Driving Innovation with Open Data and Interoperability

Jeanne Holm
Evangelist, Data.gov
November 14, 2012

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There are three questions to ask about open data

Why Do Agencies Share Data?

- Meet regulatory compliance
- Better communicate with citizens and stakeholders

Why Do Countries Share Data?

- Create new economic development
- Kickstart innovation

Why Do People Want Open Data?

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Releasing and using open data is about empowering people to make better decisions and change their behavior

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Creating a Data Ecosystem

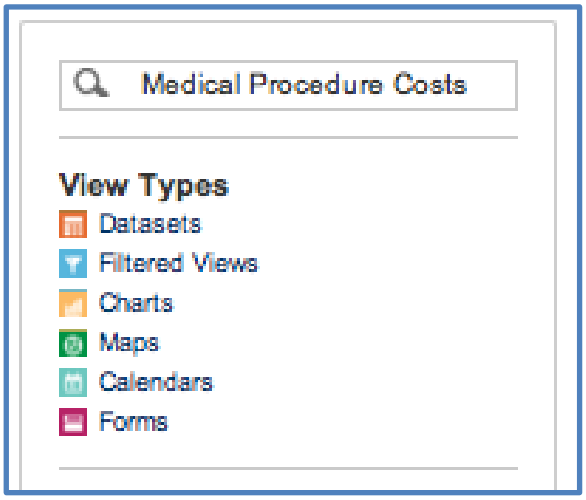
1. **Gather data**
   - from many places and give it freely to developers, scientists, and citizens
2. **Connect the community**
   - in finding solutions to allow collaboration through social media, events, and platforms
3. **Provide an infrastructure**
   - built on standards and interoperability
4. **Encourage technology developers**
   - to create apps, maps, and visualizations of data that empower people's choices
5. **Gather more data**
   - and connect more people

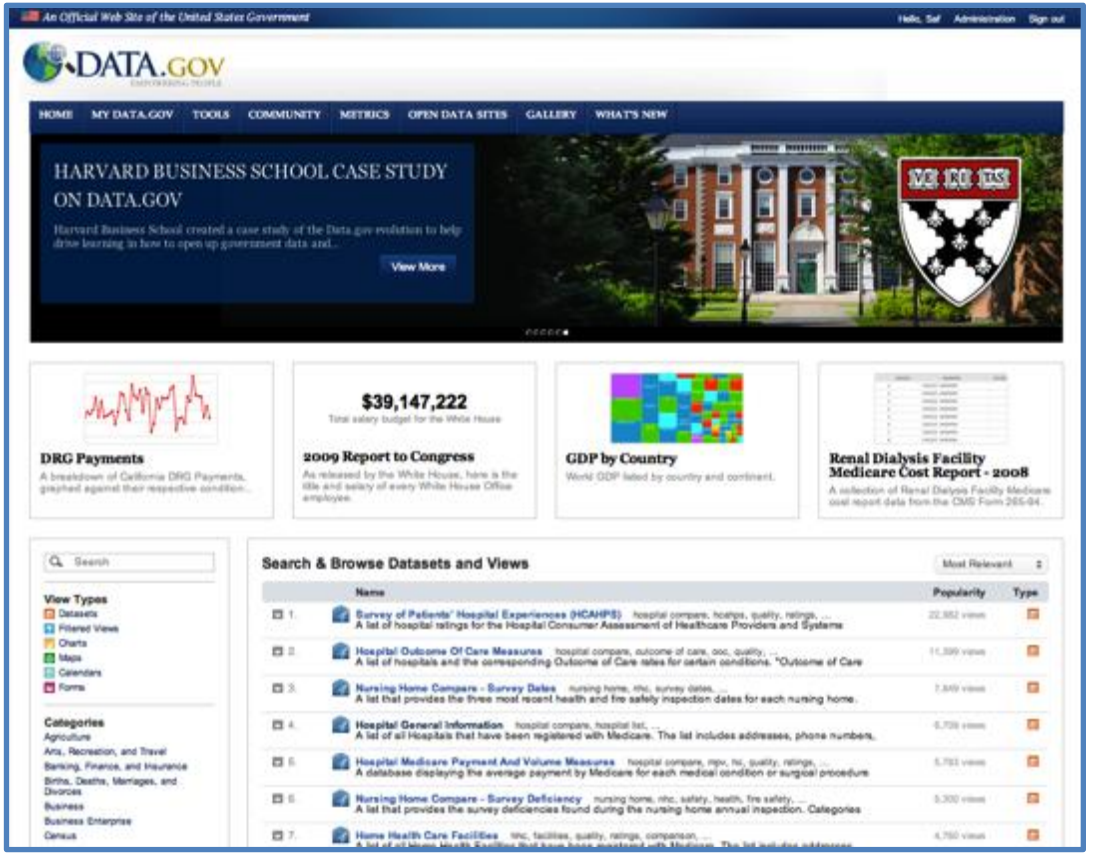
"A Strategy for American Innovation" published September 2009

Data.gov

- Provides instant access to ~400,000 datasets in easy to use formats
- Contributions from UN, World Bank, and 172 agencies
- Encourage development of innovative applications
- Drive innovation and knowledge use across the globe

Easy to Find Data





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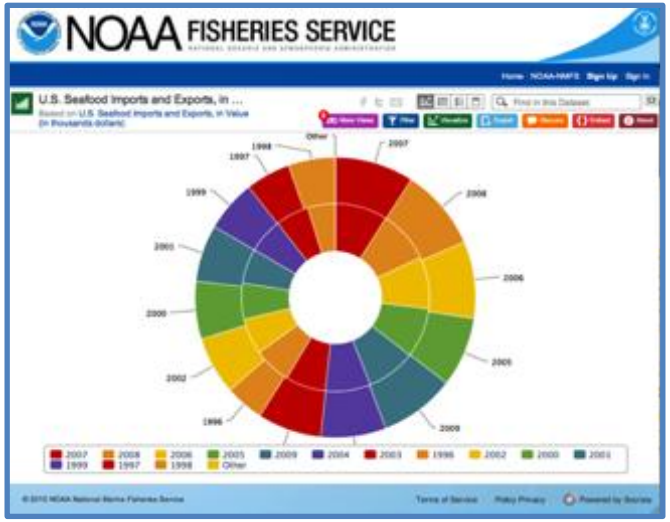
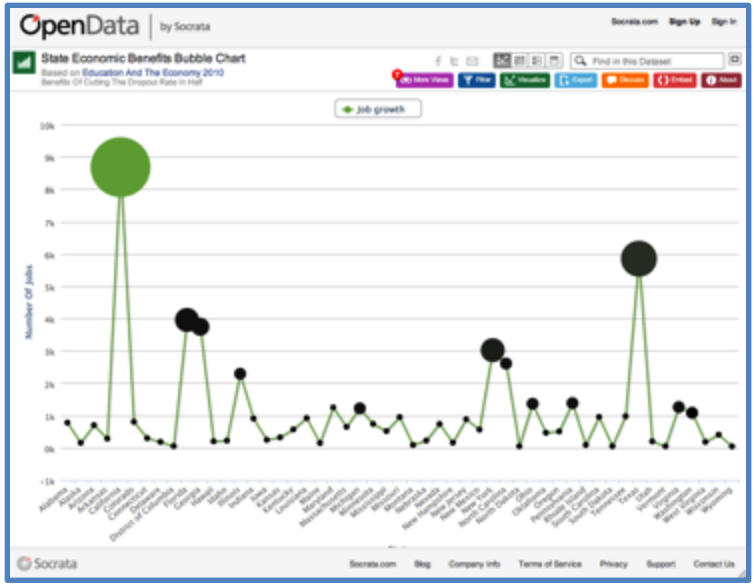
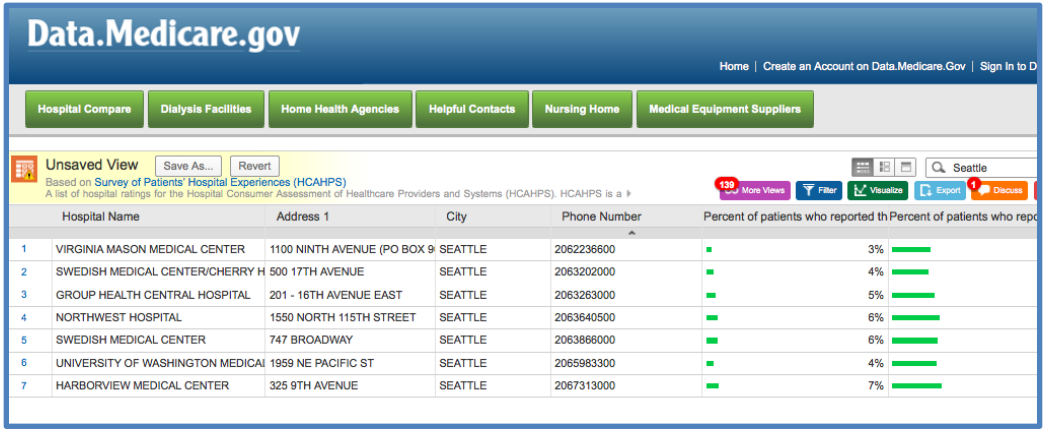
The Power of Visualizations







