

## University of Colorado Boulder

The IMLS-funded MAP pilot, organized by the California Digital Library and the Association of Research Libraries, explored how machine-actionable data management plans (maDMPs) could streamline infrastructure, coordination, automation, and research data stewardship.

# Developing maDMPS-Centered Workflows and Automations to Streamline Processes



## INTRODUCTION

The University of Colorado Boulder (CU Boulder) used its maDMP pilot to explore how machine-actionable DMPs (maDMPs) could support infrastructure planning, automate research support workflows, and connect research data systems across the institution. The project team collaborated with campus-wide stakeholders to evaluate existing tools, map integration opportunities, and identify scalable strategies for automation, with a specific focus on post-award data workflows.



## CAMPUS ECOSYSTEM MAPPING

CU Boulder began by surveying current systems that interact with the DMP Tool and identifying both internal and external data sources that could be enhanced by utilizing maDMPs. The team created detailed architecture diagrams that showed the current state of the DMP-related information flow and a proposed future state with improved integration.

This work developed a shared understanding across units and helped prioritize targets for integration and automation. The team also explored how maDMPs could integrate into the Laboratory for Atmospheric and Space Physics (LASP) infrastructure as a model for domain-specific implementation.

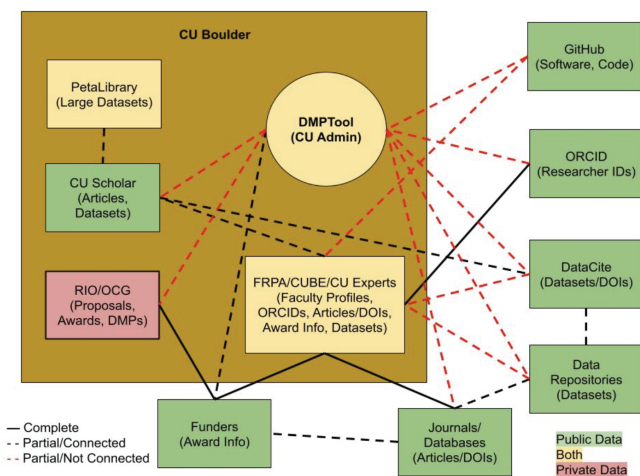


Figure 1: CU Boulder's current state of maDMP-related systems and data connections.

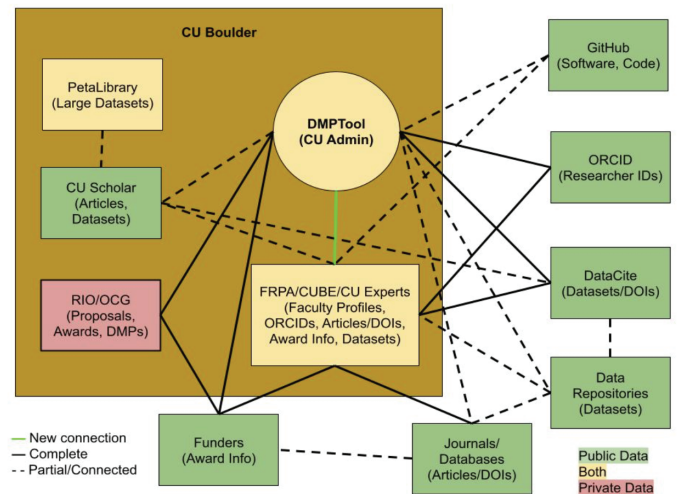


Figure 2: Outline of the desired future state of CU Boulder's RDM systems, including improved technical and sociotechnical integration.

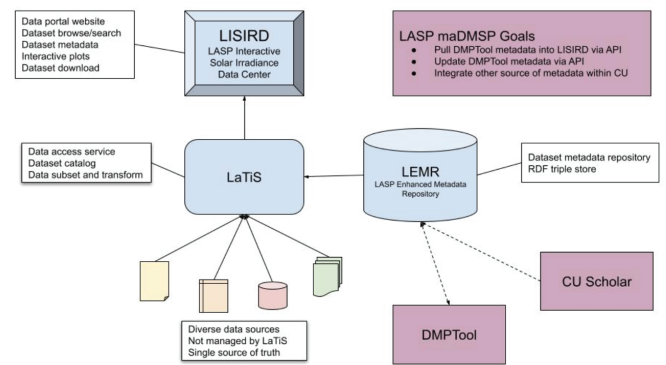


Figure 3: A map of the Laboratory for Atmospheric and Space Physics (LASP) infrastructure and potential maDMP touchpoints.



