

BIG DATA REGIONAL INNOVATION HUBS

Accelerating the Innovation Ecosystem

Fen Zhao

Staff Associate, Strategic Innovation
CISE Directorate, Office of the Assistant Director

THE BDHUBS TEAM

Many thanks goes out to...

- **Martin Wiener**
- **Al Suarez**
- **Chaitan Baru**
- **Sylvia Spengler**
- **Suzi Iacono**
- Casey Henderson , Camille Mulligan,
Natalie DeJarlais(USENIX)
- Andy Burnett (KI)
- Dan Akins
- Fran Berman
- Alan Blatecky
- David Logsdon
- Chris Mentzel
- Glenn Ricart
- George Strawn



WHAT IS THE BDHUBS PROGRAM?

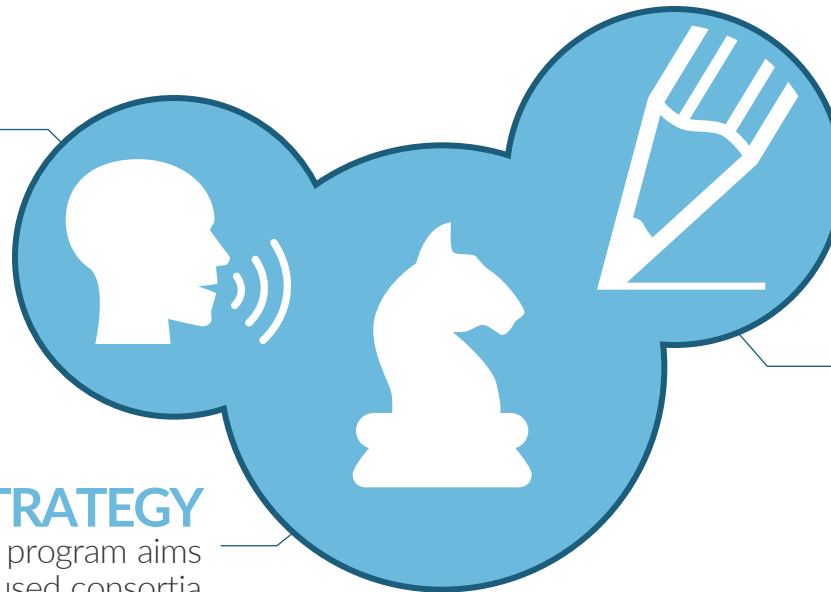
An Agenda for The Discussion Today

01 THE HISTORY

BDHubs continue and scale up the innovation activities initiated by White House Data2Action event

02 THE STRATEGY

The multiphase BDHubs program aims to build regionally focused consortia around the country that will ideate, plan, and support Big Data partnerships and collaborative activities



03 PHASE ONE

NSF has released a solicitation (15-562) to support the first phase of BDHubs.

NSF is hosting a series of charrettes around the country where regional Big Data stakeholders will design the structure of their BD Hub

WHAT IS THE HISTORY BEHIND BDHUBS?

The National Big Data R&D Initiative & Data to Knowledge to Action (Data2Action)

MAR
2012

Launch

OSTP and NITRD Agencies kick off National Big Data R&D Initiative with new federal programs totaling \$200M

NOV
2013

Data2Action

90 organizations announce 29 new Big Data partnerships supported by \$100M in non-federal funds

JUN
2014

Partnerships Bear Fruit

Partnerships update NITRD on midterm outcomes from announced projects

MAY
2013

Big Data Partnerships Workshop

Industry, academia, and government representatives gathered to learn about current Big Data partnership and brainstorm new ideas

MAR
2015

BDHubs

NSF initiates BDHubs effort to sustain and scale up collaborative Big Data innovation activities

The background of the slide features several large, stylized, light gray clouds with black outlines, scattered across the upper and middle portions of the frame.

Why focus on Big Data

Partnerships?

JOHN HOLDREN

Assistant to the President for Science and Technology
@ Data2Action, Nov 2013

“America is rich with institutions that are expert at generating data, but as a Nation we have not fulfilled our potential to make the most of these data by merging pre-competitive resources, partnering on analytics, and sharing lessons learned.

Today’s announcements show that we are maturing in this respect, finding synergies and collaborative opportunities that will accelerate progress in a wide range of scientific, social, and economic domains.”

WHAT IS A PARTNERSHIP?

