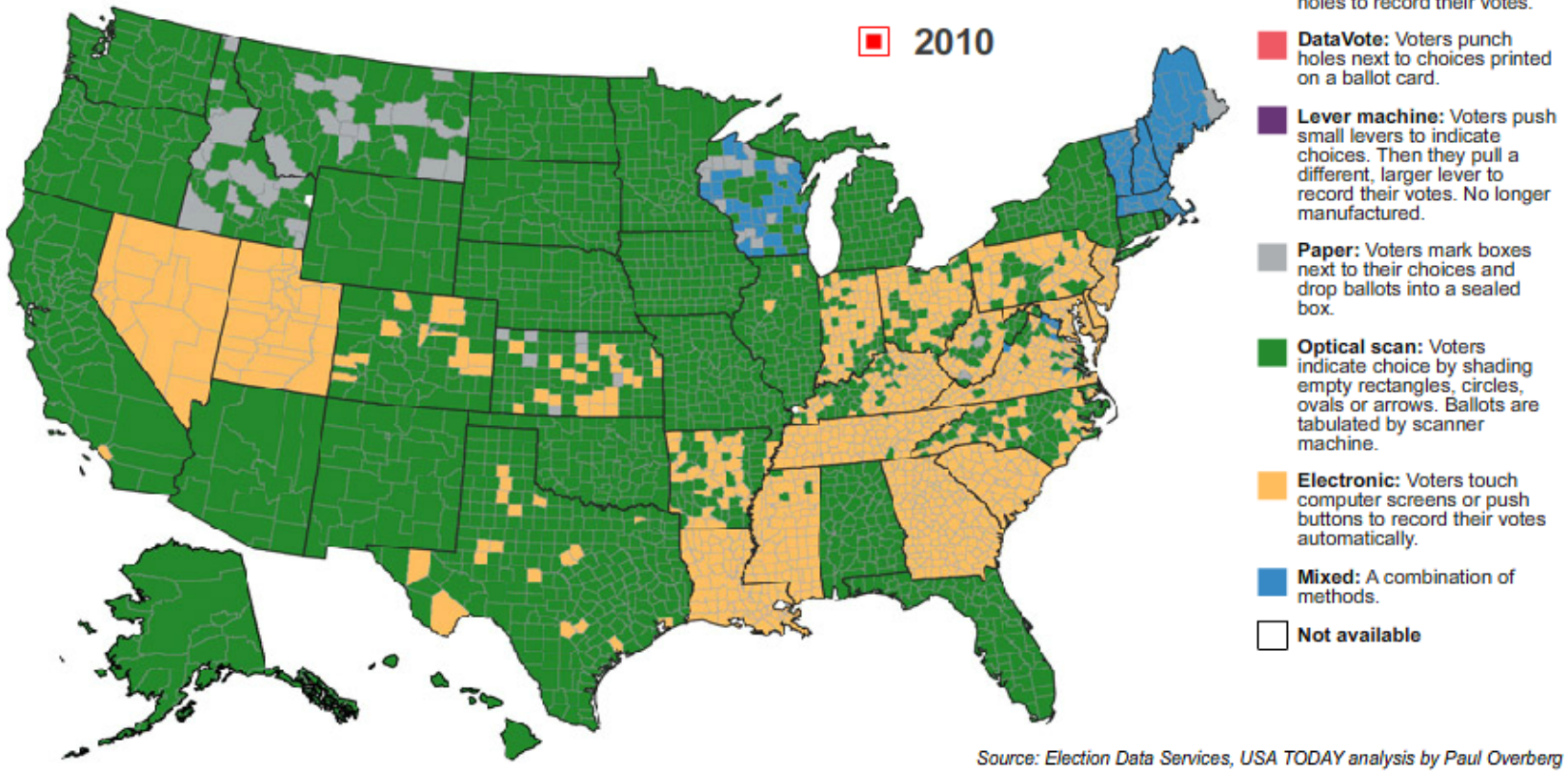

Slicing the storm
An automated weather station on Bayou LaBranche, just off Interstate 10 west of New Orleans, recorded Katrina's passage.
Landfall
Water depth (in feet)
10
8
6
4
2
0
Midnight
Noon
Midnight
Noon
8:00 p.m.
Aug. 28
Aug. 29
Barometric pressure (millibars)
1010
1000
980
960
0
Midnight
Noon
Midnight
Noon
11:00 p.m.
Water temperature
90°
80°
70°
Midnight
Noon
Midnight
Noon
11:00 p.m.
Wind speed and direction (mph)
45
30
15
0
Wind blowing from the:
North
South
Midnight
Noon
Midnight
Noon
8:00


