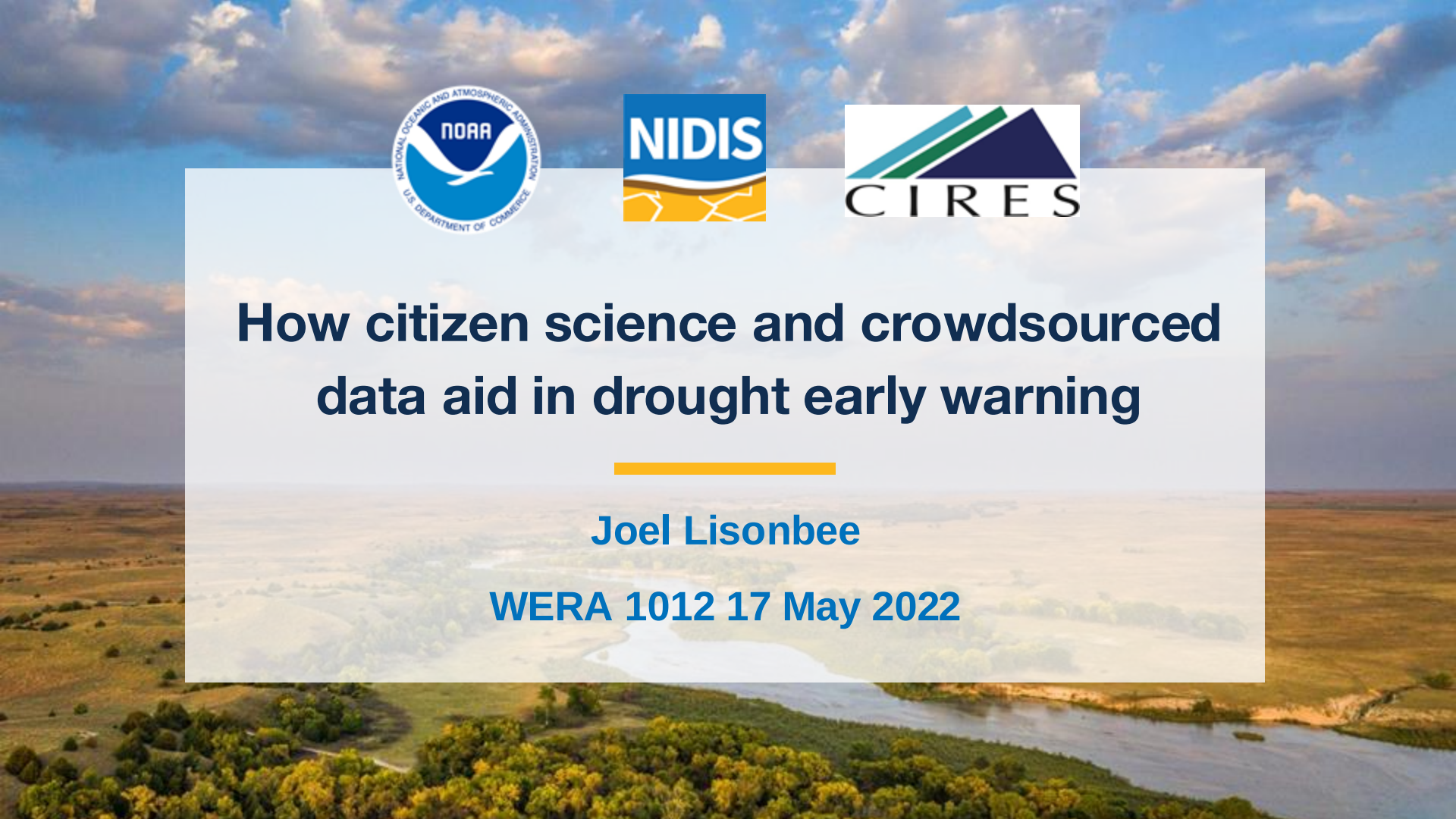


How citizen science and crowdsourced data aid in drought early warning

Joel Lisonbee

WERA 1012 17 May 2022

What Is NIDIS?

