

Opportunities and Challenges in Crisis Informatics



**COMMONS LAB
WOODROW WILSON CENTER
WASHINGTON, DC**

**PRESENTED TO ESIP
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- **Definition:** An integrated approach to the technical, social, and informational aspects of crises
- **Scope:** Full life-cycle of a crisis
- **Focus:** Needs and contributions of the public

See Hagar (2006, 2010), Palen (2007, 2011)

American Red Cross Surveys



- “Followed by television and local radio, the internet is the 3rd most popular way for people to gather emergency information.
- 80% of the general and 69% of the online populations surveyed believe that national emergency response organizations should regularly monitor social media sites in order to respond promptly.”

- American Red Cross Press Release (August 24, 2011)

Social Media Systems



- Social Networks
- Blogs
- Microblogs
- Aggregators
- Idea Sharing
- Document Sharing
- Knowledge Sharing

- Image Sharing
- Map Sharing
- Video Sharing
- Video Streaming
- Video Conferencing
- Virtual Worlds

Crowdsourcing Methods



- Soliciting open data collection, sharing and problem-solving
- Coordinating many individuals to achieve “collective intelligence”
- Novel combinations of incentives, processes, and staffing to achieve organizational goals
- Peer production of public goods

- Goodspeed Update (Jan 4, 2011)

Crowdsourcing



Activities

- Data or photo collection
- Content analysis
- Classification
- Pattern recognition
- Micro-tasking
- Problem-solving
- Idea generation
- Programming
- Computational resources

Types

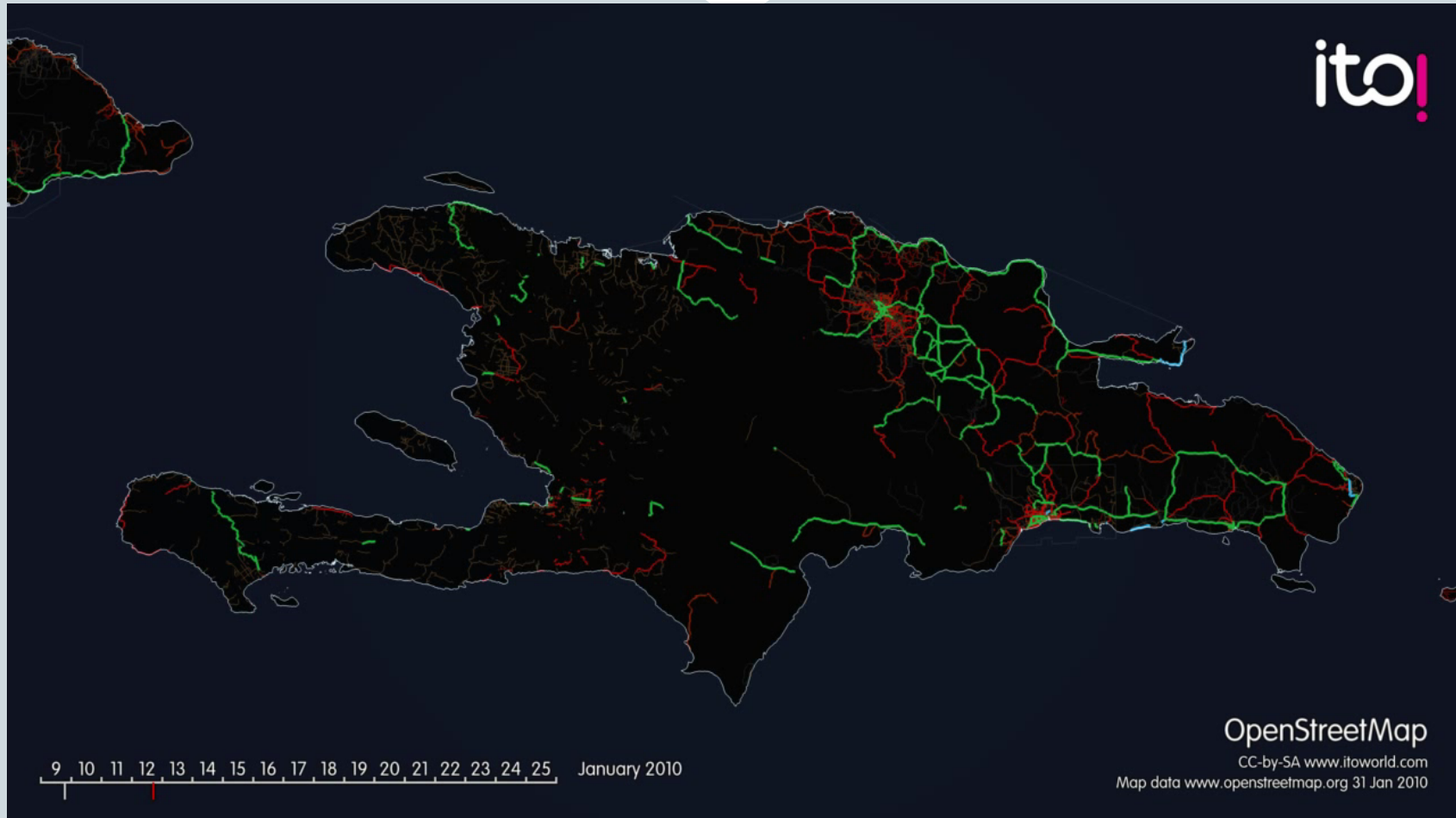
- Crisis mapping
- Crowdvoting
- Crowdfunding
- Prize competitions
- Code-a-thons
- Gamification / serious games
- Prediction markets
- Data mining

