Ag quick CAST

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Material excerpted from original CAST document

Enabling Open-source Data Networks in Public Agricultural Research

The next generation of agricultural problem solving will require big science and linkages forged across data sets and disciplines.

- Agriculture's pathway forward requires dedicated partnering among domain researchers, data scientists, science administrators and agencies, professional societies, and private publishing entities.
- Teams must bridge expertise gaps through meaningful collaborations between agricultural researchers and data scientists.
- Initiatives to leverage assets should focus on surfacing grey-dark data not represented by peer-review publication.
- For research data to achieve and maintain public value, it must connect feedbacks to ensure data are useful and useable for informing the end-user "apps" designed to enhance and secure our current food supply and address environmental and social challenges.

Research has created the most efficient food production system in history through accrual of massive amounts of data, information, and knowledge.

- With much research data remaining unpublished, only partially available, or incompletely described, policy decisions and program design may lean disproportionately on expert opinion and partial information.
- For agriculture, the scope of opportunities and challenges linked to data is hard to overstate.
- Free and open access to information generated by federal funding is clearly in the spirit of the original legislation creating the USDA and the land-grant university system to develop and apply scientific knowledge in food production for the betterment of the U.S. population.

Although agricultural research has been slow in developing e-infrastructure and mechanisms that promote efficiencies and transparency via open data, examples from other domains demonstrate that open data can catalyze new discoveries, decisions, and economic growth.

- Reports in the agricultural literature have repeatedly highlighted the potential for such infrastructure to improve the quality of the primary agricultural literature and its use in evidence-based decision making.
- Numerous, large, data-sharing efforts initially developed for other, broader purposes are already bringing significant ancillary benefits to agricultural research.
- Moving agriculture from its present culture of short data life cycles and limited sharing to one valuing open data and data reuse requires development and implementation of best practices that ensure readability over time and between disciplines.

Simultaneous pursuit of four strategies will facilitate agriculture's pathway forward into data-driven research:

- Bridging gaps with novel teams and data sciences
- Institutional facilitation of team science and data sharing
- Leveraging assets and surfacing grey/dark data
- Connecting feedbacks to ensure data are useful and usable

Physical and cyber infrastructure require a business case for making open access data and data tools viable to start and sustain over the long term.

- Competitive grants programs could be extremely useful to build tools and apps but would not be efficient mechanisms for long-term data storage and curation.
- As agriculture considers pathways forward for data, careful examination of the various financial models currently under active consideration by other domains should be undertaken.
- Even with stronger requirements from funders for data preparation, some activities such as anonymization remain beyond the scope of the funded research.

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Upcoming CAST Events (March–April)

NUTRIENT LOSS ROLLOUT

CAST plans to release Issue Paper 64, *Reducing the Impacts of Agricultural Nutrients on Surface Water Quality across a Changing Landscape*, during the week of the Spring Board of Directors Meeting on April 15.

BORLAUG CAST COMMUNICATION AWARD ANNOUNCEMENT

The 10th Borlaug CAST Communication Award nominee will be announced April 16 at the CAST Spring Board of Directors Meeting. The announcement will take place at the USDA Whitten Building. Dr. Marty Matlock, the BCCA 2018 winner, will deliver the keynote address prior to the announcement of this year's winner. The event will take place at 3:00 p.m.

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Ground and Aerial Robots for Agricultural Production: Opportunities and Challenges
Interpreting Agricultural Chemical Residues Measured in Food or Milk
Impact of Recruitment and Retention of Food Animal Veterinarians on the U.S. Food Supply
Protecting Food Animal Gene Pools for Future Generations
Producing Food Products from Cultured Animal Tissues
The Microbiome's Positive Impacts on Crops

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