- First authorized by Congress in 2006; reauthorized in 2014 and 2018.
- Interagency mandate to develop and provide a **national drought early warning information system**
- Enable the Nation to move **from a reactive to a more proactive** approach to managing drought risks and impacts
- Authorizes NIDIS to **engage in partnerships** with federal, state, tribal, and local partners, as well as the private sector, academic institutions, and citizen scientists

NIDIS DROUGHT + Citizen Science

Public Law No: 115-423 (01/07/2019)
National Integrated Drought Information System Reauthorization Act of 2018

“NIDIS may

- engage with the private sector to improve drought monitoring, forecast, and communication if the National Oceanic and Atmospheric Administration (NOAA) determines such partnership is appropriate, cost-effective, and beneficial to the public and certain decision-makers;
- facilitate the development of academic cooperative partnerships to assist with NIDIS functions; and
- utilize and support monitoring by citizen scientists, including by developing best practices to facilitate maximum integration of data.”

How can NIDIS utilize and expand the reach of crowdsourced data?

1. **Convening and Coordination**
   Partnerships, consultations, networks, workshops, etc.

2. **Delivering Information**
   Drought.gov, condition monitoring, communications, etc.

3. **Advancing and Integrating Research Into Action**
   Applied research, product development, assessments

Interagency collaboration and partnerships are key to all we do!

How can NIDIS utilize and expand the reach of crowdsourced data?

1

Convening and Coordination
Partnerships, consultations, networks, workshops, etc.

How?

Partner with regional Drought Early Warning Systems to collaborate upcoming on meetings or projects.

How can NIDIS utilize and expand the reach of crowdsourced data?

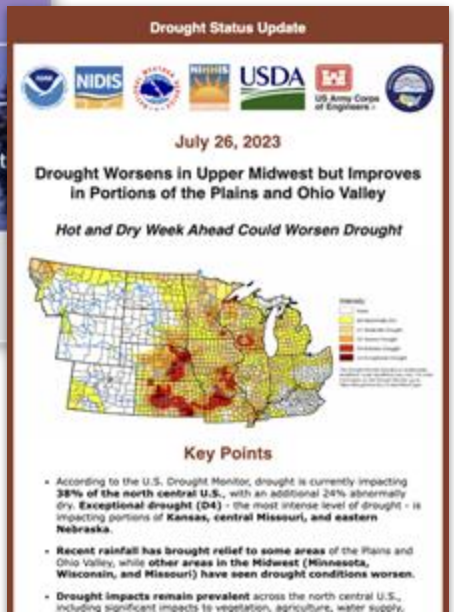
How? Ask us to help spread the word about anything your are working on.

2 **Delivering Information**
Drought.gov, condition monitoring, communications, etc.

@NOAADrought

Delivering Information

Sign up for NIDIS emails here:



21.5K Email subscribers

@NOAADrought

14.2K Twitter Followers

3.6K Facebook Followers

1.1K YouTube Subscribers

320 Instagram Followers

How can NIDIS utilize and expand the reach of crowdsourced data?