Opportunities



- Citizen-based hazards science
- Hazards detection
- Public safety and crisis information
- Public engagement and trust building
- Fostering transparency
- Emergency warnings and alerts
- Situational awareness
- Requests for assistance
- Damage estimates
- Locating family members and friends

Open Street Map – Haiti 2010



<http://www.maploser.com/2010/09/06/openstreetmap-in-the-first-month-after-the-haiti-quake/>

Challenges to Adoption



- Learning curve
- Proliferation of social media platforms
- Organizational culture
- Lack of trust
- Accuracy and reliability
- Information security
- Potential liabilities
- Limited staff time and resources
- Lack of policies and guidelines
- Data overload
- Need for automated data filtering tools and verification methods

Legal and Policy Issues



- Liability
- Privacy and safety
- Open records
- Paperwork Reduction
- Records management and retention
- Data ownership / terms of service

- Free labor
- Employee access and conduct
- Account management
- Acceptable uses and content
- Network and information security

Digital Volunteer Groups



- **Volunteer groups:** Humanity Road, Crisis Mappers, CrisisCommons, CrisisCamps, FrontlineSMS, Humanitarian OpenStreetMap Team, GISCorps, Standby Task Force
- **Volunteer Operations Support Teams and Forum**
<http://vosg.us> hashtags: #VOST #VOSG
- **Social Media 4 Emergency Management Forum**
<http://www.sm4em.org> hashtags: #SMEM #SMEMChat
- **American Red Cross Digital Operations Center**
<http://content.dell.com/us/en/corp/d/campaigns/red-cross-disaster-operations.aspx> hashtag: #CrisisData

Digital Volunteer Challenges



- Volunteer management and sustainability
- Cross training
- Preparedness and prioritization
- Data scramble
- Data licensing interoperability
- Decision-makers' needs assessment
- Transition
- Impact evaluation framework
- Overall coordination

Research Challenges (Draft)



- Technology mediated-behavior
- Data integration and system interoperability
- Information extraction and natural language processing
- Information security and reputation systems
- Legal and policy issues
- Ethics and codes of conduct

