

# Interactive Maps of Science and Technology

**Dr. Katy Börner**

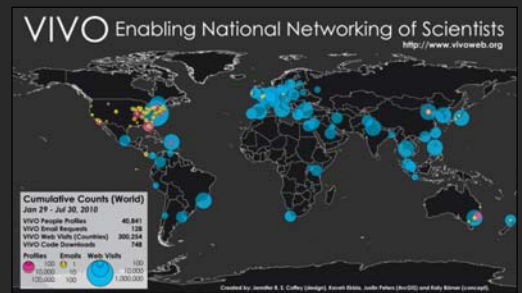
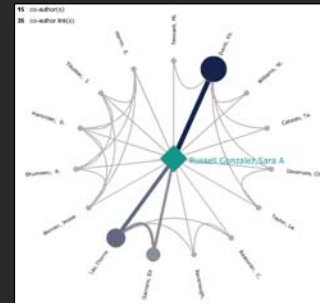
Cyberinfrastructure for Network Science Center, Director  
Information Visualization Laboratory, Director  
School of Library and Information Science  
Indiana University, Bloomington, IN

[katy@indiana.edu](mailto:katy@indiana.edu)

With special thanks to the Cyberinfrastructure for  
Network Science Center team and the VIVO Team.

*3<sup>rd</sup> International Workshop on Network Theory:  
"Web Science meets Network Science"  
Northwestern University.*

*March 4-5, 2011*



## NSF/JSMF Workshop on Mapping of Science and Semantic Web

### Date

March 4-5, 2010

### Meeting Place

E174 Wells Main Library, Indiana

### Organizers



**Katy Börner**

Victor H. Yingve Professor,  
Director, Cyberinfrastructure  
exhibit, Bloomington,  
[PR^2 | Slides | Intro]



**Ying Ding**

Assistant Professor, I  
dingying@indiana.edu  
[PR^2 | Slides]

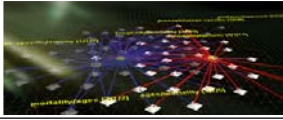


**Peter Fox**

Tetherless World Con  
Professor, Earth and E  
Rensselaer Polytechni  
[PR^2 | Slides]

<http://scimaps.org>





## Web Science meets Network Science

### Opportunities

- High quality data, e.g., **semantic web data**
- Advanced data analysis techniques
- Visual communication of results to a large audience, e.g., using **science maps**

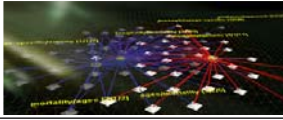
### Challenges

- Different languages, cultures, value systems, data formats
- Interplay of science, engineering, and design

### Disclaimers for my talk:

- Just visuals but **80%** of effort to create those is spent on data cleaning while another **15%** is spent on data analysis
- For formulas see references

## Science and Technology Maps



## Science Map Users

### Advantages for Funding Agencies

- Supports monitoring of (long-term) money flow and research developments, evaluation of funding strategies for different programs, decisions on project durations, funding patterns.
- Staff resources can be used for scientific program development, to identify areas for future development, and the stimulation of new research areas.

### Advantages for Researchers

- Easy access to research results, relevant funding programs and their success rates, potential collaborators, competitors, related projects/publications (**research push**).
- More time for research and teaching.

### Advantages for Industry

- Fast and easy access to major results, experts, etc.
- Can influence the direction of research by entering information on needed technologies (**industry-pull**).

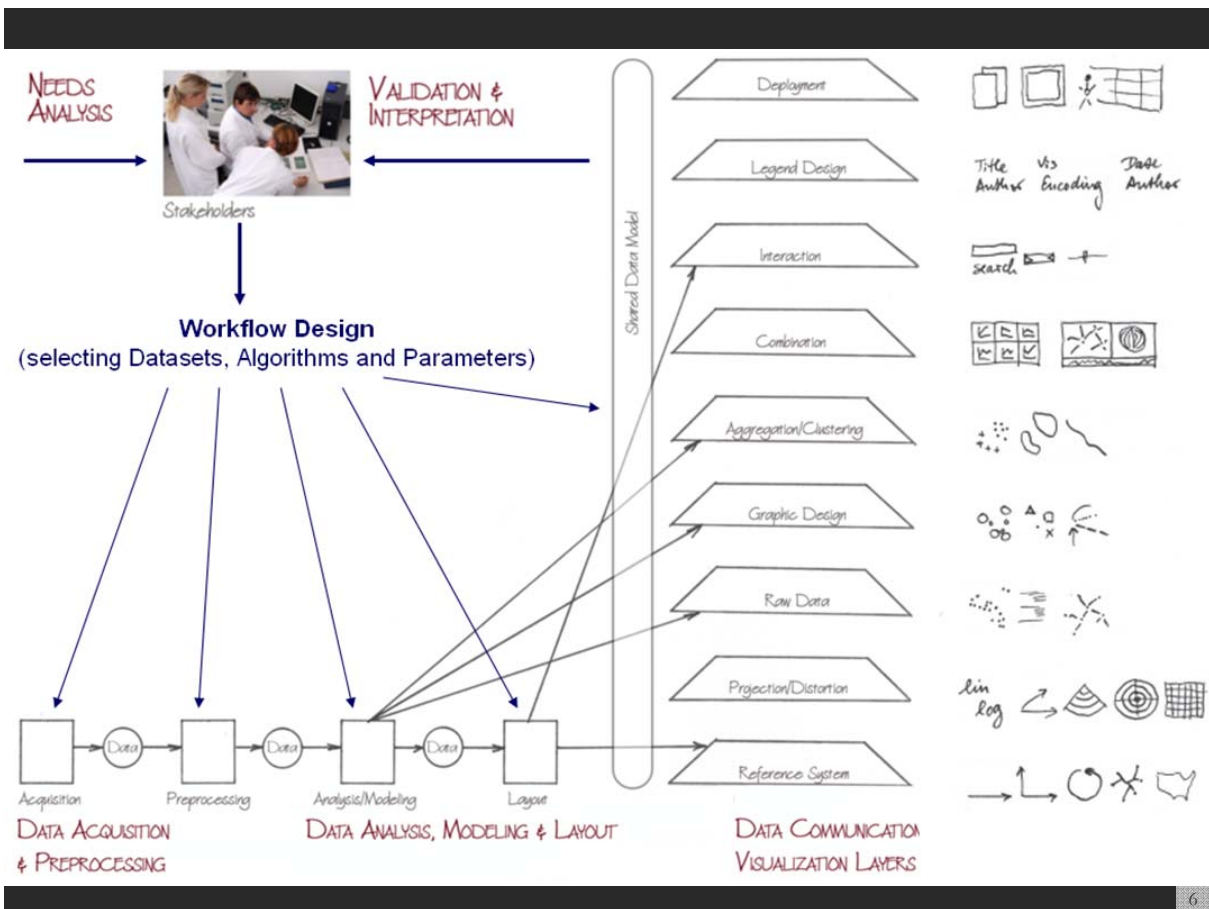
### Advantages for Publishers

- Unique interface to their data.
- Publicly funded development of databases and their interlinkage.

### For Society

- Dramatically improved access to scientific knowledge and expertise.

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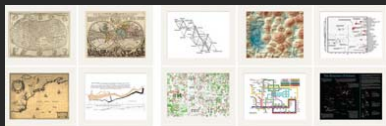
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## Mapping Science Exhibit – 10 Iterations in 10 years

<http://scimaps.org>

### The Power of Maps (2005)



### The Power of Reference Systems (2006)



### The Power of Forecasts (2007)



### Science Maps for Economic Decision Makers (2008)



### Science Maps for Science Policy Makers (2009)



### Science Maps for Scholars (2010)

### Science Maps as Visual Interfaces to Digital Libraries (2011)

### Science Maps for Kids (2012)

### Science Forecasts (2013)

### How to Lie with Science Maps (2014)

Exhibit has been shown in 72 venues on four continents. Currently at

- NSF, 10th Floor, 4201 Wilson Boulevard, Arlington, VA
- Center of Advanced European Studies and Research, Bonn, Germany
- University of Michigan, Ann Arbor, MI

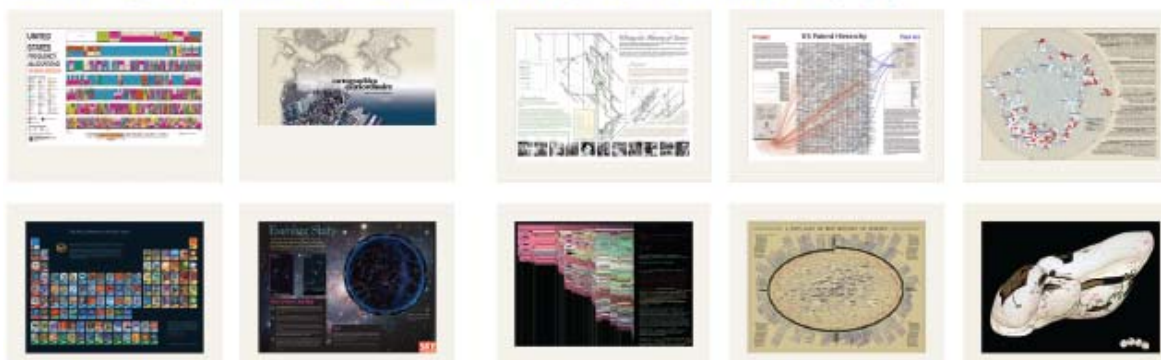


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## THE POWER OF MAPS 2005



## THE POWER OF REFERENCE SYSTEMS 2006

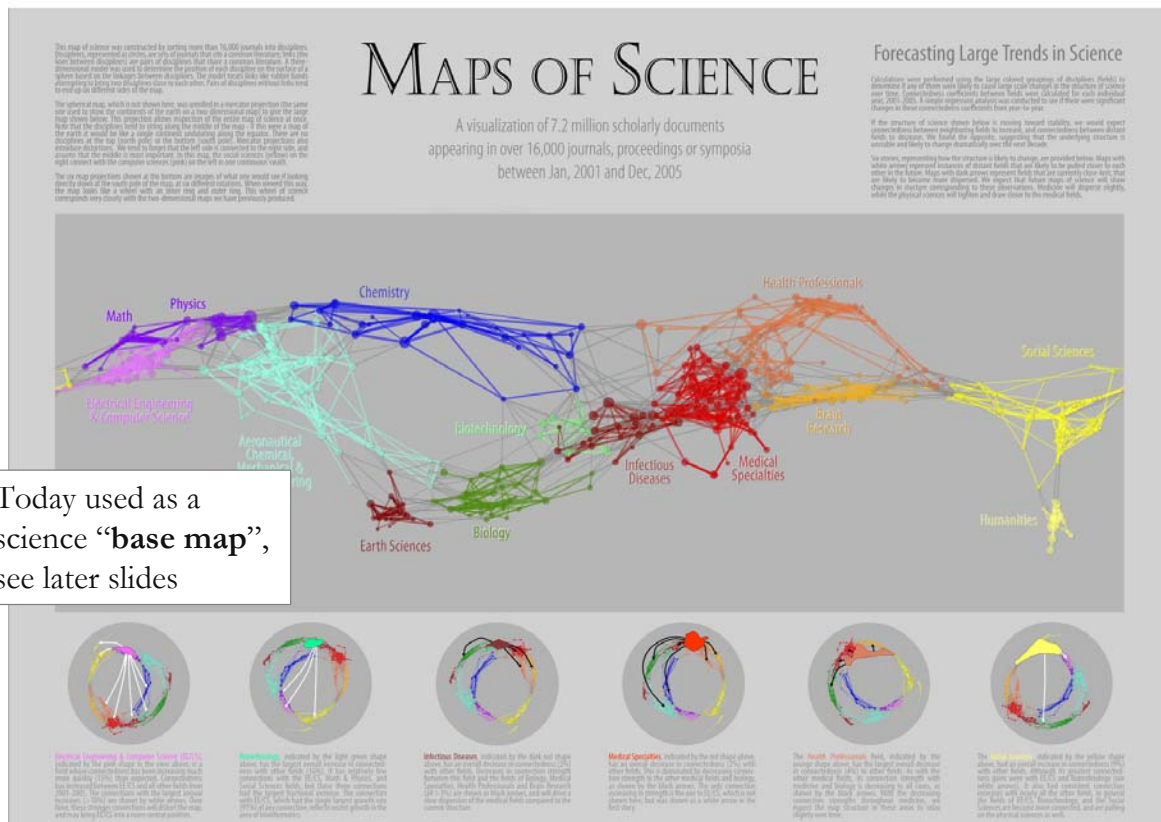




# THE POWER OF FORECASTS 2007



# SCIENCE MAPS FOR ECONOMIC DECISION MAKERS 2008



## SCIENCE MAPS FOR SCIENCE POLICY MAKERS 2009



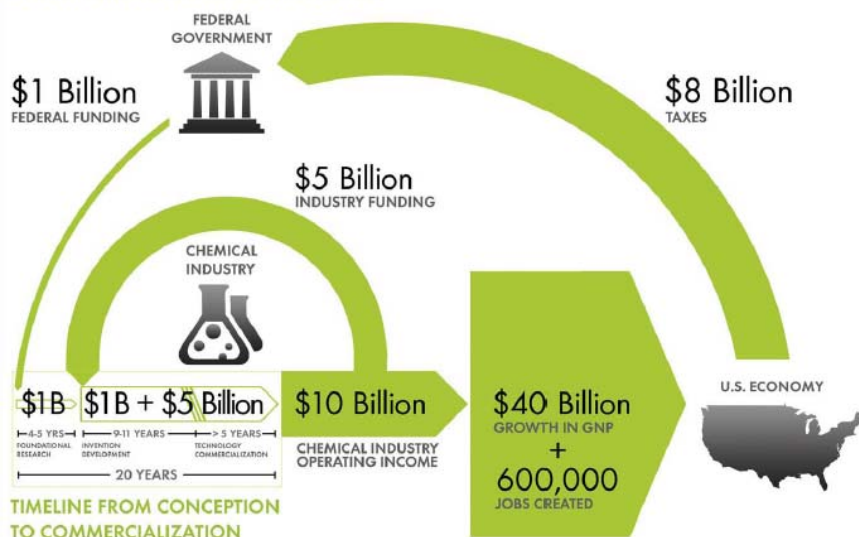
## SCIENCE MAPS FOR SCHOLARS 2010



## Chemical Research & Development Powers the U.S. Innovation Engine

Macroeconomic Implications of Public and Private R&D Investments in Chemical Sciences

