Lessons from both sides: challenges in providing and using data from specimens

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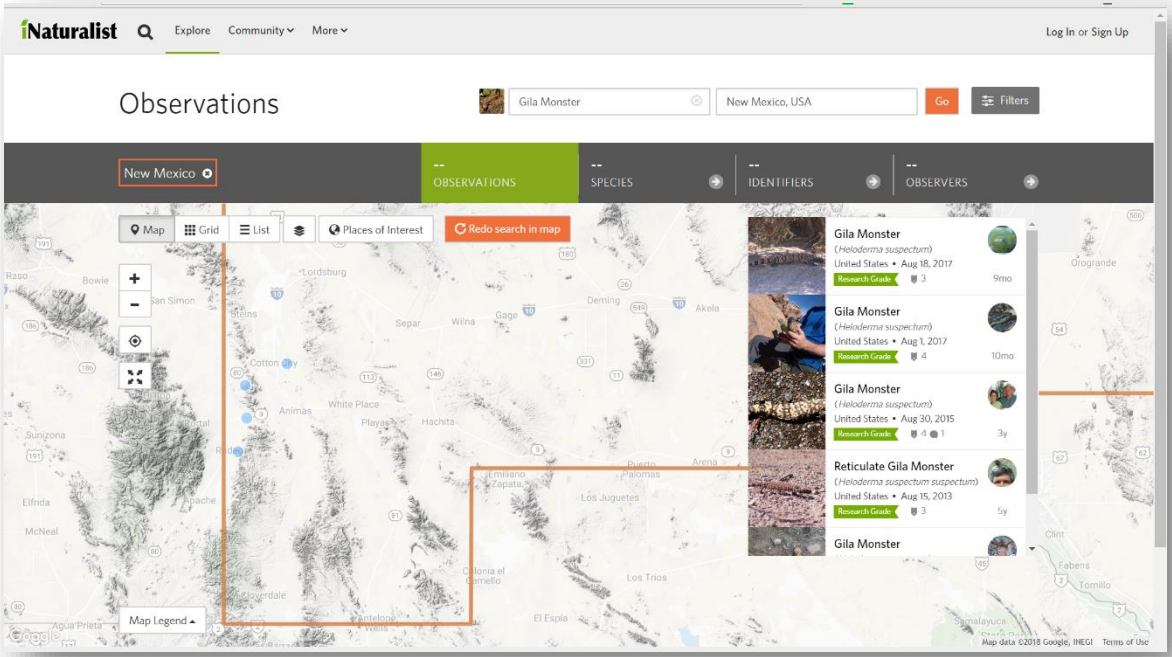
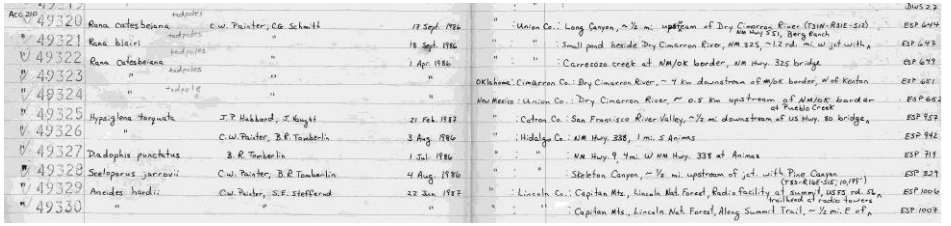
Outline

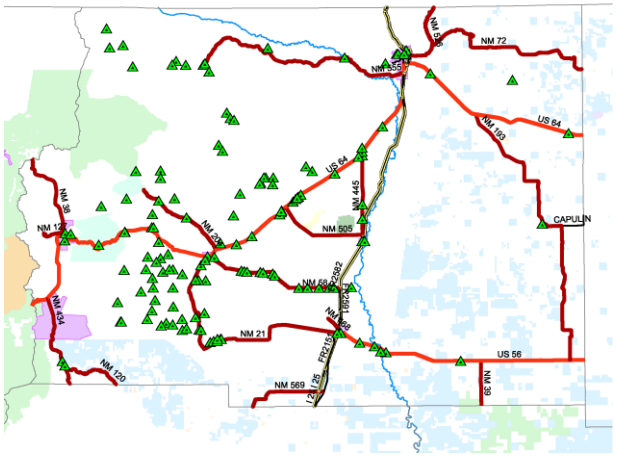
- Value of natural history specimens enhanced by data
  - Shift focus from documenting species to <u>conserving</u> species:
    - Availability: enhance and provide data to wide audiences
    - Quality: QA/QC and standardize data likely to be used repeatedly



Enhance and provide data

- Enhance specimen data
  - Georeferencing
  - Collection digitization
    - Specimen imaging
    - Scanning of original documentation
    - Transcription of field notes



