

# Cost of characterization to prepare for permitting

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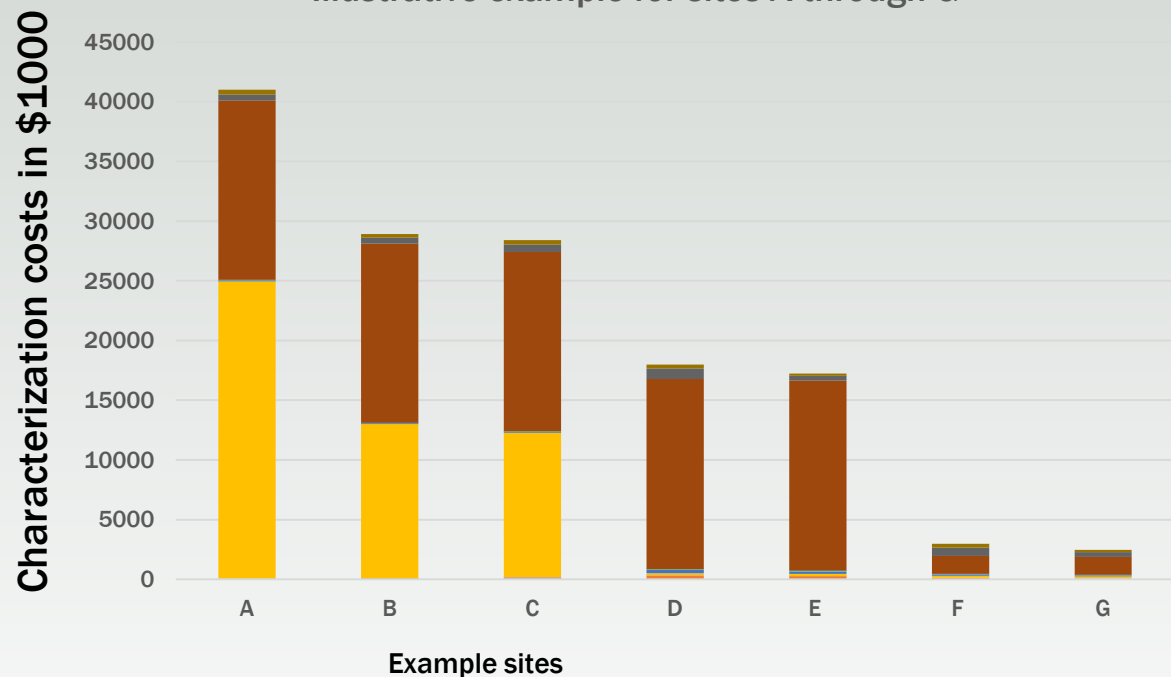


# Statement of problem

- **As source industries consider storage, they need reliable information on cost & risk of developing suitable storage resource**
- **Cost and risk are not fixed; vary depending on geology, project characteristics & regulatory conditions**
- **Uncertain cost = deterrent to project development,**
  - **Especially early stages when total project risk is high**
  - **Site characterization = sunk cost whether or not project proceeds**