2010
Full Coverage
On Politics Blog
Photos
Video
RESULTS
U.S. House
193
242
256
179
CURRENT
RESULTS
U.S. Senate
51
46
57
41
CURRENT
RESULTS
Governor
20
29
26
24
CURRENT
How we vote
Americans have moved away from punching a card or pulling a lever to cast a ballot. A look at the changes in types of voting equipment used in 2000 and 2010.
Voting equipment by county
2000
2010
Punch card: Voters insert blank cards into machines that list ballot choices. Then they punch out pre-scored holes to record their votes.
DataVote: Voters punch holes next to choices printed on a ballot card.
Lever machine: Voters push small levers to indicate choices. Then they pull a different, larger lever to record their votes. No longer manufactured.
Paper: Voters mark boxes next to their choices and drop ballots into a sealed box.
Optical scan: Voters indicate choice by shading empty rectangles, circles, ovals or arrows. Ballots are tabulated by scanner machine.
Electronic: Voters touch computer screens or push buttons to record their votes automatically.
Mixed: A combination of methods.
Not available
Source: Election Data Services, USA TODAY analysis by Paul Overberg

	RESULTS	CURRENT
U.S. House	193 / 242	256 / 179
U.S. Senate	51 / 46	57 / 41
Governor	20 / 29	26 / 24

How we vote

Americans have moved away from punching a card or pulling a lever to cast a ballot. A look at the changes in types of voting equipment used in 2000 and 2010.



Source: Election Data Services, USA TODAY analysis by Paul Overberg

Jobs forecast 2011

View by metro | View by state

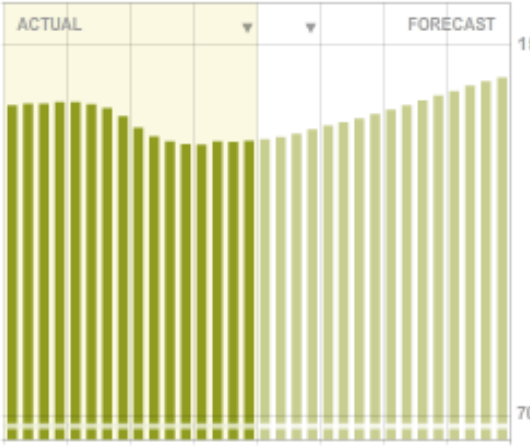
One-year forecast change in jobs: United States: All sectors: 1.7%

Job sectors

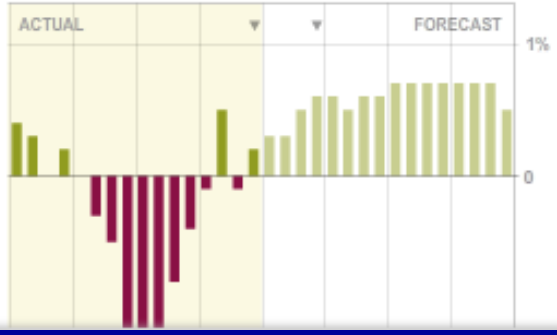
- All sectors
- Construction
- Education & health services
- Financial activities
- Government
- Information
- Leisure & hospitality
- Manufacturing
- Natural resources & mining
- Other services
- Professional & business services
- Retail trade
- Transportation & warehousing
- Utilities
- Wholesale trade

All sectors: Total number of persons on establishment payrolls employed full or part time. Excludes proprietors, self-employed, unpaid family or volunteer workers, farmworkers, and domestic workers.