Here are three examples from the Nov 2013 Data2Action White House Event

Foundational Research

- Berkeley AMPLab is funded by NSF, DARPA, DOE and a large number of private sector companies such as AWS, Google, and SAP
- AMPLab creates Apache open source software platform (BDAS) for the whole community, including Spark/Shark, Mesos, Tachyon
- Sponsors are able to interact with researchers and students at meetings, hearing about progress in cutting edge research

Education

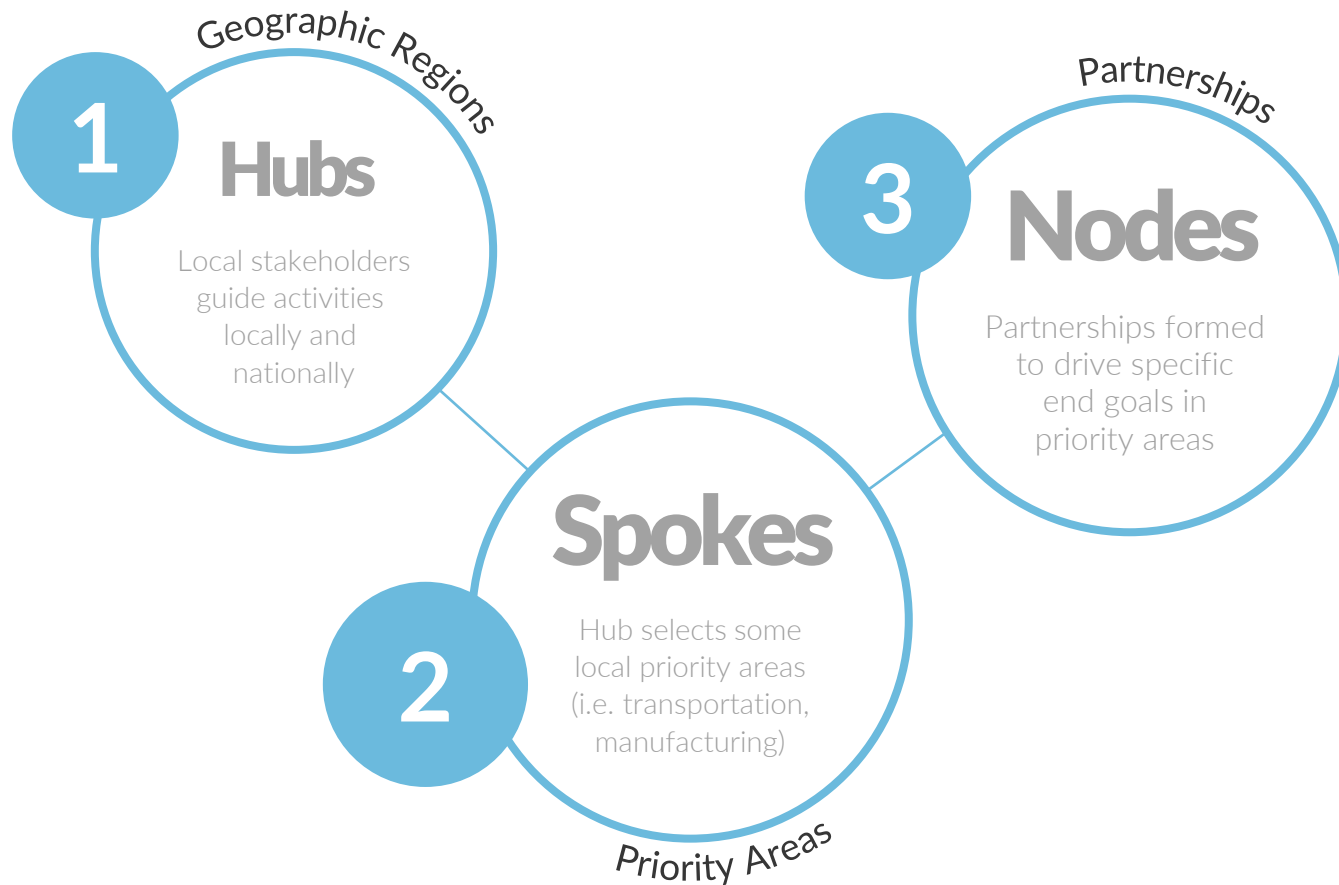
- Funded by the Schmidt Family Foundation, University of Chicago runs the Data Science for Social Good summer program
- Fellows work to solve and create apps to solve data science challenges defined by DSSG partners,
- Partners include City of Chicago, Cook County Land Bank, Cook County Sheriff, Ushahidi, Qatar Computing Research Institute, Lawrence Berkeley National Laboratory, Environmental Defense Fund and many others

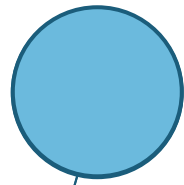
Healthcare

- Novartis, Pfizer, and Eli Lilly partner to improve access to information about clinical trials
- New platform builds on clinicaltrials.gov data to will provide more detailed and patient-friendly information, including a machine readable “target health profile” to improve the ability of healthcare software to match individual health profiles to applicable clinical trials

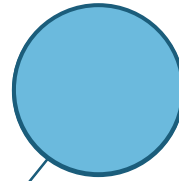
WHAT IS THE BDHUBS NETWORK?