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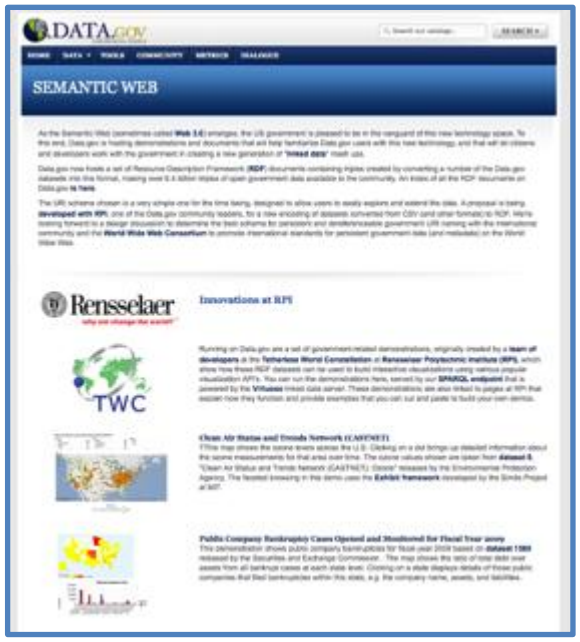
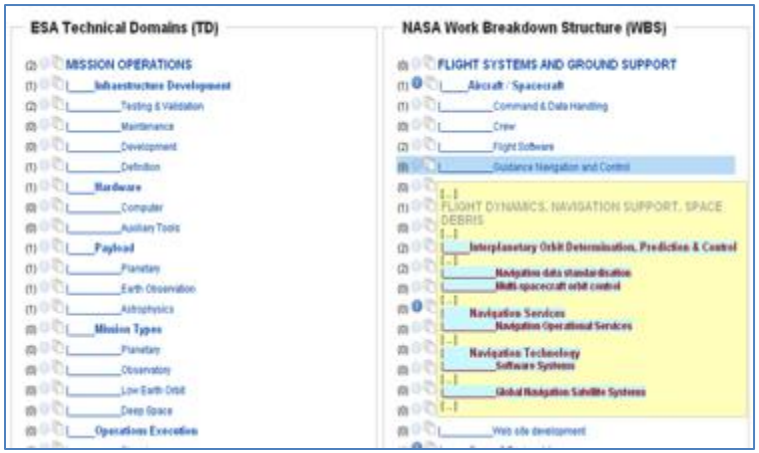




Powered Through Advanced Technologies

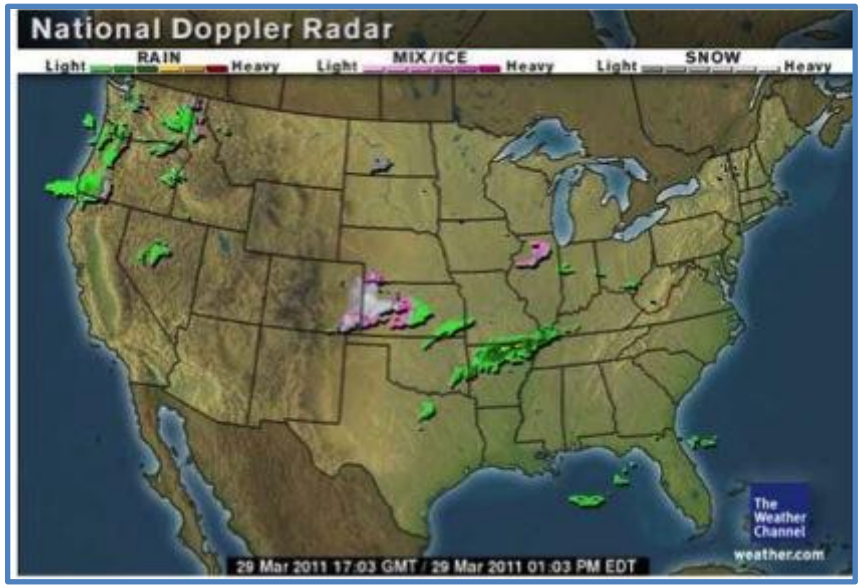
- Provides developers tools and raw data formats to develop new capabilities
- Partnership with
  - W3C: eGov Interest Group + activities, standards, and recommendations
  - RPI for research in semantic web and open linked data
- Data hosted in the cloud
- Open source platform
- Builds on ontologies developed in specific areas

Students and Learning

- Universities are using Data.gov in the classroom as a learning guide and to have students develop apps from government data http://www.data.gov/story/datagov-in-the-classroom
- Elsevier's SciVerse project called US Government Dataset Search creates an index of references and use of government data in scientific publications http://www.data.gov/communities/node/116/view/215

Data.gov for the Economy

- NOAA's data helped build weather-related business
- When the Department of Defense released satellite data…private industry created affordable GPS devices!
- Together these open data services empower $100B data-driven industries



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Open Communities

Community	
Developers	✓
Open Data	✓
Semantic Web	✓
Health	✓
Law	✓
Energy	✓
Education	✓
Ocean	✓
Safety	✓
Manufacturing	✓
Business	✓
Ethics	✓
Cities	✓
Sustainable Supply Chain	✓
+ many more…	

Open Data is
an Ecosystem

Creating Community

- Communities are public-facing spaces that present data, information, and subject matter knowledge about a single topic from many organizations in one place
  - The topics for communities can be chosen based on priorities from the public, departments based on their mission, or issues of national importance

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Creating a Shared Vision

- These questions help to guide early discussions
  1. Vision: What will the community connection and collaboration look like in the future?
  2. Leaders: Who will help to lead the community?
  3. Participants: Who will participate?
  4. Outcome: What are the expected outcomes, metrics, and measurements that will show success? How will this community work to improve the lives of citizens?
  5. Functionality: What types of activities will be conducted on the site (forums, blogs, wikis, ranking, rating, challenges, or apps)?
  6. Content: What content should be displayed
  7. Interactivity: What ways will the community interact with the leaders, with each other, and with the public?

Energy Drives Innovation

- Energy.Data.gov connects innovators, industry, academia, and government at federal, state, and local levels

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Challenges Spark Ideas

- Energy.Data.gov works with groups and challenges across the nation to innovate around federal data

CHALLENGES

Want to get involved in helping to solve an energy problem that you see in your home, community, or country? Join in on one of our challenges. Challenges range from brainstorming ideas to creating applications to proposing research. Not ready to jump in? Then come and see how others have responded and look at the winners of previous challenges.

Open Challenges

Code for Livability

The Partnership for Sustainable Communities is hosting a code-a-thon to brings together citizens, developers, and government personnel to work on solutions that bring sustainability to the forefront of peoples' everyday lives. Join us on January 21-22, 2011 to make a difference!

2011 ENERGY STAR National Building Competition: Battle of the Buildings

It's an energy savings battle as 245 buildings compete to see who can be the most efficient.

Resources:
- CBECS
- CEUS
- EnergyIQ
- Portfolio Manager
- NREL Renewable Energy Certificate and Green Power Markets

America's Home Energy Education Challenge

Participate in three great ways:
- Have your class or school join in the Home Energy Award by saving energy and win prizes for your school!
- Feeling artistic? Design a conservation plan and poster.
- Shall we play a game? Compete in the Energy Fitness Award with online games, quizzes and activities to earn prizes for you and your school.

Resources:
- EnergySmart
- EnergySavers.gov

Apps for the Environment

EPA challenges you to find new ways to combine and deliver environmental data in a new app. In the Apps for the Environment challenge, you have free reign to make an app that uses EPA data, addresses one of Administrator Lisa Jackson's Seven Priorities, and is useful to communities or individuals. EPA encourages you to use other environmental, energy, and health data too. The winners will be honored at a recognition event in Washington, D.C. this fall and the winning apps will be publicized on EPA's website. EPA is counting on you to come up with exciting and useful new apps!