### INVESTMENT IN CHEMICAL SCIENCE R&D



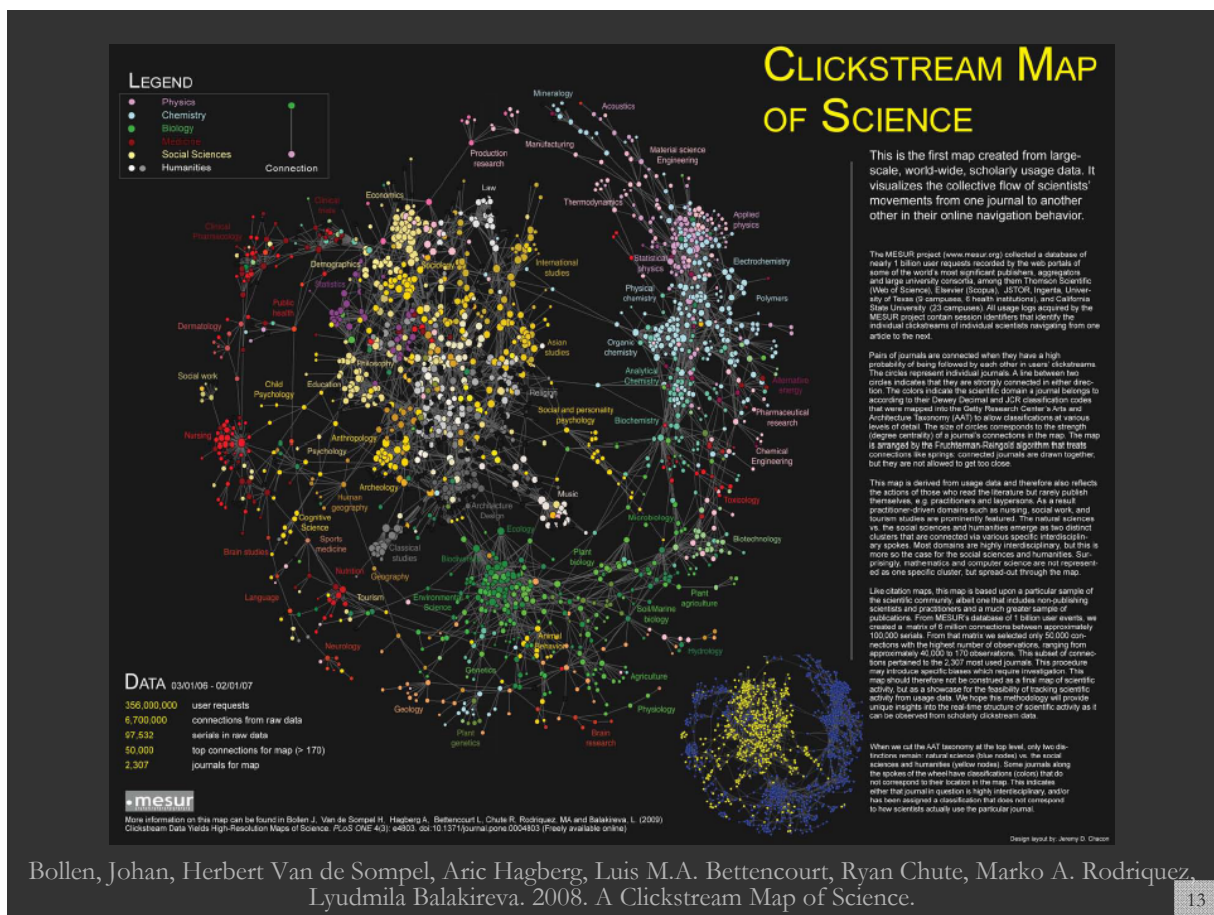
### The Council for Chemical Research (CCR)

has provided the U.S. Congress and government policy makers with important results regarding the impact of Federal Research & Development (R&D) investments on U.S. innovation and global competitiveness through its commissioned 5-year two phase study. To take full advantage of typically brief access to policy makers, CCR developed the graphic below as a communication tool that distills this complex data produced by these studies in direct, concise and clear terms.



The design shows that an input of \$1B in federal investment, leveraged by \$5B industry investment, brings new technologies to market and results in \$10B of operating income for the chemical industry, \$40B growth in the Gross National Product (GNP) and further impacts the U.S. economy by generating approximately 600,000 jobs, along with a return of \$8B in taxes. Additional details, also reported in the CCR studies, are depicted in the map to the left. This map clearly shows the two R&D investment cycles; the shorter industry investment at the innovation stage to commercialization cycle; and the longer federal investment cycle which begins in basic research and culminates in national economic and job growth along with the increase tax base that in turn is available for investment in basic research.





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Debut of 5<sup>th</sup> Iteration of the Mapping Science Exhibit at MEDIA X was in 2009 at Wallenberg Hall, Stanford University, <http://mediax.stanford.edu>, <http://scaleindependentthought.typepad.com/photos/scimaps>

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Science Maps in “Expedition Zukunft” science train visiting 62 cities in 7 months, 12 coaches, 300 m long. <http://www.expedition-zukunft.de>

# Interactive S&T Maps

The screenshot shows the Scholarometer website. At the top is a navigation bar with links: Home, About, Download, Explore, API, FAQ, Help, and Feedback. Below the navigation bar, the main heading reads: "Scholarometer<sup>(beta)</sup> is a social tool to facilitate citation analysis and help evaluate the impact of an author's publications." To the right of this text are two large blue buttons: "DOWNLOAD NOW" and "GET YOUR WIDGET". Below these buttons is a line of text: "Install the browser extension and start querying and tagging authors!". The page is divided into three columns: "Features", "Statistics", and "Latest Updates". The "Features" column contains a video player titled "Scholarometer Overview by Scholarometer". The "Statistics" column is titled "Top authors by h index" and lists authors with their corresponding h-index values. The "Latest Updates" column shows recent activity, including mentions of "RA Robins" and "G Alexander" in the discipline of "#behavioral\_sciences".

**Home** About Download Explore API FAQ Help Feedback

Scholarometer<sup>(beta)</sup> is a social tool to facilitate citation analysis and help evaluate the impact of an author's publications.

**DOWNLOAD NOW**

**GET YOUR WIDGET**

Install the browser extension and start querying and tagging authors!

Features	Statistics	Latest Updates
<b>Scholarometer Overview</b> by Scholarometer	<b>Top authors by h index</b>	<b>Scholarometer Tool</b> scholarometer
	y zhang 247	RA Robins and 1 other author in discipline #behavioral_sciences, <a href="http://bit.ly/hQF3vw">http://bit.ly/hQF3vw</a> 3 hours ago · reply
	m cohen 235	G Alexander and 1 other author in discipline #behavioral_sciences, <a href="http://bit.ly/fufWvg">http://bit.ly/fufWvg</a> 3 hours ago · reply
	j taylor 217	
	c smith 214	
	j walker 177	
	sh snyder 176	
	ha simon 173	
	r schwartz 173	

<http://scholarometer.indiana.edu>

Maps of Science - Windows Internet Explorer

http://mapofscience.com/

File Edit View Favorites Tools Help

Maps of Science

MAPS OF SCIENCE

Overview Detail Disciplinary Maps Competency Maps Paradigm Maps Posters Education

BETTER MAPS • BETTER DECISIONS

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Done

<http://mapofscience.com> and SciVal by Elsevier

## Interactive Maps of Science – Philanthropy

Zoom To Grantmaker Map Create/Edit Grant Map Create/Edit Tell us what you think »

View State Data: Select a state...

U.S. Map World Map

Standard Terrain Satellite

7,908 Grantmakers  
93,091 Recipients  
418,555 Grants

Current Parameters  
Geographic Display: State  
Grant Indicator: None  
Thematic Indicator: None  
Grant Years: 2009, 2008, 2007  
Grantmaker Filters: None

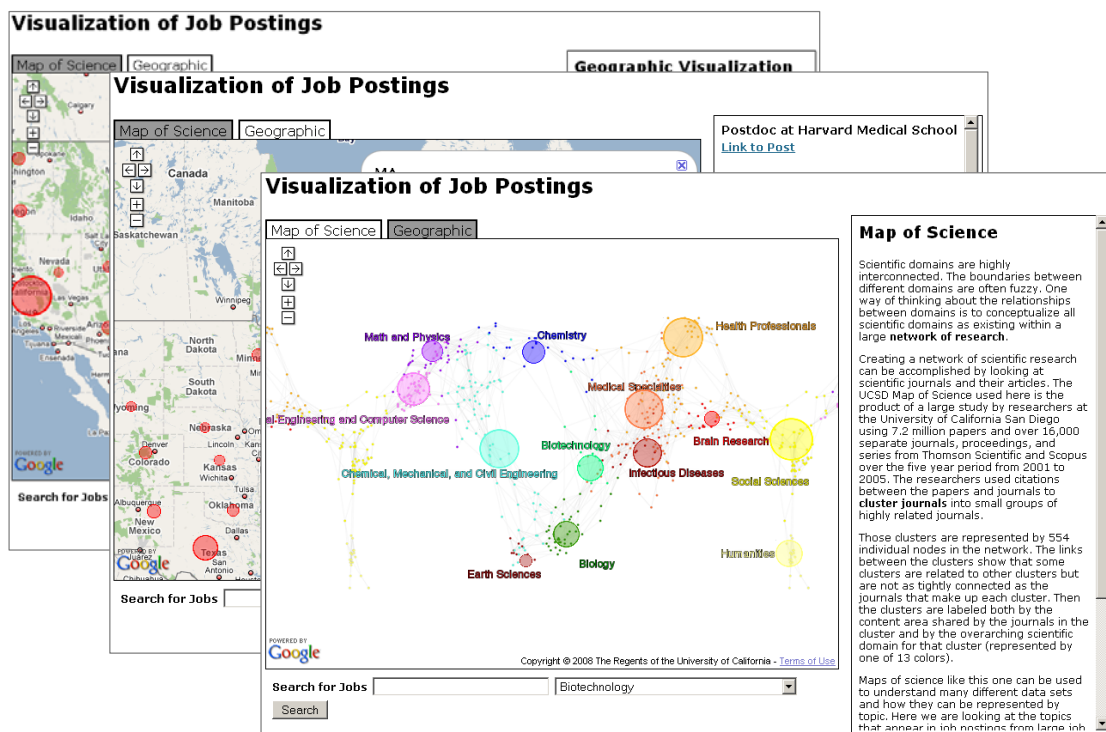
Print/Save Map  
Copy Map

Grantmaker/Grant data ©2009 The Foundation Center

<http://www.philanthropyinsight.org>



*Angela Zoss, Michael Connover, Katy Börner (2010)*



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Geographic Map

Science Map

Maps

Detail

Data

About

About

A new field of *Sustainability Science and Engineering* is emerging that seeks to understand the fundamental character of interactions between nature and human society and to help steer the impact of humanity's needs on the planet's natural resources towards sustainable trajectories. The field is unified in clear terms by its ultimate goals but occupies an interdisciplinary position among traditional research fields, spanning both science and engineering and spreading across disciplines as diverse as agriculture, ecology, oceanography, climate studies, economics, a diverse set of social sciences, energy and materials and several additional aspects of engineering, physics, biology, and chemistry. Although Sustainability Science and engineering is by now widely discussed in the scientific and engineering community, and is beginning to be connected to the political agenda for economic and social development, it remains unclear to what extent its many facets are being integrated into a global perspective and whether researchers are utilizing it as a nexus to collaborate across traditional scientific and engineering fields.

Please consult the [Mapping the Structure and Evolution of Sustainability Science](#) workshop web page for further information and details.

**Web Page Design**

This web site provides an interactive interface to publication, patent, and funding data on 'biomass' and 'biofuel' research. Visitors are invited to explore what funding is available in what geospatial regions and in what areas of science and what publications and patents

Google Map JavaScript API was used to implement both maps with two aggregation layers for each. The geographic map aggregates to the **state level** and the **city level**. The science map has a high level of aggregation of 13 top-level scientific **disciplines** and a low level of 554 **sub-disciplines**.

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Geographic Map

Science Map

Maps

Detail

Data

About

Datasets

The dataset covers 13,528 records on "biomass" and "biofuel" research and technology from seven different publication, patent, funding datasets for the years 1901 to 2010.

**Funding**

National Institutes of Health (NIH) awards retrieved from the Scholarly Database (<http://sdb.slis.indiana.edu>) at Indiana University on 11/20/2010. Search query used was biomass OR biofuel OR "bio mass" OR "bio fuel" in the 'All Text' field.

National Science Foundation (NSF) awards retrieved from the Scholarly Database (<http://sdb.slis.indiana.edu>) at Indiana University on 11/20/2010. Search query used was biomass OR biofuel OR "bio mass" OR "bio fuel" in the 'All Text' field.

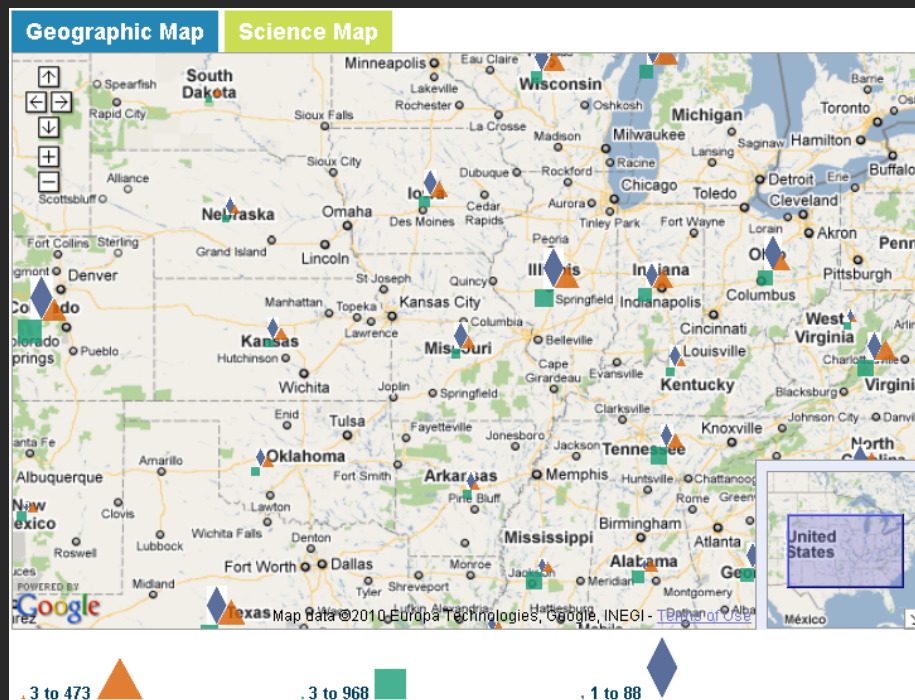
US Department of Agriculture (USDA) awards made available by a staff member of the Office of Scientific and Technical Information from the US Department of Energy (DOE).

**Publications**

MEDLINE papers by the National Library of Medicine retrieved from the Scholarly Database (<http://sdb.slis.indiana.edu>) at Indiana University on 11/20/2010. Search query used was biomass OR biofuel OR "bio mass" OR "bio fuel" in the 'All Text' field.

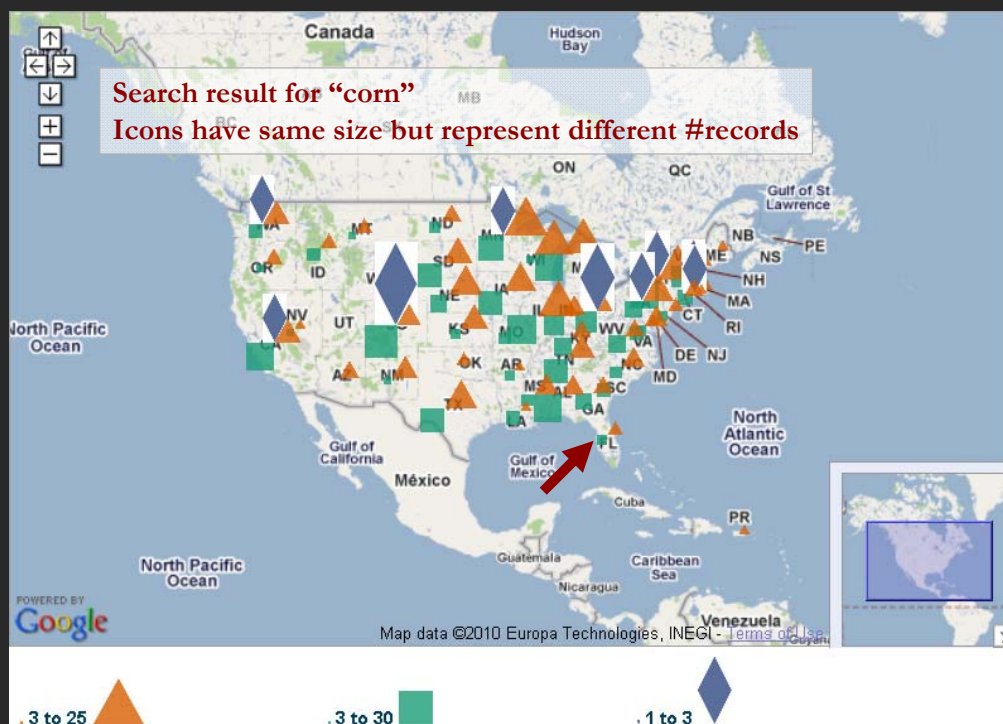
The geographic map at **state level**.