“Hub and Spoke” – A Nation-Wide Network for Data Innovation

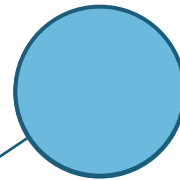




Accelerating the ideation and development of Big Data solutions



Driving successful pilot programs



Engaging stakeholders from across the region

Hubs should focus on key challenges & opportunities in their region

Potential

activities could be



Facilitating engagement with opinion and thought leaders on the societal impact of Big Data

Increasing the speed and volume of technology transfer

Providing data resources

Hubs should focus on key challenges & opportunities in their region

Potential

activities could be

WHAT ARE THE BENEFITS OF PARTNERING?

Achieve collectively what is impossible individually



INITIATE PARTNERSHIPS

Hubs will bring together academia, industry, non-profits, and government to initiate new partnerships.

By collectively ideating and bringing together resources from across sectors, partnerships can drive faster innovation and more novel ideas



COMMON RESOURCES

Participants can leverage the resources contributed by partners to Hub partnerships. Hubs can help develop “plug and play” infrastructure resources for partners.

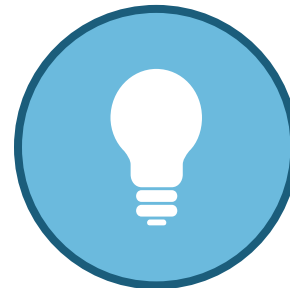
Resource providers can find users that will develop novel applications for their infrastructure.



ACCESS TO TOP TALENT

In a world where demand for Big Data talent far exceeds supply, Hubs will connect partners with students in academia.

Projects with academia will train those students in projects of interest to partners before they even leave school.



SHARED BEST PRACTICES

Big Data practices, especially in a socio-technical context, are increasingly complex.

Partners can develop and share best practices in areas such as privacy, discrimination, and ethics to ensure adoption while minimizing unwanted consequences.

