



University of Tennessee, Knoxville
**TRACE: Tennessee Research and Creative
Exchange**

DataONE Sociocultural and Usability &
Assessment Working Groups

Communication and Information

10-12-2013

Understanding amateur data: Interactions in astronomy and environmental science.

Todd Suomela
University of Tennessee - Knoxville, tsuomela@utk.edu

Follow this and additional works at: https://trace.tennessee.edu/utk_dataone



Part of the [Library and Information Science Commons](#)

Recommended Citation

Suomela, T. (2013, October 12). Understanding amateur data: Interactions in astronomy and environmental science. Presentation at the 2013 Annual Meeting of the Society for Social Studies of Science (4S), San Diego, CA.

This Presentation is brought to you for free and open access by the Communication and Information at TRACE: Tennessee Research and Creative Exchange. It has been accepted for inclusion in DataONE Sociocultural and Usability & Assessment Working Groups by an authorized administrator of TRACE: Tennessee Research and Creative Exchange. For more information, please contact trace@utk.edu.

UNDERSTANDING AMATEUR DATA

Todd Suomela
University of Tennessee
tes@utk.edu

Amateur or Professional



BACKGROUND

Goldilocks?

- Too much data
 - Storage challenges for large projects like CERN, NCAR
 - Analysis challenge for SDSS leading to GalaxyZoo
 - Weather observation coverage leading to CoCoRAHs and NWS volunteer weather observers
- Too little data
 - Lack of detailed spatial and temporal coverage for environmental science
 - Professional response with projects like Long-Term Ecological Research Network (LTER)
 - Citizen science response with NPN and other projects

Dissertation

- Current investigation into citizen science
 - What are the communication frames and information exchanges among scientists, project managers, publicists, journalists, and volunteers
 - How are the frames created and shared among these groups of people
 - Does citizen science change the relationship between the public and science?

Citizen science and amateurs

- Introduced in the 1990s
 - But earlier antecedents exist
 - National Weather Service, Audubon Society Christmas bird count, AAVSO
- Two traditions
 - Critical-emancipatory
 - Pragmatic-instrumental
- Factors for growth
 - Improvements in technology
 - Public is a potential labor source
 - Funding requirements for public outreach

Methods

- Observation-participation for amateur astronomy groups
- Content analysis for Sloan Digital Sky Survey and GalaxyZoo
- Observation-participation for National Phenology Network and DataONE.

DataONE

GALAXY ZOO

USA nbn
National Phenology Network
Taking the Pulse of Our Planet

CASE STUDIES

DataONE

- Large-scale, multi-disciplinary and multi-institutional project
- Funded by NSF over 5 years.
- Two big challenges
 - Building an infrastructure to handle the diversity of data formats produced by professional scientists
 - Convincing scientists that data management is important and worth the effort

National Phenology Network

- Phenology is the study of "cyclic and seasonal natural phenomenon"
 - National phenology network has been gathering volunteer data since the 1960s
 - Currently using a web interface – Nature's Notebook
- Data is publicly available on website
 - Visualizations and data sets

SDSS and GalaxyZoo

- Sloan Digital Sky Survey
 - Multi-year project funded by Sloan Foundation
 - Automated data capture using photographic and spectrographic equipment
- Public website provides access to data
 - Data is available to professionals using bulk download command line tools
 - Data is available to the public using a visual interface
- Challenge of identifying patterns leads to GalaxyZoo
 - Too expensive to have a PhD student go through 1000s of photographs to classify galaxies so let's use crowdsourcing

Amateur Astronomers

- Exchange information through email lists
 - Return comments about "nice" images, beauty and aesthetic judgment
- Pictures posted to personal websites
 - Style of personal websites is often hand-made, basic HTML circa 2000.
- Group meetings
 - Two types
 - Technical presentation about equipment or observing methods
 - Star parties – get together at a location away from light pollution to setup equipment and watch the stars
- Edging into professional work
 - Contributing to American Association of Variable Star Observers or academic paper

CONCLUSIONS AND QUESTIONS

Amateur v. professional data

Differences	Similarities
<ul style="list-style-type: none"> • Infrastructure and funding <ul style="list-style-type: none"> • Data centers • Technical tools <ul style="list-style-type: none"> • Especially based on cost • Collaborative structures <ul style="list-style-type: none"> • Group funded projects e.g. DataONE, CERN, etc. • Standards <ul style="list-style-type: none"> • Aesthetics, enjoyment v. reliability 	<ul style="list-style-type: none"> • Digital file types <ul style="list-style-type: none"> • Photographs • GPS measurements • Technologies <ul style="list-style-type: none"> • Internet and web for communications • Digital photography (CCDs)

Conclusion

Limitations	The Social?
<ul style="list-style-type: none"> • Are these projects really comparable? • Exploratory instead of comprehensive • Lack of depth <ul style="list-style-type: none"> • Working on dissertation to dig deeper into these issues 	<ul style="list-style-type: none"> • If the digital structure of amateur data can be similar to professional data then what... <ul style="list-style-type: none"> • What is the difference between the data we use? • Purpose • How its gathered • Who its gathered by

Amateur or Professional



References

- Andromeda Galaxy
 - Joe Dinapoli, Amateur Astronomer Association of New York, <http://www.aaa.org/node/358/85>
 - Hubble Space Telescope, NASA, http://www.californiaindianeducation.org/science_lab/andromeda_galaxy.html