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The geographic map at city level.

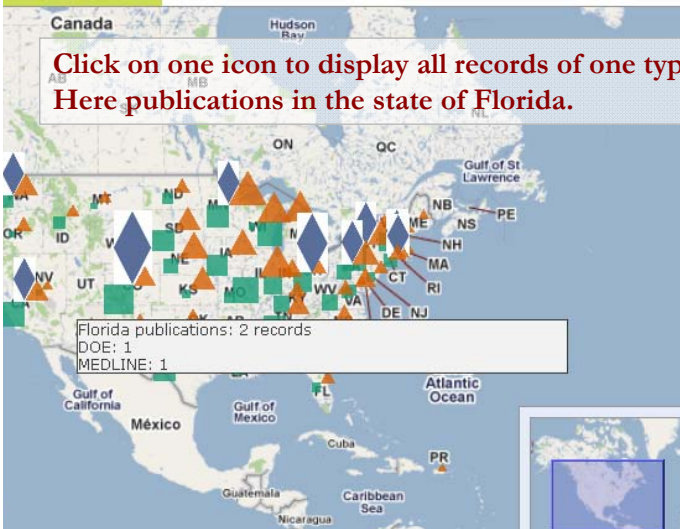
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## Science Map



## Maps

## Detail

## Data

## About

> Florida

MEDLINE  
2002

- [Recovery Of Dairy Manure Nutrients By Benthic Freshwater Algae](#)

DOE  
1985

- [Enzymatic Hydrolysis And Fermentation Of Corn For Fuel Alcohol](#)



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Information Bridge: DOE Scientific and Technical Information - - Document #5789929 - Mozilla Firefox

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http://www.osti.gov/bridge/product.biblio.jsp?osti\_id=5789929

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**Full Text** Availability information may be found in the Availability, Publisher, Research Organization, Resource Relation and/or Author (affiliation information) fields and/or via the "Full-text Availability" link. For a journal article, please see the Resource Relation field.

**Title** Enzymatic hydrolysis and fermentation of corn for fuel alcohol  
[Word Cloud](#) | [More Like This](#)

**Creator/Author** [Mullins, J.T.](#)

**Publication Date** 1985 Jan 01

**OSTI Identifier** OSTI ID: 5789929

**Other Number(s)** Journal ID: CODEN: BIBA

**Resource Type** Journal Article

**Resource Relation** Journal Name: Biotechnol. Bioeng.; (United States); Journal Volume: 27:3

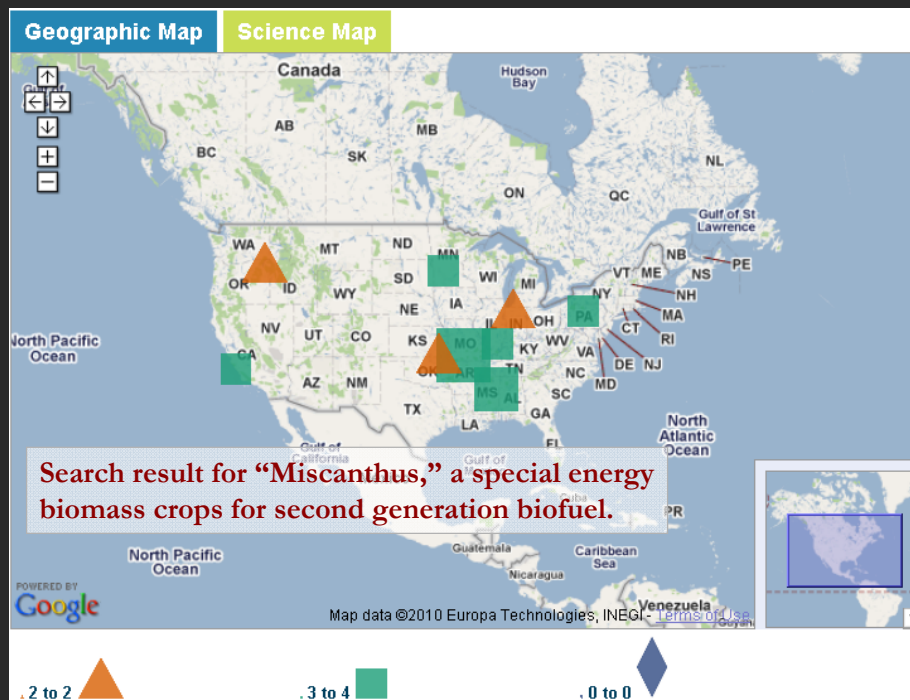
**Research Org** Univ. of Florida, Gainesville

**Subject** 09 BIOMASS FUELS; 32 ENERGY CONSERVATION, CONSUMPTION, AND UTILIZATION; ETHANOL FUELS; BIOSYNTHESIS; MAIZE; ENZYMATIC HYDROLYSIS; FERMENTATION; PRODUCTIVITY; COST; ENERGY EFFICIENCY; EXPERIMENTAL DATA; WASTE PRODUCT UTILIZATION; ALCOHOL FUELS; BIOCONVERSION; CEREALS; CHEMICAL REACTIONS; DATA; DECOMPOSITION; EFFICIENCY; FUELS; GRASS; HYDROLYSIS; INFORMATION; LYSIS; NUMERICAL DATA; PLANTS;

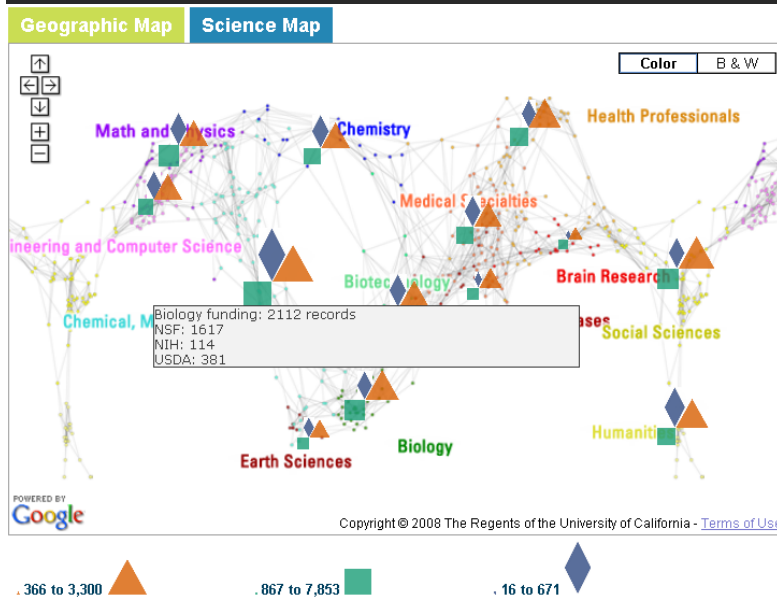
Done

Detailed information on demand  
via original source site for exploration and study.

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Maps Detail Data Ab

> Biology

NIH  
2009

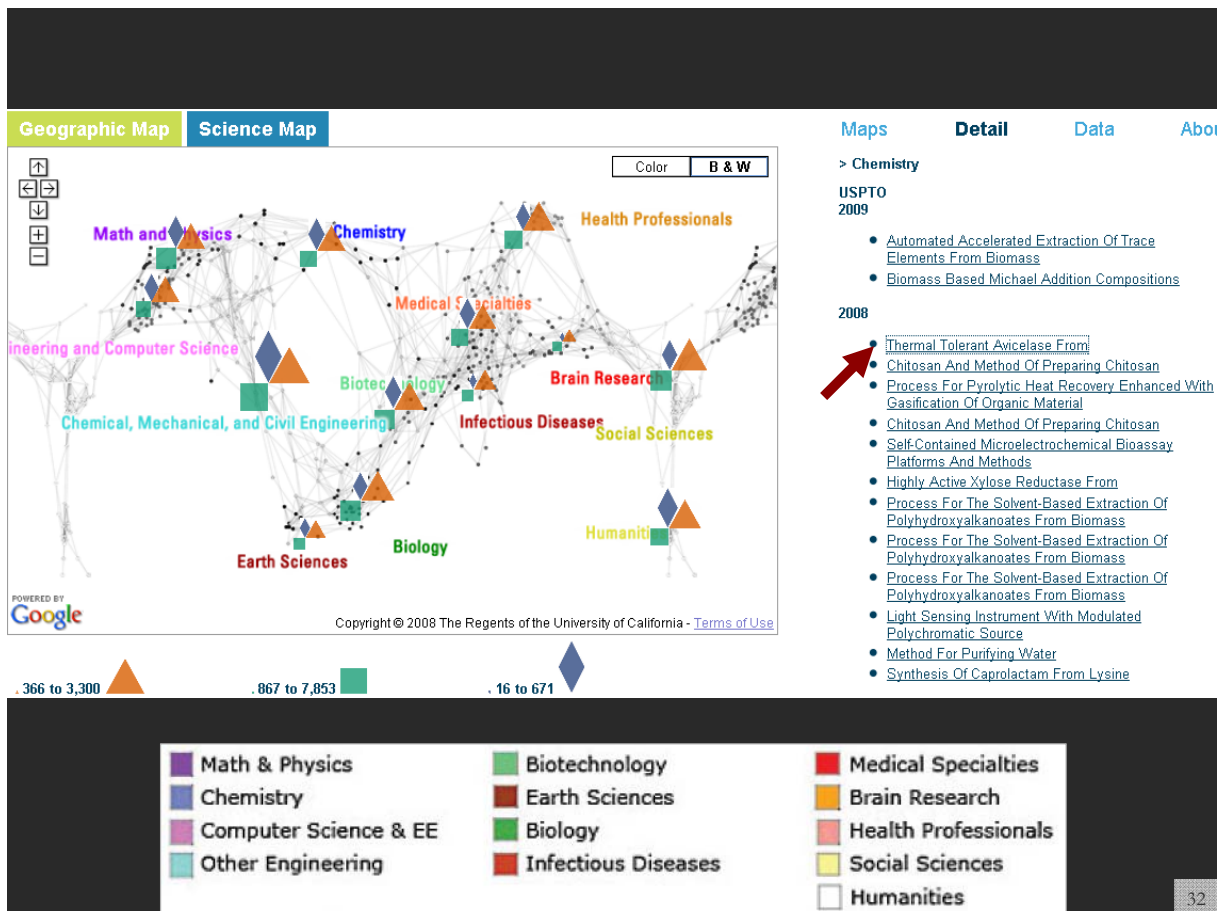
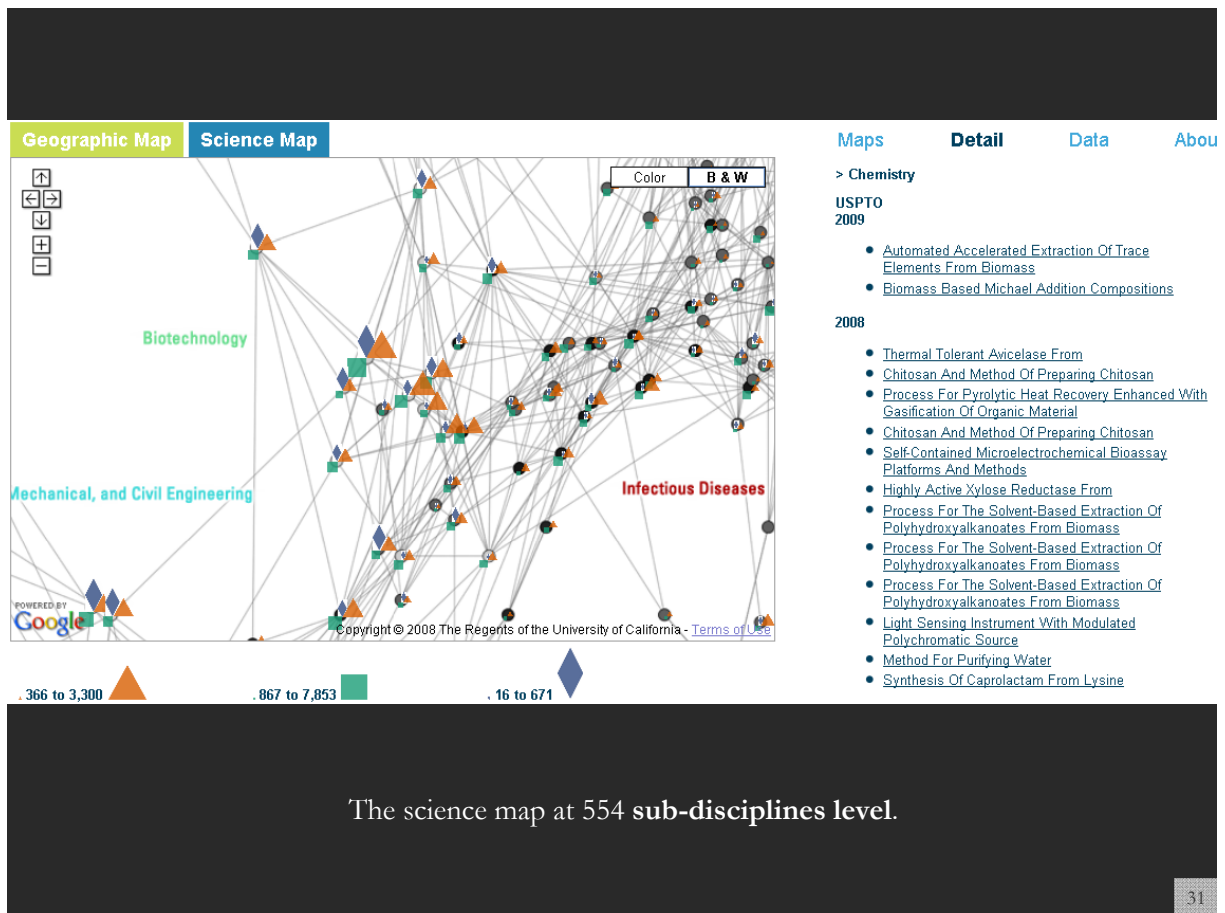
- [Label-Free And Simultaneous Detection Of Multiple Bacterial Pathogens And Virulen](#)
- [Mechanism Of Psp Mediated Adhesion](#)
- [Label-Free And Simultaneous Detection Of Multiple Bacterial Pathogens And Virulen](#)
- [Novel Mechanism Of Uranium Reduction Via Microbial Nanowires](#)
- [Nano-Scale Mechanisms Of Metal\(Loid\) Rhizostabilization In Desert Mine Tailings](#)
- [Label-Free And Simultaneous Detection Of Multiple Bacterial Pathogens And Virulen](#)
- [Mechanism Of Psp Mediated Adhesion](#)

2008

- [The Effect Of Inter-Species Interactions On The Virulence Of Streptococcus Mutans](#)
- [Cookstove Replacement For Prevention Of Ari And Low Birthweight In Nepal](#)
- [Diverse Drug Lead Compounds From Bacterial Symbionts In Tropical Marine Mollusks](#)
- [Remote Sensing Of Wildfire Smoke Exposures To Assess Health Effects](#)
- [Cookstove Replacement For Prevention Of Ari And Low Birthweight In Nepal](#)

The science map at 13 top-level scientific disciplines level.

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United States Patent: 7364890 - Mozilla Firefox

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http://patft.uspto.gov/netacgi/nph-Parser?Sect1=PTO1&Sect2=HITOFF&d=PALL&p=1&u=/netacgi/PTO/srch

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MapSustain United States Patent: 7364890 United States Patent: 7364890 Information Bridge: DOE Scientific a...