Build your own challenge for energy efficiency

You can use this platform and process to employ ENERGY STAR tools and resources in your energy improvement efforts.

Rooftop Solar Challenge

Be part of a national effort to make clean solar electricity cost-competitive for your community.

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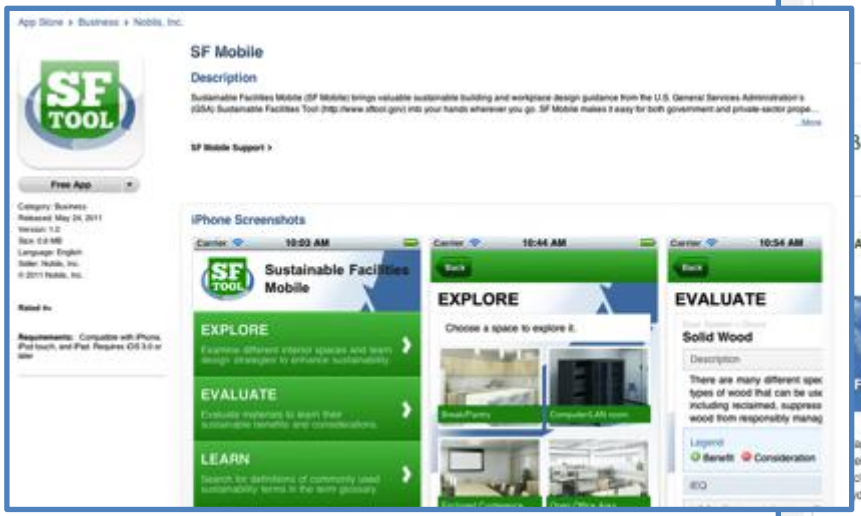
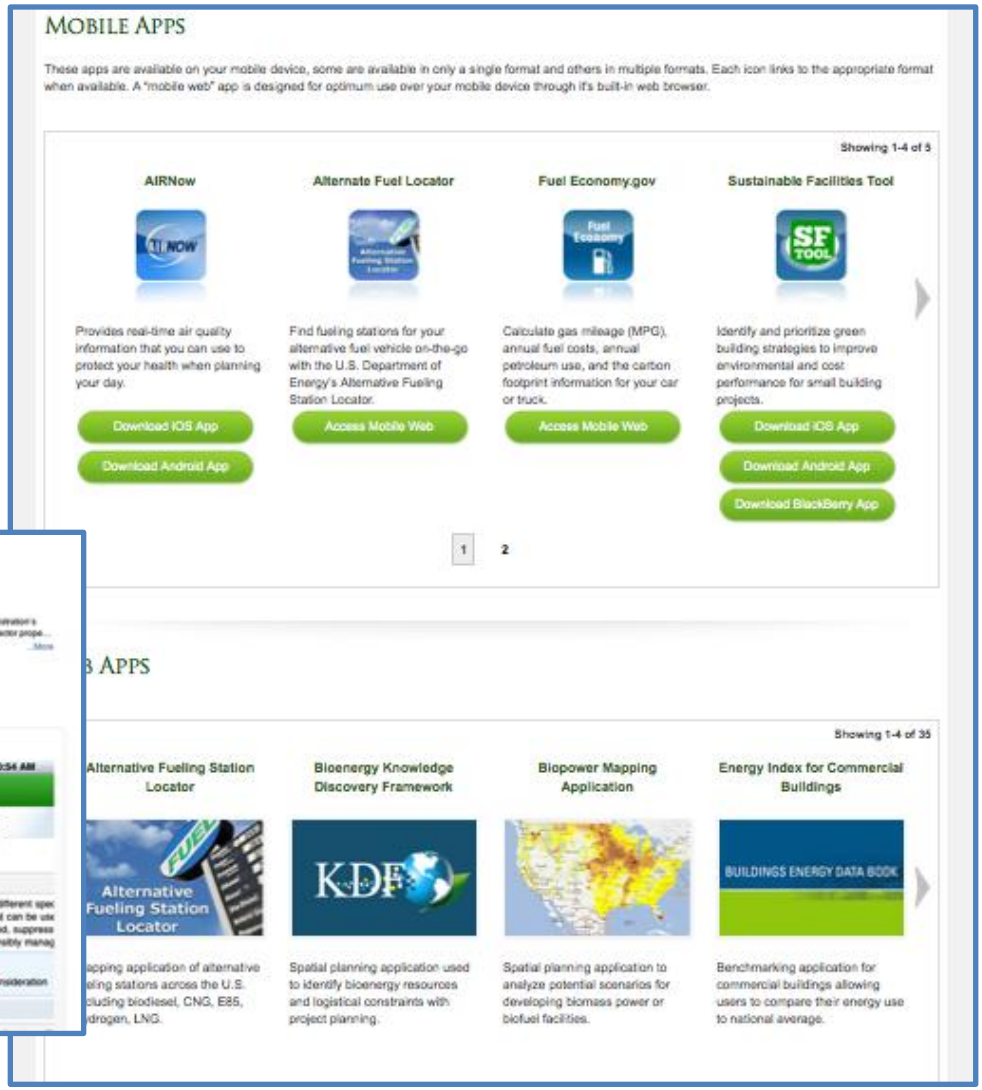
Data Drives Decisions

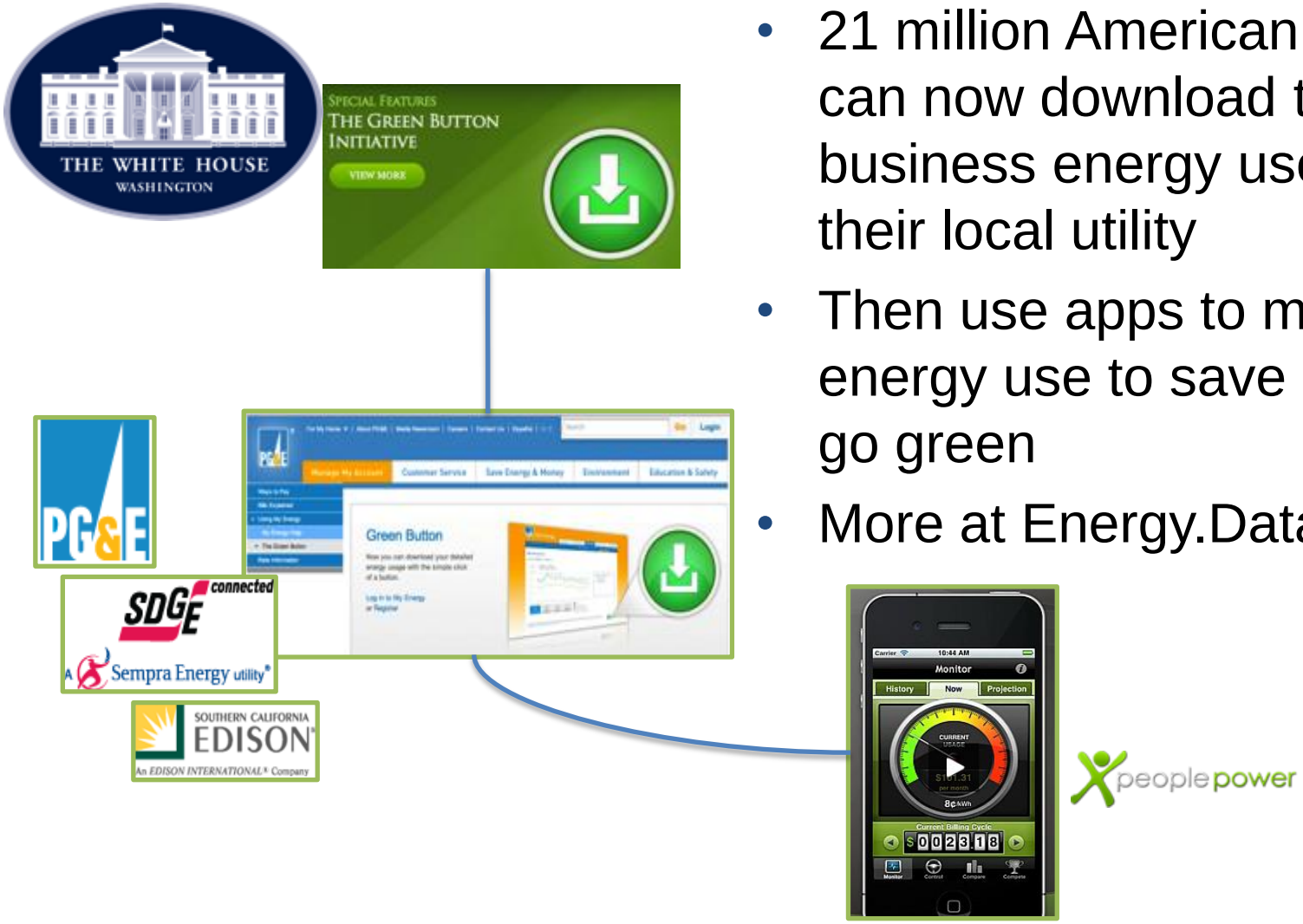
- Apps transform data in understandable ways to help people make decisions





