DIGITAL MAPPING TECHNIQUES 2024

The following was presented at DMT'24

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The contents of this document are provisional

See Presentations and Proceedings
from the DMT Meetings (1997-2024)
http://ngmdb.usgs.gov/info/dmt/

Catching Errors In Evolving Compilations

David Vohra (Idaho Geological Survey)

Evolving compilations are databases comprised of data covering a large area, sourced from multiple authors, and unlike standard compilations, contain new field mapping that is added each year. This accretion of new data to a large database presents some unique challenges in ensuring a consistent and seamless map. The GeMS Topology Check tool reports numerous types of errors, but does not report the cases where the same map unit exists on either side of a contact. A script was written to identify cases of this using planarized ContactsAndFaults and dissolved MapUnitPolys. Another issue is inconsistent assignment of symbol codes to map units, which is resolved with a script that reports to the user which map units and their respective symbols do not adhere to a 1:1 relationship. The larger issues present in evolving compilations are changes in geologic interpretation as new mapping is completed. No automated solution has been created to identify these issues in 2D, and it is difficult to make headway without a 3D stratigraphic model.

Catching Errors in Evolving Compilations

David Vohra
Digital Mapping Techniques 2024

Normal, IL

Recurring Problems

- Three problems of working with evolving compilations:
    - Large area
    - Differing data sources
   - Changing geologic interpretations
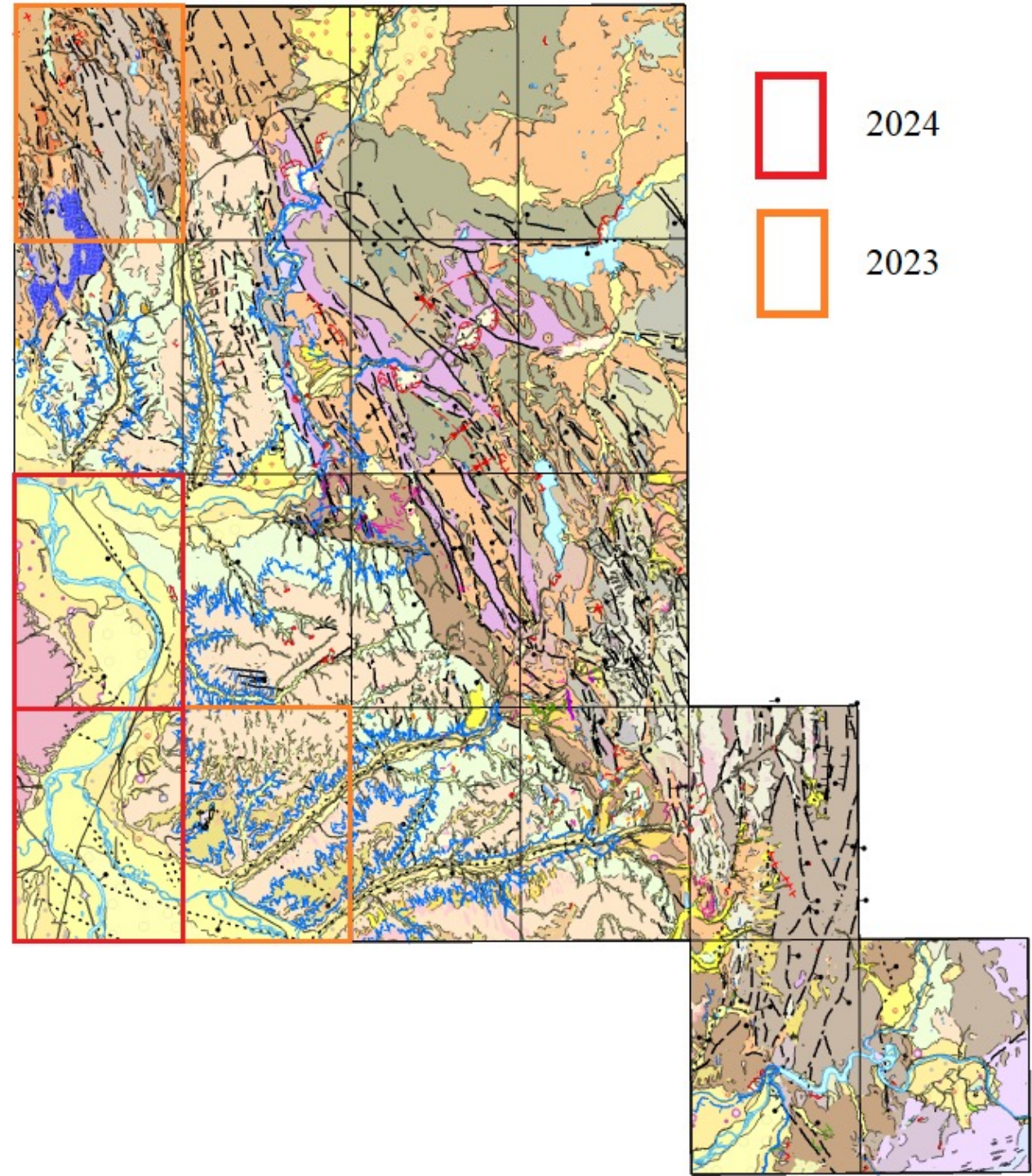
Different Sources, Different Symbology