### USPTO PATENT FULL-TEXT AND IMAGE DATABASE

Home Quick Advanced Pat Num Help

Bottom

View Cart Add to Cart

Images

(1 of 1)

**United States Patent** 7,364,890  
**Ding, et al.** April 29, 2008

**Thermal tolerant avicelase from *Acidothermus cellulolyticus***

**Abstract**

The invention provides a thermal tolerant (thermostable) cellulase, AvIII, that is a member of the glycoside hydrolase (GH) family. AvIII was isolated and characterized from *Acidothermus cellulolyticus* and, like many cellulases, the disclosed polypeptide and/or its derivatives may be useful for the conversion of biomass into biofuels and chemicals.

Inventors: **Ding; Shi-You** (Golden, CO), **Adney; William S.** (Golden, CO), **Vinzant; Todd B.** (Golden, CO), **Himmel; Michael E.** (Littleton, CO)  
 Assignee: **Midwest Research Institute** (Kansas City, MO)  
 Appl. No.: **09/017,276**  
 Done

**NIH Map Viewer** Show Topic Browser ? Export Data Methods Feedback

2009 ? add delete AND Topic Words cancer breast cancers cancer\_risk cancer\_p 20 0/0 ? Search Clear Search

**Institutes (9)**

NIH Inst	#Grants	Count	+
NCI		116	
NCRR		10	
NIEHS		5	
NCMHD		1	
MTA		-	

**Topics**

%	Title Words	+
25.9	breast, cancer, cancer_risk, women, cancer_surv	
3.86	risk, risk_factors, cancer, prospective, women,	
3.76	genome_wide_association, loci, genome_wide,	
3.70	genetic, genetics, genes, gene_environment, c	

**Grants (137)**

NIH Inst	Grant	+
NCRR	3P20RR011792-10S2 6914 OBESITY, INSULIN RESISTANCE, IGF'S, AND BREAST CANCER RISK IN AFRICAN AMERICANS PI: CUI, YONG	
NCI	3R01CA120562-03S1 Commonly Used Medications and Breast Cancer Recurrence PI: BOUDREAU, DENISE M	
NCI	5R01CA120562-03 Commonly Used Medications and Breast Cancer Recurrence PI: BOUDREAU, DENISE M	
NCI	5R01CA093772-06 Long-term Survivorship in Older Women with Early Stage Breast	

Powered by ChalkLabs

<https://app.nihmaps.org>

# NIH Topic Browser - Institute Information

NLM NCI NEI NCCAM NIEHS NIGMS NINR NICHD NINDS NIA NCMHD NIAMS NIH NIDDK NHLBI NIAAA NIMH NHGRI FIC NIBIB NIDCR NCRR NIAID NIDA

NIDCD

Institute: NCI - National Cancer Institute

Export Data

## Top Topics

%	Topic	Topic Words	Title Words	Phrases	+
4.05	<a href="#">210</a>	cancer cancer_center program cancer_research	cancer_center, program, cancer, core, spore, tre	anderson cancer_center, shared resource, canc	
2.42	<a href="#">597</a>	cancer tumor tumorigenesis tumors myc tumor_	cancer, tumorigenesis, myc, tumor_suppressor,	tumor progression, malignant transformation, tu	
2.28	<a href="#">430</a>	cancer treatment therapy patients tumor diseas	cancer, therapy, treatment, tumor, prostate, bre	cancer treatment, treatment cancer, metastatic	
1.73	<a href="#">16</a>	metastasis invasion tumor metastatic progressi	metastasis, cancer, invasion, breast, tumor, pro	tumor progression, invasion metastasis, cancer	
1.47	<a href="#">345</a>	clinical_trials trials oncology cancer treatment di	clinical_trials, clinical_oncology, oncology, unit, p	clinical_trials unit, phase_i clinical_trials, cancer	
1.43	<a href="#">686</a>	cancer breast cancers cancer_risk cancer_patien	breast, cancer, cancer_risk, women, cancer_sur	breast cancer, breast cancer_risk, breast cancer	
1.41	<a href="#">370</a>	tumor immunotherapy t_cells t_cell immunity an	tumor, immunotherapy, t_cell, immunity, t_cells,	antitumor immunity, adoptive immunotherapy, b	
1.14	<a href="#">480</a>	therapeutic agents treatment therapies targets	therapeutic, targeting, agents, treatment, ther	therapeutic agents, therapeutic targets, therap	
1.08	<a href="#">346</a>	biomarkers markers biomarker disease patients	biomarkers, biomarker, markers, disease, cancer	disease progression, biomarker validation, seru	
0.98	<a href="#">660</a>	prostate cancer pca cancer_cells lncap androgei	prostate, cancer, cancer_cells, androgen_recept	prostate cancer, prostate cancer_cells, prostate	
0.90	<a href="#">171</a>	scientific committee administrative management	core, administrative, administration, planning, a	steering committee, internal external, institutio	
0.87	<a href="#">182</a>	breast cancer her2 cancer_cells human mcf7 neu	breast, cancer, cancer_cells, her2, human, estr	breast cancer, breast cancer_cells, her2 neu, br	
0.85	<a href="#">437</a>	risk risk_factors cases cohort prospective high_r	risk, risk_factors, cancer, prospective, women, e	cases controls, prospective cohort_study, modif	
0.85	<a href="#">23</a>	tumor tumors tumor_growth mice treatment tun	tumor, tumors, cancer, tumor_growth, targeting	tumor regression, tumor burden, tumor progres	
0.85	<a href="#">695</a>	core statistical projects biostatistics investigat	core, biostatistics, data_management, bioinform	biostatistics core, projects core, data_managem	
0.79	<a href="#">603</a>	intervention interventions program prevention p	intervention, prevention, interventions, program	randomized_controlled trial, intervention reduce	

<https://app.nihmaps.org>

# NIH Topic Browser

Show Map Viewer ?

Export Data

Methods

Feedback

Topics by NIH Institute

Topics by Category

2009

?

add

delete

AND

Exact Text

cancer

Search

Clear Search

## 2009 Grants (137)

## Institutes (9)

Col	NIH Inst	Project/Subproj	Title	Investigator(s)	# 1 Topic	# 1 Topic Word	+	NIH Inst	# Grants	Count	+
	NCRR	<a href="#">3P20RR011792-10S2</a>	<a href="#">6914</a> OBESITY, INSULIN RESISTANCE, IGF'S, AND BREAST CANCER RISK IN AFRICAN AMERICANS	CUI, YONG	686 (50%)	cancer brea...		NCI	116		
	NCI	<a href="#">3R01CA120562-03S1</a>	Commonly Used Medications and Breast Cancer Recurrence	BOUDREAU, DENISE M	686 (42%)	cancer brea...		NCRR	10		
	NCI	<a href="#">5R01CA120562-03</a>	Commonly Used Medications and Breast Cancer Recurrence	BOUDREAU, DENISE M	686 (42%)	cancer brea...		NIEHS	5		
	NCI	<a href="#">5R01CA093772-06</a>	Long-term Survivorship in Older Women with Early Stage Breast Cancer	SILLIMAN, REBECCA A	686 (42%)	cancer brea...		NCMHD	1		
	NCI	<a href="#">5R01CA064277-11</a>	Shanghai Breast Cancer Study	ZHENG, WEI	686 (41%)	cancer brea...		NIA	1		
								NCCAM	1		
								NICHD	1		
								NINR	1		
								NHGRI	1		

## Topics

## Similar Grants

Show Top 100 on Map

%	Topic	Topic Words	Title Words	+	Similar	NIH Inst	Grant	+
25.91	<a href="#">686</a>	cancer breast cancers cancer_risk cancer_patients	breast, cancer, car		6.51	NCI	<a href="#">1R01CA129639-01A2</a> Genome-Wide Association Study of Radiation Exposure and Bilateral Breast Cancer PI: BERNSTEIN, JONINE LISA	
3.86	<a href="#">437</a>	risk risk_factors cases cohort prospective high_ris	risk, risk_factors, v		6.46	NCI	<a href="#">1K07CA136758-01A1</a> Genetic variants in the PI3K pathway in mammographic density and breast cancer PI: THOMPSON, CHERYL L	
3.76	<a href="#">544</a>	snps snp genome_wide_association cases genes	genome_wide_ass		6.31	NCI	<a href="#">5P50CA116199-05</a> UTMADACC SPORE in Breast Cancer PI: HORTOBAGYI, GABRIEL N	
3.70	<a href="#">173</a>	genetic genes risk susceptibility polymorphisms	genetic, genetics,		6.02	NCI	<a href="#">2R01CA050385-21A1</a> Risk Factors for Breast Cancer in Younger Nurses PI: WILLET, WALTER C	
2.62	<a href="#">252</a>	treatment patients management patient outcome	management, tre		4.6	NCI	<a href="#">5R01CA127617-02</a> Who Cares For Older Breast Cancer Survivors And How Does It Affect Quality? PI: MANDELBLATT, JEANNE	
1.64	<a href="#">235</a>	conference meeting workshop symposium scientifi	th, conference, sy					
1.63	<a href="#">351</a>	community implementation community_based he	community, preve					
1.54	<a href="#">325</a>	million disease treatment united_states public_h	disease, treatmen					
1.51	<a href="#">580</a>	training candidate career skills applicant program	treatment, depres					

<https://app.nihmaps.org>

3P20RR011792-10S2 6914 [Map Viewer](#) [Topic Browser](#) [Export Data](#) [Methods](#) [Feedback](#)

2009 NCR CUI, YONG NIH RePORTer [Map Similar Grants](#) [Highlight on Map](#) [Show Parent/Other Subs](#)

**OBEsITY, INSULIN RESISTANCE, IGF'S, AND BREAST CANCER RISK IN AFRICAN AMERICANS**

The purpose of this study is to better understand how lifestyle factors and their interaction with genetic factors influence a women's risk of developing breast cancer. In order to learn more about the causes of breast cancer, we need to compare the lifestyles of people who have breast cancer with those who do not. 600 women are expected to be enrolled.

**Top Topics**

50.00	686	cancer breast cancers cancer_risk cancer_patients women cancer_surviv
11.54	378	african_american white ethnic racial african_americans black race white
11.54	548	obesity weight bmi obese overweight weight_loss body_mass_index kg

**Tags**

**NIH Reporting Categories**  
Breast Cancer... Cancer... Obesity

**NIH Concept Keywords**  
African American... cancer risk... Clinical Research... Computer Retrieval of Information on

**Similar Grants**

Similar	Co NIH Inst	Project/Subproject	Title	Investigator(s)	#1 Topic	#1 Topic Words
0.54	NCI	<a href="#">3K22CA127519-03S1</a>	Beyond Adiposity: Insulin and Inflammation in Postmenopausal Breast Cancer	NUNEZ, NOMEI PANIAGUA	686 (33%)	cancer breast...
0.54	NCI	<a href="#">5K22CA127519-03</a>	Beyond Adiposity: Insulin and Inflammation in Postmenopausal Breast Cancer	NUNEZ, NOMEI PANIAGUA	686 (33%)	cancer breast...
0.48	NCI	<a href="#">5R01CA128799-02</a>	Mechanisms for Increased Breast Cancer Risk in Type 2 Diabetes	LEROITH, DEREK	66 (17%)	diabetes diab...
0.48	NCI	<a href="#">3P30CA013696-36S2 0007</a>	BREAST CANCER RESEARCH	PARSONS, RAMON E	210 (40%)	cancer cancer...
0.48	NCI	<a href="#">3P30CA013696-36S3 0007</a>	BREAST CANCER RESEARCH	PARSONS, RAMON E	210 (40%)	cancer cancer...

<https://app.nihmaps.org>

**NIH Map Viewer** [Show Topic Browser](#) [Export Data](#) [Methods](#) [Feedback](#)

2009 [add](#) [delete](#) [AND](#) [Related Grants](#) 7960745 [Top 100](#) [Search](#) [Clear Search](#)

**Institutes (3)**

NIH Inst	# Grants	Count
NCI		94
NCR		6
NCMH		1

**Topics**

%	Title Words
14.72	breast, cancer, cancer_risk, women, cancer_sui
11.05	breast, mammography, mammographic, canci
9.60	risk, risk_factors, cancer, prospective, women,
3.23	genome_wide_association, lodi, genome_wide,

**Grants (101)**

NIH Inst	Grant
NCR	<a href="#">3P20RR011792-10S2 6914</a> OBEsITY, INSULIN RESISTANCE, IGF'S, AND BREAST CANCER RISK IN AFRICAN AMERICANS PI: CUI, YONG
NCI	<a href="#">3R01CA120562-03S1</a> Commonly Used Medications and Breast Cancer Recurrence PI: BOUDREAU, DENISE M
NCI	<a href="#">5R01CA120562-03</a> Commonly Used Medications and Breast Cancer Recurrence PI: BOUDREAU, DENISE M
NCI	<a href="#">5R01CA093772-06</a> Long-term Survivorship in Older Women with Early Stage Breast

**Settings**

Powered by **ChalkLabs**

<https://app.nihmaps.org>



# R+D Dashboard

BETA

Tracking our progress.  
Leading the world in scientific and technological innovation.

- Home
- Investments
- Outputs
- About
- Contact

## Publications

Discover Publications by clicking on map or using the options below.

Illinois

NIH/NSF

Year(s): 2000-2009

Refine results by selecting institutions or topics:

Top Research Institutions

University of Illinois at Urbana-Champaign  
Northwestern University  
University of Chicago  
RUSH UNIVERSITY MEDICAL CENTER  
LOYOLA UNIVERSITY CHICAGO  
Southern Illinois University at Carbondale

Top Topics

Download selected data as CSV

USA View Highlight selected area Map

Show 100 entries Search:

Year	Publication Number	Grant Number	Federal Agency	Receiving Institution
2009	PMID 19129223	1R01HL094585-01	NIH	CHILDREN'S MEMORIAL HOSPITAL

<http://rd-dashboard.nitrd.gov/pub.html>

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# R+D Dashboard

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- Contact

## Publications

Discover Publications by clicking on map or using the options below.

Illinois

National Science Foundation

Year(s): 2000-2009

Refine results by selecting institutions or topics:

Top Research Institutions

Top Topics

climate model atmospheric data global  
flow fluid transport wave dynamic  
optical laser light high system  
economic policy market decision public  
technology engineering team technologies

Download selected data as CSV

USA View Highlight selected area Map

Select multiple topics by clicking on each topic; to de-select, click again.