Green Button

- 21 million American households can now download their home or business energy use data from their local utility
- Then use apps to manage their energy use to save money and go green
- More at Energy.Data.gov



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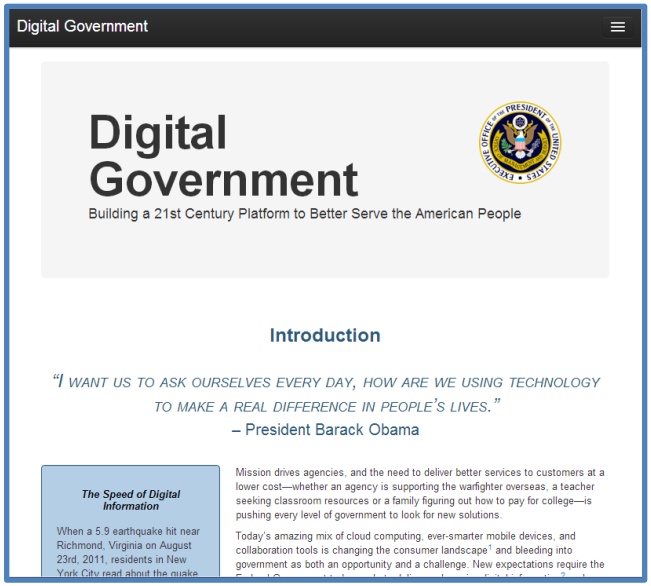
US Digital Strategy

- Ensure that as the government adjusts to this new digital world, we seize the opportunity to procure and manage devices, applications, and data in smart, secure and affordable ways
- Unlock the power of government data to spur innovation across our Nation and improve the quality of services for the An people

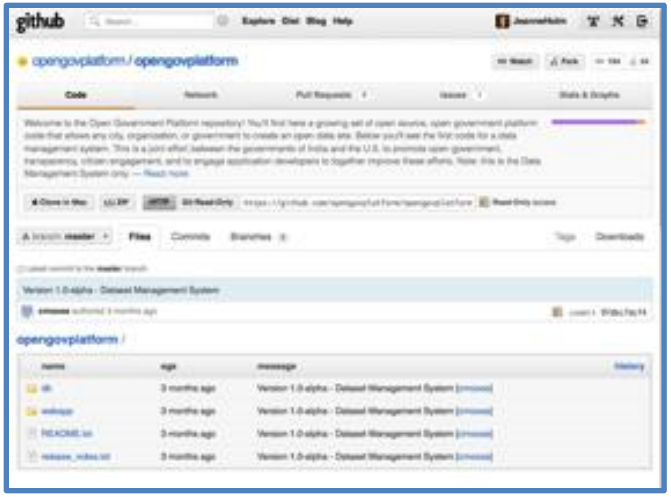


WhiteHouse.gov/digitalgov

US Open Government Action Plan

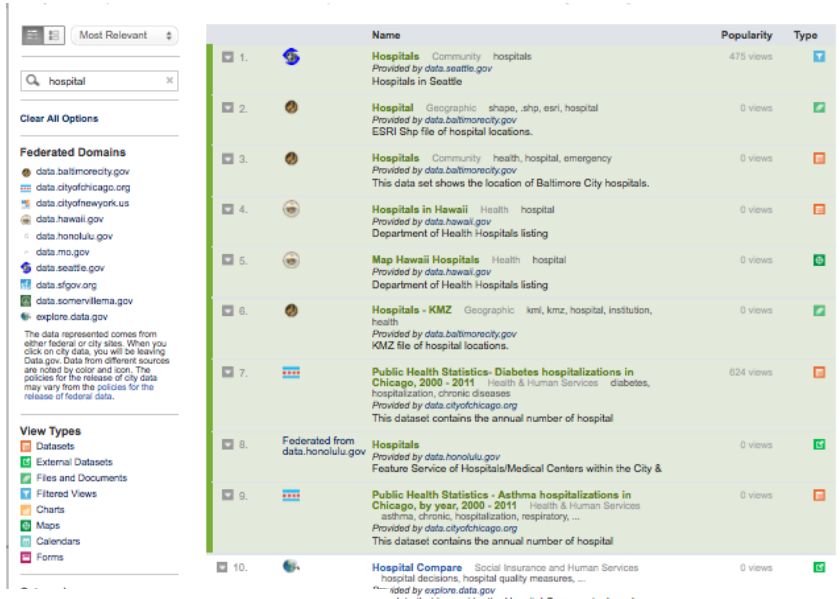
- On 20 September 2011, President Obama announced at the UN General Assembly…
  - Contribute Data.gov as a platform (Government of India and the U.S.)
  - Foster communities on Data.gov
  - Health, energy, and law plus new communities in education, research and development, and public safety
- In September 2012, President Obama reported these actions delivered

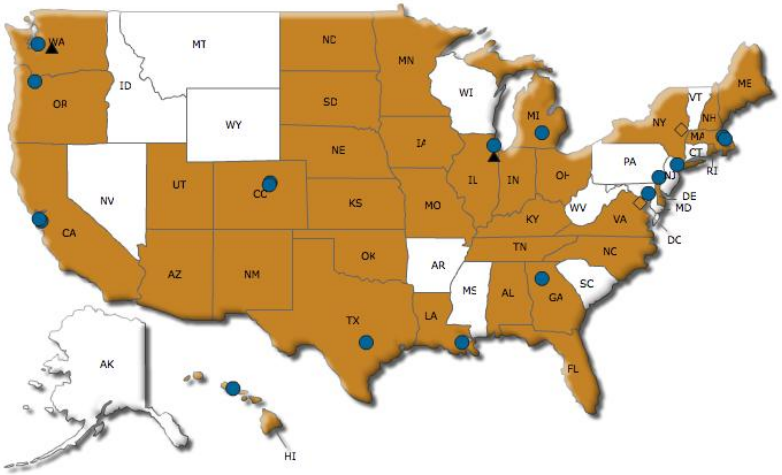
DATA.GOV EMPOWERING PEOPLE — Open Government Platform (OGPL)



- Open source co-developed by India's National Informatics Centre and US Data.gov Team
- Data.gov is migrating to OGPL in 2012
- Coordinating with open data providers, platforms, and communities like W3C, World Bank, CKAN, and open source developers worldwide
- Public commits and tracker on Github
- Public mailing list for discussion
- Join the community!
  - https://github.com/opengovtplatform
  - http://www.opengovplatform.org

US Open Data at Cities, Counties, and States





Data.gov Capabilities

- Present
  - Dataset Management
    - Workflow engine and metadata editor
    - Extended Dublin Core
  - Search
    - Keyword and filtering by basic metadata facets
    - 6.7 billion triples
  - Geo
    - Search, harvesting, and map visualizations via www.geoplatform.gov
  - Vocab.Data.gov
    - Vocabulary and schema engine for linked data
    - URIs for all health data

- Future
  - OGPL
    - Open source platform built on Drupal +
  - API key registry
    - API key authorization
    - Templates and standards
    - Application statistics
  - Enhanced search
    - Federated catalogs across agencies, cities, regions, and topics
  - Vocab.Data.gov
    - Federated ontologies
    - URIs for all data
  - Standards driven
    - ADMS-based metadata

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Partnerships for Better Data

- Ontologies and schema adoption and augmentation with
  - Schema.org, IEEE, ISO, AGU, and others
  - Crowdsourced folksonomies
- RPI and Professor Jim Hendler
  - Lead for semantic web for Data.gov

Rensselaer

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International Partnerships for Better Data

- W3C leadership (w3c.org)
  - Government Linked Data Working Group
  - eGovernment Interest Group (join for free!)
- Government of India
  - Shared leadership in the Open Government Platform
- CKAN
  - Co-developing components of the Open Government Platform
  - Open Knowledge Foundation