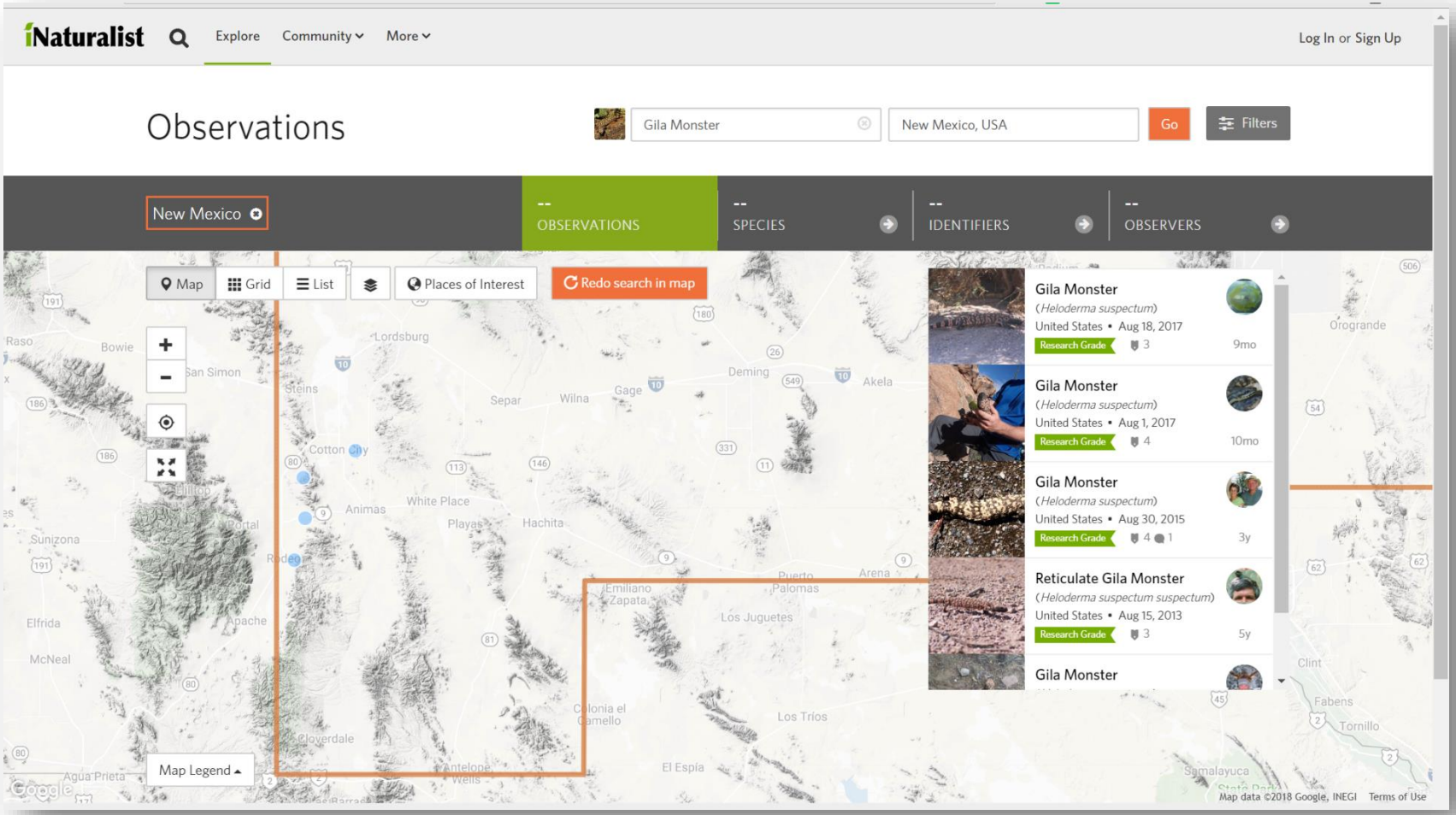


provides context and allows for new approaches in applied research and conservation

