Jemez-Catalina CZO Data Management System and its Integration

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CUAHSI Conference on Hydrologic Data and Information Systems
Critical Zone Observatories

We study how the Critical Zone operates and evolves, including predictions of its response to future climate & land-use changes.

The Critical Zone lies between rock and sky... where water, atmosphere, ecosystems, and soils interact. It is essential to life on Earth, including food production and water quality.
Jemez – Catalina CZO Instrumentation

**SCM Elevation Gradient (AZ)**
- MAT: 18 to 11 °C
- MAP: 0.4 to 0.8 m y\(^{-1}\)
- Lithology: Granite & Schist
- Watershed: Santa Cruz → Colo.

**JRB Elevation Gradient (NM)**
- MAT: 11 to 3 °C
- MAP: 0.4 to 0.8 m y\(^{-1}\)
- Lithology: Rhyolite
- Watershed: Jemez → Rio Grande

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**Marshall Gulch**
- Oracle Ridge
- B2 desert

**Upper La Jara**
- Spruce-Fir Montane Grassland
- Mixed Conifer
- Ponderosa Pine
- Juniper-Grassland

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**Instrumented Zero Order Basins (ZOBs)**
- Existing
- This year
- Planned

By J. Chorover
Jemez – Catalina Critical Zone Observatory

Santa Catalina Mountains

- How does variability in climate and lithology influence CZ structure and function over both short (e.g., hydrologic event) and long (e.g., landscape evolution) time scales?

Jemez River Basin

- Our research integrates four crosscutting science themes: Ecohydrology and Hydrologic Partitioning, Subsurface Biogeochemistry, Landscape Evolution and Surface Water Dynamics.
Data Collection

- **Instrumentation / Sensors**
  - Real-time
  - Downloaded from data loggers
- **Samples**
  - Manually / automatically
  - Sample processing
  - Analysis
- **Spatial data**
  - GPS locations
  - Vegetation survey
  - LiDAR
Data Processing

- QC by data owner
- Producing metadata
- QC by data manager
- Loading to database
- Generating report files for harvesting by CZO Central
  - Sites
  - Methods
  - Metadata
  - Data
- Developing GIS datasets
  - Vector data
  - Raster datasets
  - Metadata
- Modeling
  - Hydrologic (TWSD, Snow)
  - Landscape (EEMT, Soil depth)
Data Storage

• Database
  – ODM for time series data
  – ODM for water chemistry data
  – EarthCHemDB, CUAHSI ODM 2.0 or CZO GeochemicalDB for geochemistry data

• Spatial Datasets
  – GIS standards for data and metadata
  – Geo-database (Oracle)
  – ArcHydro for hydrologic features

• Files
  – All raw data are archived in original formats

• CZO Central Data Depository
CUAHSI ODM Modification

CUAHSI ODM: [http://his.cuahsi.org/odmdatabases.html](http://his.cuahsi.org/odmdatabases.html)
Integrated CZO Data Publication System

CZO Data Repository and Indexing (CZO Central)
Jemez – Catalina CZO Website

http://www.czo.arizona.edu/
Conclusion

• Significant progress in the development of the central depository and harvesting system
• Collaboration between all CZOs and making data available to scientific community
• Next Focus
  – Development and implementation of Geo-chemistry data model and harvesting format
  – Publishing water chemistry data
  – Development and publishing LiDAR derived products and metadata
Acknowledgment
This is what I do

CZO data management

Geo-spatial modeling

Basin scale hydrologic modeling and data assimilation

B2 database development