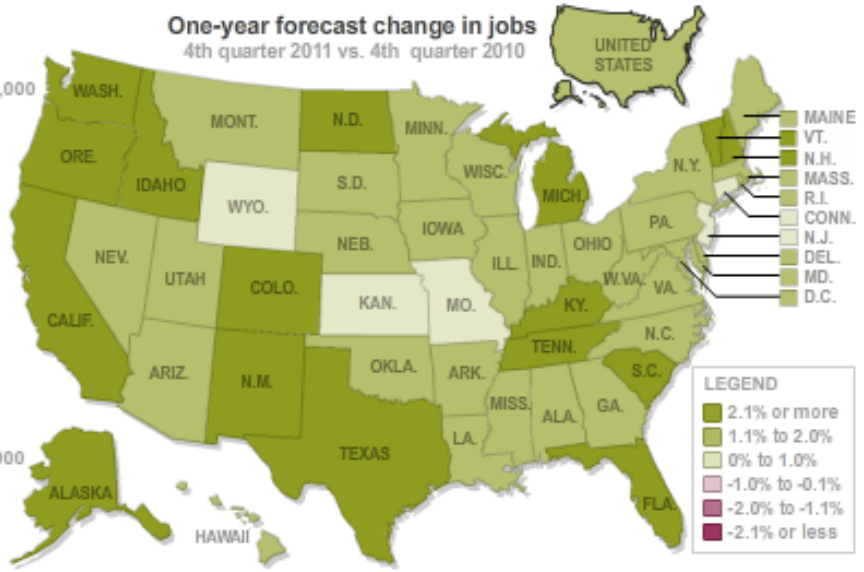
Number of jobs, by quarter



Percent change in jobs from preceding quarter



One-year forecast change in jobs
4th quarter 2011 vs. 4th quarter 2010



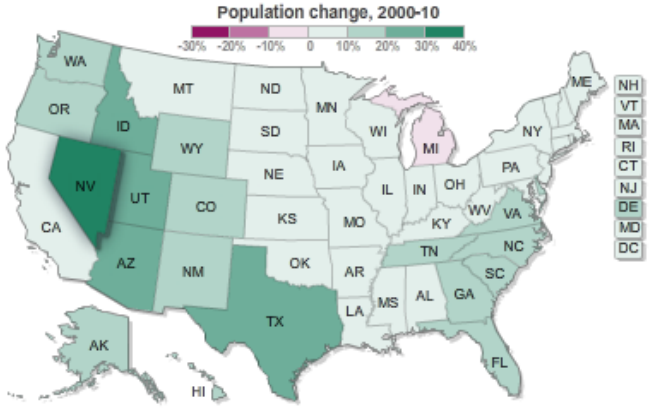
State	One-year forecast change in jobs
Tennessee	2.2%
Texas	3.2%
United States	1.7%
Utah	1.3%
Vermont	2.6%
Virginia	2.0%
Washington	2.2%

Census 2010 | VIDEO: What is reapportionm | Alabama

Current U.S. POPULATION
311,447,236
This year
BIRTHS DEATHS NET IMMIGRATION
1,745,546 1,110,802 305,470

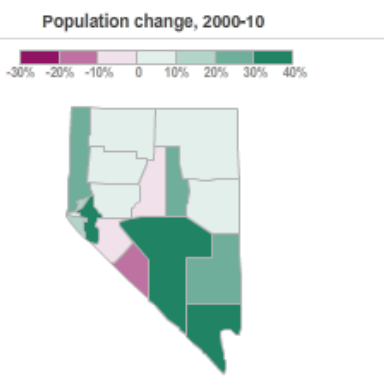
Census 2010 data show population and diversity trends

Click on states and counties to see the first local data from the 2010 Census. Data on population trends and racial and ethnic makeup for thousands of localities has been released.



Nevada demographics

2010 Population	2,700,551
Pct. change, 2000-10	35.1%
Pop. density	24.6 per sq. mile
White	66.2%
Black	8.1%
Am. Indian	1.2%
Asian	7.2%
Native Hawaiian	0.6%
2 or more	4.7%
Other	12.0%
Non-Hispanic	73.5%
Hispanic	26.5%
Diversity Index*	65



Nevada 2010 Census data: Explore counties, cities and towns.