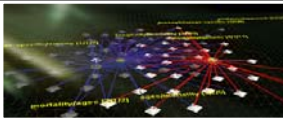
Search:

Year	Publication Number	Grant Number	Federal Agency	Receiving Institution
2009	PUB 5767715	0848647	NSF	American Bar Foundation

40

# S&T Studies Using Semantic Web Data

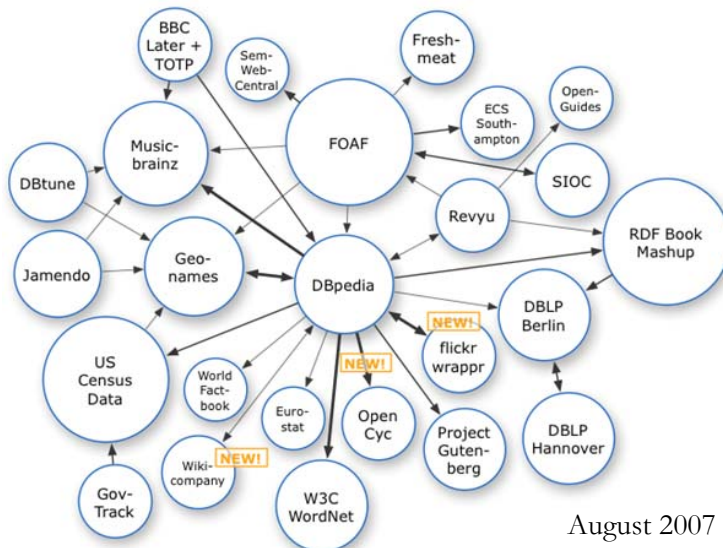
41



## Linked Open Data

- Interlinking existing data silos and
- Exposing them as structured data
- Adding new high quality data relevant for S&T studies

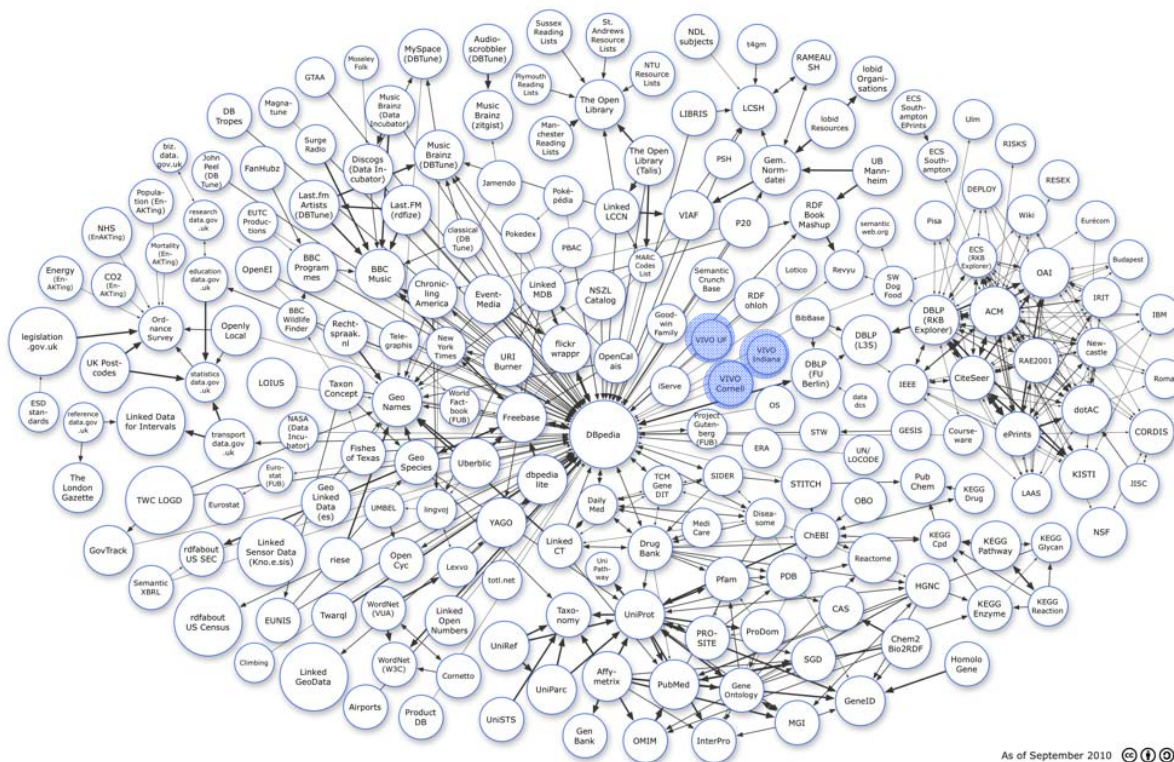
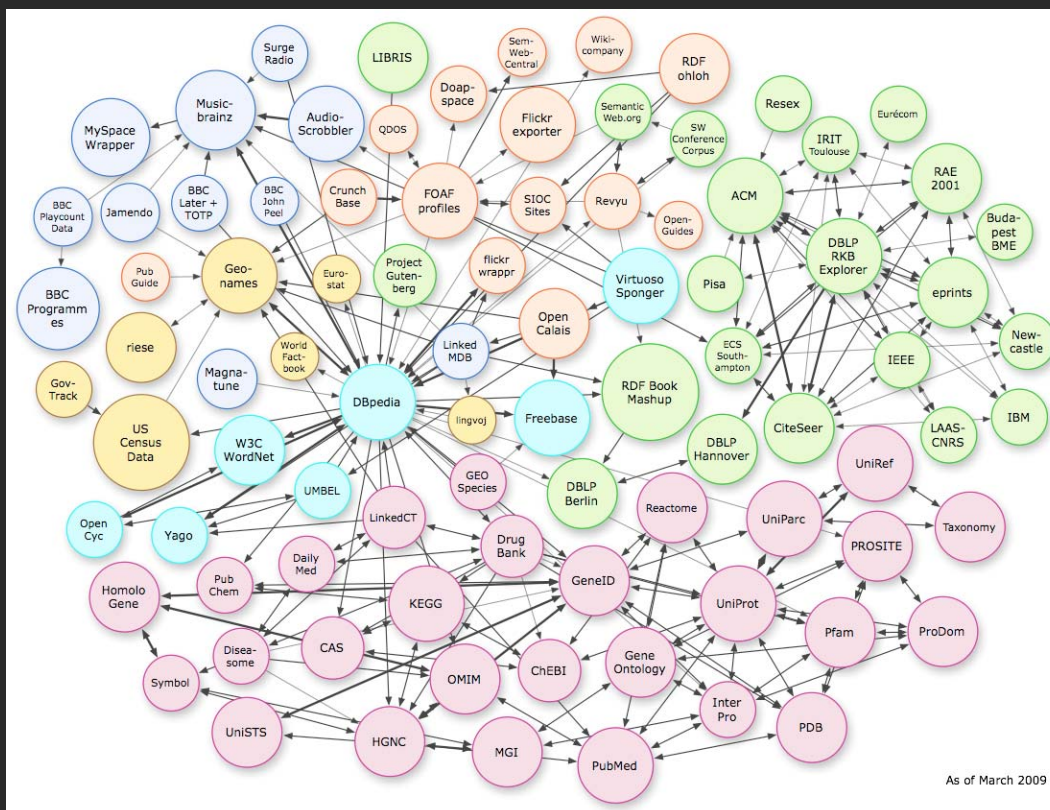
<http://linkeddata.org>



August 2007

42

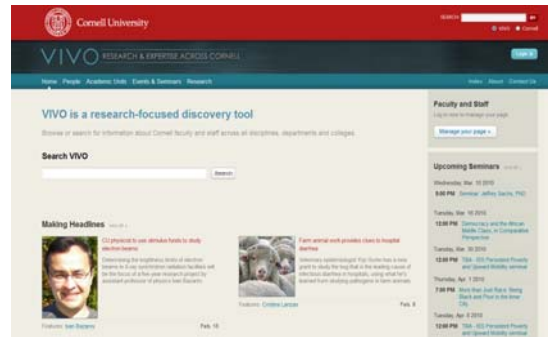






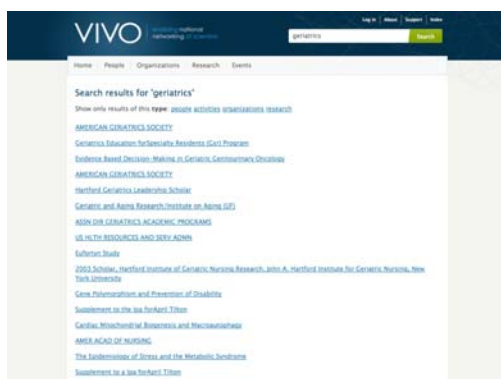
## VIVO: A Semantic Approach to Creating a National Network of Researchers (<http://vivoweb.org>)

- Semantic web application and ontology editor originally developed at Cornell U.
- Integrates research and scholarship info from systems of record across institution(s).
- Facilitates research discovery and cross-disciplinary collaboration.
- Simplify reporting tasks, e.g., generate biosketch, department report.



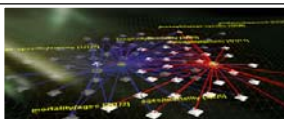
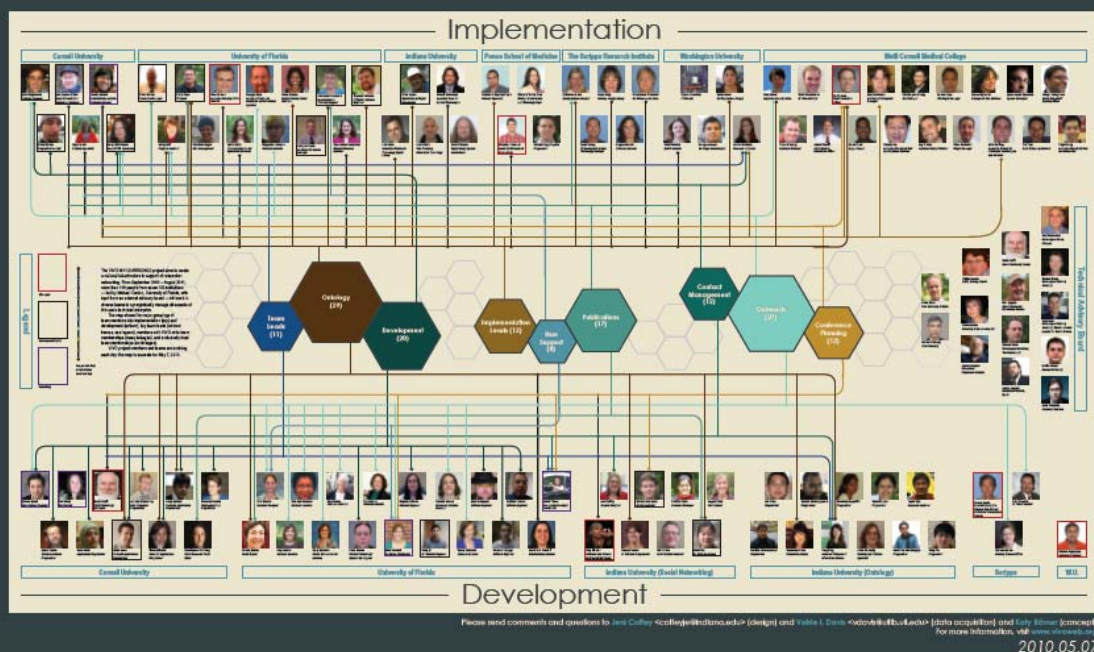
Funded by \$12 million NIH award.

**Cornell University:** Dean Krafft (Cornell PI), Manolo Bevia, Jim Blake, Nick Cappadona, Brian Caruso, Jon Corson-Rikert, Elly Cramer, Medha Devare, John Ferreira, Brian Lowe, Stella Mitchell, Holly Mistlebauer, Anup Sawant, Christopher Westling, Rebecca Younes. **University of Florida:** Mike Conlon (VIVO and UF PI), Cecilia Botero, Kerry Britt, Erin Brooks, Amy Buhler, Ellie Bushhousen, Chris Case, Valrie Davis, Nita Ferree, Chris Haines, Rae Jesano, Margeaux Johnson, Sara Kreinest, Yang Li, Paula Markes, Sara Russell Gonzalez, Alexander Rockwell, Nancy Schaefer, Michele R. Tennant, George Hack, Chris Barnes, Narayan Raum, Brenda Stevens, Alicia Turner, Stephen Williams. **Indiana University:** Katy Borner (IU PI), William Barnett, Shanshan Chen, Ying Ding, Russell Duhon, Jon Dunn, Micah Linnemeier, Nianli Ma, Robert McDonald, Barbara Ann O'Leary, Mark Price, Yuyin Sun, Alan Walsh, Brian Wheeler, Angela Zoss. **Ponce School of Medicine:** Richard Noel (Ponce PI), Ricardo Espada, Damaris Torres. **The Scripps Research Institute:** Gerald Joyce (Scripps PI), Greg Dunlap, Catherine Dunn, Brant Kelley, Paula King, Angela Murrell, Barbara Noble, Cary Thomas, Michaelen Trimarchi. **Washington University, St. Louis:** Rakesh Nagarajan (WUSTL PI), Kristi L. Holmes, Sunita B. Koul, Leslie D. McIntosh. **Weill Cornell Medical College:** Curtis Cole (Weill PI), Paul Albert, Victor Brodsky, Adam Cheriff, Oscar Cruz, Dan Dickinson, Chris Huang, Itay Klaw, Peter Michelini, Grace Migliorisi, John Ruffing, Jason Specland, Tru Tran, Jesse Turner, Vinay Varughese.

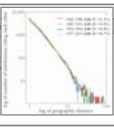
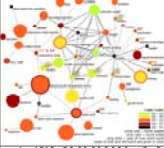


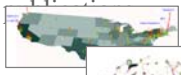
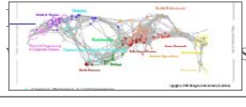
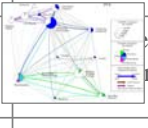
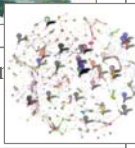

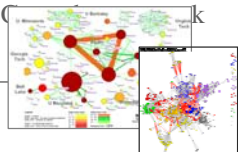
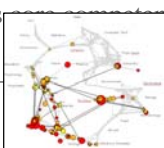


# VIVO Enabling National Networking of Scientists

## Project Members and Teams



## Type of Analysis vs. Level of Analysis

	<i>Micro/Individual</i> (1-100 records)	<i>Meso/Local</i> (101-10,000 records)	<i>Macro/Global</i> (10,000 < records)
<b>Statistical Analysis/Profiling</b>	Individual person and their expertise profiles	Larger labs, centers, universities, research domains, or states	All of NSF, SA, all of science 
<b>Temporal Analysis (When)</b>	Funding portfolio of one individual	Topic bursts of PNAS 	113 Years of P Research 
<b>Geospatial Analysis (Where)</b>	Career trajectory of one individual	Wrapping a state intellectual landscape 	PNAS 
<b>Topical Analysis (What)</b>	 s.	Research flow in research 	VxOrd/Topic in NIH funding 
<b>Network Analysis (With Whom?)</b>	NSF one work of 	Work of 	NIH's 

How do you want to compare?

by Grants

Who do you want to compare?

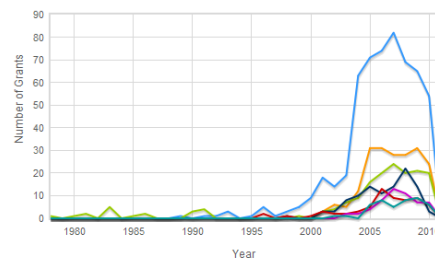
Search: X

Records 1 - 10 of 30 « First &lt; Prev Next &gt; Last »

Entity Label	Grant Count	Entity Type
<input checked="" type="checkbox"/> Continuing Education	562	UF Department, Agent, Non-Academic Department, Department
<input checked="" type="checkbox"/> Florida Museum of Natural History	203	Museum, Agent
<input checked="" type="checkbox"/> College of Agricultural and Life Sciences	166	Agent, UF College, College
<input checked="" type="checkbox"/> College of Engineering	103	Agent, UF College, College
<input checked="" type="checkbox"/> Evelyn F. and William L. McKnight Brain Institute of the University of Florida	64	UF Center, Agent, Center
<input checked="" type="checkbox"/> International Center	54	UF Department, Agent, Non-Academic Department, Department
<input checked="" type="checkbox"/> Florida Sea Grant	44	UF Center, Agent, Center
<input type="checkbox"/> Whitney Laboratory for Marine Bioscience	42	UF Research Laboratory, Agent, Laboratory, Research Laboratory
<input type="checkbox"/> Water Institute	38	UF Center, Agent, Center
<input type="checkbox"/> College of Dentistry	35	Agent, UF College, College

