



Contribution ID: 141

Type: **Session**

## The Sample Management Lifecycle in Action: Stages, Stakeholders, Identifiers, and Opportunities

*Tuesday 14 October 2025 11:30 (1h 30m)*

### Significance of the issues to be tackled in the session

Effective sample management is essential to ensuring the integrity, reproducibility, and openness of research across diverse disciplines. From the Physical and Life Sciences to the Social Sciences and the Arts, material samples serve as the foundation for countless research projects. As the scale, complexity, and diversity of sample collections grow, the need for robust, interoperable management strategies becomes increasingly urgent.

Persistent identifiers (PIDs), such as International Generic Sample Numbers, play a central role in addressing this challenge. By providing globally unique and resolvable identifiers, PIDs enhance the traceability, discoverability, and reusability of material samples. They digitally connect samples to related datasets, publications, instruments, and contributors, strengthening research transparency and ensuring alignment with the FAIR Principles.

However, realizing the full potential of PIDs in sample management and the challenges due to the high granularity of objects to be managed, requires a coordinated effort among multiple stakeholders. Researchers, collection curators, data and informatics specialists, infrastructure providers, and publishers each contribute to different stages of the sample lifecycle—from collection and documentation to curation, dissemination, and reuse. Gaps in standardization, interoperability, and best practices still hinder effective sample management, limiting the ability to link samples across disciplines and repositories.

This session will explore the full sample lifecycle, examining current practices, identifying pain points, and highlighting opportunities for enhancement. By fostering dialogue across the community, the session aims to promote greater consensus around sample management standards, advocate for wider adoption of PIDs, and inspire collaborative solutions that drive scientific advancement.

### Approach, structure, format, and suggested agenda for the session

To maximize engagement and impact, this session will feature a panel of presenters combined with a structured, interactive dialogue. The format is designed to capture the different perspectives of key stakeholders and encourage audience participation.

The session will begin with short presentations by the panellists (~45 min) with the objective of providing insights into the current challenges and opportunities in sample lifecycle management. The panel will be composed of representatives from the main stakeholder groups:

- Researchers: Needs and expectations for sample documentation and discovery.
- Collection Curators/Repository Managers: Sample preservation, access, and metadata standards, and tools for metadata collection.
- Data/Information Specialists: Technical considerations, such as PID assignment and integration with other research outputs.
- Publishers and Infrastructure Providers: Sample metadata in linking samples to publications and enhancing research integrity.

Following the presentations, there will be an interactive dialogue (~35 min), encouraging everyone in the room to share their experiences and explore solutions collaboratively. We will reflect on lessons learned, promoting cross-disciplinary understanding and identifying areas for improvement. The session will then

end with a wrap-up (~10 min), summarizing key points and actionable insights, listing opportunities for future collaboration and any next steps to advance sample management practices.

### **Proposed speakers and the subject of their papers**

The following stakeholder representatives have been invited and have confirmed their participation. Each speaker will present a paper that supplies their perspectives on the session themes of the importance of PIDs in sample lifecycle management, challenges in standardizing sample metadata and protocols across disciplines, real-world examples of successful and problematic sample management practices, and strategies for improving sample discoverability and interoperability.

- Researchers: Andrea Thomer/Natalie Raia (ESIP Physical Sample Curation Cluster)
- Collection Curators/Repository Managers: Kerstin Lehnert (Interdisciplinary Earth Data Alliance)
- Data/Information Specialists: Anusuriya Devaraju (Commonwealth Scientific and Industrial Research Organisation)
- Publishers and Infrastructure Providers: Kirsten Elger (Earth System Science Data, Copernicus Publications)

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**Presenters:** THOMER, Andrea (University of Arizona); DEVARAJU, Anusuriya (CSIRO); ELGER, Kirsten (GFZ Helmholtz-Centre for Geosciences); LEHNERT, Kerstin (Lamont-Doherty Earth Observatory of Columbia University); RAI, Natalie (University of Arizona)

**Track Classification:** SciDataCon2025 Specific Themes: Open research through Interconnected, Interoperable, and Interdisciplinary Data