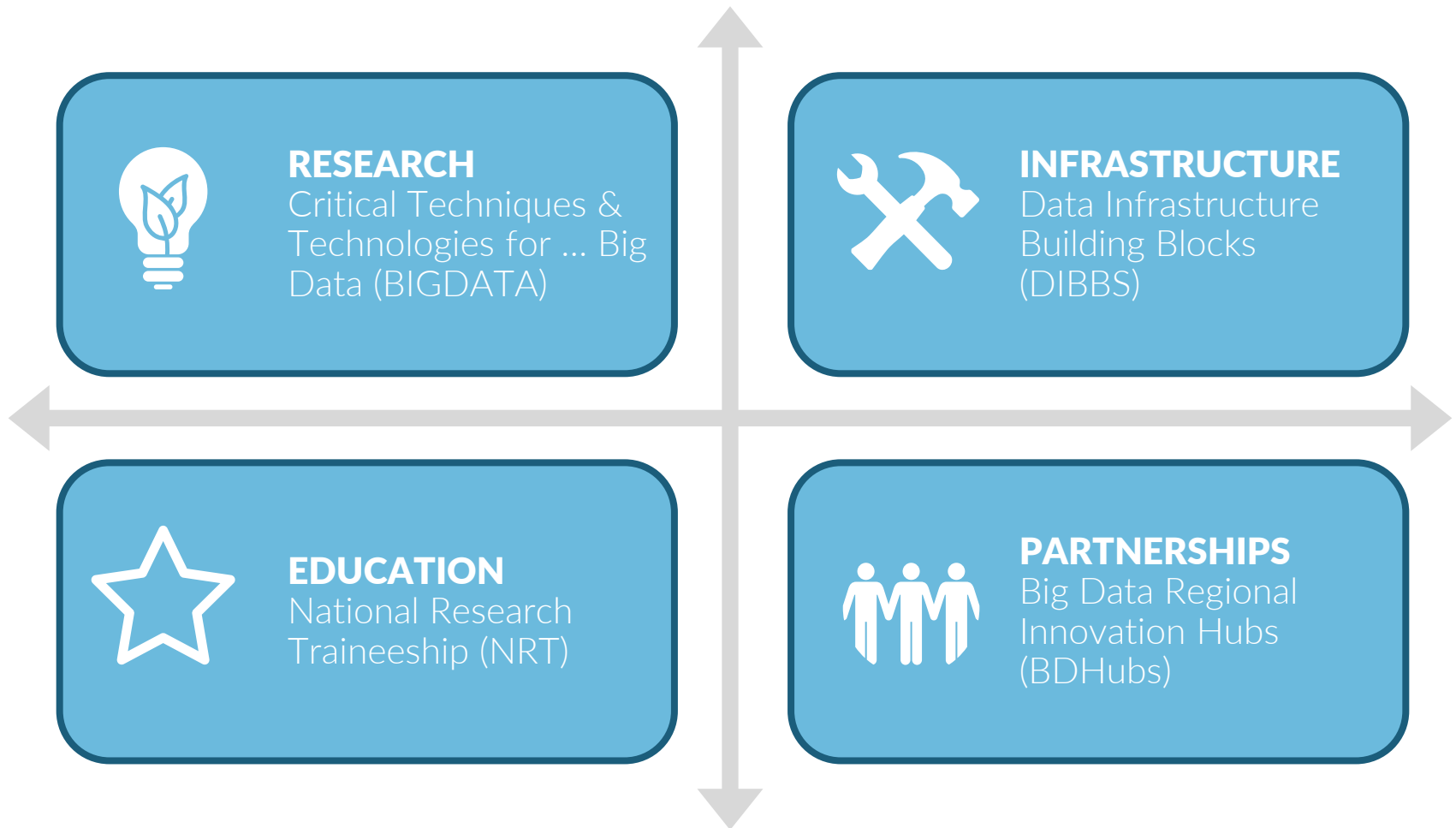


REDUCED COORDINATION COSTS

Partnerships always come with a logistical cost. With BDHubs, NSF will fund the staff and logistics support necessary for more complex collaborations, reducing overhead and maximizing benefits for participants.

THE NSF BIG DATA **PORTFOLIO OF PROGRAMS**

Within the broader NSF portfolio, BDHubs focuses on building partnerships around Big Data



HOW IS THE BDHUBS PROGRAM DIFFERENT?

BDHubs is not your typical NSF research program



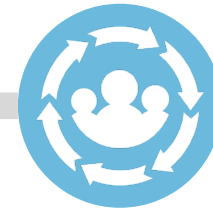
NETWORKING

NSF is funding the staff & networking activities between partners, not research.



DYNAMIC

Hubs will be dynamic and grow over time to accommodate more interested participants



COLLABORATION NOT COMPETITION

NSF prefers one proposal per region that describes the general consensus around Hub activities. Submitting institution is only a logistics facilitator for the Hub.



MULTIPHASE

Partners can use networking activities to determine what future priority areas to take on. Activities around these areas will be funded in later phases

THE BD HUBS SOLICITATION (15-562)

Details and Specifications

AWARD INFORMATION & DUE DATES

An estimated **4 awards** is anticipated – 1 award per region.

Each project will be funded up to a maximum of **\$1,250,000 for up to 3 years**, subject to the availability of funds.

Total anticipated funding amount of \$4M-\$5M

Full Proposal Deadline:

June 24, 2015

(5pm proposer's local time)

ELIGIBILITY INFORMATION

Proposals may be submitted by

- ✓ Universities and Colleges
- ✓ Non-profit, non-academic organizations
- ✓ State and Local Governments
- ✓ Other Federal Agencies and Federally Funded Research and Development Centers (FFRDCs)

NSF welcomes collaborative proposals that include for-profit organizations. **However, for-profit organizations may only participate as subawardees.**

An organization may only submit one proposal. This limit holds across all regions defined in the Program Description.

An individual may only serve as the PI or co-PI in at most one submission.

