

# Best Practices for Multi-User Editing with ArcMap 10.3

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## PURPOSE

Cooperative mapping efforts are ideal for covering large areas with great detail or providing practical application for students/trainees. However, producing a coherent and consistent product from this distributed workflow requires a greater amount of planning and preparation on the front end from the mapping group than single mappers or single ArcGIS project users. This document provides multiple workflows for mappers to consider before deciding which is best for them: versioned editing in an *enterprise geodatabase*, distributed datasets among multiple *file geodatabases*, and sharing a single *file geodatabase*. These variations are based mostly on GIS management experience and IT infrastructure available to their organization. We begin by exploring the most comprehensive – and most involved – methods and work our way down in terms of sophistication.

The most important factor for all of these, though, is for every contributing member of the mapping team to understand their GIS environment and how their piece of the puzzle fits with the others. The individual on the mapping team responsible for bringing the map together, be it the PI or delegated to another member, will benefit from preparation on the front end. Also, this document includes a template mapping specification to distribute to team members for reference.

### Required systems/software

ArcGIS Desktop 10.3 Advanced License

### Basic ArcGIS features used in this SOP

#### [Geodatabases](#)

## VERSIONED EDITING IN AN ENTERPRISE GEODATABASE

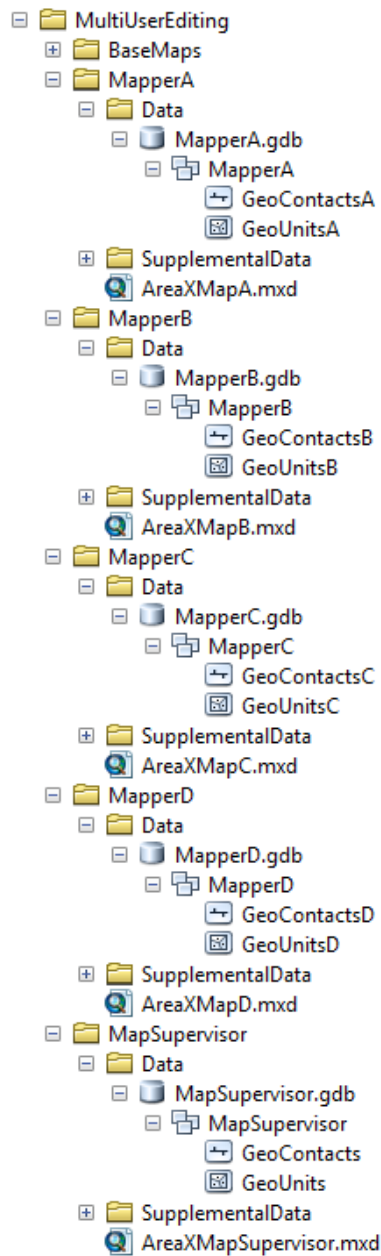
This is the most robust multi-user editing environment, but also the most complicated to establish. It requires a relational database connection via IBM DB2, Informix, Oracle, PostgreSQL or SQL Server, and someone involved with the project to act as database administrator (DBA). Versioned editing allows the DBA to create a hierarchical user structure with role-specific privileges where edits to the default geodatabase view are saved in delta tables (add and delete tables), which can be reviewed/rejected before edits are posted. It also identifies conflicts and supports archiving of previous versions of a dataset. This practice will not be detailed further, as it is an advanced topic that is best discussed between the lead mapper, GIS specialist and IT managers before implementation. For more information, refer to this [Esri reference](#). We do not support the implementation or maintenance of this practice.

## DISTRIBUTED DATASETS AMONG MULTIPLE FILE GEODATABASES

Without the option of building an enterprise geodatabase, a file geodatabase is ideal for organizing and integrating data from multiple users. The primary limitation of a file geodatabase is that feature classes cannot be edited concurrently by different users, and because of this all recommendations herein are based on each user mapping features to their own dataset, to be merged later. Avoid using a personal geodatabase unless compatibility with data formats outside of ArcGIS require it. Below are four potential schemas for organizing mapping efforts: common directory access, feature separation, geographic separation, or coordinated mapping in isolated workspaces.

### **Common directory access**

The first consideration for preparing the collaborative GIS environment is to identify where all members of the mapping team will be located, or more specifically, whether they can reliably access the same workspace. If so then it is recommended that one *file geodatabase* is created for each mapper containing identical *feature classes* (i.e., matching schema), using one common set of base maps. This allows each user to edit their own dataset and the mapping supervisor to maintain visibility throughout the process. Additionally, separate map documents for each mapper can be pointed to read-only copies of other mappers' work while editing their own, which can help to identify potential conflicts and coordinate mapping at boundaries.

