DATA NEEDS FOR CHARACTERIZATION OF HYDRATE DEPOSITS IN THE GOM

SUPPORT AND VALIDATION OF NUMERICAL MODELS

Data Requirements - 1

- **Geologic model**
  - Layering/stratification
  - Boundaries (existence and type)
  - Geometry/extent of reservoir
- **Initial and Boundary Conditions**
  - Pressure
  - Temperature
  - Phase saturations
  - Hydrate interface (Class I)
  - Salinity

Data Requirements - 2

- **Flow properties**
  - Intrinsic permeability and porosity (all layers)
  - Relative permeability and capillary pressure (fundamental knowledge gaps)
- **Thermal properties (forgiving)**
  - Specific heat (all layers)
  - Thermal conductivity (all layers)

Data Requirements - 3

- **Physical/chemical properties**
  - Hydration number
  - Gas composition (a problem if not overwhelmingly CH_4)
- **Geomechanical properties** (Critical in oceanic systems; fundamental knowledge gaps in the geomechanical behavior of hydrate-bearing sediments)
  - Initial stress distribution (magnitude & direction)
  - Young and shear moduli
  - Cohesion
  - Poisson's ratio

Coring contributions

NECESSARY,
BUT FAR FROM SUFFICIENT

Unless multiple cores are obtained over an extended area: difficult in oceanic deposits

Not a single undisturbed core has been obtained, even when pressurized

What can cores provide? (1)

- **Geologic model**
  - Layering/stratification: YES – limited/localized
  - Boundaries (existence and type): NO
  - Geometry/extent of reservoir): NO
- **Initial Conditions(YES)**
- **Boundary Conditions (NO)**
  - Pressure : YES - localized
  - Temperature : YES - localized
  - Phase saturations : YES – very localized
  - Hydrate interface (Class I) : YES - limited
  - Salinity : YES

What can cores provide? (2)

- **Flow properties: YES – Limited/Localized**
  - Intrinsic permeability and porosity (all layers)
  - Relative permeability and capillary pressure
- **Thermal properties : YES – Localized**
  - Specific heat (all layers)
  - Thermal conductivity (all layers)

What can cores provide? (3)

- **Physical/chemical properties : YES**
  - Hydration number
  - Gas composition
- **Geomechanical properties: Disturbed sample**
  - Initial stress distribution (magnitude/direction): NO
  - Young and shear moduli: MAYBE – Limited
  - Cohesion: MAYBE – Limited/localized
  - Poisson's ratio: MAYBE – Limited/localized