BASIC HUB STRUCTURE

NSF has set a broader structure for the Hub,
with details to be determined by Hub participants as appropriate

Steering Council



- Tasked with making key decisions (i.e. governance and agenda setting) for the regional consortium as a whole
- Consist of unpaid representatives from a subset of participating organizations
- Encouraged to be representative BD Hub's membership, while also considering participation from underrepresented groups

Executive Staff

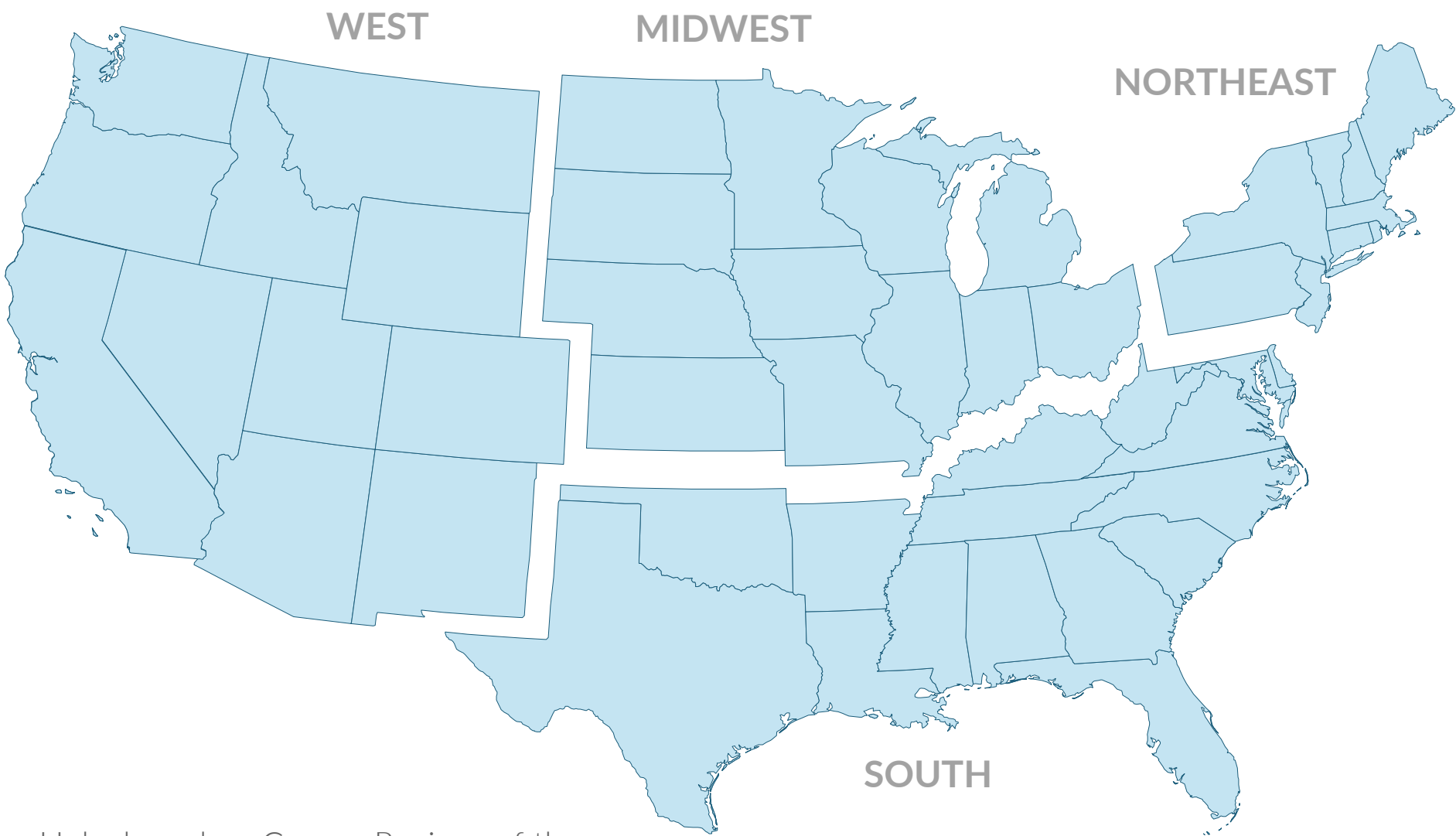


- The proposing organization should provide fiscal and implementation oversight to the BD Hub
- The proposing institution will establish a full-time, paid executive director and associated staff
- Will implement the decisions of the steering council and oversee day-to-day operations of the BD Hub

Partner Organizations



- Need not be members of the steering council
- Can join the Hub at the inception or during the period of the BD Hub award
- Need not be located within a region to be engaged in the corresponding consortium, given that many organizations have a national scope and will therefore span multiple regions.