Enhance and provide data

- Provide data
  - Examples of efforts:
    - GBIF
    - Vertnet
    - Arctos

QA/QC and standardize data



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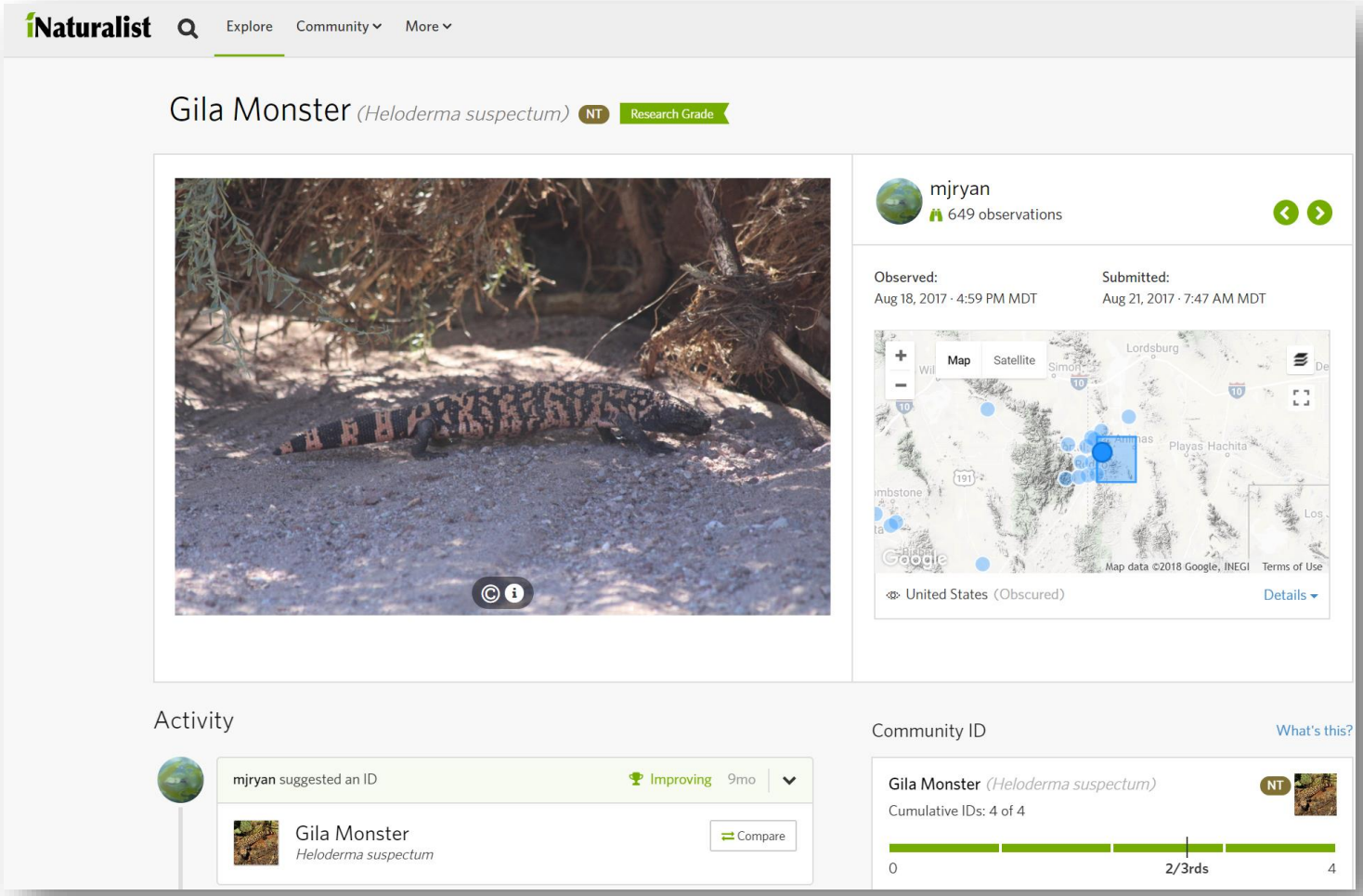

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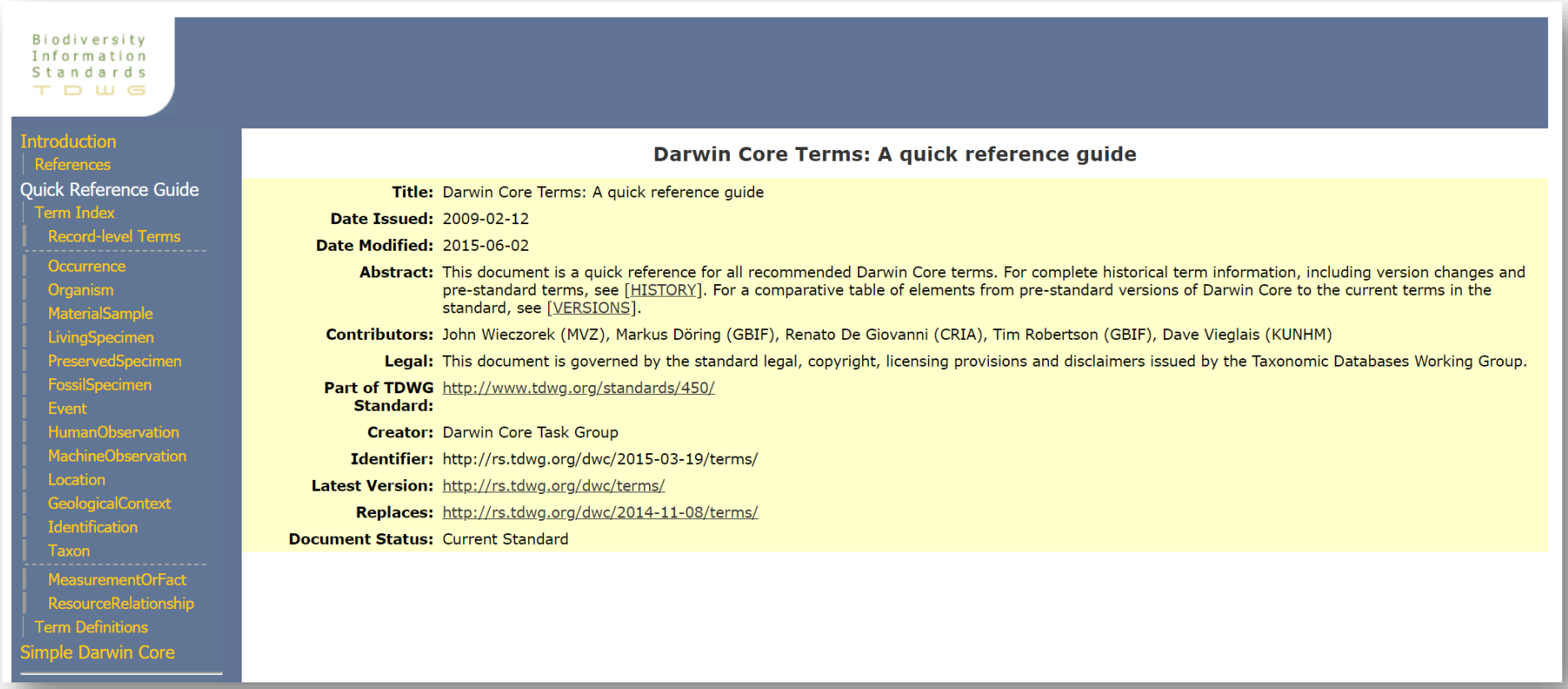
QA/QC and standardize data

