

AWF09 – Science Missions



Science Division

Two Phases

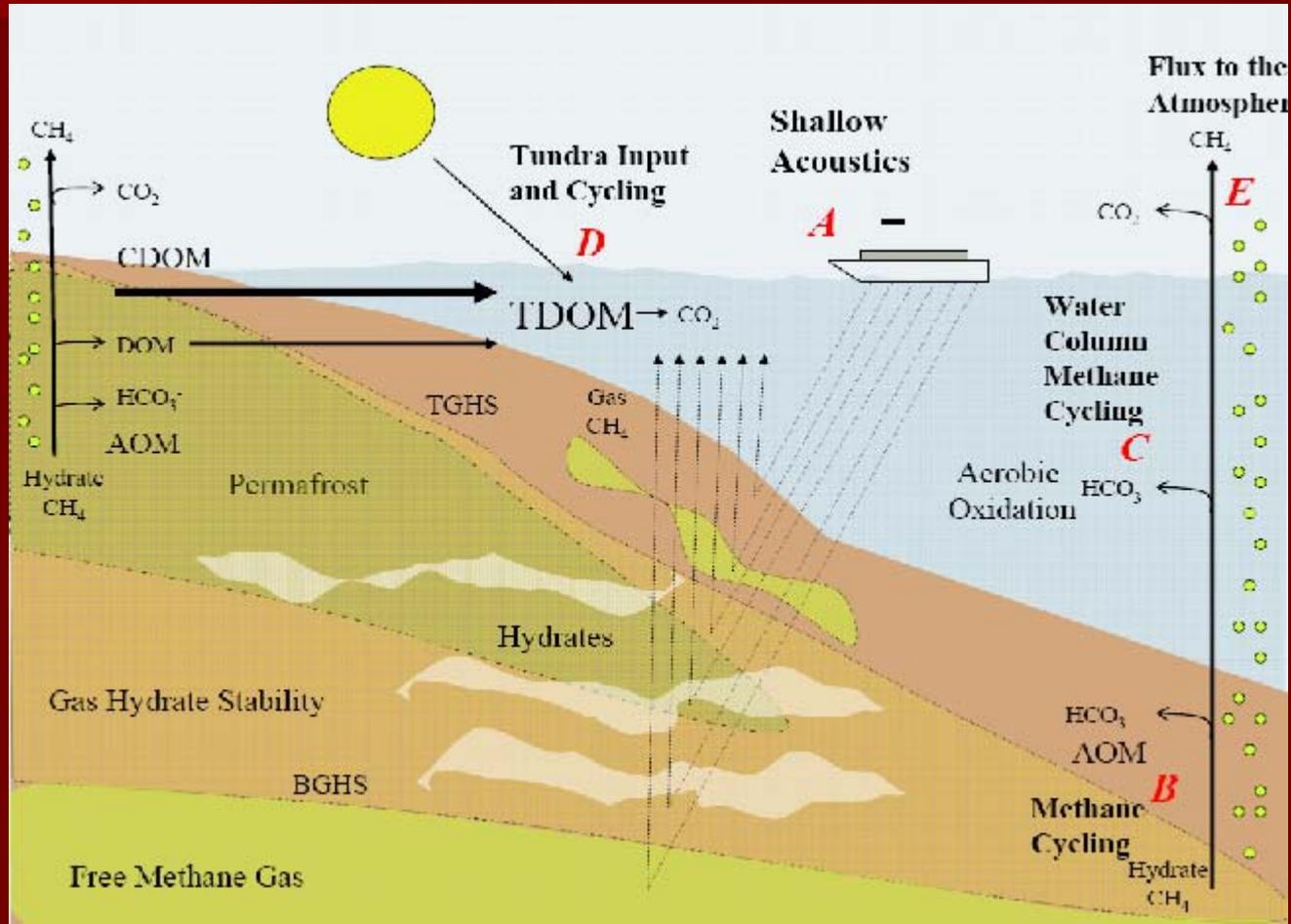
- 1st Phase: September 15-26
 - Scientists will be conducting a bathymetric survey to find methane hydrate deposits.
- 2nd Phase: September 27- November 1
 - Scientists plan to recapture polar bears for sampling of breath, blood, fat, and muscle.
 - Also, marine mammal observers, dive ops to study sea ice ridges, and studying of sea water properties.