Commons Lab Reports



- The National Broadband Map: A Case Study on Open Innovation for National Policy
- Responding to Liability: Evaluating and Reducing Tort Liability for Digital Volunteers
- Privacy and Crowdsourced Missing Persons Registries in Natural Disasters
- Did You Feel It? A Case Study on Crowdsourcing for Earthquake Science and Response
- New Media for Emergency Managers: A Case Study and Exploratory Assessment of Adoption and Use

Science Policy

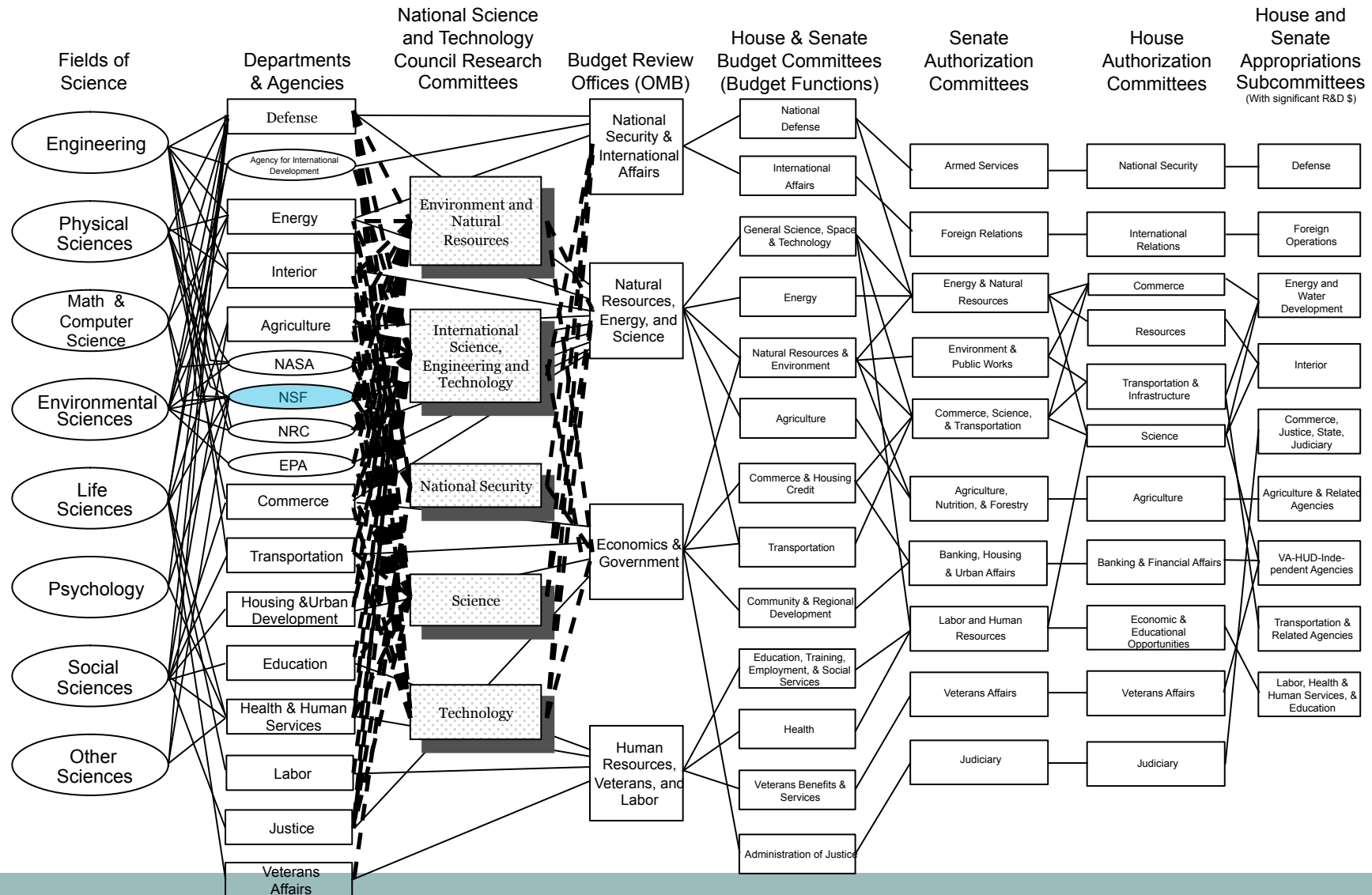


- Policy is a multi-factorial process for which science is only one component.
- Politics and jurisdiction matter.
- Unpredictable and complex
- Low signal to noise ratio
- Limited bandwidth
- Be prepared to fail or be ignored.

Development of the Federal R&D Budget

Showing Fields of Science and Executive and Legislative Decision Units

Connecting lines indicate location of agency budget decisions, but not decision sequences.



Science Policy



Research Community

- Importance of Scientific Process and Merit Review
- More funding for important research
- Long-term view