Hubs based on Census Regions of the

United States

Alaska & Hawaii are part of the West Region
US Territories can participate in any region



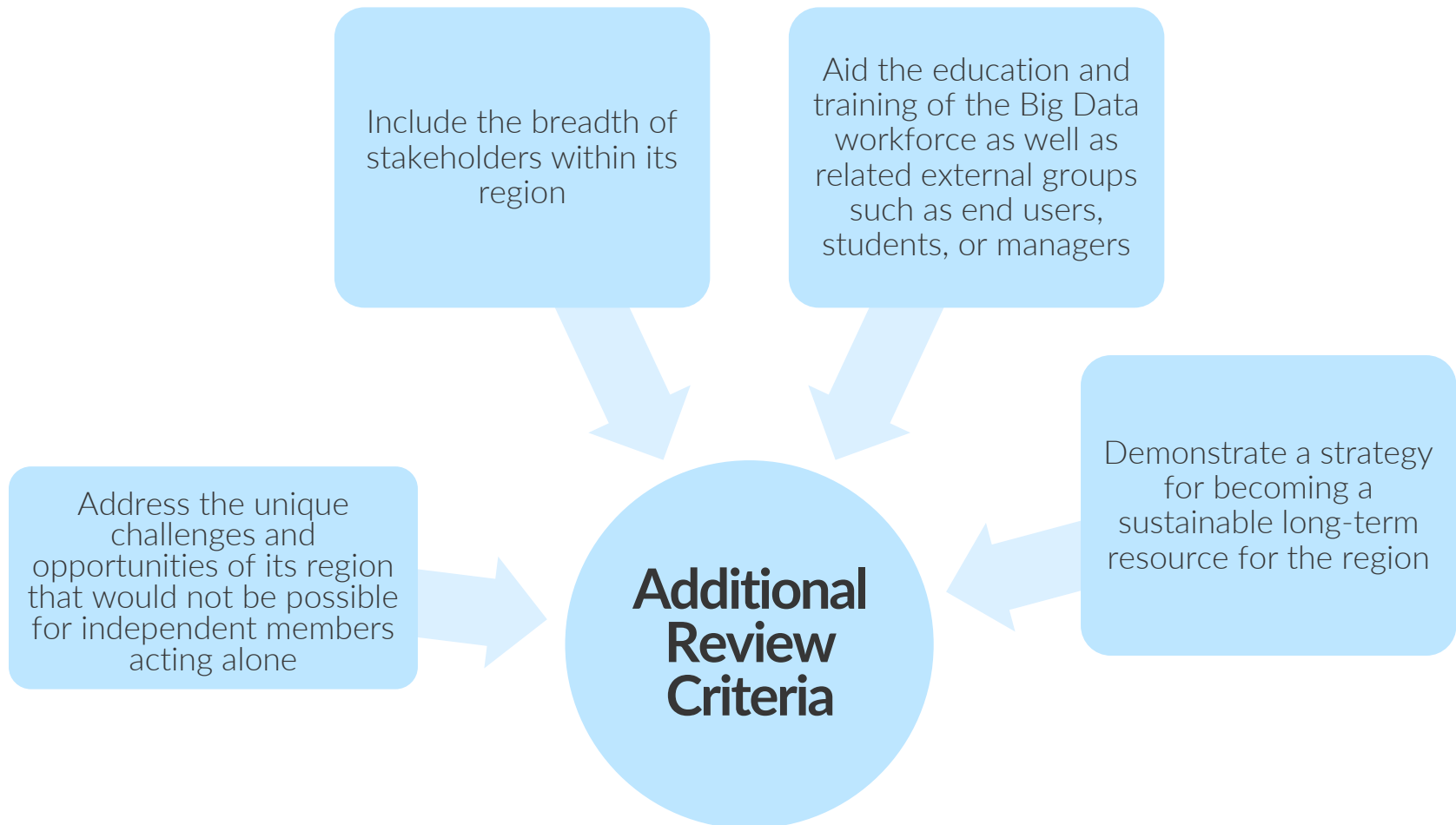
PROPOSAL PROJECT DESCRIPTION

The 15 page project description must include this information

- Initial projects (aka. Partnerships) that will be implemented under the context of the BD Hub
- The specific roles of the collaborating universities, industry partners, government agencies, non-profits and other organizations involved
- The administrative and organizational structure of the BD Hub, including the steering council as well as any necessary advisory, administrative, and scientific support structures, and the BD Hub's relationship to the proposing organization
- The specific coordination mechanisms that will enable cross-institution and/or cross-discipline scientific integration (e.g., workshops, graduate student exchanges, project meetings at conferences, use of videoconferencing and other communications tools, software repositories, regional working groups, community gatherings, etc.)
- Efforts the BD Hub will pursue to ensure collaboration with other funded BD Hubs;
- Plans for how the BD Hub will engage additional partners and how they may be incorporated into the BD Hub during the proposed project period
- Specific references to the budget line items that support these coordination mechanisms
- How the BD Hub may become a sustainable resource for the region following the proposed project period (e.g., dues for members, additional funding sources, etc.)