Graphic by Anthony DeBarros, Barbara Hansen, Raul Miller, Paul Overberg, Juan Thomassie

* The USA TODAY Diversity Index is a 0-100 score that represents the probability that two people chosen randomly from an area will have different racial or ethnic backgrounds. A score of 50 means there is a 50% chance they are different.

census | Comments 342 | Recommend 7

Fewer couples embrace marriage, more live together

CAPTION STR, AP

By Haya El Nasser and Paul Overberg, USA TODAY

Top news

census | Comments 899 | Recommend 13
Blacks' exodus reshapes cities

census | Comments 26 | Recommend 3
Census shows growth among Asian Indians

census | Comments 164 | Recommend 11
After 50 years of decline, household size is growing

nation | Comments 19 | Recommend 3
Suburban growth focused on inner and outer communities

census | Comments 6 | Recommend 5
Growth slowed in U.S. metros last decade

USA TODAY info graphics

- Think outside in – user perspective
- Think about various kinds of users
- Show – don’t tell
- Simplify, simplify, simplify

USA TODAY info graphics

- Report, report, report
- What story can we tell?
- Sketch (wire-frame)
- Build, revise, build, revise, etc.
- Edit, edit, edit

Get out of the way – data API

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- Articles
- Best-Selling Books
- Book Reviews
- Census
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- Snapshots
- Sports Salaries

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Getting started

- Browse documentation for our APIs in the left rail.
- Read our Terms of Use.
- Request an API key, or access your existing keys.
- Contribute to our forum, or follow us on Twitter.