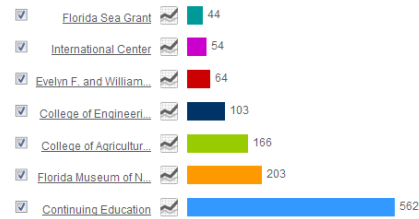
Save as CSV Clear

Comparing Grants of Organizations in University of Florida



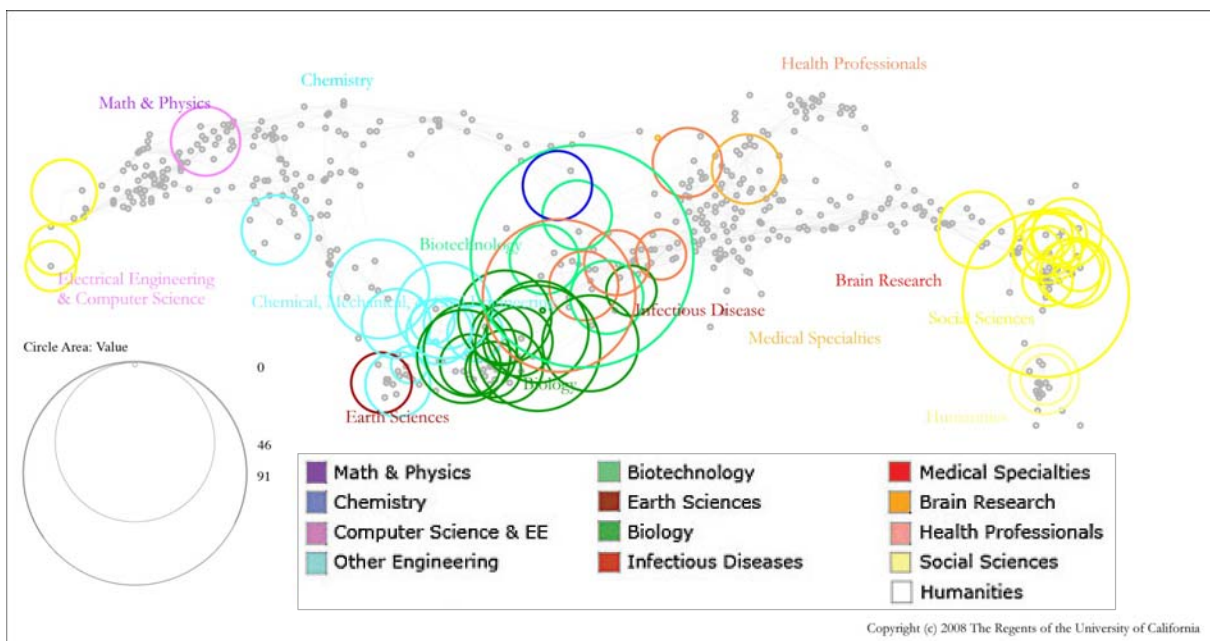
Total Number of Grants

You have selected 7 of a maximum 10 organizations to compare. Clear



**Temporal Analysis (When)** Temporal visualizations of the number of papers/funding award at the institution, school, department, and people level

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Copyright (c) 2008 The Regents of the University of California

**Topical Analysis (What)** Science map overlays will show where a person, department, or university publishes most in the world of science. (in work)

50





```

<?xml version="1.0" encoding="UTF-8" ?>
<rdf:RDF>
  <rdf:Description rdf:about="http://vivo.ufl.edu/individual/n56206">
    <rdfs:label rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Member</rdfs:label>
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#Thing"/>
    <rdf:type rdf:resource="http://vivoweb.org/ontology/core#Role"/>
    <rdf:type rdf:resource="http://vivoweb.org/ontology/core#MemberRole"/>
    <j.3:roleIn rdf:resource="http://vivo.ufl.edu/individual/n57238"/>
    <j.3:memberRoleOf rdf:resource="http://vivo.ufl.edu/individual/n25562"/>
    <j.3:startYear rdf:datatype="http://www.w3.org/2001/XMLSchema#Year">1997</j.3:startYear>
  </rdf:Description>
  <rdf:Description rdf:about="http://vivo.ufl.edu/individual/n78765">
    <rdfs:label rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Member</rdfs:label>
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#Thing"/>
    <rdf:type rdf:resource="http://vivoweb.org/ontology/core#Role"/>
    <rdf:type rdf:resource="http://vivoweb.org/ontology/core#MemberRole"/>
    <j.3:roleIn rdf:resource="http://vivo.ufl.edu/individual/n52513"/>
    <j.3:memberRoleOf rdf:resource="http://vivo.ufl.edu/individual/n25562"/>
    <j.3:startYear rdf:datatype="http://www.w3.org/2001/XMLSchema#Year">1980</j.3:startYear>
  </rdf:Description>
  <rdf:Description rdf:about="http://vivo.ufl.edu/individual/n25562">
    <j.3:featuredIn rdf:resource="http://vivo.ufl.edu/individual/n6868"/>
    <j.3:featuredIn rdf:resource="http://vivo.ufl.edu/individual/n3884"/>
  </rdf:Description>

```

Home Index About

Search

## Networks and Complex Systems Research at Indiana University

This VIVO instance provides information on networks and complex systems

- [Faculty](#) and their [departments](#)
- [Publications](#)
- [Grants](#)
- [Courses](#)

at Indiana University. The site was created in support of a NSF IGERT grant application. A major intent is to cross-fertilize between research done in the social and behavioral sciences, research in natural sciences such as biology or physics, but also research on Internet technologies.

- The site will be continuously updated to help
- New faculty to get in contact with relevant researchers.
  - Faculty and policy makers to pool teams in response to funding solicitations.
  - Faculty to coordinate research efforts – collaborations using existing funding/resources.
  - Faculty to coordinate teaching.
  - Students identify relevant courses, potential advisors, funding.
  - Organize the Mon talk series on [Networks and Complex Systems](#).
  - Arrange research meetings for visitors with relevant faculty/students

<http://vivo-netsci.cns.iu.edu>

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### Co-Investigator Network [\(GraphML File\)](#)

#### Profile

[Daniels, Michael Joseph](#)

PROFESSOR

[VIVO profile](#) | [Co-investigator network](#)

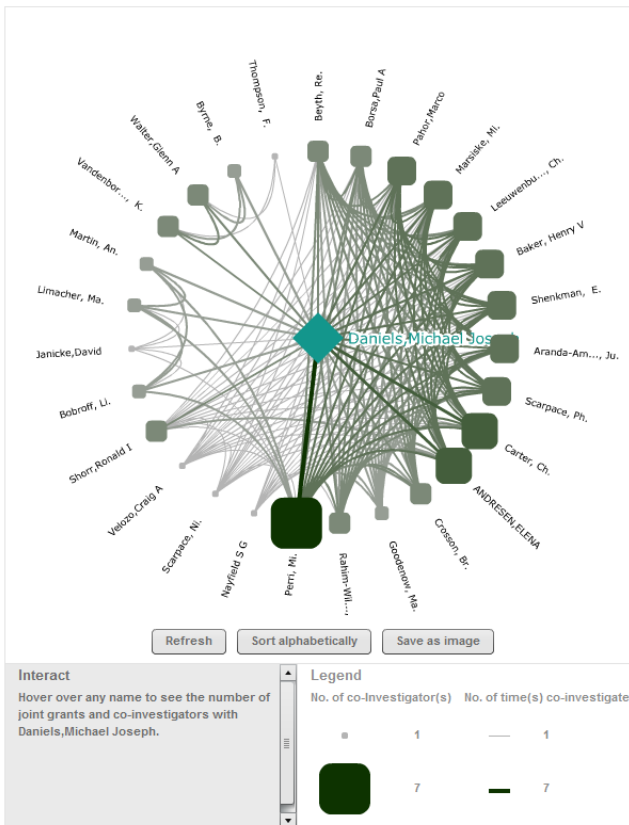
17 Grant(s)

27 Co-investigator(s)

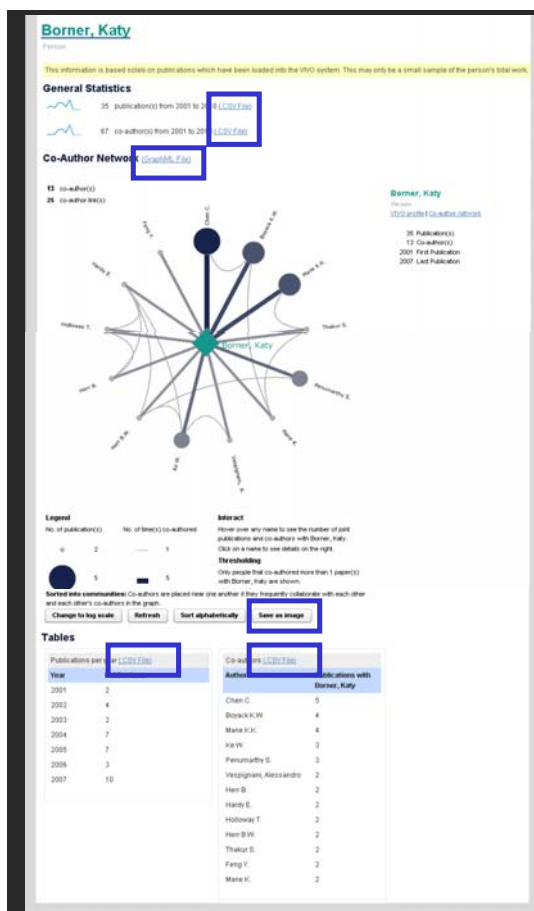
2003 First Grant

2010 Last Grant

Note: This information is based solely on grants which have been loaded into the VIVO system. This may only be a small sample of the person's total work.



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## Data Download Support

### General Statistics

- 36 publication(s) from 2001 to 2010 (.CSV File)
- 80 co-author(s) from 2001 to 2010 (.CSV File)

### Co-Author Network

(GraphML File)

Save as Image (.PNG file)

### Tables

- Publications per year (.CSV File)
- Co-authors (.CSV File)

36 publication(s) from 2001 to 2010 (.CSV File)

80 co-author(s) from 2001 to 2010 (.CSV File)

Year	Count	Co-Author(s)
2001	1	Chen C.
2002	3	Chen C.; McMahon T.; Feng Y.
2003	2	Chen C.; Boyack K.W.
2004	17	Sengupta A.; Penumarthi S.; Thakur S.; Sooriamurthi R.; Maru J.T.; Shiffrin R.M.; Mane K.; Moor K.A.;

Co-author network (GraphML File)

```

1 <?xml version="1.0" encoding="UTF-8"?>
2 <graphml xmlns="http://graphml.graphdrawing.org/xmlns"
3   xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
4   xsi:schemaLocation="http://graphml.graphdrawing.org/xmlns
5     http://graphml.graphdrawing.org/xmlns/1.0/graphml.xsd">
6   <key id="label" for="node" attr.name="label" attr.type="string" />
7   <key id="number_of_authored_works" for="node" attr.name="number_of_authored_works" attr.type="int" />
8   <key id="num_unknown_publication" for="node" attr.name="num_unknown_publication" attr.type="int" />
9   <key id="num_latest_publication" for="node" attr.name="num_latest_publication" attr.type="int" />
10  <key id="latest_publication" for="node" attr.name="latest_publication" attr.type="int" />
11  <key id="profile_url" for="node" attr.name="profile_url" attr.type="string" />

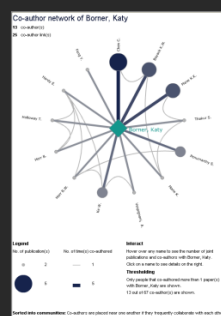
```

Save as Image (.PNG file)

Publications per year (.CSV File), see top file.

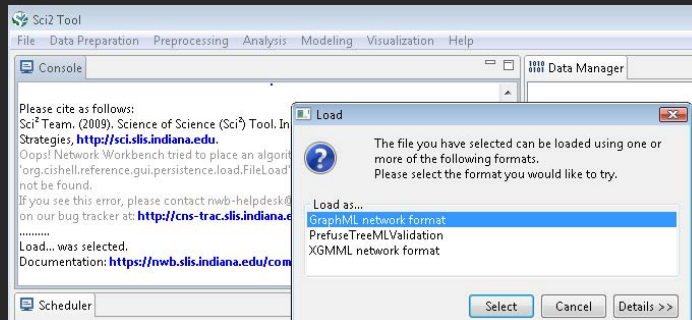
Co-authors (.CSV File)

Co-Author	Count
Andrienko G.	1
Andrienko N.	1
Ben-Miled Z.	1
Blackwell A.	1
Boyack K.W.	4
Bozicevic M.	1
Brodbeck D.	1
Burkhard R.A.	1
Chen C.	5





## Run Science of Science (Sci2) Tool and load Co-Author Network ([GraphML File](#))

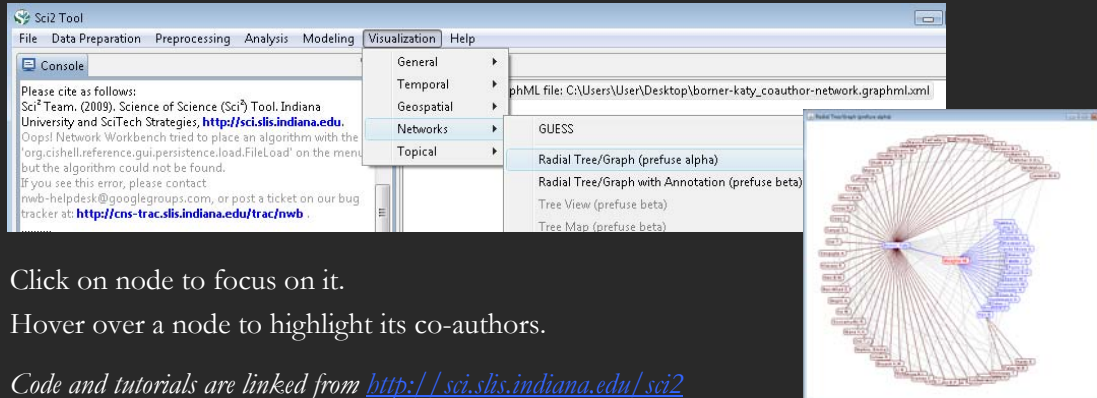


Network Analysis Toolkit

Nodes: 81

Edges: 390

Visualize the file using Radial Graph layout.

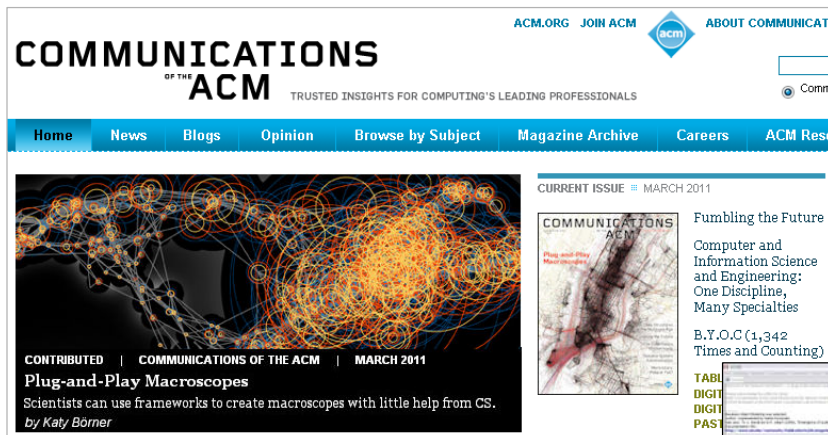


Click on node to focus on it.


Hover over a node to highlight its co-authors.