# Project Goal

Illustrative example for sites A through G

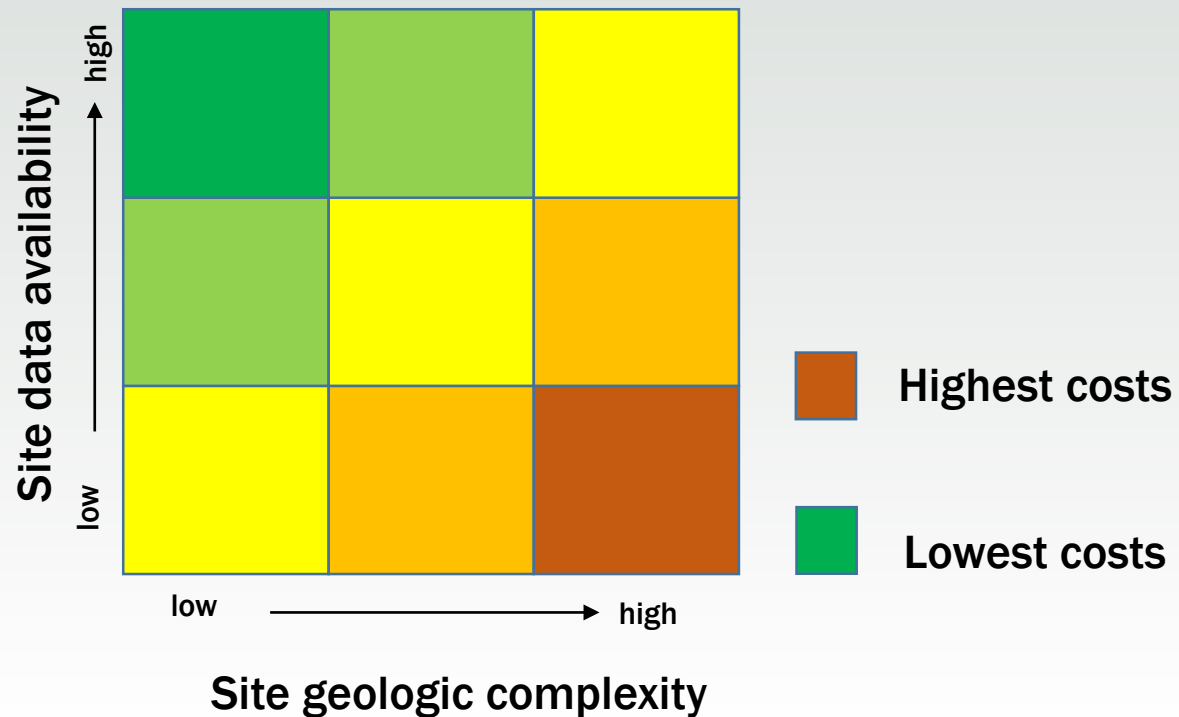


Project stages

- Feasibility
- Site nomination
- Downslection
- Characterization for initial model
- fluid flow modeling and Risk assessment
- Monitoring design
- Detailed project costing
- Site-specific data collection

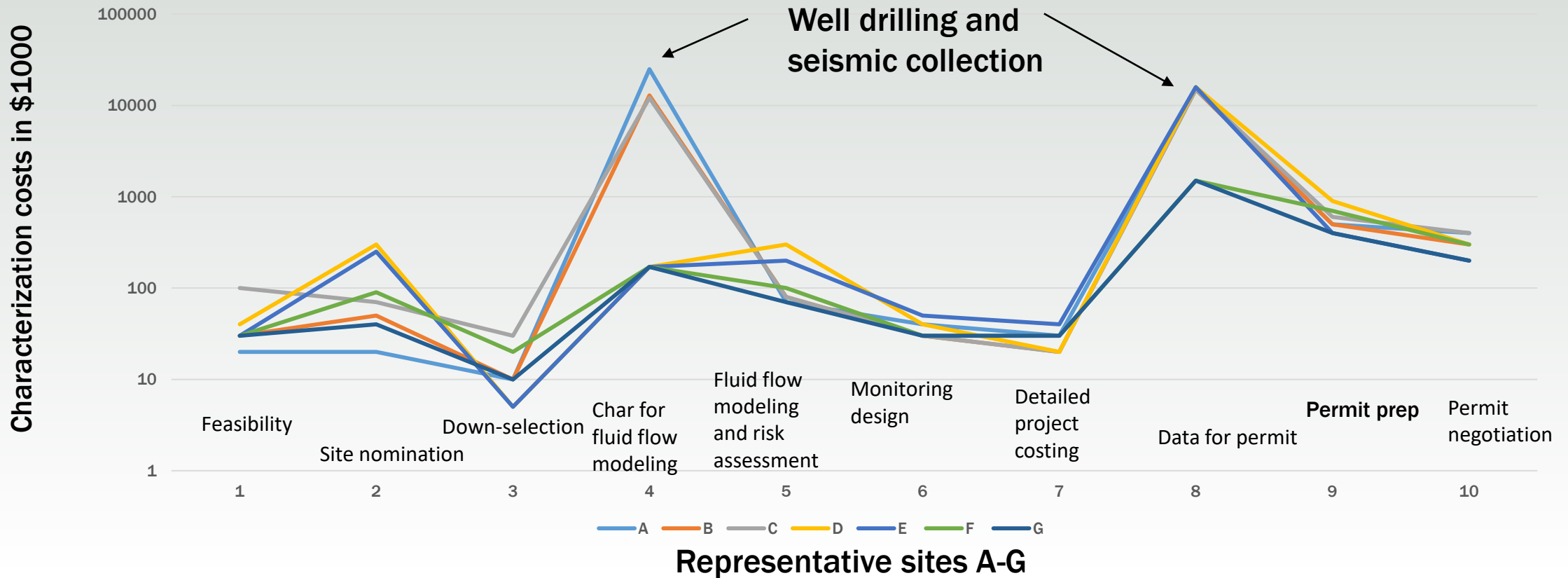
- **Develop geologic characterization:**
  1. constrained cost curve
  2. Cost-predictive matrix

# Total Cost Variables



- Top costs variables
  1. site geologic complexity
  2. data availability
- Other factors
  1. risk tolerance
  2. permitting demands
  3. existing wells

# Spending per Project Stage



Site-specific data collection, Permit preparation, Permit negotiation

# Project Status

- Just a plan!
- But we have conducted about a dozen studies (onshore and offshore)
- Can be mined for input data –
- Use other sites characterized by others
- Compile input data
- Compile cost data



Taylor Barnhart

# Data Types

- **Comprehensive list of data needs (e.g. reservoir thickness and porosity)**
- **Types of input**
  - core, thin sections, SCAL, logs, log calibration
- **Risk based driver**
  - thickness and porosity limit project?
  - need large investment?
- **Data availability at sites**
- **Order-of-magnitude cost for acquiring data**
  - analyze existing vs. collect new core

# Suggestions?