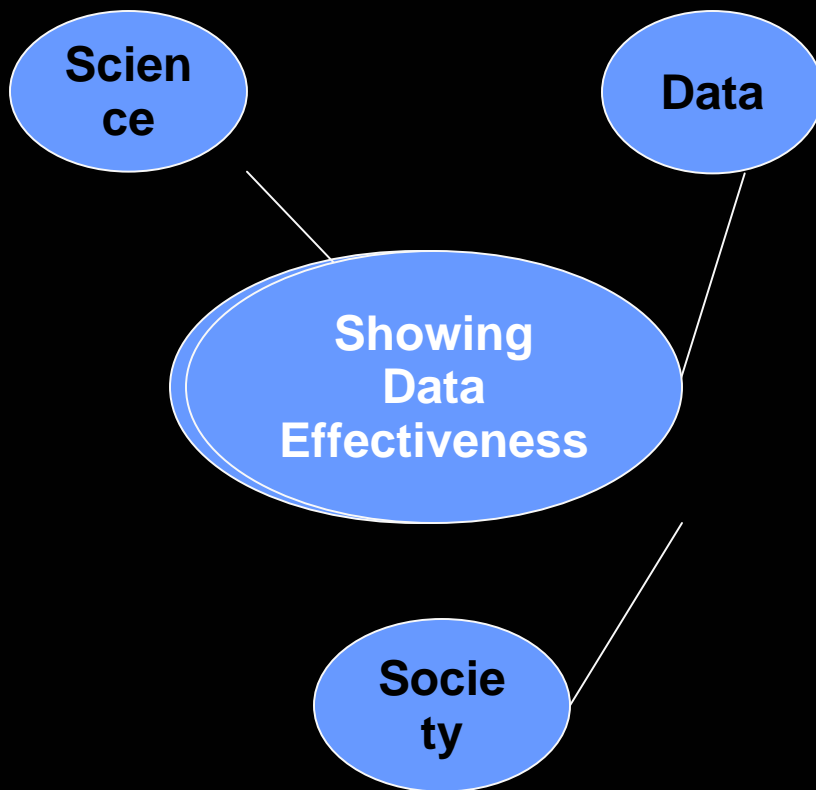


A Maturity Model for Earth Science Data and Information Services

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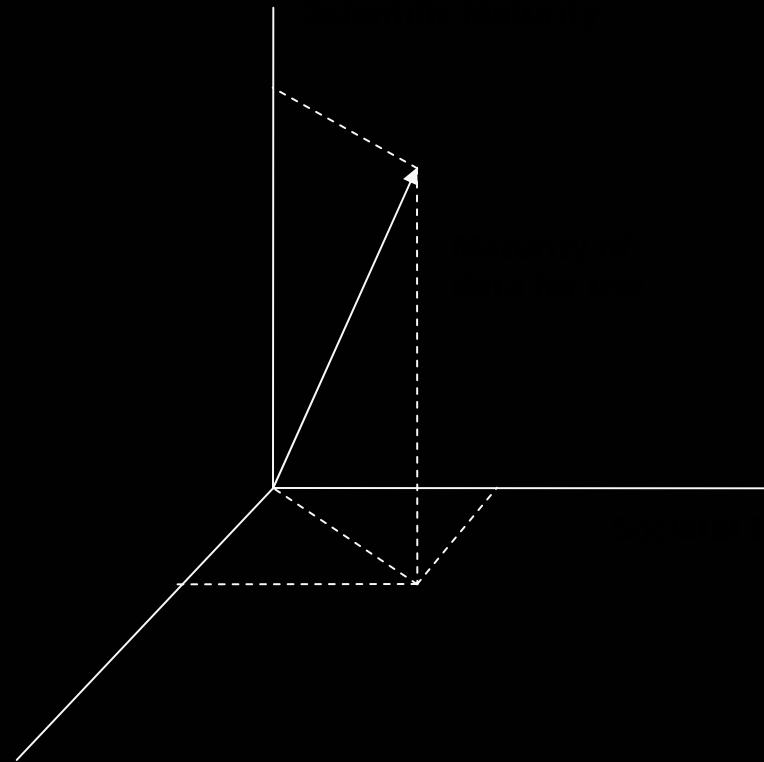
OWGDIS

- Reduce difficulty and confusion in community about scientific data stewardship
- Produce an easily understood way of identifying maturity of data products and science data stewardship approaches
- Help identify areas needing improvement



- Interagency views of data maturity and science data stewardship needs reflect wide diversity
 - Vocabulary
 - Experience
 - Background
- Need understandable approach

- Represent data maturity in terms of three separate dimensions:
 - Scientific Maturity
 - Preservation Maturity
 - Societal Impact
- Use CMMI-like levels
- Total maturity is simply length of vector



1. Initial – Unpredictable results
2. Managed – Repeatable performance
3. Defined – Cross-project interoperability
4. Quantitatively Managed – Improved performance + Compliance with Federal Enterprise Architecture
5. Optimized – Rapidly configurable performance + Continuous Process Improvement

- Identify key attributes of maturity in each dimension
- Develop maturity ranking for each attribute on scale of 0 to 5
- Summarize component maturity by weighting each attribute
 - Simplest weight = $1/\text{Number of attributes}$
 - Develop more complex weightings after experience with approach
- Advantage: can do much of work with simple spreadsheet

- Physical Understanding of Measurement Process
- Measurement of Key Instrument Characteristics
- Public Accessibility of Data Processing
- Rigorous Validation

- Systematic Approach to Guaranteeing Preservation of Data Understanding
- Systematic Reduction of Threats to Preservation
- Assurance of Preservation Cost Effectiveness

- Bibliometric Metrics
 - Publications and Citations
- Scientific Community Knowledge
 - Data use, including interdisciplinary data fusion and statistical studies
- Economic and Policy Utility
 - Market valuation increase
 - Reduction in time to influence policy
 - Benefit/Hazard Reduction resulting from data use

- Using a Maturity Model will be exploratory – and iterative
 - No expectation we'll get it "right" the first time through
- Community Diversity must be incorporated
 - Different views of data processing, calibration, validation, need for knowledge preservation
 - Different vocabularies
- Deep Uncertainty needs to be incorporated
 - Diversity of opinions on areas of scientific controversy and value need common framework and disciplined discussion – openness a key
 - Including "societal benefit" is very difficult and risky

- Allows OWGDIS (and OWG) to develop an approach consistent with NRC Recommendations on Metrics
- Open Process
 - Can surface divergent needs and opinions
 - Can provide disciplined forum for discussion and resolution of differences
- Periodic Evaluation is required
 - Incorporate new information and deeper thought
 - Evaluation allows new directions

- Community Discussion
 - Disseminate notional maturity model to interested community (scientists, agencies, data managers)
 - Solicit community comments within 60 days [end ~Aug. 1]
- Edit Model
 - John Bates, Bruce Barkstrom as editors; seek up to 7 contributors (volunteers) to help
- Revised Model Distribution and Final Document
 - Disseminate revised document [~Sept. 1]
 - Face-to-Face discussion at Fall Workshop [~Nov. 15]
- Suggest Annual Revision Cycle
 - Spring deadline may be needed to align with agency budget work