- Darwin Core



Value of natural history specimens

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Distribution of the Gila Monster (*Heloderma suspectum*) in southwestern New Mexico

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Outline

- Status of Gila Monsters in New Mexico
  - Widespread and locally common in other areas
  - Few scattered records in disjunct areas in NM
- Threats
  - Illegal collection for trade
  - Habitat fragmentation
  - Changes in land use
  - Change in habitat due to changing climate

Objectives

- Evaluate distribution in NM based on previous records and surveys
  - Still there?
- Quantify detectability
  - How effective are VES?
- Calculate current and future areas of occurrence
  - Is the current range larger than previously expected?
  - Is it likely to change in the future?

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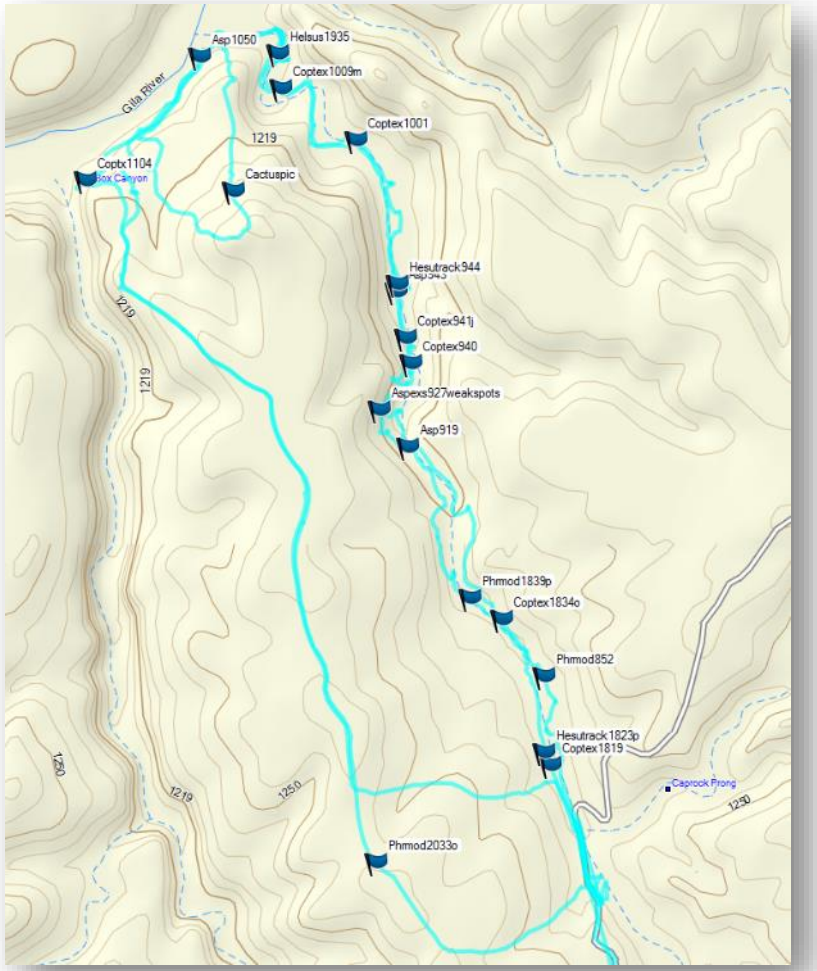
Outline of methods

- Review known occurrences
  - Map records and observations
  - Select areas of interest
- Visual Encounter Surveys
  - Areas of previous records
  - Various observers/speeds
  - Record track to quantify effort
- Calculate detectability
  - Compare several models to inform future survey and monitoring
- Model distribution
  - Incorporate results from this study