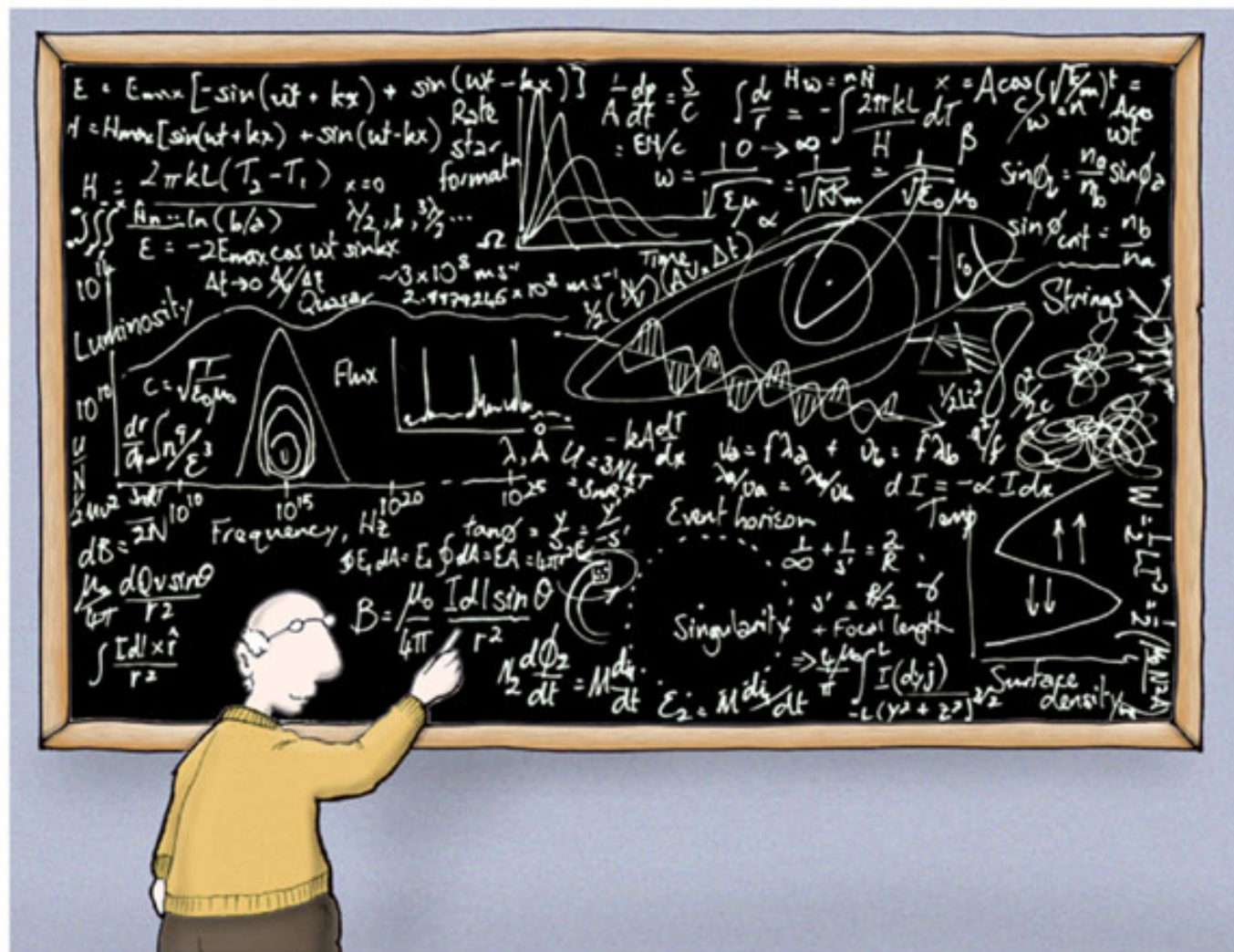
Members of Congress

- Local Impact (Good Publicity)
- Close oversight (Good Government)
- Near-term Results (To get re-elected)

Briefing Policy Makers



- Be on time and keep it short!
- NO technical jargon!
- Respect expertise of the staffer.
- NO big binders—one page memo!
- NO PPT—print out handouts.
- Relevancy to policy maker?
- Tell a story—specific examples



Astrophysics made simple

Briefing Policy Makers



- Demonstrate tangible impact
- Make “ask” clear and specific
- Leave spin behind
- Don’t embarrass
- Don’t burn bridges
- Ask about the staffer’s work
- Don’t share confidential information

Contact Information



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Events and archived videos:

