Tephra Fusion 2022 workshop focused on best practices in tephra data recommends innovative computer solutions to build databases

Kristi Wallace[1], Marcus Bursik[2], Steve Kuehn[3], Andrei Kurbatov[4]
[1]Geological Survey/Volcano Science Center, AK, kwallace@usgs.gov,; [2]University at Buffalo, SUNY, Buffalo, NY;
[3]Concord University, Athens, WV, sckuehn@concord.edu; [4]University of Maine, Orono, ME, akurbatov@maine.edu

EarthCube Annual Meeting – June 2022

Background

A series of international workshops held in 2014, 2017, 2019, and 2022 focused on improving tephra studies through standardization from field collection through publication and encouraging FAIR (findable, accessible, interoperable, reusable) data practices for tephra data and metadata.

Two consensus needs for tephra studies emerged from the 2014 and 2017 workshops: (a) standardization of tephra field data collection, geochemical analysis, correlation, and data reporting, and (b) development of next generation computer tools and databases to facilitate information access across multidisciplinary communities. To achieve (a), we developed a series of recommendations for best practices in tephra studies, from sample collection through analysis and data reporting (https://zenodo.org/record/3866266).

Tephra Fusion 2022 Workshop

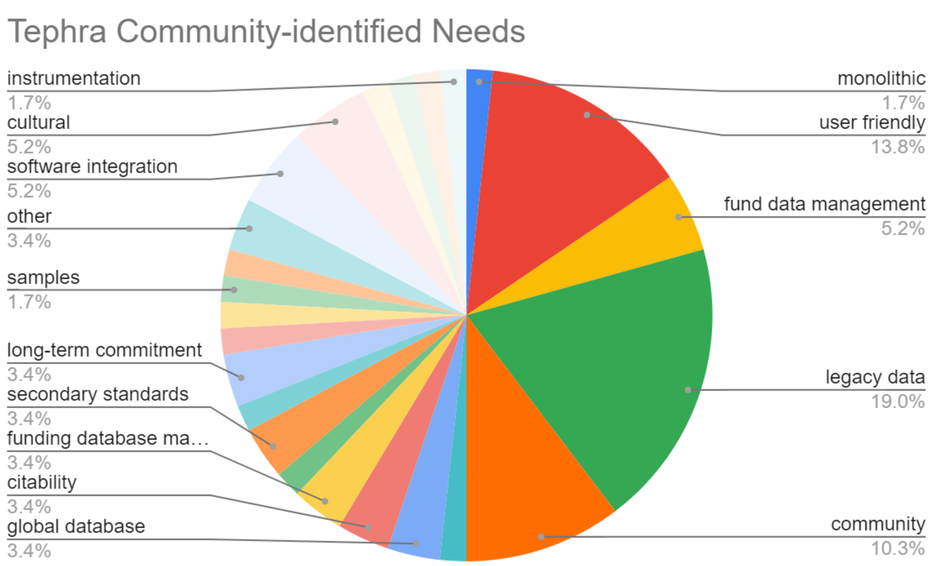
A 4-part virtual workshop series (https://tephrochronology.org/cot/Tephra2022/) was held in 2022 and attended by more than 230 people from 25 nations with the goal to: (1) update the tephra community on best practice developments and implementations, (2) get community feedback, (3) learn of unmet needs, and (4) plan a future roadmap for open and FAIR tephra data.

Tephra Community Needs Innovative Computer Systems to Build Databases

The community strongly emphasized the need for:

Better computer systems to store, manage and serve global tephra datasets including:

- Physical infrastructure (repositories and servers),
- Digital infrastructure (software and tools), and
- Human infrastructure (people, training, and professional assistance).

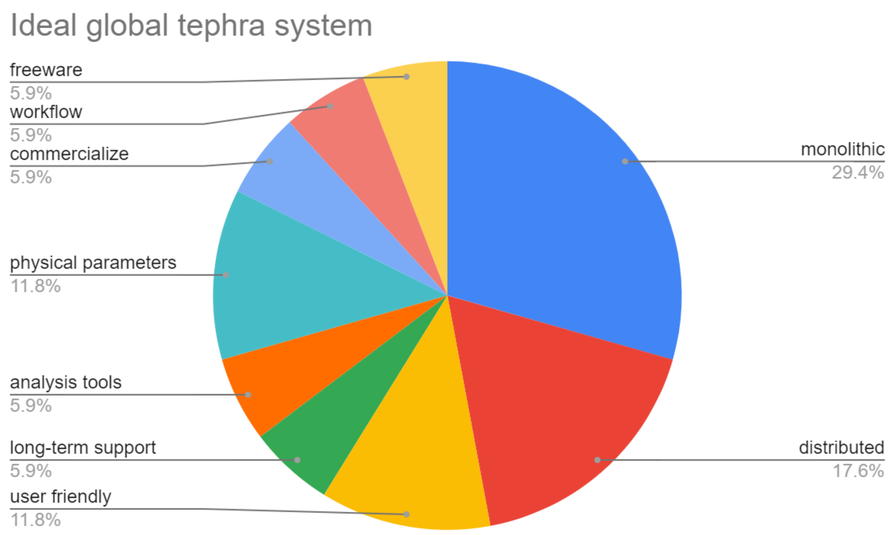


Responses to a workshop survey question: "What are your ideas for moving forward; What does the tephra research community need?"

Future Roadmap – we need help from the EarthCube Community

Desired Attributes of Future Cyberinfrastructure for Tephra Data

- User friendliness,
- Ability to easily ingest multiparameter tephra data (using best practice recommended data fields),
- Interoperability with existing data repositories,
- Development of tool add-ons (e.g., plotting and statistics),
- Improved searchability,
- Can deal with legacy data (may not follow standards),
- Development of a tephra portal with access to distributed data systems, and
- Commitments to long-term support from funding agencies, publishers and the cyberinfrastructure community.



Responses to a workshop survey question: "What could a global tephra data system look like? What part(s) should it have? What infrastructure is needed to support such a system?"

Learn more about the needs of the tephra community – Visit the Tephra Fusion workshop website (https://tephrochronology.org/cot/Tephra2022/)

1. Recordings of all presentations
   - Motivation for this work
   - Implementations of Best Practice metadata - StraboSpot, SESAR, EarthChem
   - Future roadmap discussion – wants, needs, poll summaries
2. Link to Best Practice metadata fields for developing databases
3. Examples of datasets

NSF ICER 1846400 Tephra Workshop 2020
NSF ICER 1740669 EarthCube Integration: THROUGHPUT: Standards and Services for Community Curated Repositories