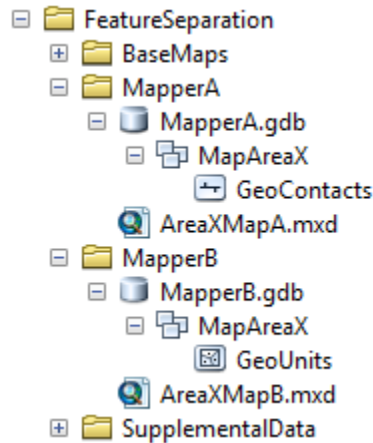


Example organization of a collaborative editing workspace, compartmentalized to prevent limit file corruption from misuse.

NOTE: Managing the read/write permissions of each mapper’s directory can prevent file corruption/misuse while maintaining visibility, and can easily be backed up as needed.

## Feature separation

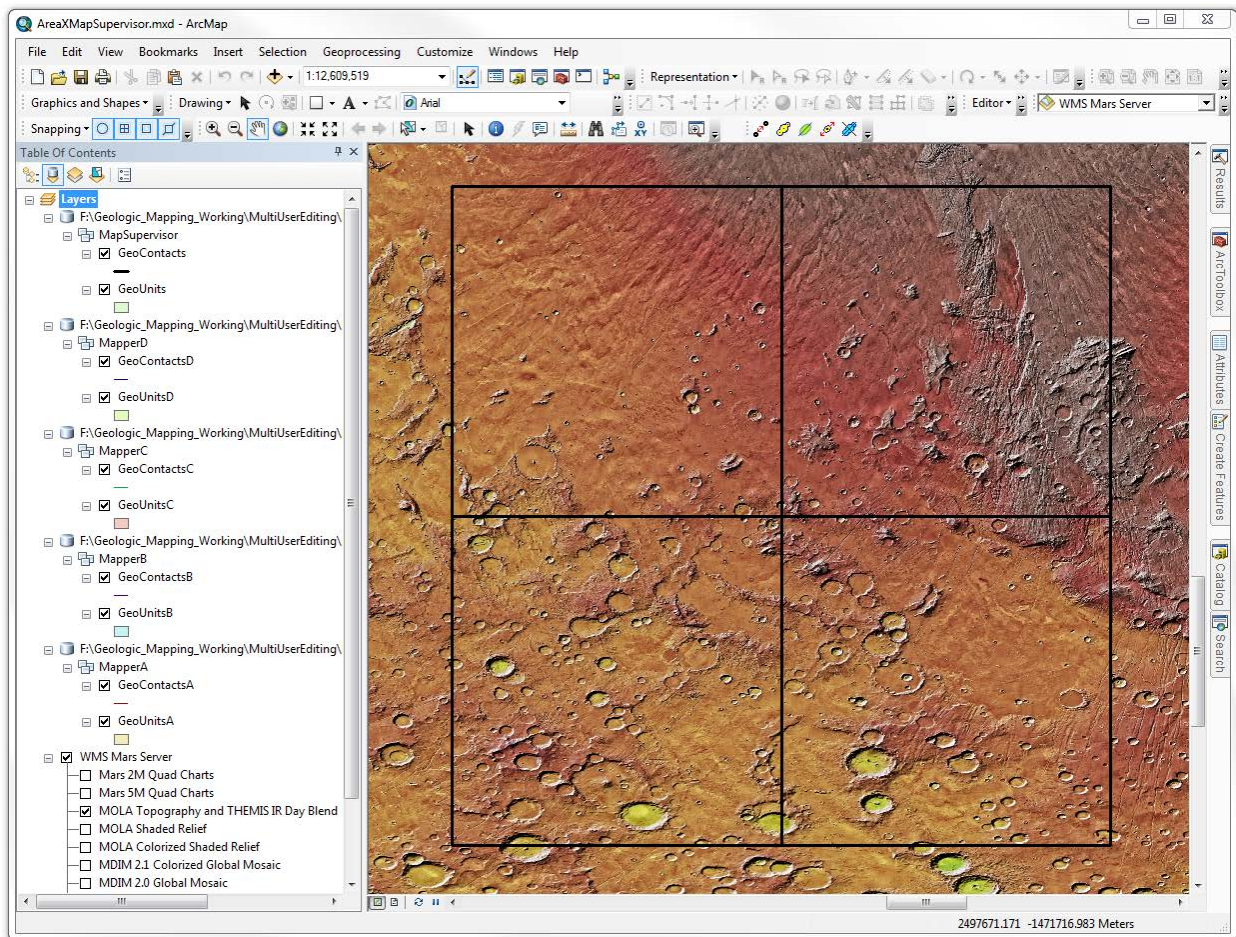
If the mapping area is relatively small or if mapping responsibilities can be easily divided by morphology, geometry type or other means, then separate databases may be organized in the same manner outlined above. This method is least likely to have problems when being brought together for finalization so long as they have been mapped to the same specification (see the Map Specification Document template).