## KEY OBSERVATIONS

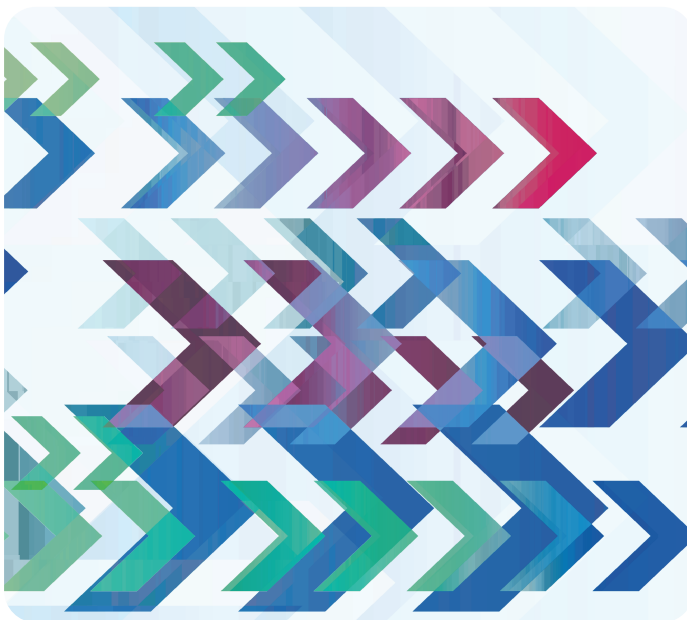
The pilot highlighted gaps in current infrastructure and workflows. For example, CU Boulder researchers rarely update plans after submission, and access to plans post award requires the permission of the Principal Investigator.

The team concluded that targeting specific post-award projects with close institutional partnership was a practical starting point to demonstrate potential new workflows. They also found that feeding information into a DMP was currently more feasible than extracting from a DMP.



## FUTURE DIRECTIONS

Following the pilot, CU Boulder is taking steps to strengthen campus readiness for maDMP integration. The team is continuing to test the DMP Tool API to identify automation opportunities that reduce manual workload. They are also promoting exemplary DMPs from large, high-impact research projects to demonstrate practical value. Institutional guidance and DMP Tool templates are being updated to include prompts about specific CU Boulder resources, making it easier to track and support the use of CU Boulder resources and services. In parallel, the team is enhancing guidance related to sensitive and secure data to improve researcher awareness and compliance. They are also sustaining cross-campus collaboration by maintaining relationships established during the pilot and expanding conversations around integrated research information workflows. These efforts reflect CU Boulder's strategic shift toward targeted, high-value interventions that can be scaled over time to support broader institutional adoption of new workflows.





## STRATEGIC RECOMMENDATIONS FOR INSTITUTIONS

### Use Ecosystem Mapping to Align Stakeholders and Identify Integration Targets

- Begin by mapping current systems and workflows related to research data, storage, compliance, and support.
- Visualize both the current and desired future states to develop a shared language across departments, clarify integration opportunities, and prioritize efforts.
- Highlight high-impact domains or units (like CU Boulder's LASP) as testing grounds for targeted maDMP use.

### Focus Early Implementation on Post-Award Workflows

- Many research support challenges emerge after funding is awarded yet most DMP attention is focused at the proposal stage.
- Identify opportunities to:
  - Trigger alerts for infrastructure or compliance needs based on DMP content.

- Feed DMP metadata into downstream systems, reducing manual work and improving service planning.

- Starting post-award also helps engage researchers who are actively working on funded projects.

### Build Institutional Readiness Through Demonstration and Iteration

- Promote exemplary DMPs and highlight their value in large, visible projects.
- Update institutional templates and guidance to include campus-specific resources and prompts, helping researchers generate more actionable plans.
- Pair technical testing (e.g., with the DMP Tool API) with policy and training improvements, strengthening both systems and user awareness.





## TEAM

**Don Elsborg**, Lead Architect, Faculty Information System, Office of Data Analytics

**Layla Freeborn**, Associate Director of User Services, Research Computing/CRDDS

**Andrew Johnson**, Head of Data and Scholarly Communication Services, Libraries/CRDDS

**Samuel Oskar Klopsch**, NCAR/UCAR Developer in Residence, Libraries

**Shelley Knuth**, Assistant Vice Chancellor for Research Computing, and Co-executive Director, CRDDS

**Doug Lindholm**, Data Systems Software Engineer and Open Science Co-chair, LASP

**Thea Lindquist**, Professor, Libraries, and Co-executive Director, CRDDS

**Matthew Murray**, Data Librarian, Libraries/CRDDS

**Adi Ranganath**, Data Librarian, Libraries/CRDDS

**Karen Regan**, Associate Vice Chancellor for Research & Innovation, Research Development, Research & Innovation Office

**Vida Sabeti**, Digital Library Senior Software Developer, Libraries

**Barb Schnell**, Associate Director of Secure Research and Computing, Research Computing/CRDDS

**Alex Viggio, Director**, FIS, Office of Information Technology

**Jamie Wittenberg**, Assistant Dean for Research & Innovation Strategies