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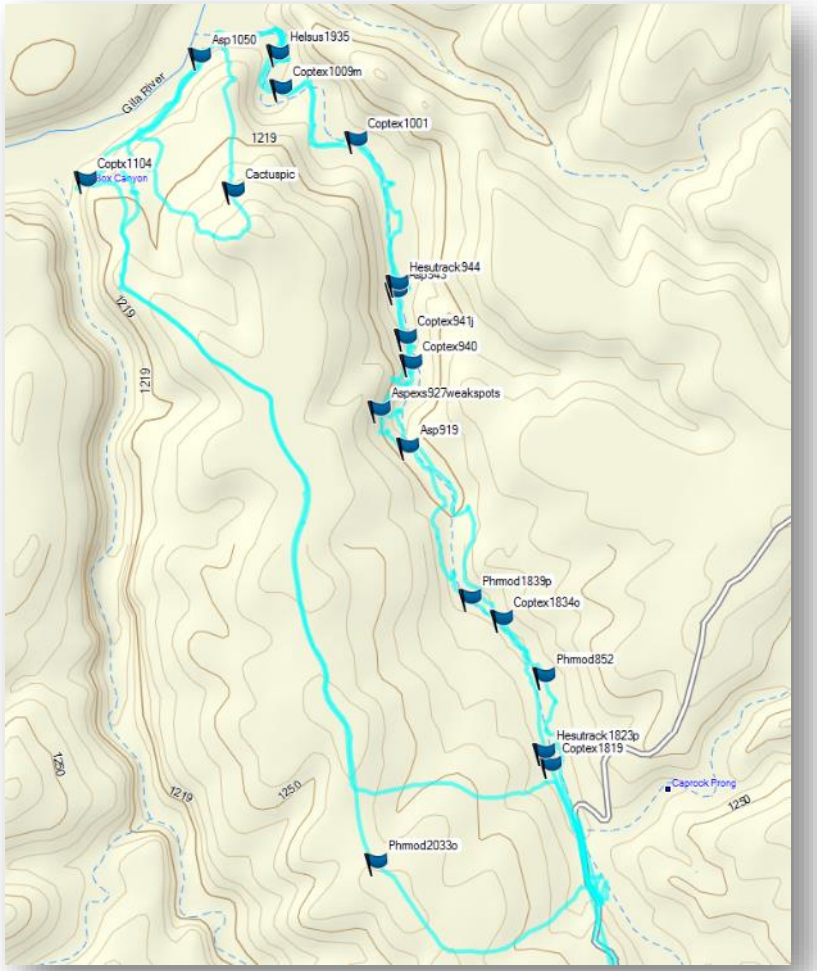