- Common error:
    - different symbols used for same MapUnits (or vice-versa) in different databases brought together in a compilation.

- Solution:
    - Tool checks for 1:1 relationship between Symbol code & MapUnit assigned. Checks MUL, MUP, and DMU.
    - Returns offending map units and the symbols associated with each of them.
    - Add functionality to Validation tool

Evolving Interpretations

- Author revises interpretation of other quads
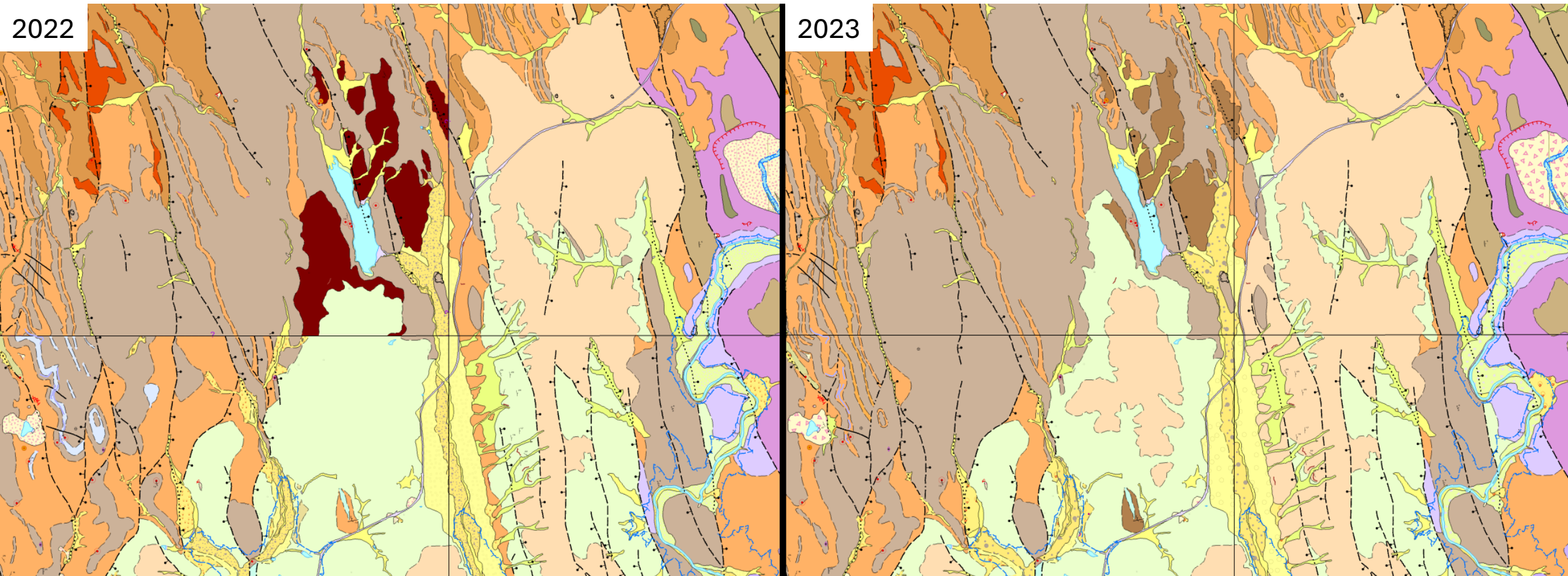
How to tell if the edits are geologically sound?

- The topology check tool does a good job of checking for more plainly incorrect data. Specifically, it checks:
  - Topology rules
  - Faults concealed if above HKey threshold
  - Fault directions consistent
  - Bad nodes
  - Same MUP on either side of a concealed fault

- Missing: check to see that no polygons of the same map unit are separated by a contact.