Example organization of a workspace using feature separation.

## Geographic separation

If the mapping area is very large, or is being used for training purposes, then geographically partitioning the mapping area is recommended. This method is potentially faster, but more susceptible to alignment problems at boundaries as well as differences in style between each mapper. To merge the separate datasets into one use **Data Management** toolbox > **General** > **Merge** tool. For more information on merging and field mapping see this [Esri reference](#).



ArcMap view of geographically separated mapping area.

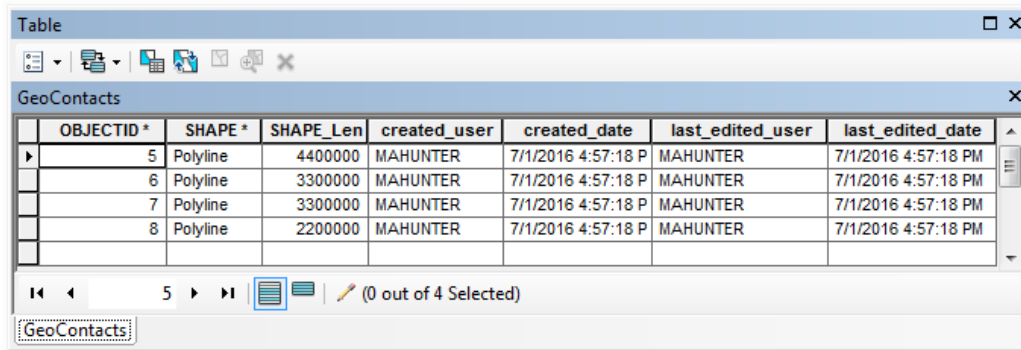
## Coordinated mapping in isolated workspaces

If sharing a common workspace is not an option (Co-Is at different institutions, no established network, etc.), then each geologic mapper must be prepared with the GIS training and mapping specifications needed to map independently. The attached Map Specification Document is a template that may be modified to better communicate mapping details that, when used with a properly set-up GIS project (map document, *geodatabase*, base maps, *layer files* and other data), allows mappers to work in nearly identical environments. Workflows using this method are typically less responsive, and trouble-shooting individual problems can be difficult.



## SHARING A SINGLE FILE GEODATABASE

A *file geodatabase* is capable of editing by multiple users, just not concurrently. Due to persistent issues with schema locks and the potential for editing conflicts it is not recommended for collaborative use. If this method is used, though, right-click *feature class* > “Manage” > Enable Editor Tracking for useful documenting of feature-by-feature edits which adds fields to the *feature class*.



OBJECTID *	SHAPE *	SHAPE_Len	created_user	created_date	last_edited_user	last_edited_date
5	Polyline	4400000	MAHUNTER	7/1/2016 4:57:18 P	MAHUNTER	7/1/2016 4:57:18 PM
6	Polyline	3300000	MAHUNTER	7/1/2016 4:57:18 P	MAHUNTER	7/1/2016 4:57:18 PM
7	Polyline	3300000	MAHUNTER	7/1/2016 4:57:18 P	MAHUNTER	7/1/2016 4:57:18 PM
8	Polyline	2200000	MAHUNTER	7/1/2016 4:57:18 P	MAHUNTER	7/1/2016 4:57:18 PM

Four fields are added to the *feature class* attribute table when Editor Tracking is enabled.

Please direct any questions, comments or improvements to:

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**Mapping Specification Document**

**Mapping Area Boundary:**

**Map Reference Scale:**       **Editing Scale:**

**Coordinate System:**

**Base Map(s):**

**Minimum Mapping Feature Size:**

**Feature Classes / Datasets:**

**Streaming Tolerance:**

**Snapping Tolerance:**

**Mapping Supervisor Notes:**