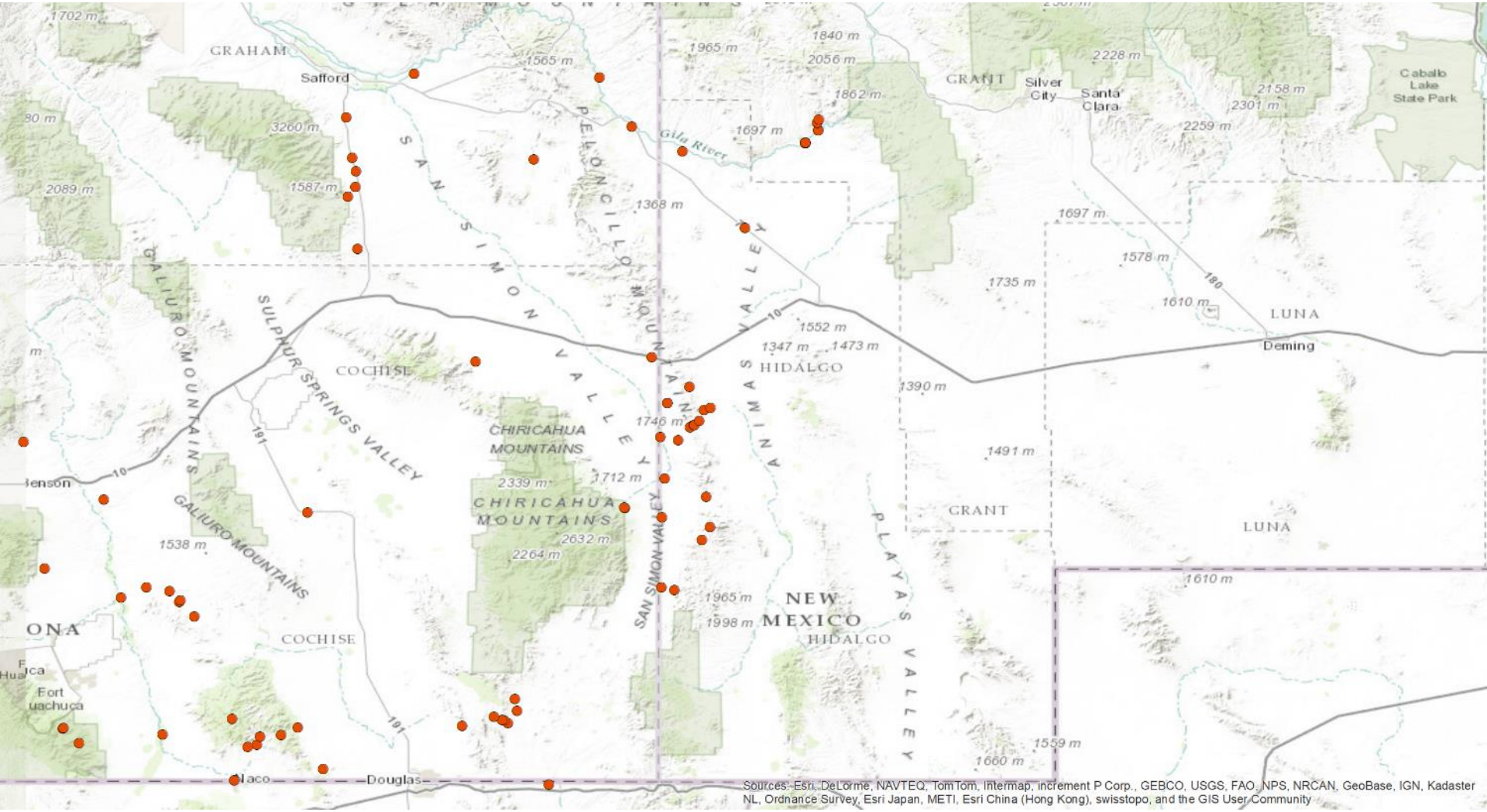
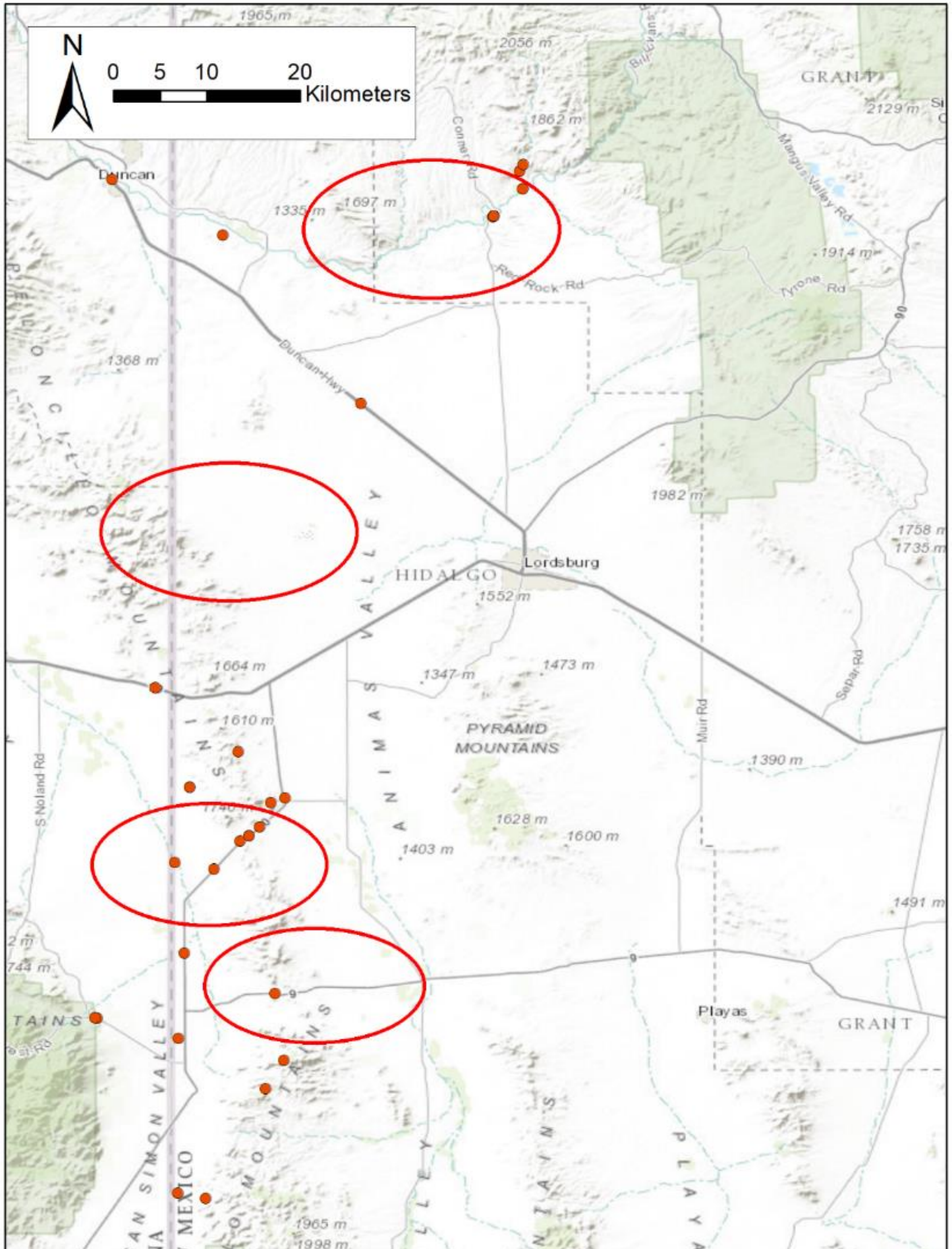