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5 Star Data

CHANGE
AHEAD

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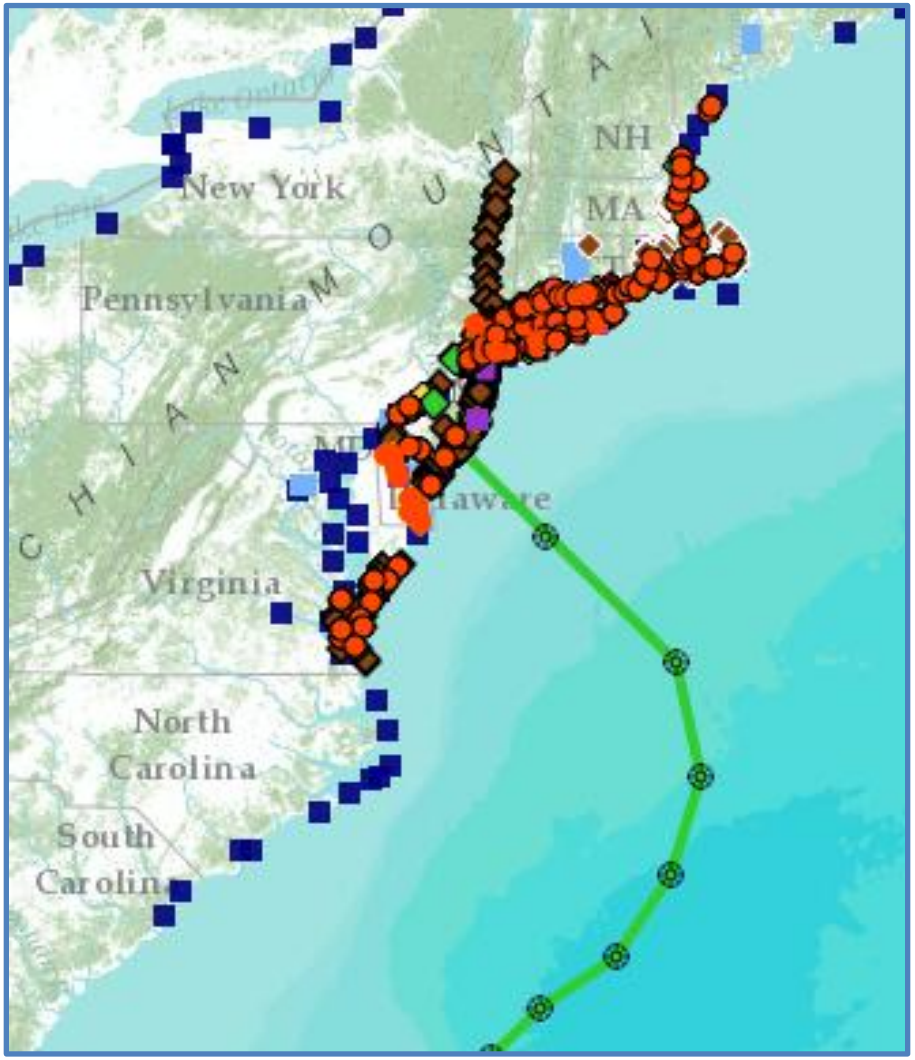
Helping Others Through a Disaster

Restore the Gulf: Deepwater Horizon

Japanese tsunami, earthquake, and radiation monitoring

Data and apps from EPA via Data.gov

Hurricane Sandy



Early warnings save lives

Data from USGS via Data.gov

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Transparency in Government Spending

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Recovery.gov

REPORT FRAUD, WASTE & ABUSE

Making the Federal Budget Easy to Understand: Visual Budget

- Visualizations to help understand data
- Great visuals can change the world (Florence Nightingale's visualizations of infection)
- We connect large numbers to personal experience
- www.visualbudget.org

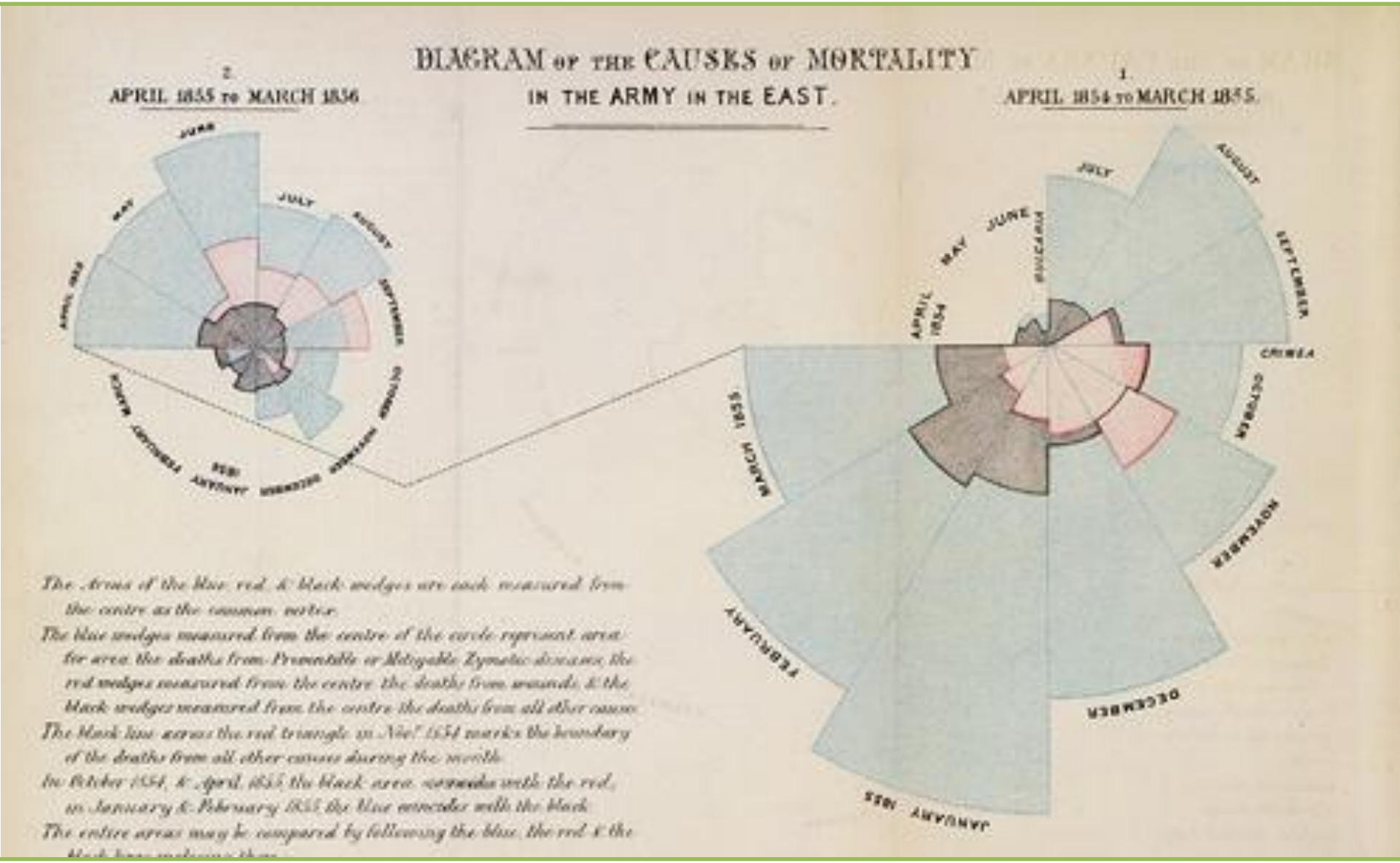
DIAGRAM OF THE CAUSES OF MORTALITY
IN THE ARMY IN THE EAST.
2
APRIL 1855 TO MARCH 1856
1
APRIL 1854 TO MARCH 1855.
JUNE
JULY
AUGUST
SEPTEMBER
OCTOBER
NOVEMBER
DECEMBER
JANUARY 1856
FEBRUARY
MARCH
APRIL 1855
MAY
JUNE
JULY
AUGUST
SEPTEMBER
CRIMEA
OCTOBER
NOVEMBER
DECEMBER
JANUARY 1855
FEBRUARY
MARCH 1855
APRIL 1854
MAY
JUNE
JULY
The Areas of the blue, red, & black wedges are each measured from the centre as the common vertex.
The blue wedges measured from the centre of the circle represent area for area, the deaths from Preventible or Mitigable Zymotic diseases, the red wedges measured from the centre the deaths from wounds, & the black wedges measured from the centre the deaths from all other causes.
The black line across the red triangle in Nov.r 1854 marks the boundary of the deaths from all other causes during the month.
In October 1854, & April 1855 the black area coincides with the red, in January & February 1856 the blue coincides with the black.
The entire areas may be compared by following the blue, the red & the