Featured Applications

Seesmic Plugin

Newsdeck

Marriott GoBoard

Get out of the way – data API


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      graduates.
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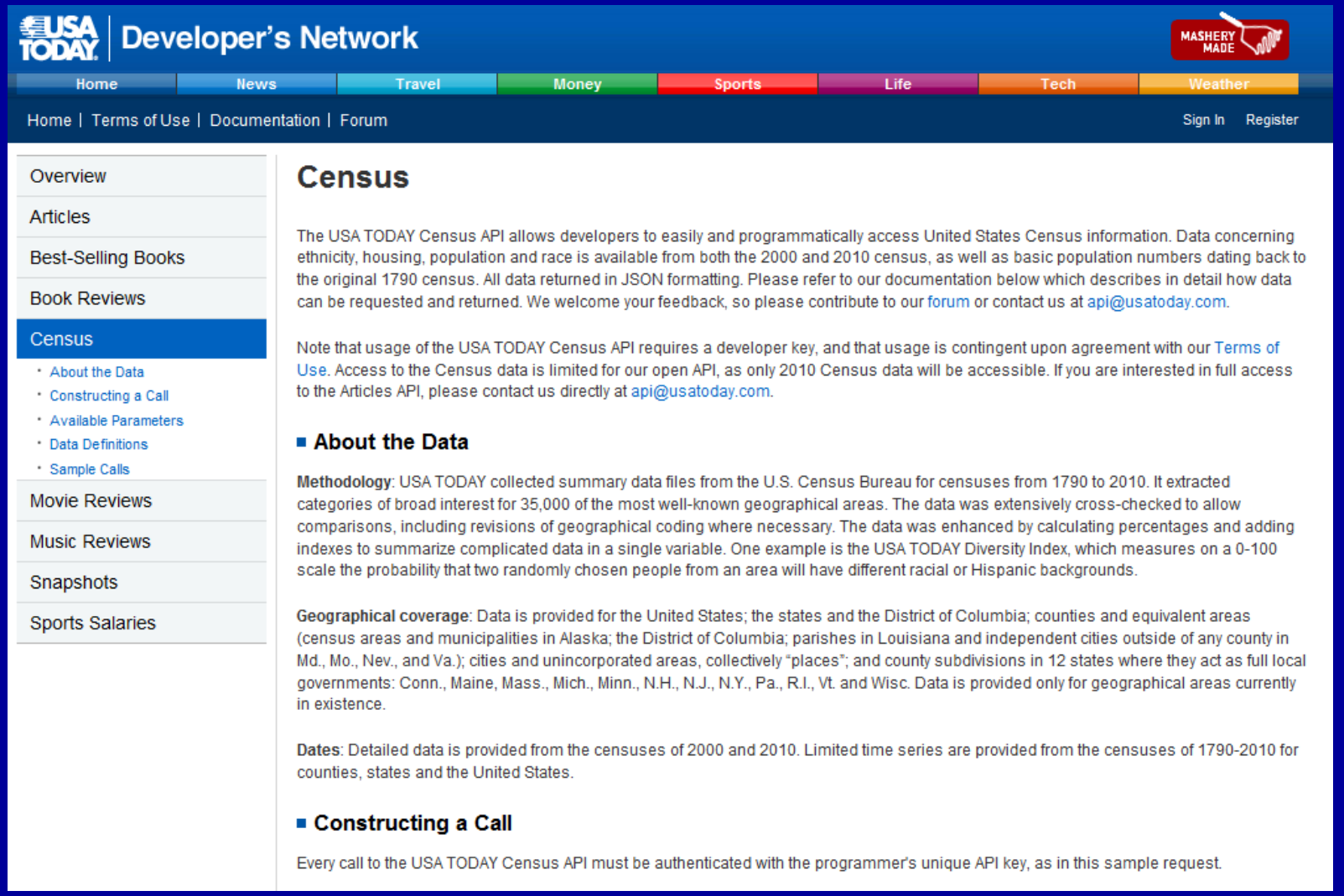
```

Get out of the way – data API



USA TODAY | Developer's Network

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Census

The USA TODAY Census API allows developers to easily and programmatically access United States Census information. Data concerning ethnicity, housing, population and race is available from both the 2000 and 2010 census, as well as basic population numbers dating back to the original 1790 census. All data returned in JSON formatting. Please refer to our documentation below which describes in detail how data can be requested and returned. We welcome your feedback, so please contribute to our forum or contact us at api@usatoday.com.

Note that usage of the USA TODAY Census API requires a developer key, and that usage is contingent upon agreement with our Terms of Use. Access to the Census data is limited for our open API, as only 2010 Census data will be accessible. If you are interested in full access to the Articles API, please contact us directly at api@usatoday.com.

About the Data

Methodology: USA TODAY collected summary data files from the U.S. Census Bureau for censuses from 1790 to 2010. It extracted categories of broad interest for 35,000 of the most well-known geographical areas. The data was extensively cross-checked to allow comparisons, including revisions of geographical coding where necessary. The data was enhanced by calculating percentages and adding indexes to summarize complicated data in a single variable. One example is the USA TODAY Diversity Index, which measures on a 0-100 scale the probability that two randomly chosen people from an area will have different racial or Hispanic backgrounds.

Geographical coverage: Data is provided for the United States; the states and the District of Columbia; counties and equivalent areas (census areas and municipalities in Alaska; the District of Columbia; parishes in Louisiana and independent cities outside of any county in Md., Mo., Nev., and Va.); cities and unincorporated areas, collectively "places"; and county subdivisions in 12 states where they act as full local governments: Conn., Maine, Mass., Mich., Minn., N.H., N.J., N.Y., Pa., R.I., Vt. and Wisc. Data is provided only for geographical areas currently in existence.

Dates: Detailed data is provided from the censuses of 2000 and 2010. Limited time series are provided from the censuses of 1790-2010 for counties, states and the United States.

Constructing a Call

Every call to the USA TODAY Census API must be authenticated with the programmer's unique API key, as in this sample request.

Get out of the way – data API


```
{
  - request: {
        keyname: "StatePostal",
        keypat: "NJ",
        sumlevid: "4",
        year: "2010"
    },
  - response: [
      - {
            Placename: "Aberdeen",
            Pop: "18210",
            PctChange: "0.0433139",
            PopSqMi: "3343.00000000",
            StatePostal: "NJ",
            FIPS: "3402500070",
            GNIS: ""
        },
      - {
            Placename: "Absecon",
            Pop: "8411",
            PctChange: "0.101205",
            PopSqMi: "1558.80000000",
            StatePostal: "NJ",
            FIPS: "3400100100",
            GNIS: ""
        },
      - {
            Placename: "Alexandria",
            Pop: "4938",
            PctChange: "0.0510856",
            PopSqMi: "180.10000000",
            StatePostal: "NJ",
            FIPS: "3401900550",
            GNIS: ""
        },
      - {
```

Questions?

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