Known records





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Duncan
Lordsburg
HIDALGO
PYRAMID MOUNTAINS
Playas
GRANT
Duncan Hwy
Red Rock Rd
Tyrone Rd
Mangus Valley Rd
Muir Rd
Separ Rd
S Noland Rd
ANIMAS VALLEY
SAN SIMON VALLEY
NEW MEXICO
1965 m
2056 m
1862 m
2129 m
1697 m
1335 m
1914 m
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1982 m
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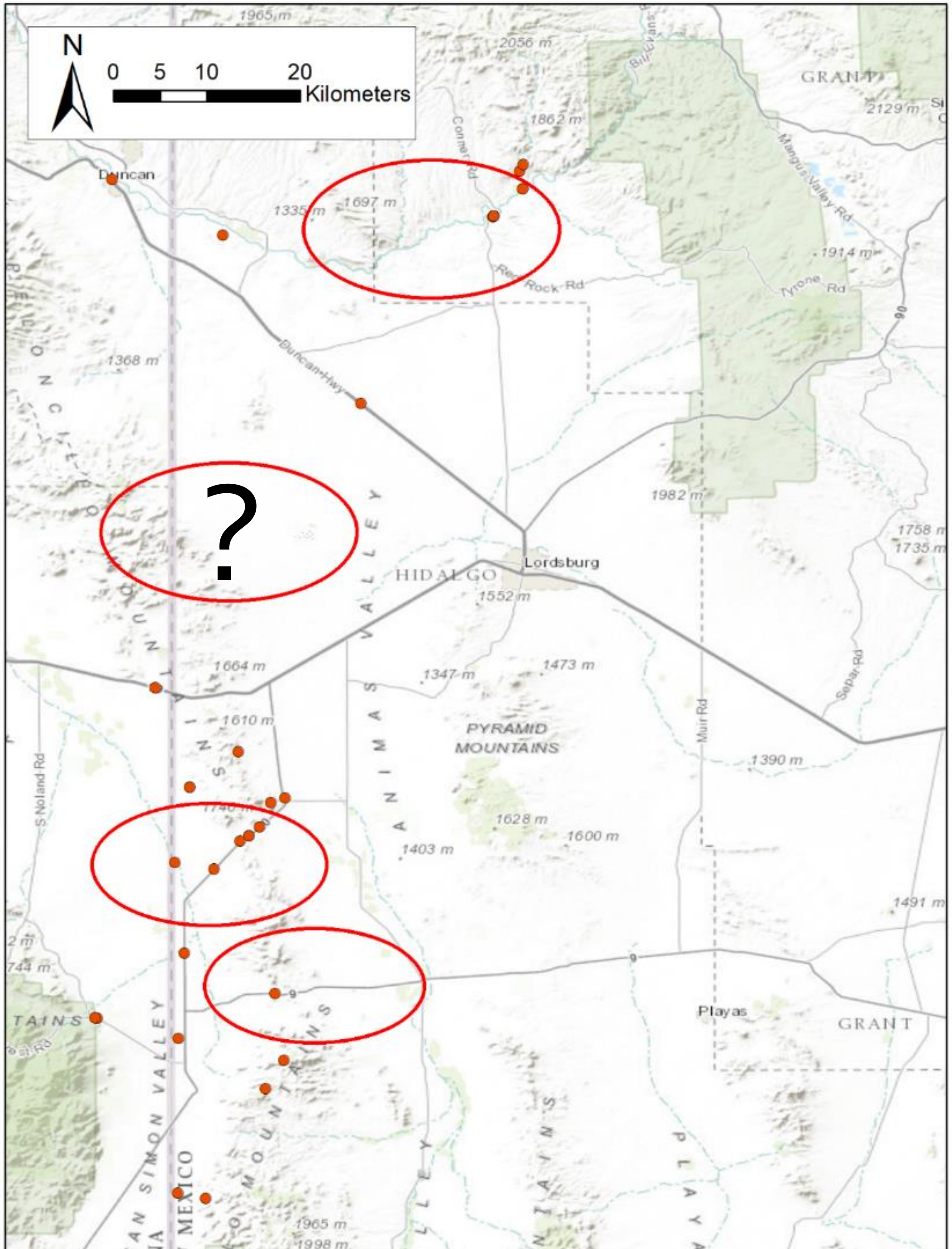
1403 m
1491 m
744 m
1998 m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SAN SIMON VALLEY
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NEW MEXICO
?