Code and tutorials are linked from <http://sci.slis.indiana.edu/sci2>

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<http://cacm.acm.org>

 Information Visualization Cyberinfrastructure  
<http://iv.cns.iu.edu>

 Network Workbench Tool & Community Wiki  
<http://nwb.cns.iu.edu>

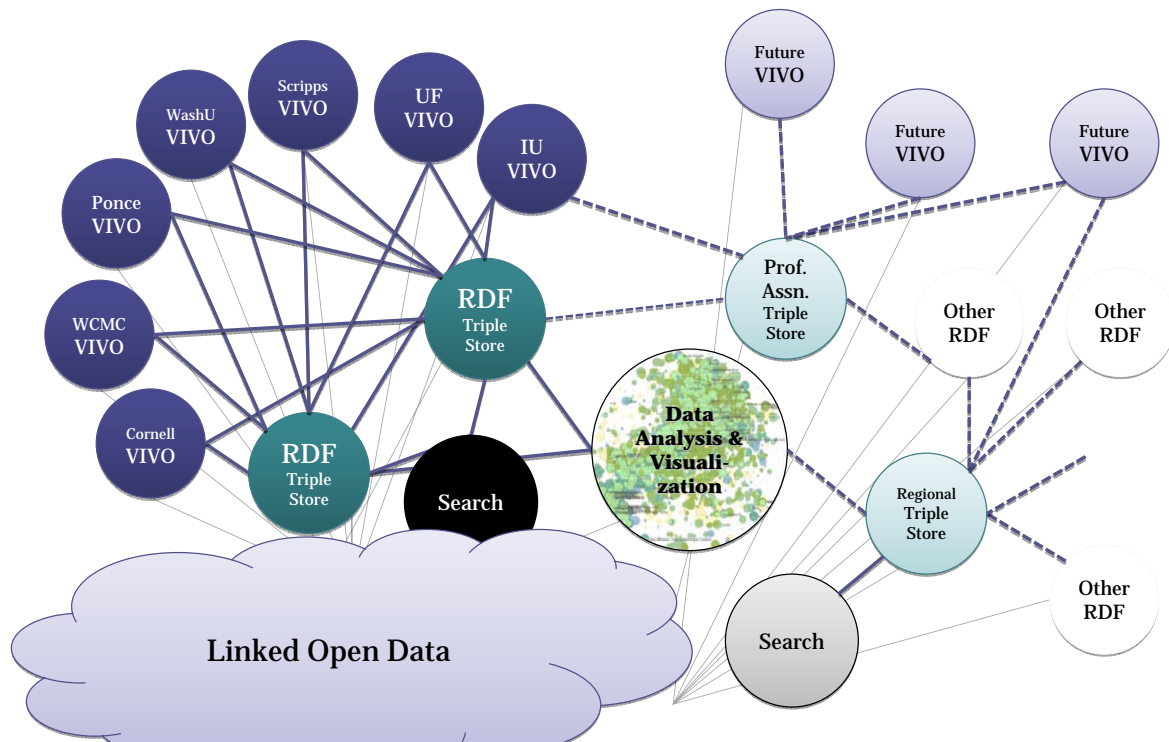
 Science of Science (Sci2) Tool and CI Portal  
<http://sci2.cns.iu.edu>

 Epidemics Cyberinfrastructure  
<http://epic.cns.iu.edu>

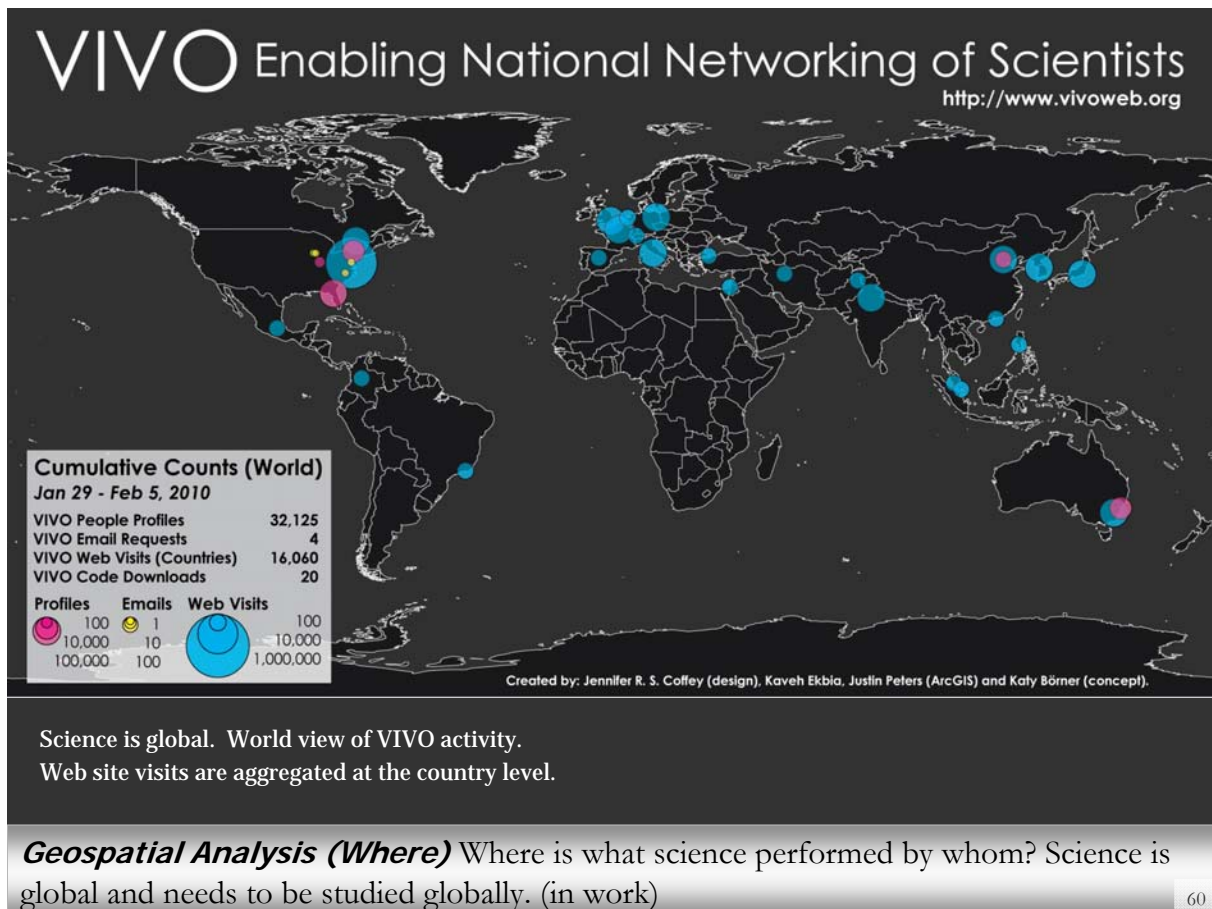


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# VIVO National Level Visualizations



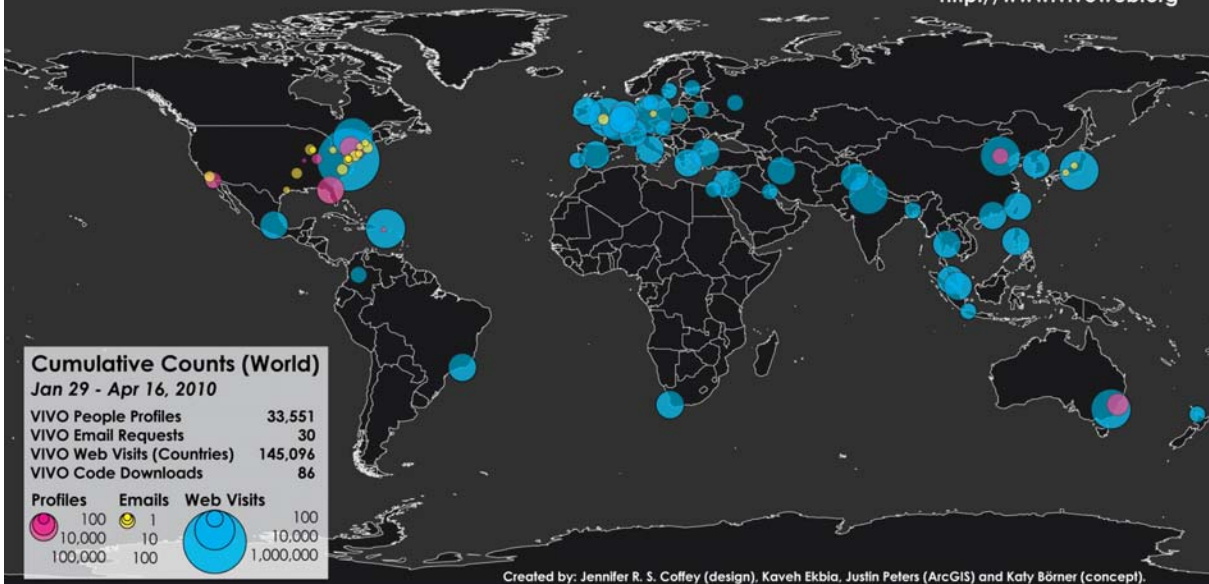
59



60

# VIVO Enabling National Networking of Scientists

<http://www.vivoweb.org>



Shown are the

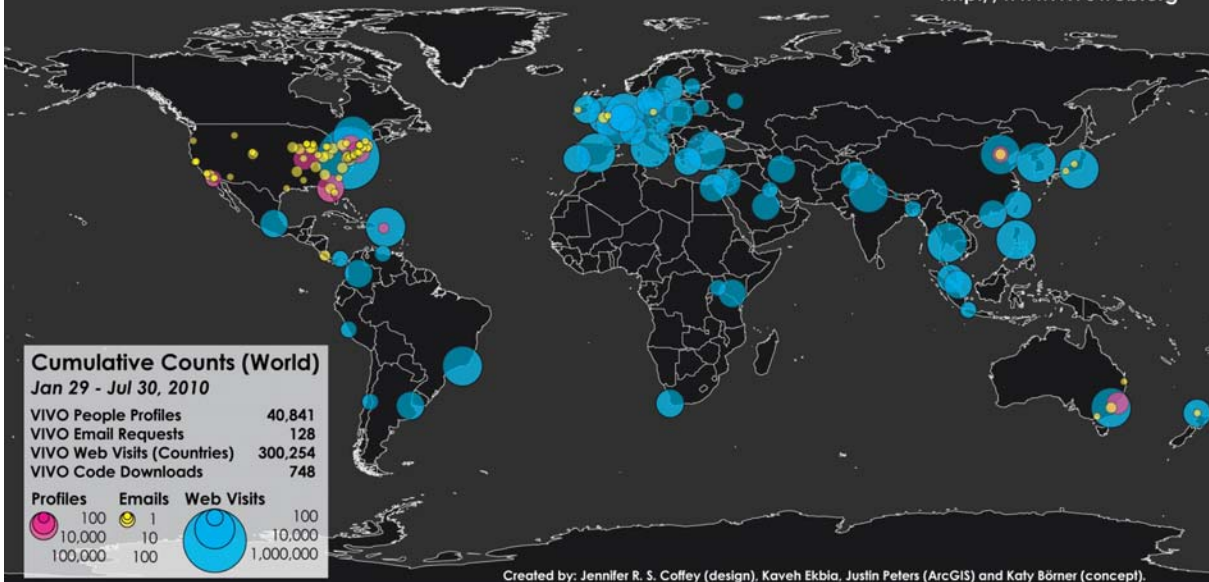
- Number of people profiles in the 7 different VIVO installation sites plus CAS and U Melbourne.
- Email contacts by data and service providers as well as institutions interested to adopt VIVO.
- The number of visitors on <http://vivoweb.org>

Circles are area size coded using a logarithmic scale.

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# VIVO Enabling National Networking of Scientists

<http://www.vivoweb.org>



VIVO 1.0 source code was publicly released on April 14, 2010

87 downloads by June 11, 2010.

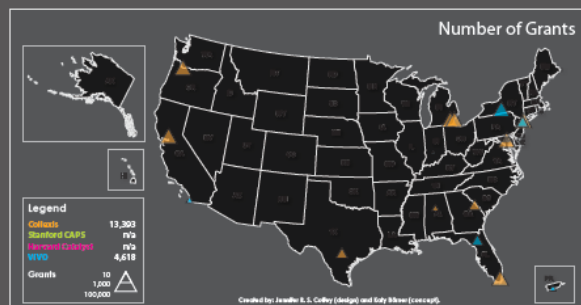
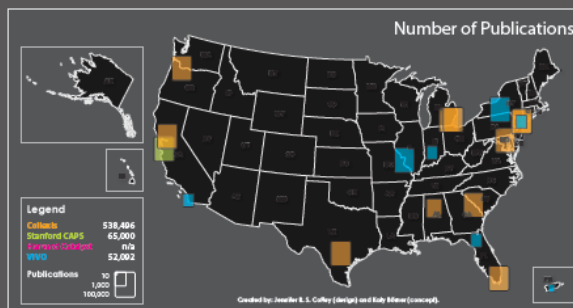
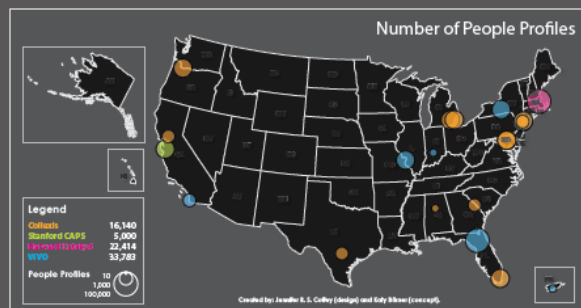
The more institutions adopt VIVO, the more high quality data will be available to understand, navigate, manage, utilize, and communicate progress in science and technology.

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# National Research Networking (NRN) Activity Visualization

**VIVO**  
Enabling a National  
Network of Scientists



<http://vivoexperts.ctsi.ufl.edu>

**Federated Search** University of Florida

Search Term:

Results for "cancer".

**University of Florida** **29 People**

UF VIVO contains all 6,900 faculty and 7,600 full-time staff of the University of Florida, as well as award information for all grants. UF students, affiliates and employees of Shands Healthcare can request to be added.

**Cornell University** **200 People**

Participants in the VIVO National Network include institutions with local installations of VIVO or those with research discovery and profiling applications that can connect unlinked or uncoordinated data.



## Second Annual VIVO Conference

August 24-26, 2011

Gaylord National, Washington D.C.

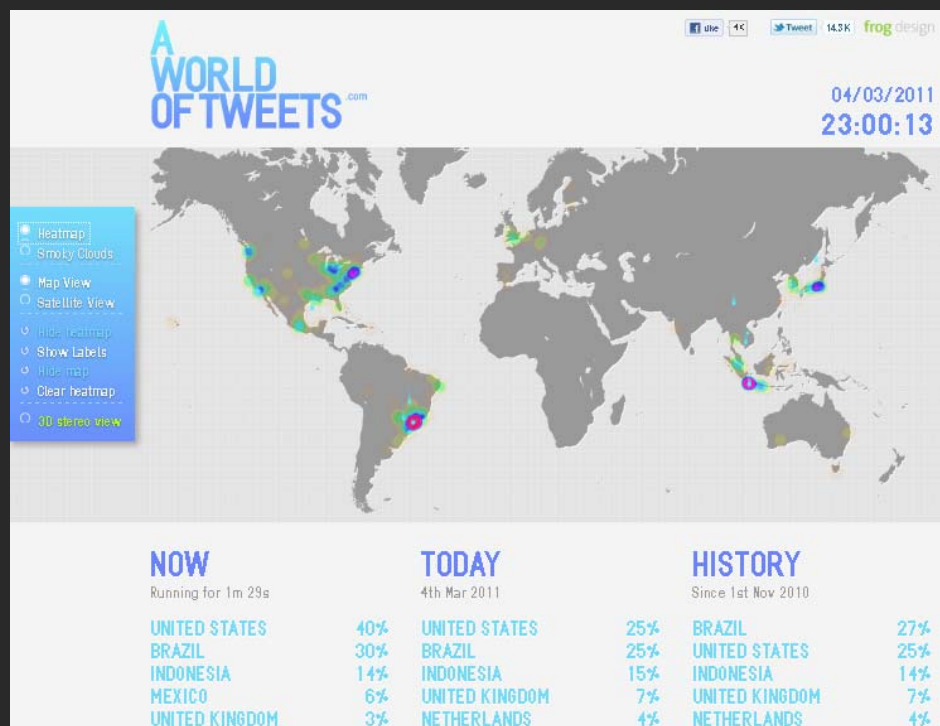
<http://vivoweb.org/conference>



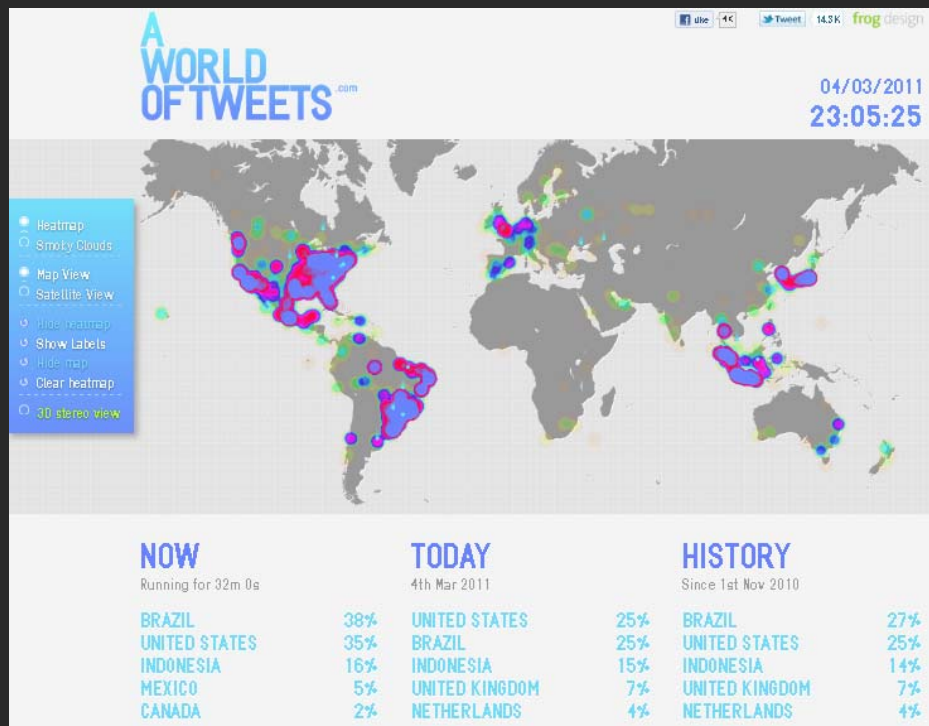
VIVO is supported by NIH Award U24 RR029822