1st Phase Scientific Activities

- Bathymetric profiling – to find methane hydrate deposits
- CTD operations – to find additional information about sea water at methane hydrate deposit
- CORING – actual sediment sample



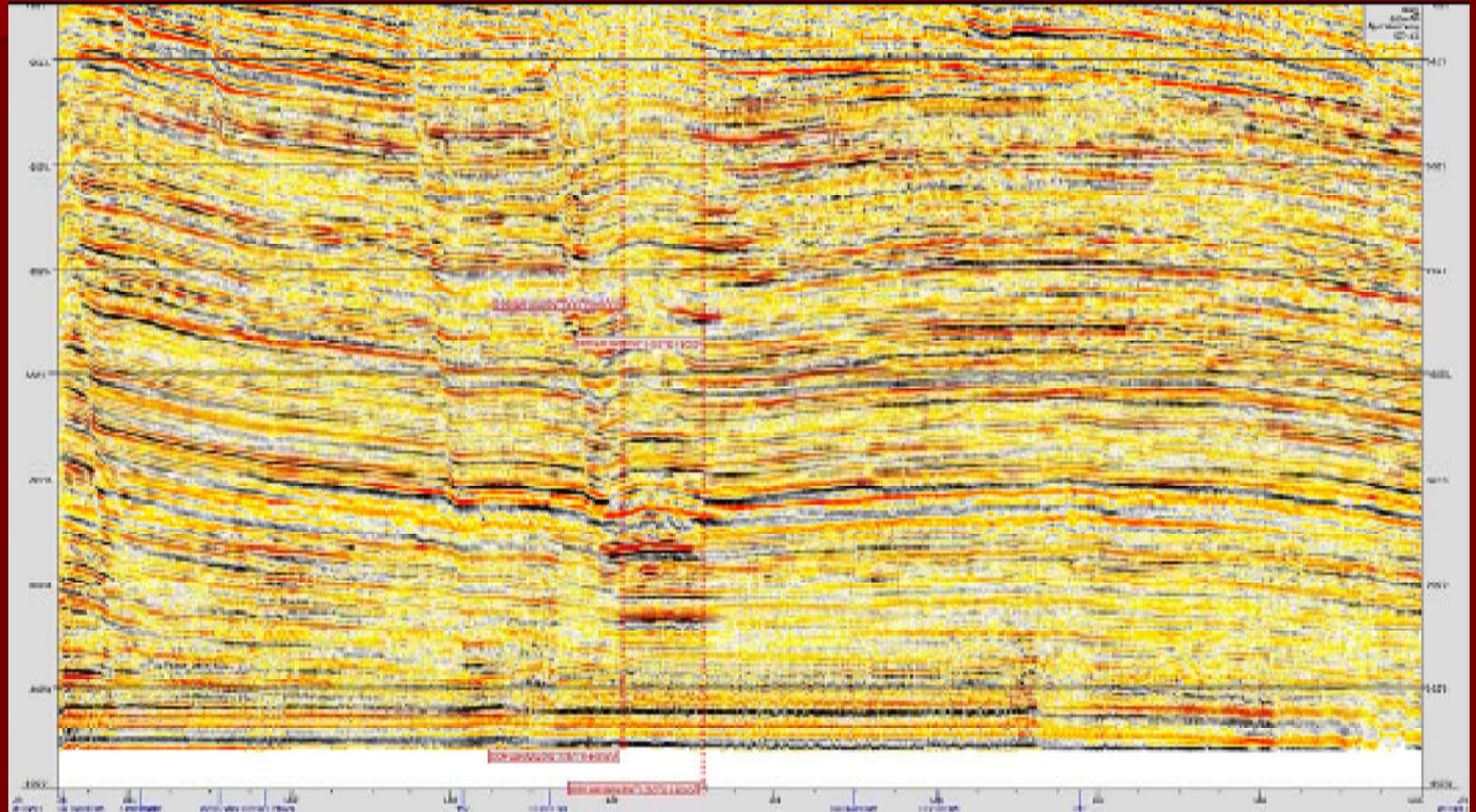
Bathymetric Profiling



Bathymetric Profiling

- Looking for pockets of trapped "frozen" methane hydrates in the sea floor
- Methane is a greenhouse gas that is kept deep in the ocean floor because of the extreme temperature and depth (pressure)
- If the temperature of water at the seafloor increases, methane can be released into the water column and eventually the atmosphere
- Pockets of gas will be located using Bathymetric Sub-Bottom Profilers (Bathy) on the ASB and POLAR SEA
- This research is important for understanding and predicting climate change, as well as identifying new sources of energy for the future