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Creating a Multi-Billion Dollar Industry

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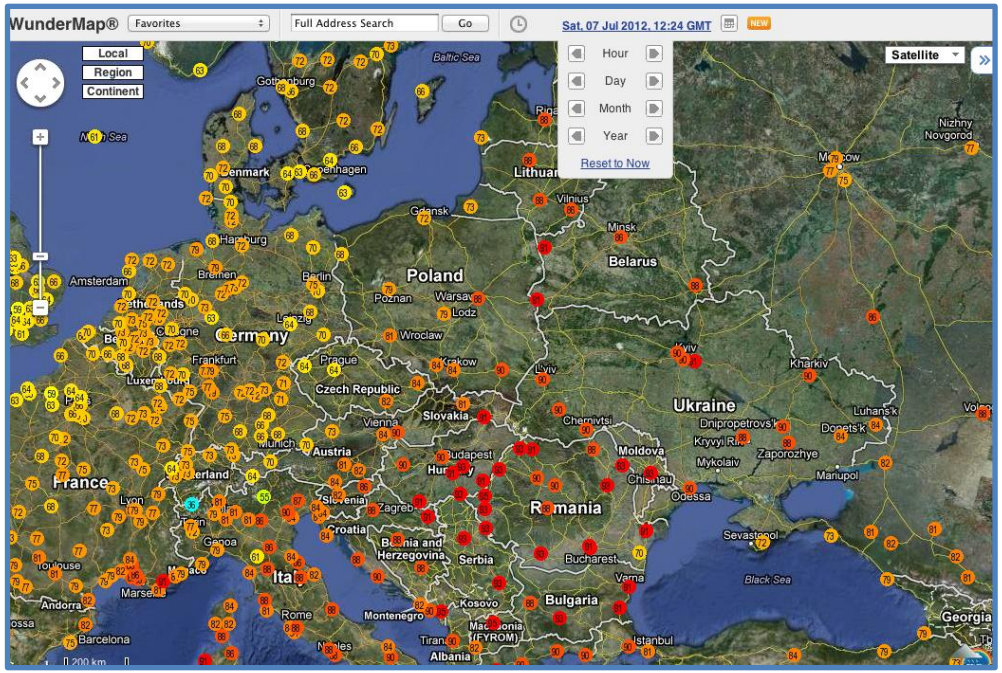
Weather Underground

- Severe weather warnings allow people to react appropriately to threats
- Internationalization: MeteoAlarm (EUMetNet)
- Need shared models and standards
- www.wunderground.com



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Crowdsourcing Data

USAID Food Security Challenge

- Kat Townsend at USAID had a great idea
  - Develop apps to increase food security
  - “Crowdsourcing the questions and crowdsourcing the solutions”
  - Three Ideation Jams → Code-a-thon and a Data Palooza
  - 10,000 data entries corrected with 145 volunteers in 16 hours with 85% accuracy
  - http://idea.usaid.gov/g8

USAID
FROM THE AMERICAN PEOPLE

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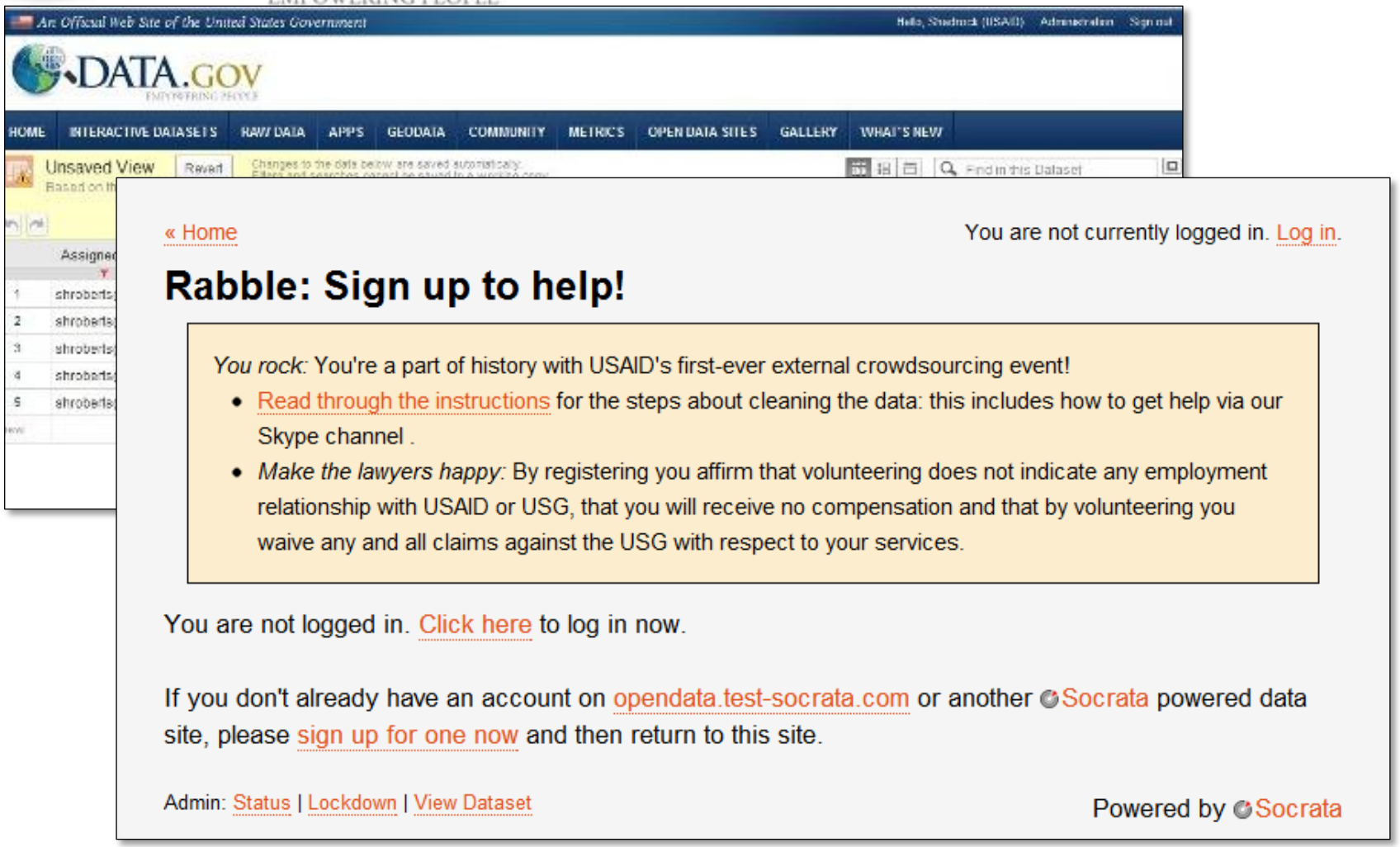