## Future Developments:

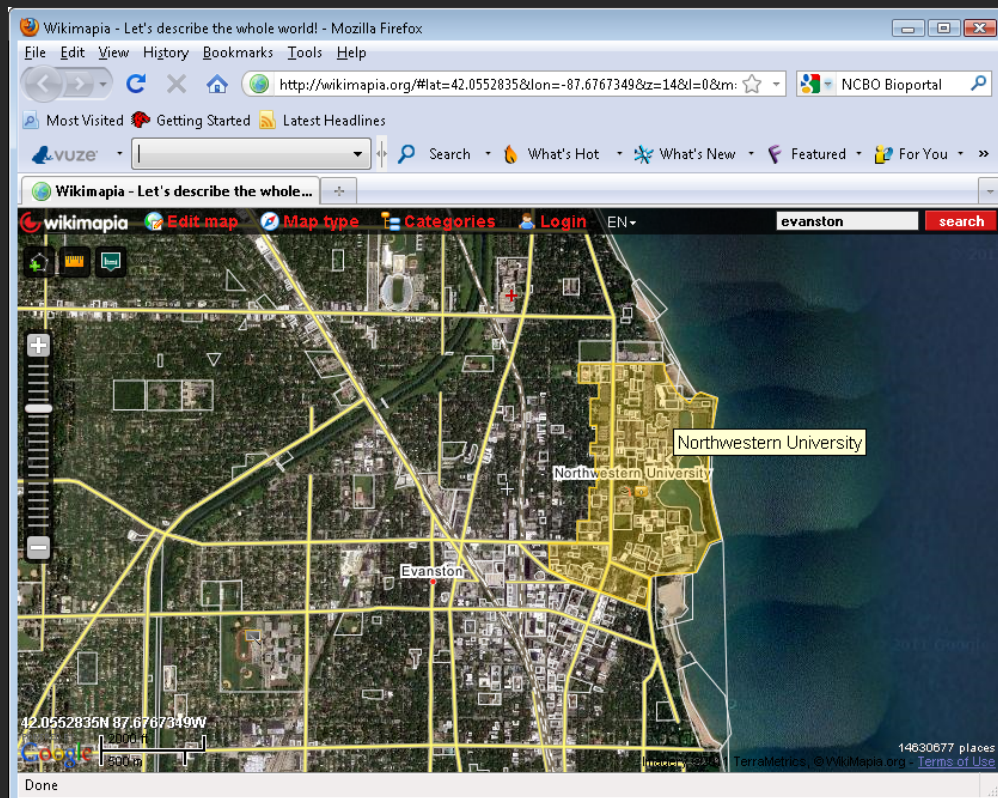
- Mapping real-time data
- Community annotation & data marketplaces
- S&T broadcasts and forecasts



<http://aworldoftweets.frogdesign.com>



<http://aworldoftweets.frogdesign.com>



<http://wikimapia.org>



**OpenStreetMap**

The Free Wiki World Map

OpenStreetMap is a free editable map of the whole world. It is made by people like you.

OpenStreetMap allows you to view, edit and use geographical data in a collaborative way from anywhere on Earth.

OpenStreetMap's hosting is kindly supported by the [UCL VR Centre](#) and [bytemark](#). Other supporters of the project are listed in the [wiki](#).

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**Map Key**

**Search** [Where am I?](#)

examples: 'Alkmaar', 'Regent Street, Cambridge', 'CB2 5AQ', or 'post offices near Lünen' [more examples...](#)

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Results from **OpenStreetMap Nominatim**

Administrative Boundary [Evanston, Uinta County, Wyoming, United States of America](#)

Town [Evanston, Cook, Illinois, United States of America](#)

Town [Evanston, Uinta, Wyoming, United States of America](#)

Hamlet [Evanston, Hancock, Tennessee, United States of America](#)

Hamlet [Evanston, Spencer, Indiana, United States of America](#)

Hamlet [Evanston, George, Mississippi, United States of America](#)

Hamlet [Evanston, Breathitt, Kentucky, United States of America](#)

Hamlet [Evanston, Clay, Missouri, United States of America](#)

Hamlet [Evanston, Hamilton, Ohio, United States of America](#)

Hamlet [Evanston, Webster, Iowa, United States of America](#)

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Results from **GeoNames**

[Evanston, United States](#)

[City of Evanston, United States](#)

[City of Evanston, United States](#)

[Evanston Township, United States](#)

<http://openstreetmap.org>

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**MAPTUBE**  
a place to put maps

**Welcome to MapTube**

MapTube is a free resource for viewing, sharing, mixing and mashing maps online. Created by UCL's Centre for Advanced Spatial Analysis, users can select any number of maps to overlay and view.

**QuickStart**

Click any map below to view it. To select a combination of maps, use the Search page. More information is available in the Help section.

**Featured Map**

**Happy 3rd Birthday**

MapTube is three years old and has just passed the 1000 maps milestone.

To celebrate this, over the coming month we will be adding a new map creation service to make it easy to create maps from data in CSV files.

**All** **Population** **Education** **Health** **Crime** **Transport** **Politics** **Economic**

Showing records 121 to 132 of 132:

Order by: [Most Popular Maps](#) - [Recently Viewed](#) - [Latest Uploads](#)

**UV04 Age 90 to 94 years**

UV04 - Age 90 to 94 years

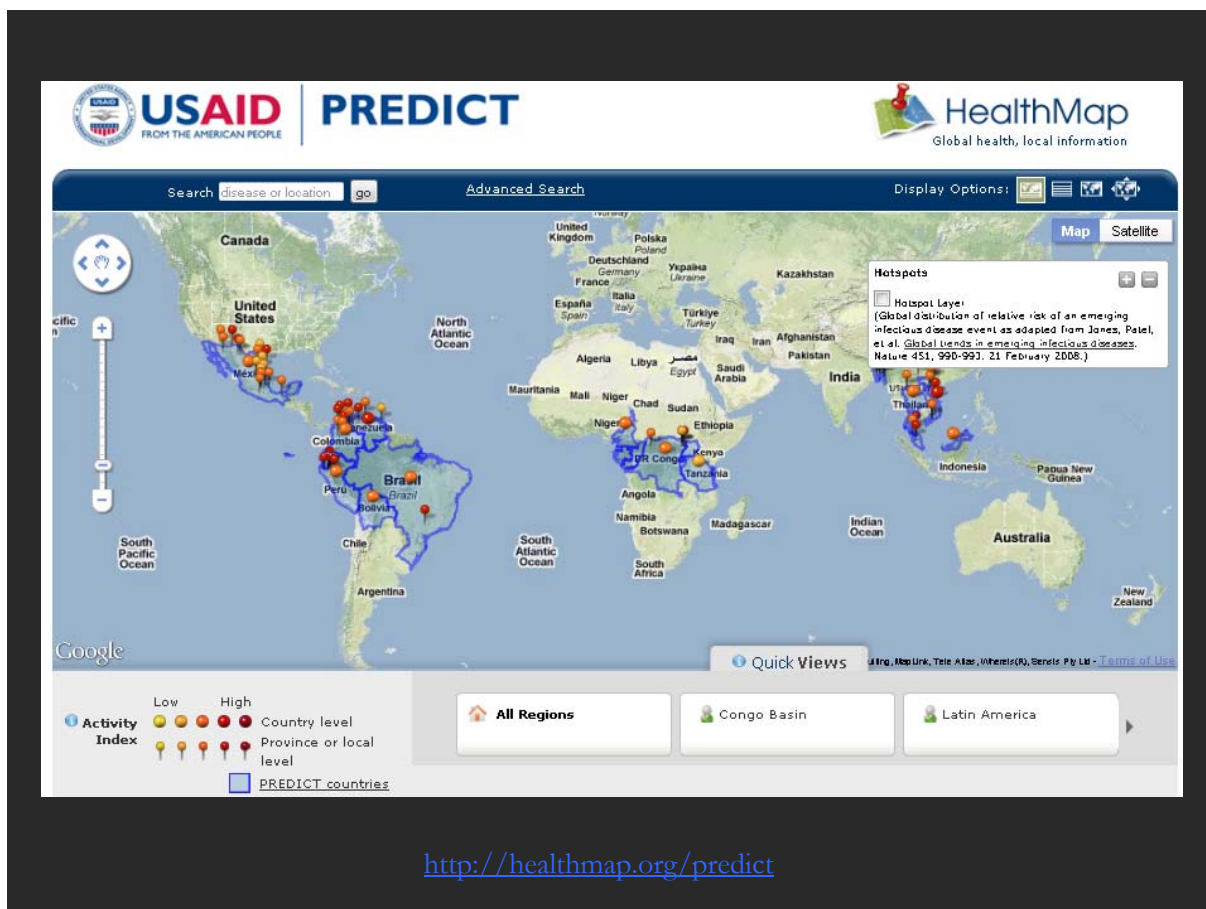
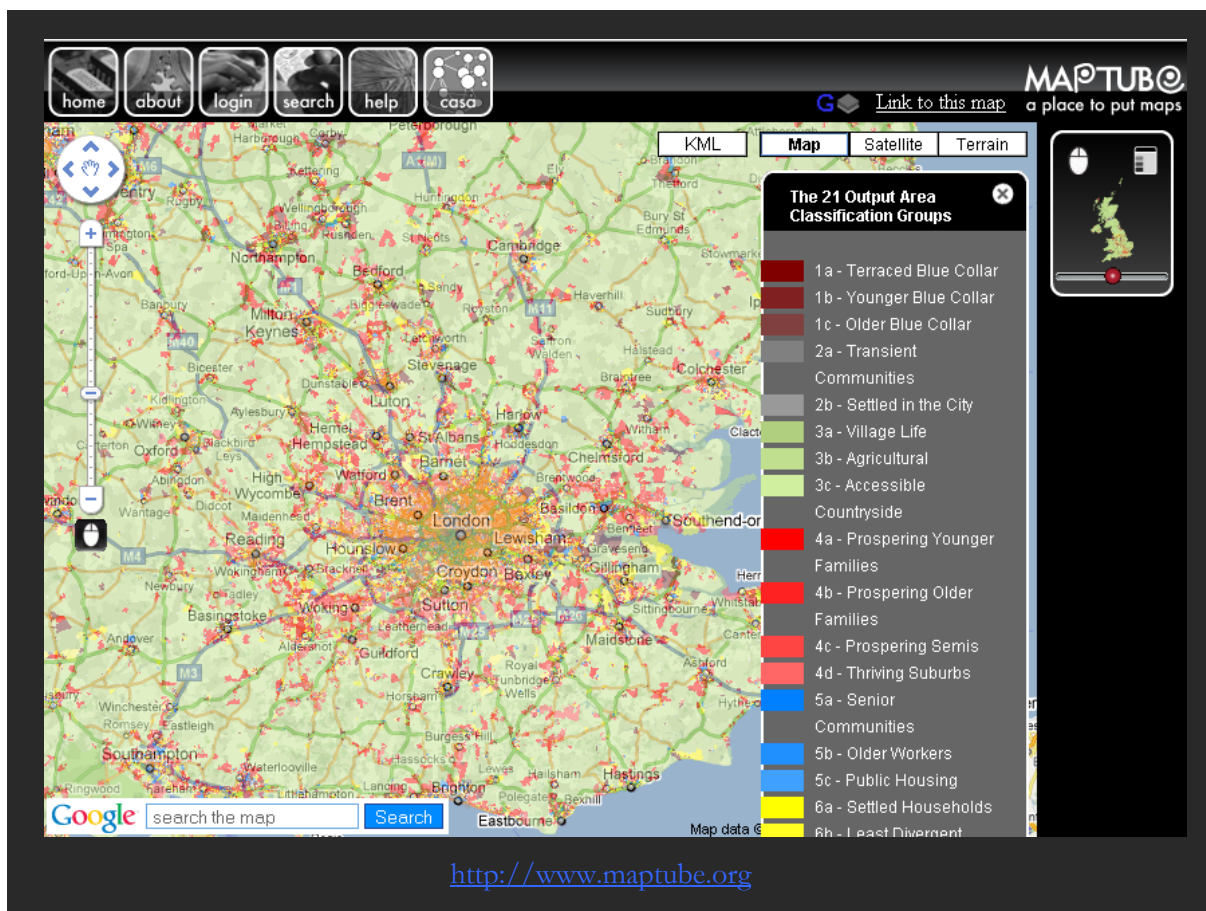
[more information](#)

Viewed 16 times

**Phoenix Population Density: People per Square Mile**

Population density for Phoenix from the 2000 US Census at the Census Tract level. The units are people per square mile.

<http://www.maptube.org>



**USAID PREDICT** HealthMap  
Global health, local information

Search:  disease or location  [Advanced Search](#) Display Options:

**Activity Index**  
Low High  
Country level  
Province or local level  
☐ PREDICT countries

**Quick Views**

**197 Alerts Now Showing** Nature 451, 990-991, 21 February 2008.)

Date: 04 Feb - 05 Mar | Diseases: African Trypanosomiasis (0)... | Places: Bangladesh (55)... | Sources: ProMED Mail (32)... | Categories: all

Source	Date	Summary	Disease	Location	Cases	Deaths
	4 Mar	Low: H1N1 still a threat	Swine Flu H1N1	Malaysia		
	4 Mar	Mexico zoo destroys 114 birds after outbreak of deadly avian virus ...	Newcastle Disease	Chilpancingo, Guerrero, Mexico		
	4 Mar	Influenza outbreak confirmed in School GN - EntornoInteligente	Influenza	Cordero, Portuguesa, Venezuela		
	4 Mar	Vietnam bird flu outbreak of foot and mouth disease has not ended - ...	Avian Influenza	Vietnam		
	4 Mar	Confirmed Highly pathogenic avian influenza in Ha Nam, Viet Nam - ...	Avian Influenza	Tỉnh Hà Nam, Hà Nam, Vietnam		

[View All](#)

Logos: UC Davis Veterinary Medicine, GVFI Global Viral Forecasting Initiative, EcoHealth Alliance, Wildlife Conservation Society, CEG, dhp, MIT, HST

Last update: 4 Mar 2011 11:00 | Next update: 4 Mar 2011 12:00

<http://healthmap.org/predict>

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