ID Bad Contacts/Same-Neighbor MUPs

- Planarize CAF.

- Dissolve MUPs by MapUnit (result must be single part)

- Select MUPs that do not have geometry identical to the dissolved polys.

- Selects planarized contacts that fall entirely within (Clementini).

- Saves selection as new feature class.
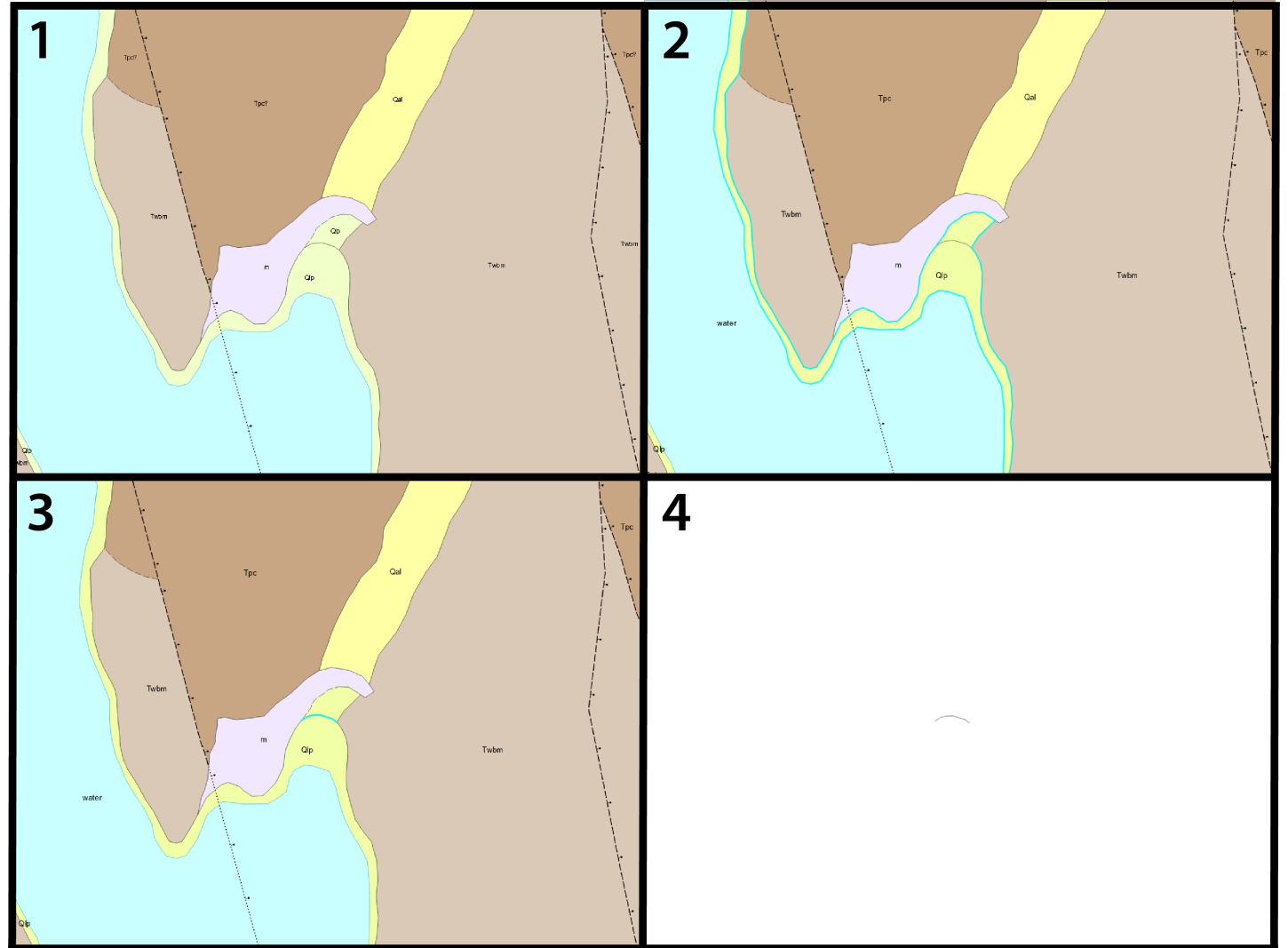
Consistent stratigraphic relations?

- Topology check ensures valid 2D relationships.
- Stratigraphic relations are 3D.

- No solution yet for automatically detecting inconsistent stratigraphic relations or fault movements.