Bathymetric Profiling



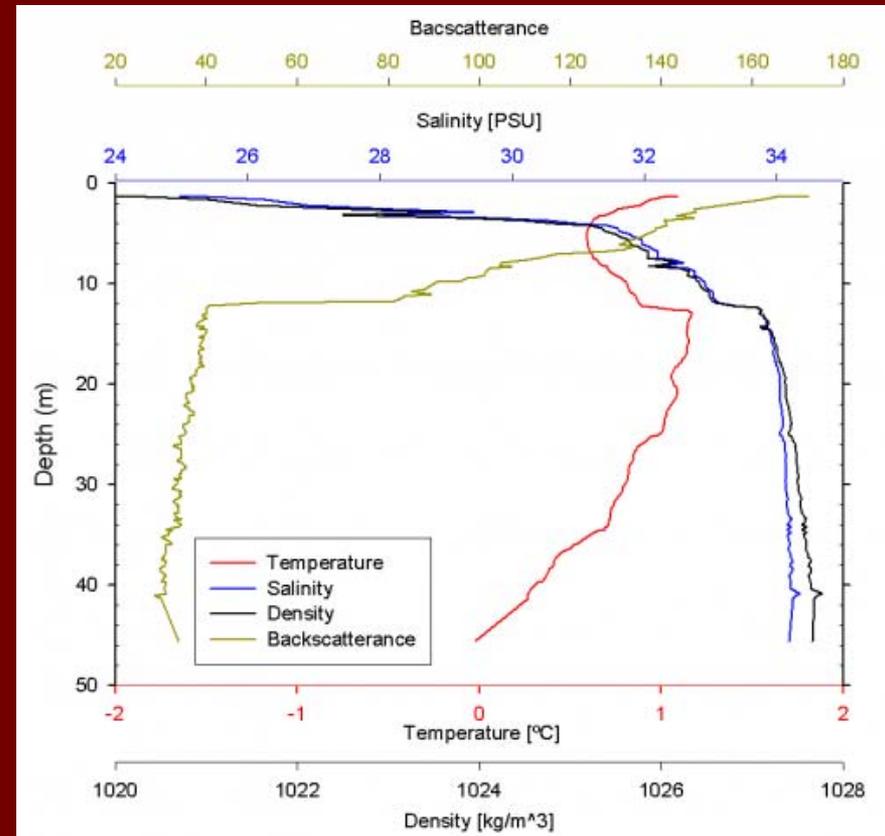
CTD Operations

- CTD stands for conductivity, temperature, depth



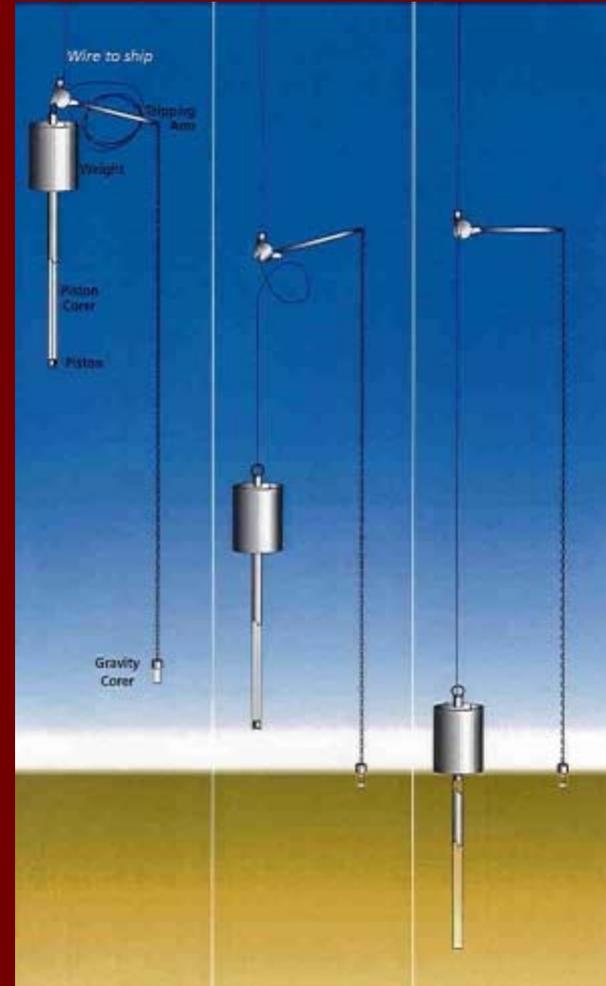
CTD Operations

- CTD lowered over the side
- Bottles tripped at different depths to collect water samples
- Scientists will be looking at temperature, salinity, dissolved oxygen levels, fluorescence, and methane levels at different depths.



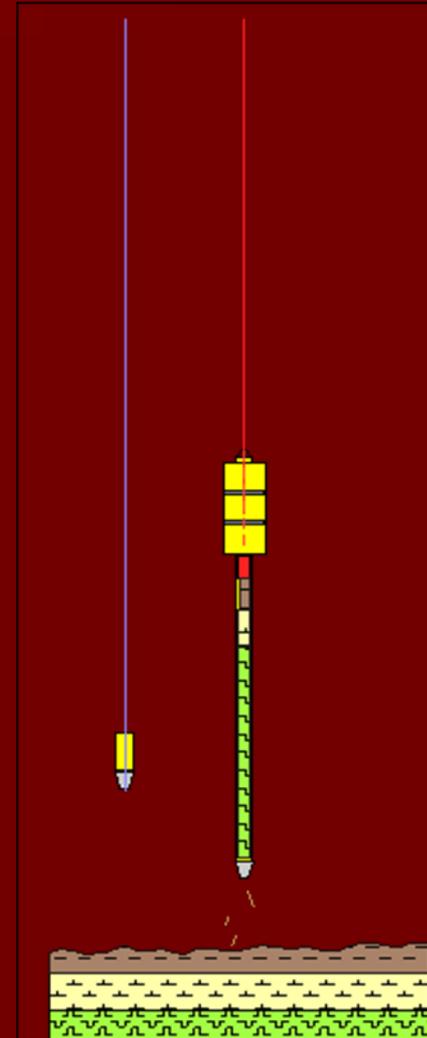
What is coring?

- Scientific coring began as a method of sampling the ocean floor.
- Cores indicate variations of climate, species and sedimentary composition during geologic history.



Coring Procedures

- Find Sample Site
- Gather Background Data
- Preparation
- Removing piston core from cradle
- Over the side
- Trigger arm assembly deploys
- Core taken
- Back aboard
- Core Processing



What does it look like?