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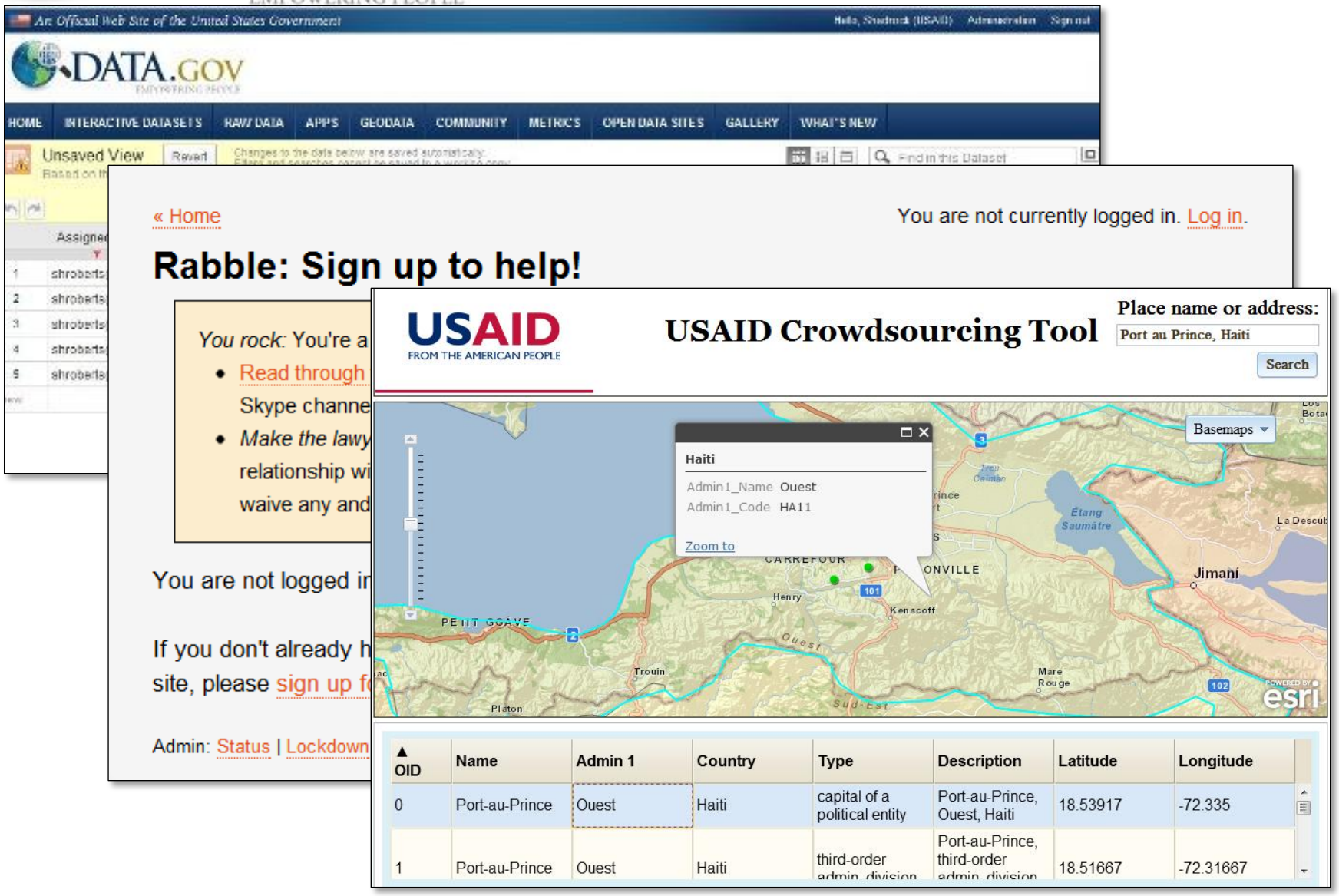

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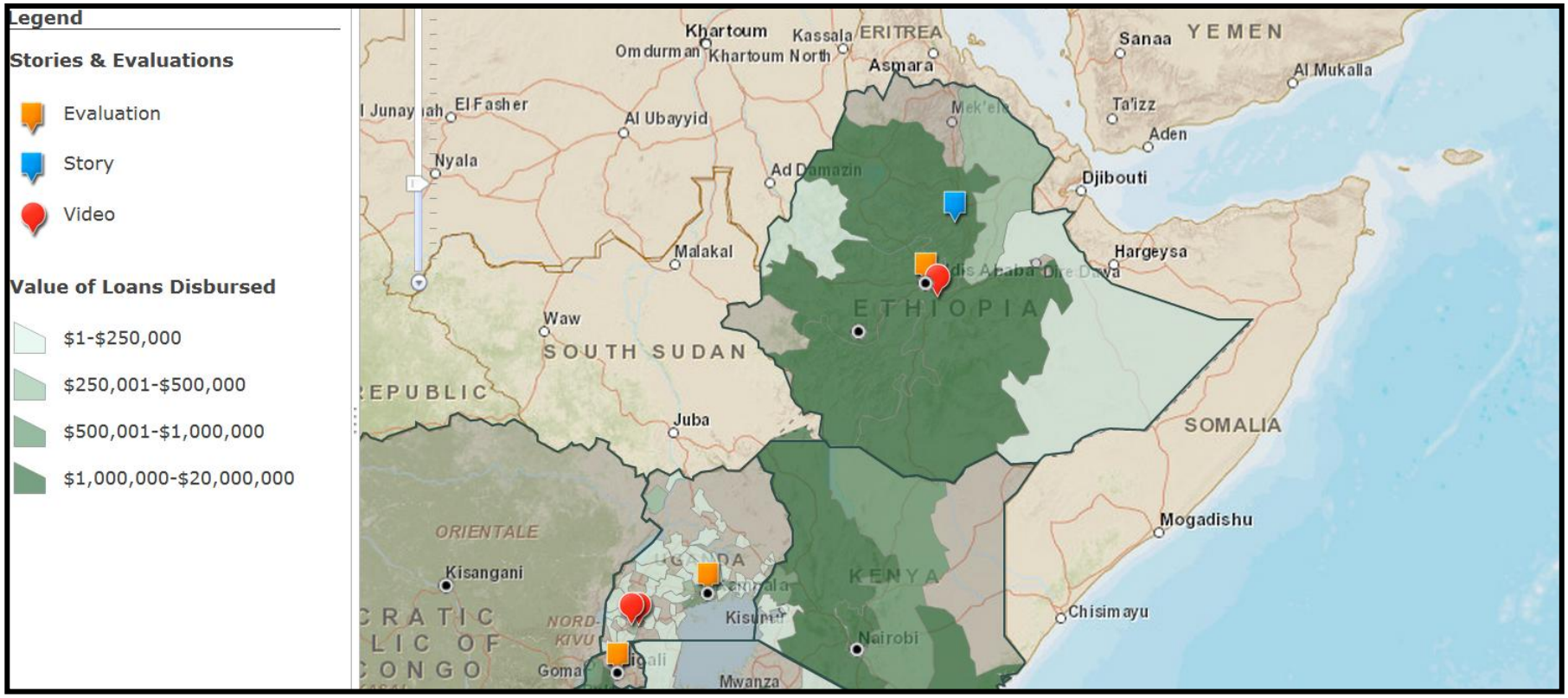

http://www.usaid.gov/results-and-data/progress-data/data/dca

Map at: http://storymaps.esri.com/stories/usaidcredit/

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Looking for work or funding?

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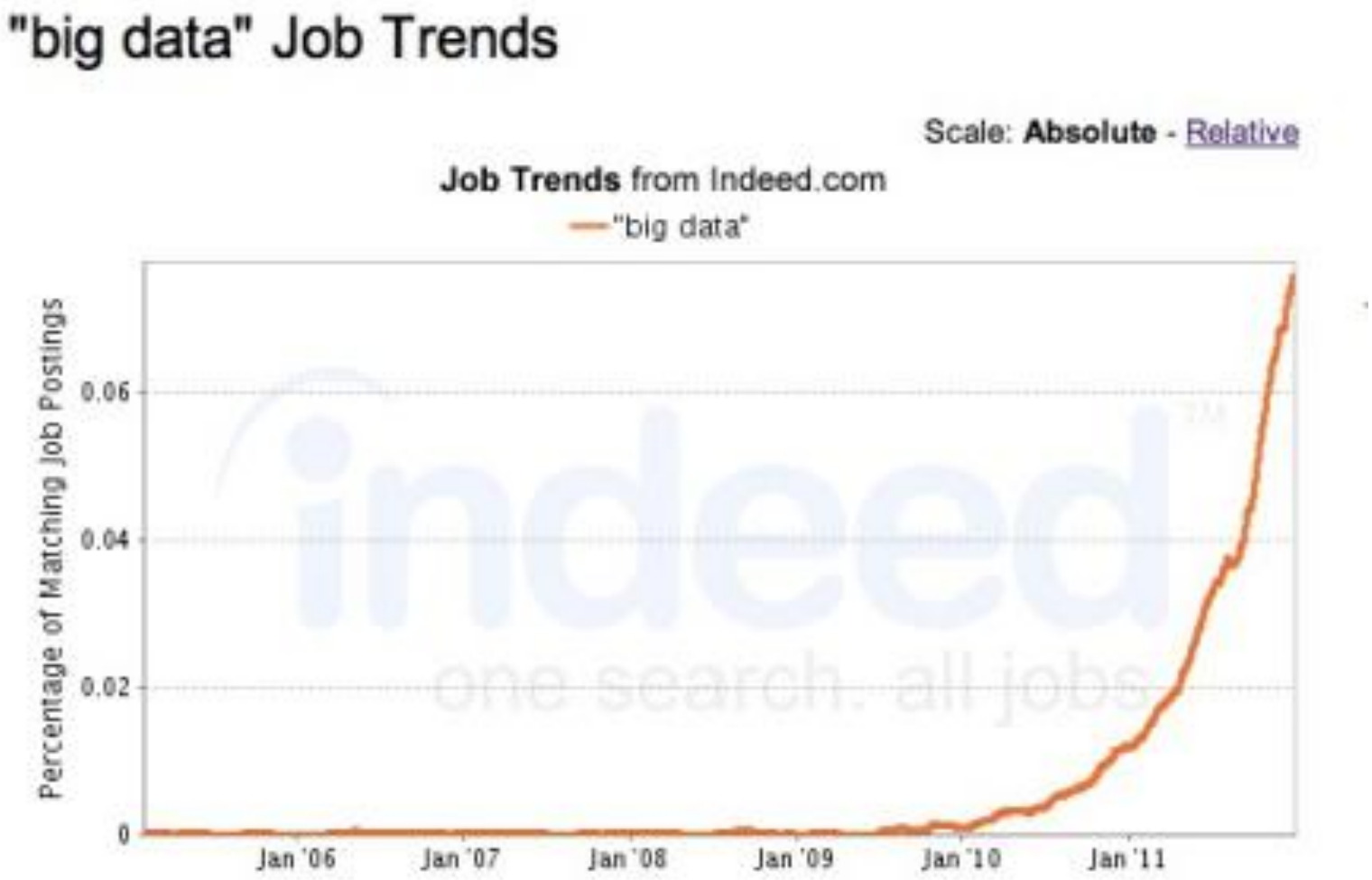
Growth in Big Data Jobs