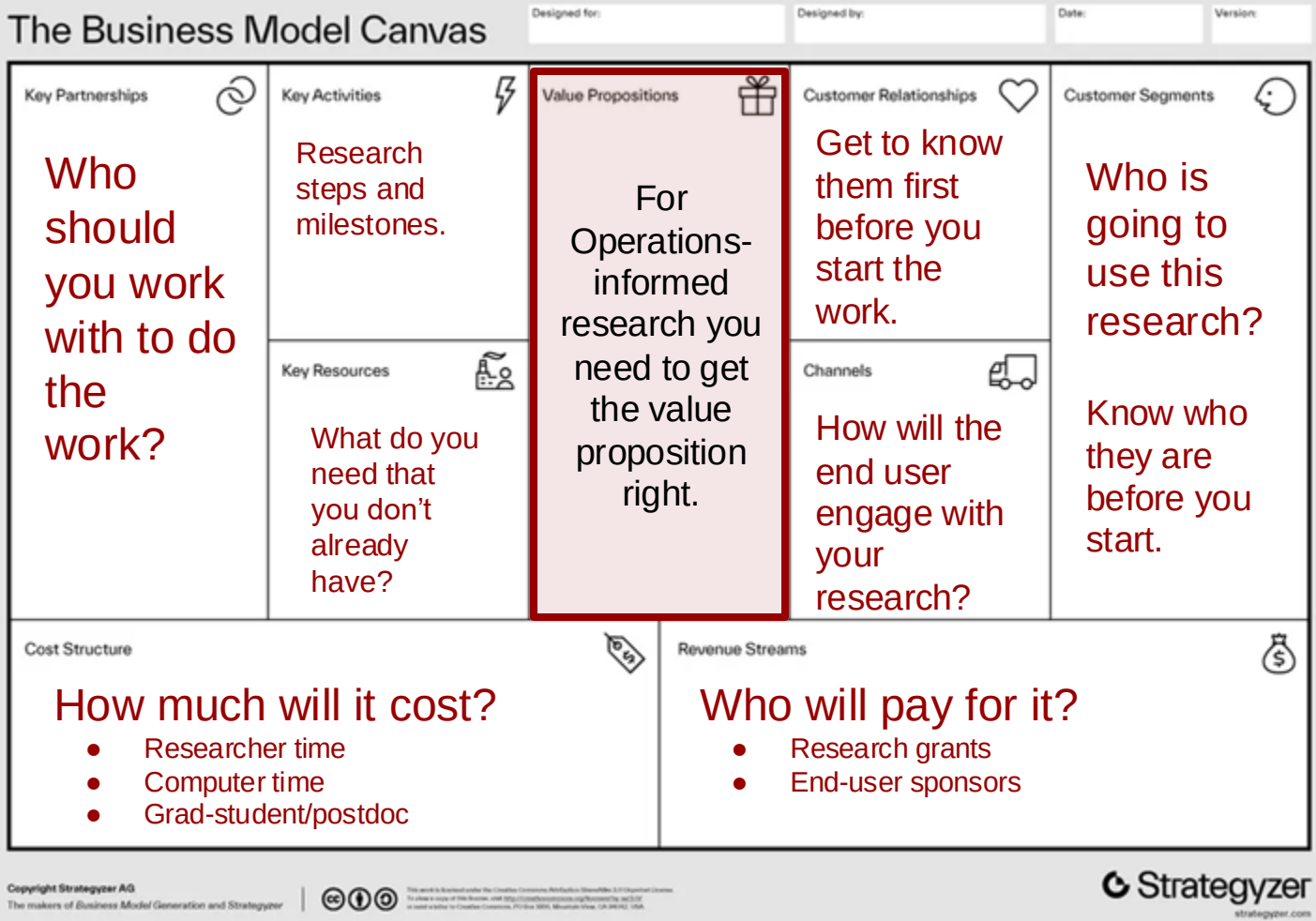
How? Learn from ***business*** how they work to meet their customers' needs.

Operational-informed research

3 **Advancing and Integrating Research Into Action**
Applied research, product development, assessments

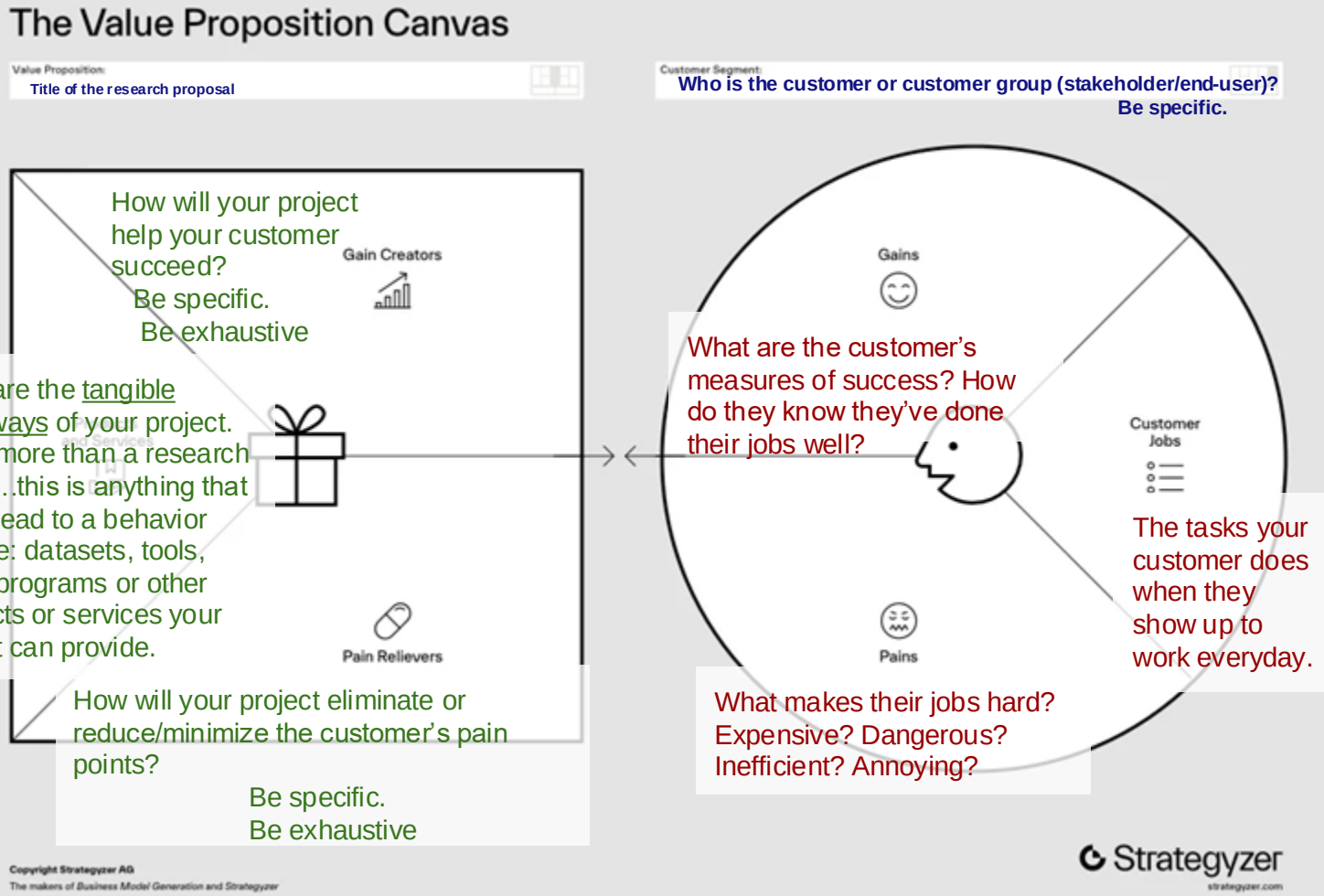
Do you have a research idea?