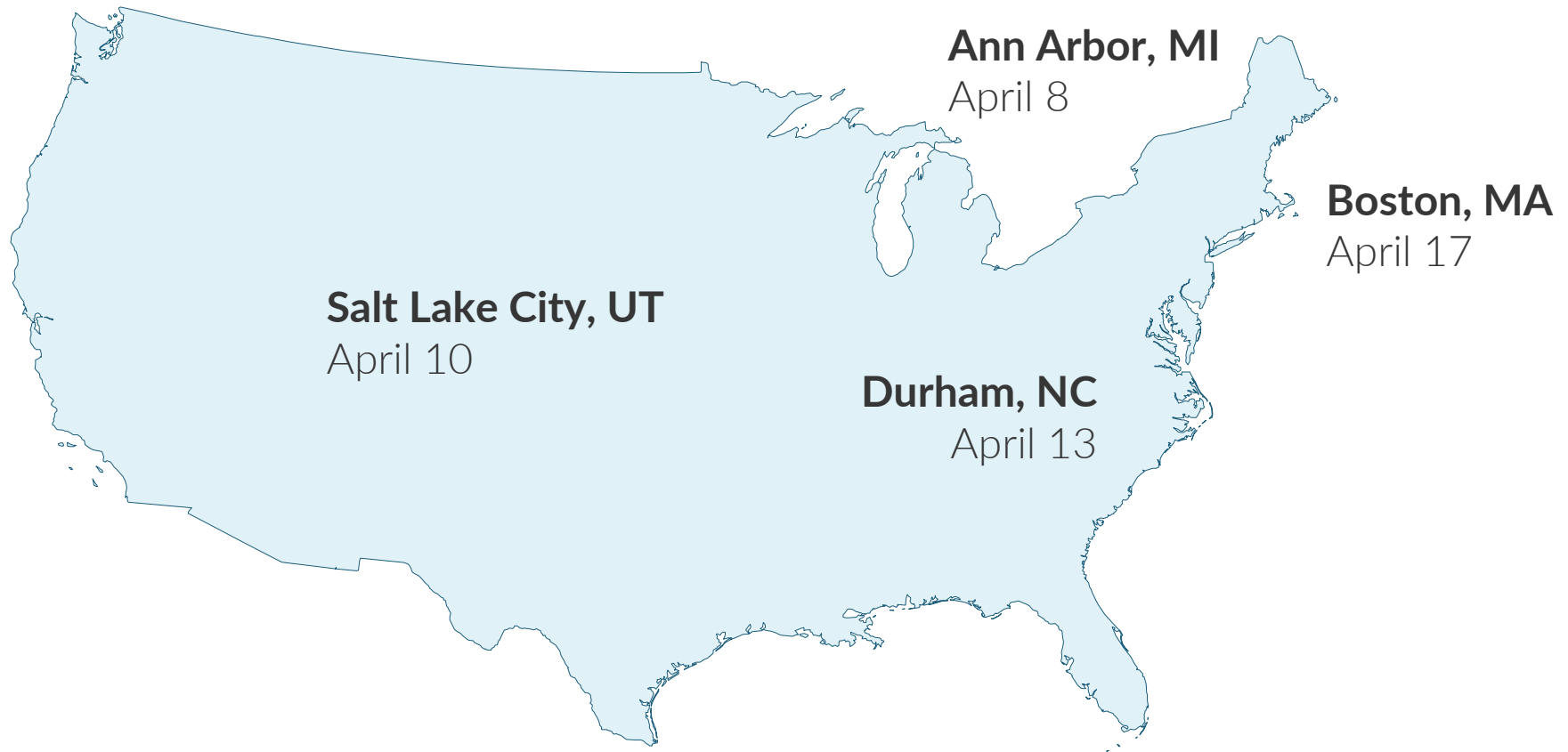
SOLICITATION SPECIFIC REVIEW CRITERIA

Additional to NSF standard Intellectual Merit and Broader Impacts criteria



THE CHARRETTE FOR ACCELERATING THE BIG DATA INNOVATION ECOSYSTEM

Purpose and Logistics



Throughout April 2015, NSF is sponsoring a series of

Regional Charrettes

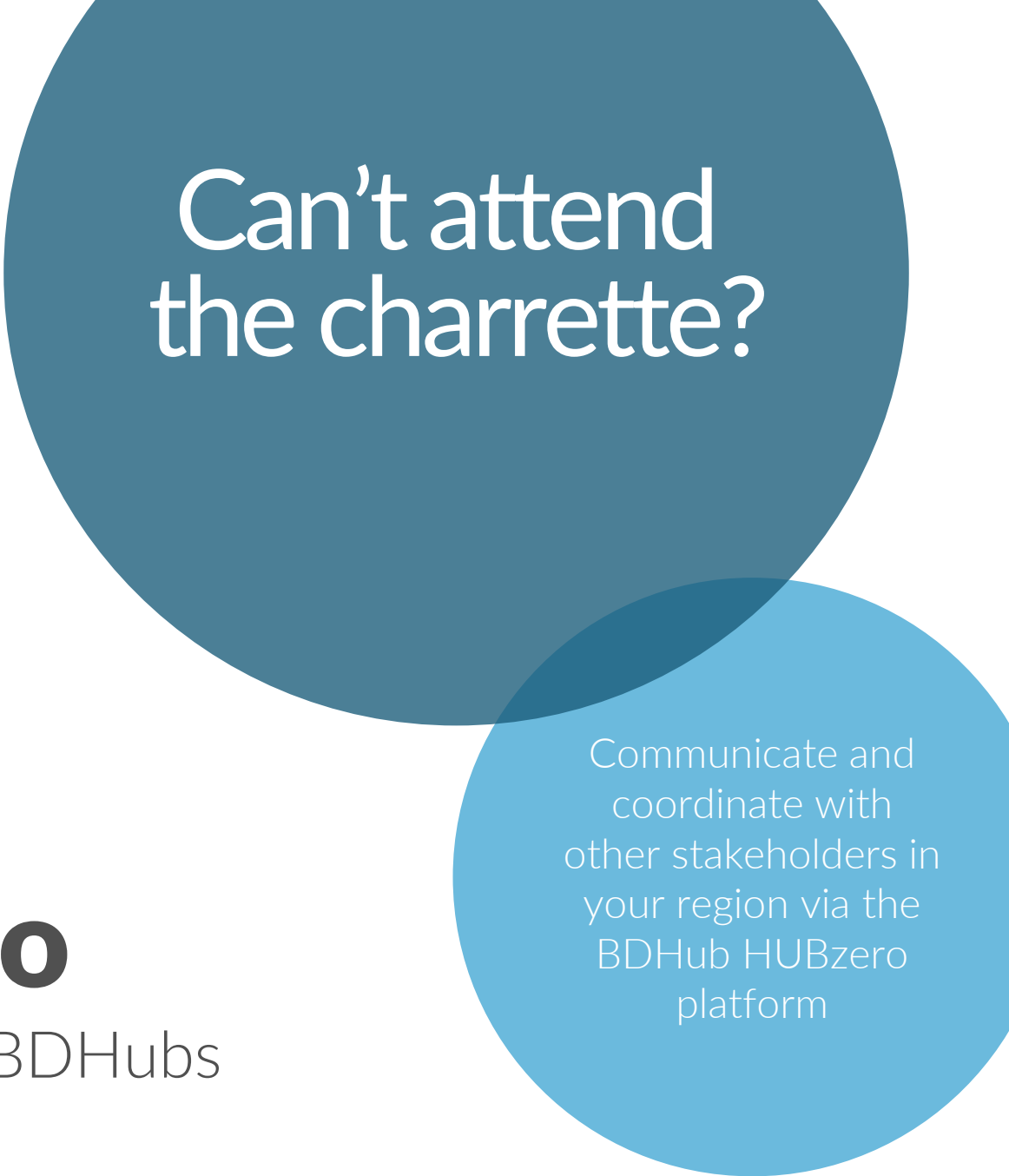


COME DESIGN YOUR REGIONAL BD HUB



Each charrette is meant to be an intensive, one-day design and planning workshop with the objective of convening stakeholders in that region around a common set of Big Data challenges —particularly those that may be especially relevant to that region

The charrette is meant to convene stakeholders to collaboratively form a single consortium for their region. Attendees will discuss which organization could take on the coordinating role of establishing the regional consortium.



Can't attend
the charrette?

bdhub.info

a virtual forum for BDHubs

Communicate and
coordinate with
other stakeholders in
your region via the
BDHub HUBzero
platform

FOR FURTHER QUESTIONS **CONTACT**

Fen Zhao, fzhao@nsf.gov 703 292 7344



NSF Headquarters, Arlington VA