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Not Sure Where to Get Started…

Challenge.Gov—Investing in Innovation

- Stimulate private sector investment
- Improve skills of the participants
- Hundreds of challenges
- Millions of dollars
- Provided by GSA

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Race to the Rooftops

- Make it faster, easier, and cheaper to install solar panels on home throughout the nation
- $10M in prizes over two years
- Department of Energy

Inspired by SunShot
U.S. Department of Energy

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Motorcoach Safety

- 4,000 people are killed and >100,000 people are injured each year in crashes with large trucks and buses
- Data from U.S. Department of Transportation's Federal Motor Carrier Safety Administration
- Challenge focuses on student entries

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Take a breath…

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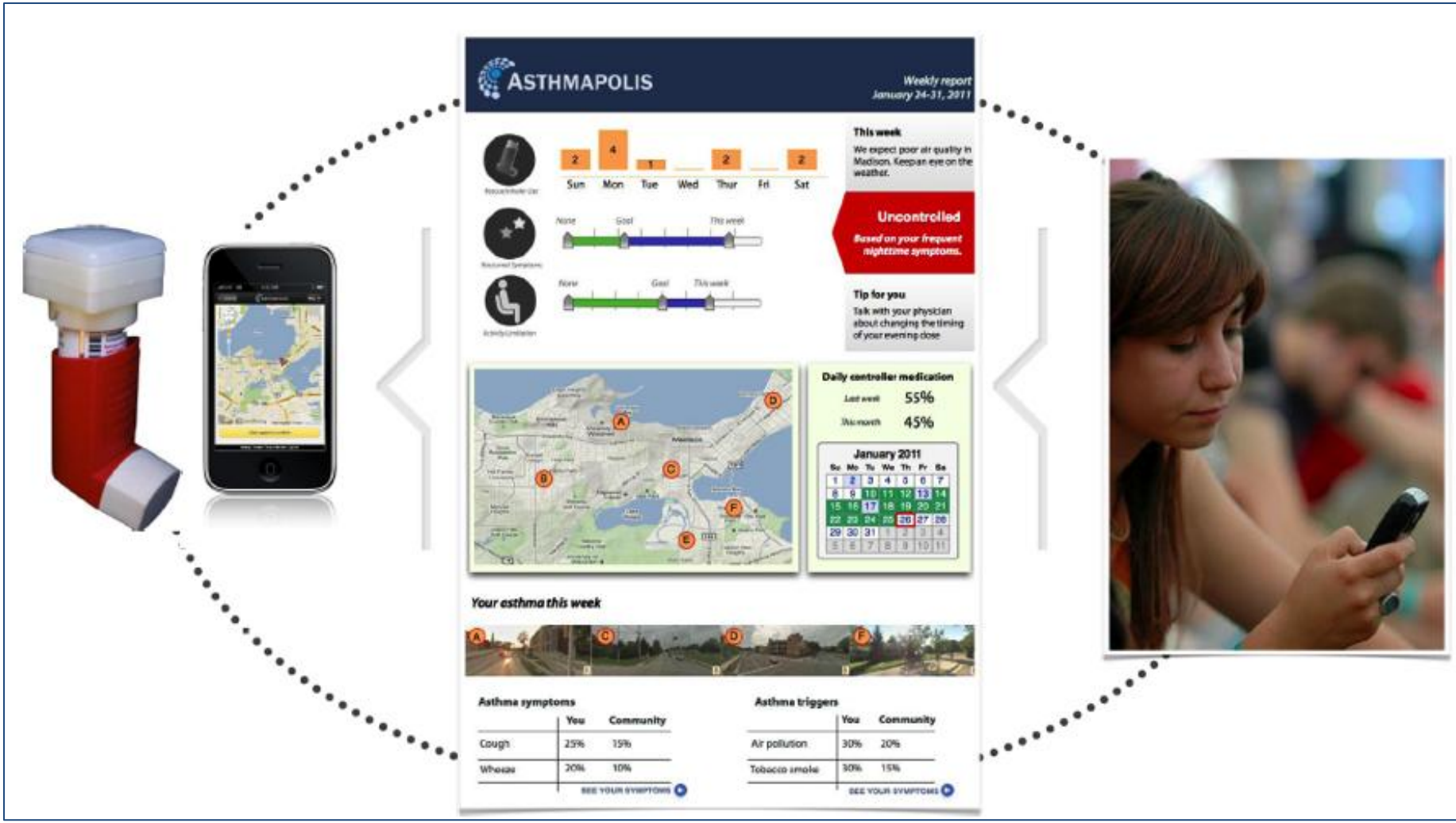
Asthmapolis



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Have you ever saved a life?

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What if you could help save 7,000,000 lives?

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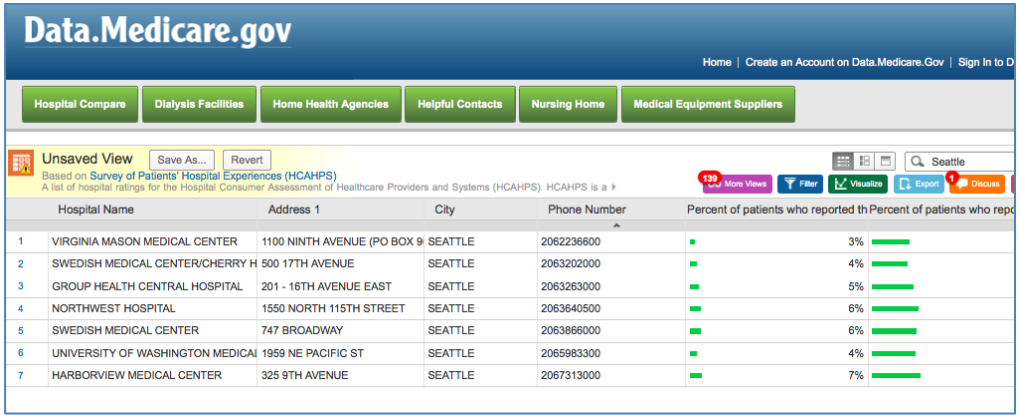
iTriage



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Moving Open Data Forward

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The Path Ahead

- Bring data up and out of government to the public ★
- Make data accessible and linked ★★★★★
- Create communities to understand and apply data
- Connect and collaborate with small businesses, industry, and academia to drive innovation
- Continue to develop OGPL with community development
- Share with others to understand global issues

We need to securely architect our systems
for interoperability and openness from conception.
—Digital Government

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U.S. States	U.S. Cities and Counties	Agencies and Subagencies	International
35	19	180	35

A Global Movement Has Begun to Provide Transparency and Democratization of Data

Don’t see your site?
Update via @usdatagov

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What if you could change the world?

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Change is Happening…

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What Will You Do?

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Let's work together to set the data free!

www.Data.Gov
@usdatagov

jholm@jpl.nasa.gov
@JeanneHolm