<http://www.wilsoncenter.org/program/science-and-technology-innovation-program>

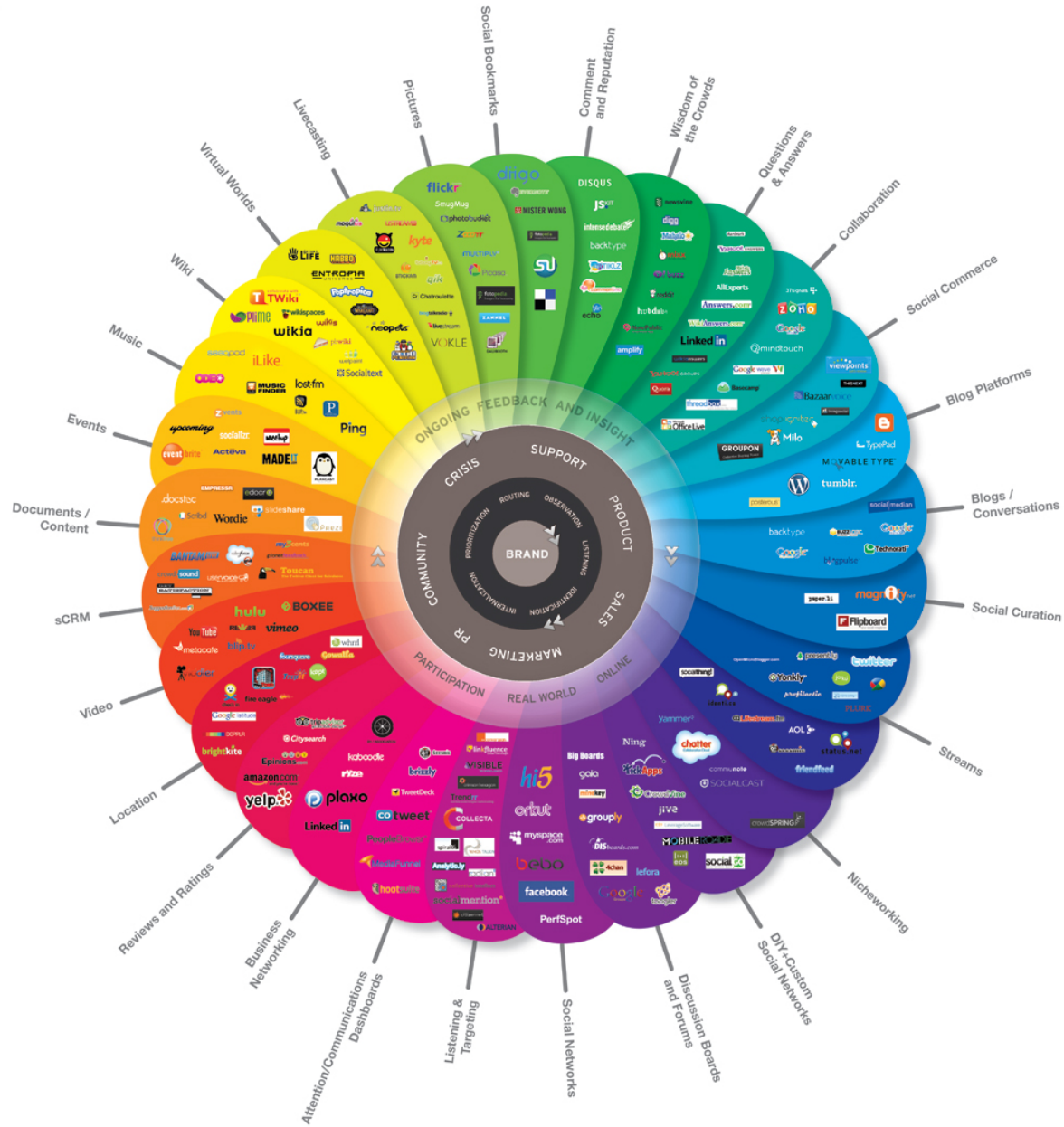
Social Media Systems



- **Social Networks** – Facebook, Google+, LinkedIn
- **Blogs** – Wodpress, Blogger
- **Microblogs** – Twitter, Tumblr
- **Aggregators** – TweetDeck, HootSuite, Paper.il
- **Document Sharing** – Google Docs, Dropbox
- **Image Sharing** – Pinterest, Flickr, Picasa
- **Idea Sharing** – IdeaScale
- **Video Sharing** – YouTube, Vimeo
- **Video Streaming** – UStream, LiveStream
- **Video Talking** – Skype, Google Hangouts
- **Knowledge Sharing** – Wikipedia, Mapipedia
- **Virtual Worlds** – SecondLife
- **Map Sharing** – OpenStreetMaps, Ushahidi, Mapstory, ESRI Story Maps, Google MapMaker, GeoCommons

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For more information
check out theconversationprism.com

Resources



- **The Evolving Role of the Public Information Officer: An Examination of Social Media and Emergency Management**
Amanda Hughes and Leysia Palen, EPIC Project, UC-Boulder, forthcoming in *Journal of Homeland Security and Emergency Management* (2012)
<http://epic.cs.colorado.edu>
- **Trial by Fire: The Deployment of Trusted Digital Volunteers in the 2011 Shadow Lake Fire**
Lise Ann St. Denis, Amanda Hughes, and Leysia Palen, EPIC Project, UC-Boulder (2012)
<http://epic.cs.colorado.edu/wp-content/uploads/TrustedDigitalVolunteersStDenisHughesPalen.pdf>
- **Disasters 2.0: The Application of Social Media Systems for Modern Emergency Management**
Adam Crowe, CRC Press (2012)
- **2011 Social Media + Emergency Management Camp: Transforming the Response Enterprise**
Clarence Wardell and Yee San Su, CNA (2011)
<http://www.wilsoncenter.org/event/social-media-emergency-management-transforming-the-response-enterprise>
- **Optimizing Citizen Engagement During Emergencies Through Use of Web 2.0 Technologies**
Laurie Van Leuven, Naval Postgraduate School (2009)
http://edocs.nps.edu/npspubs/scholarly/theses/2009/Mar/09Mar_Van_Leuven.pdf