To this point, these are also key components of a good applied research proposal.



Value Proposition

Why would anyone apply your research?



Value Proposition

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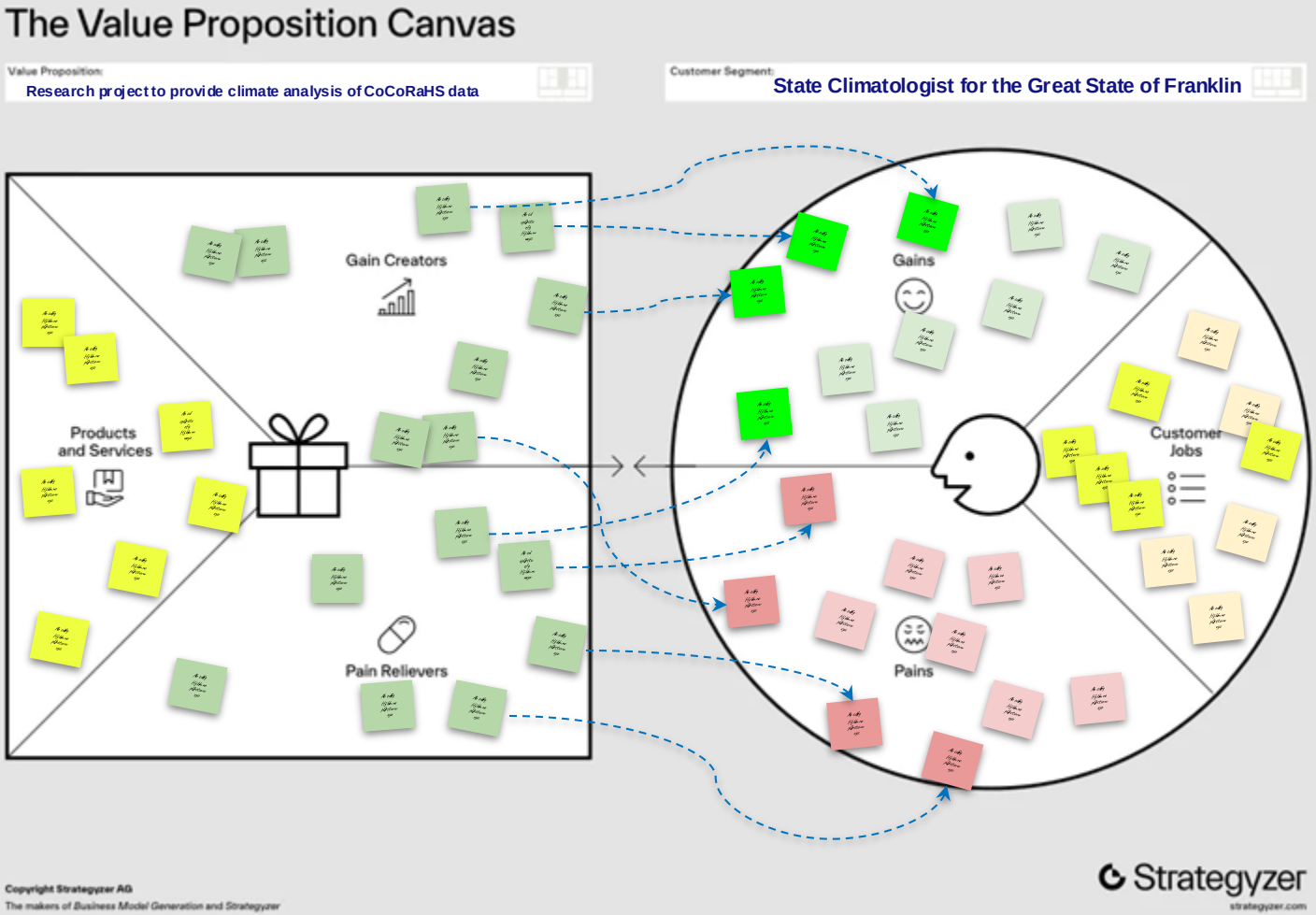