Value of specimens

1. Gather records from databases
   - Use all three and then some…
2. Combine all data into one spreadsheet
3. Identify and fix data deficiencies
   - Coordinates, locality description, date of collection
4. Map specimen data to identify areas for surveys

Value of specimens

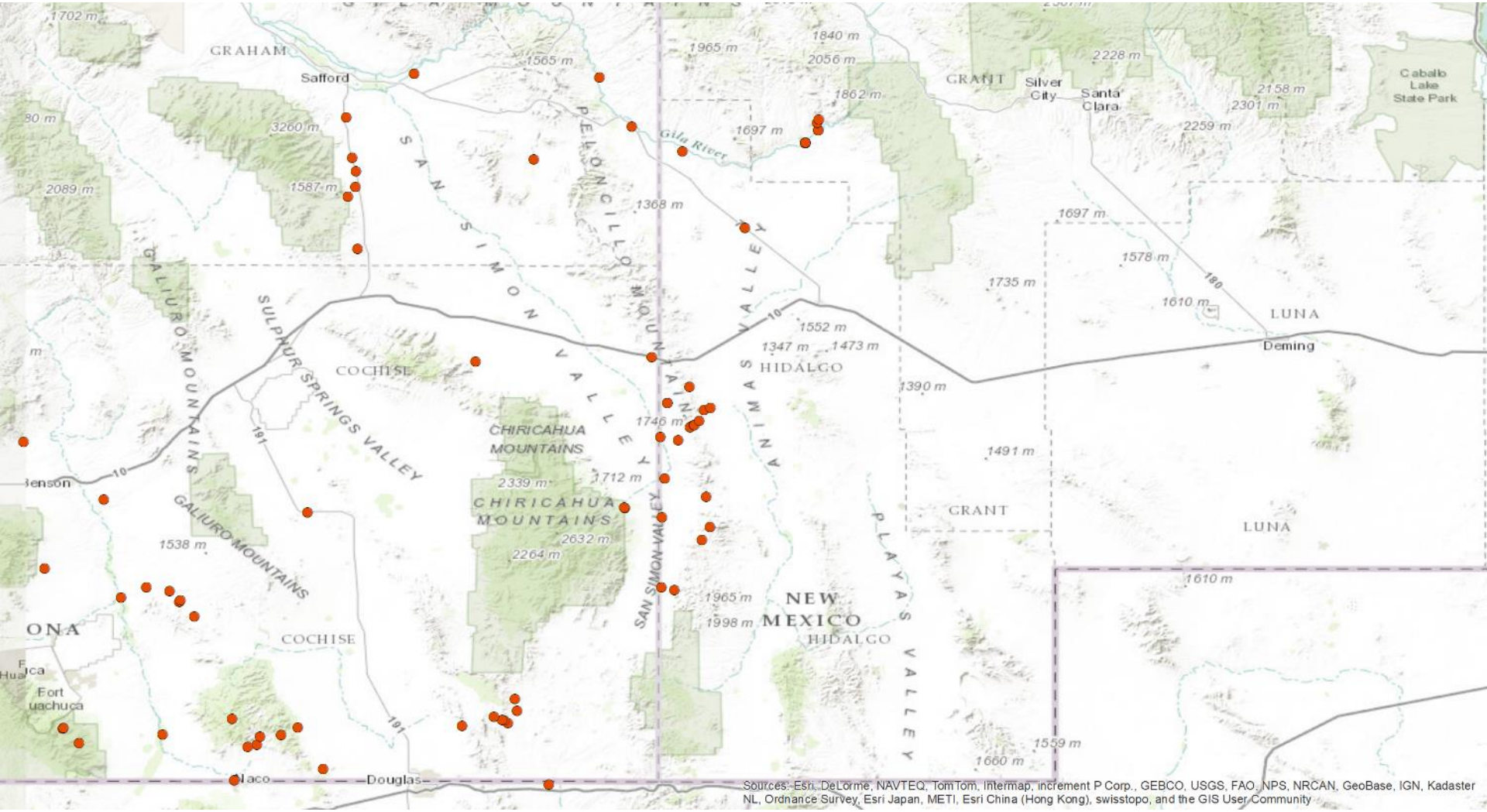
1. Gather records from databases
   - 173 data columns → 81 for analyses
2. Combine all data into one spreadsheet
   - Add data from several institutions → missing
3. Identify and fix data deficiencies
   - Contact collections and modify records
4. Map specimen data to identify areas for surveys
   - Use GIS software to import specimen data

Value of specimens

1. Gather records from databases
   - 8 hours
2. Combine all data into one spreadsheet
   - 88 hours
3. Identify and fix data deficiencies
   - 38 hours
4. Map specimen data to identify areas for survey
   - 6 hours

140 hours to produce a high quality map

Known records



Conclusions

- Research grade means a need to review specimens and associated data for errors and omissions
  - Accuracy of data associated with specimens potentially overlooked by both curators and users of specimens
  - Quality of data increases value & credibility of collections
    - There's a cost/burden to increase availability and quality of data associated with specimens – next challenge is to create effective mechanisms for data flows both ways

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