BAD core
foamy mud & murky water



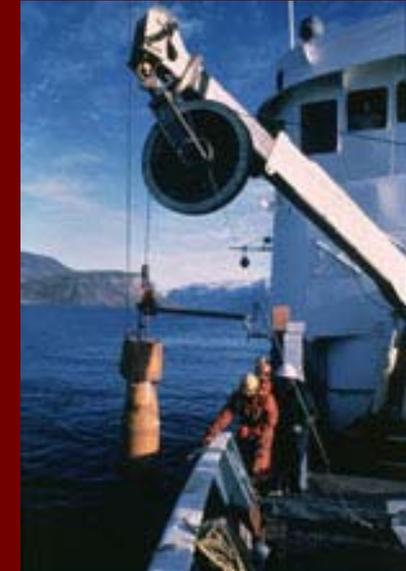
GOOD core
compact mud and clear water

Core samples

- The sediments on land are exposed to erosion from wind and precipitation, whereas sediments on the ocean floor can be far better preserved.



Equipment

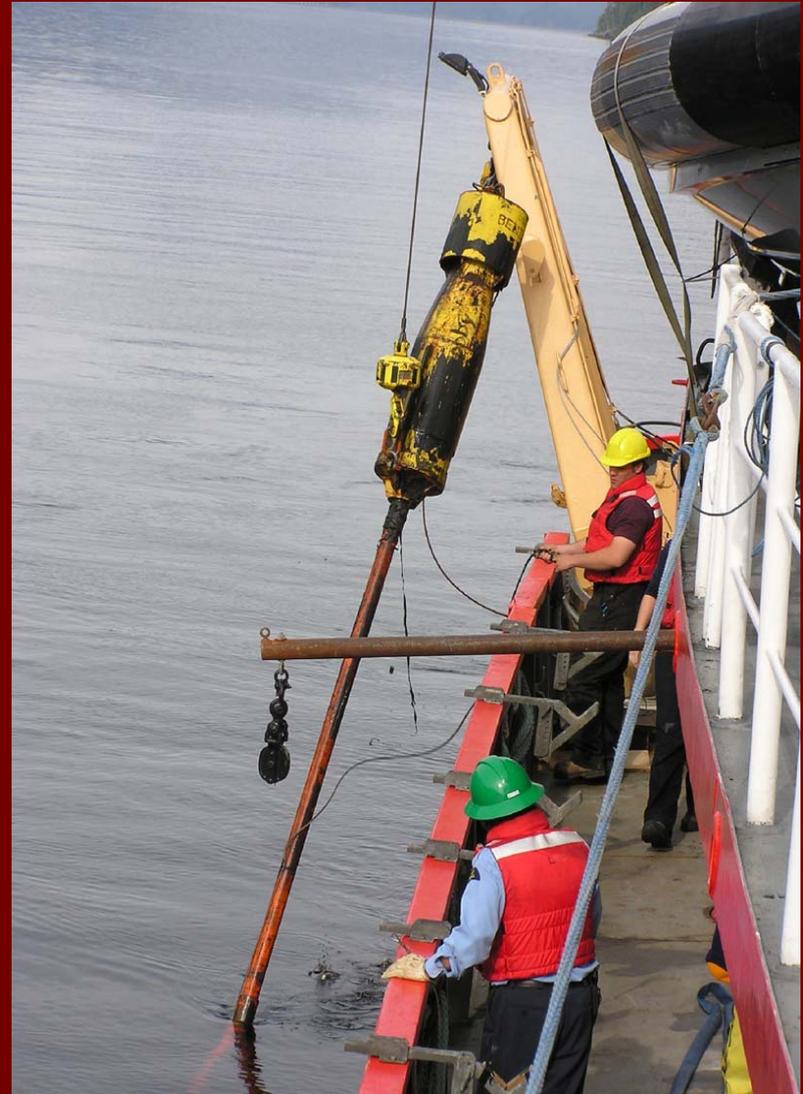


- Coring Unit
- J-Frame
- Trawl Core Winch

- Trigger Arm Assembly
- Capstan
- Bathy/Knudsen

Personnel requirements:

- Safety Supervisor
- Cast Deck Supervisor
- Lead Rigger
- J-Frame Operator
- Winch Operator
- Capstan Operator
- 2 Deck Hands



Administration

- Coring SOPs
- Safety Considerations
- Checklists



PPE

- Hard Hats
- Steel-toed Boots
- PFD
- Gloves



Questions?