NOAA Service delivery model

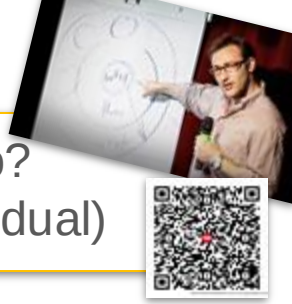
Why do you do what you do?
(As an organization or individual)

How do you do your job?

What do you do when you show up to work everyday?
Can I come and see what you do?

What makes your job hard?

How do you know if/when you are doing your job well?



Ask **WHY** at least 5 times

The goal is to really drill down to the fundamental core of the problem you are trying to solve.

1. **Why** aren't new observations, such as CoCoRaHS being included as initial conditions to initialize weather models?
    a. Some models require data that is a specific format, quality controlled, and the uncertainty is known. There may also be some other roadblocks with current data infrastructure that you'd need to navigate and there would need to be buy in from the modeling community.

1. **Why** would there be pushback from the modeling community?
    a. They are skeptical of the quality and reliability of CoCoRaHS Data

1. **Why** does crowdsourced engender skepticism when compared to traditional observations?
    a. Because crowdsourced data can be prone to errors, e.g site selection, gauge reading, reporting

1. **Why** do we assume that crowdsourced data is more error prone than traditional observations?
    a. Because quality assurance protocols cannot be implemented at scale like with MesoNet sites, for example

1. **Why** can't post-observation quality control algorithms automatically flag observations that may have lacked pre-observation quality assurance, or that are different from what's expected.
    a. Post-observation processing could provide that level of control, but the algorithm hasn't been written yet. ML/AI would probably do this really well. But even the, you would need to be able to demonstrate statistically that the data is of the same calibre as traditional observations.

1. **What if…**

NOAA Funding for Drought Research

Competitive Research Opportunities

Coping with Drought Research Competition

60+ *Projects since 2007*

$9M *Funding provided for FY20 & FY22*

FY22 *Tribal Resilience & Ecological Drought*

Next competitive research opportunity in **FY25**

Modeling, Analysis, Predictions, and Projections (MAPP) Program

50+ *Drought projects since 2011*

For every **$1** *of NIDIS funds, MAPP funds an add'l* **$1.55** *in research advancing NIDIS goals*

Regional and State Research Projects

Support **co-production of applied research** to address stakeholder needs.

RESEARCH to ACTION

Take home messages:

- **NIDIS can utilize and expand the reach of crowdsourced data in the following ways:**
  - Convening potential users for your projects.
  - Delivering information through:
    - Drought.gov, emails, newsletters, etc.
    - Promoting already-complete low-flow, or other drought-related projects
  - Advancing and Integrating Research Into Action

- **NIDIS** support for citizen science efforts, such as CoCoRaHS, requires…
  - A clear, and very strong research proposal focusing on applied drought science
  - Identified impact and value
  - Ties to the NIDIS or Regional DEWS Strategic Plans or Public Law.

Thank You

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nidis.program@noaa.gov

www.drought.gov

@NOAADrought

The U.S. Drought Portal

Drought.gov

Sign up for Drought Information

www.drought.gov/drought-alerts/signup

ACF Watershe Drought Dashbo

www.drought.gov/watersheds/acf-da

Business Model Canvas

www.strategyzer.com/library/the-business-model-canvas

Value Proposition Canvas

www.strategyzer.com/library/the-value-proposition-canvas

Simon Sinek's Ted talk

www.ted.com/talks/simon_sinek_how_ers_inspire_action?language=