Bonding Chemistry with Data: Developing Disciplinary Data Literacy Competencies

To what extent are undergraduate chemistry instructors already teaching data literacy?
Would it be more comfortable for them if we changed the way we talked about data literacy and used terms that they were familiar with?

Obstacles
- Faculty may not be familiar with data literacy concepts.
- Adding additional material to their over-burdened syllabi.
- Data literacy concepts that are critical in one discipline were not relevant in other disciplines.

Examine and Refine Concepts
- Laboratory science classes instruct students in hands-on data use through the process of capturing, analyzing and reporting data. As a laboratory science, chemistry is a natural place to introduce data literacy.
- Students are routinely taught the use of spreadsheets (data collection), correct graphing techniques (visualization), the importance of reviewing data to find errors (quality assurance) and how to use units correctly (metadata).

Carlson's Data Information Literacy (DIL) Competencies
- Introduction to Databases and Data Formats
- Discovery and Acquisition of Data
- Data Management and Organization
- Data Conversion and Interoperability
- Quality Assurance
- Metadata
- Data Curation and Re-use
- Cultures of Practice
- Data Preservation
- Data Analysis
- Data Visualization
- Ethics, including citation of data

Data Literacy Competencies for Chemistry Undergraduates
- Introduction to Databases
- Data Discovery
- Data Management
- Data Conversion
- Quality Assurance
- Metadata
- Data Curation and Re-use
- Cultures of Practice
- Data Preservation
- Data Analysis
- Data Visualization
- Ethics of Data

Next Steps
- Survey development and distribution for chemistry students and faculty.
- Evaluate which data literacy competencies are being incorporated into chemistry undergraduate curricula.
- Develop data literacy modules for chemistry.
- Students become data literate!

References