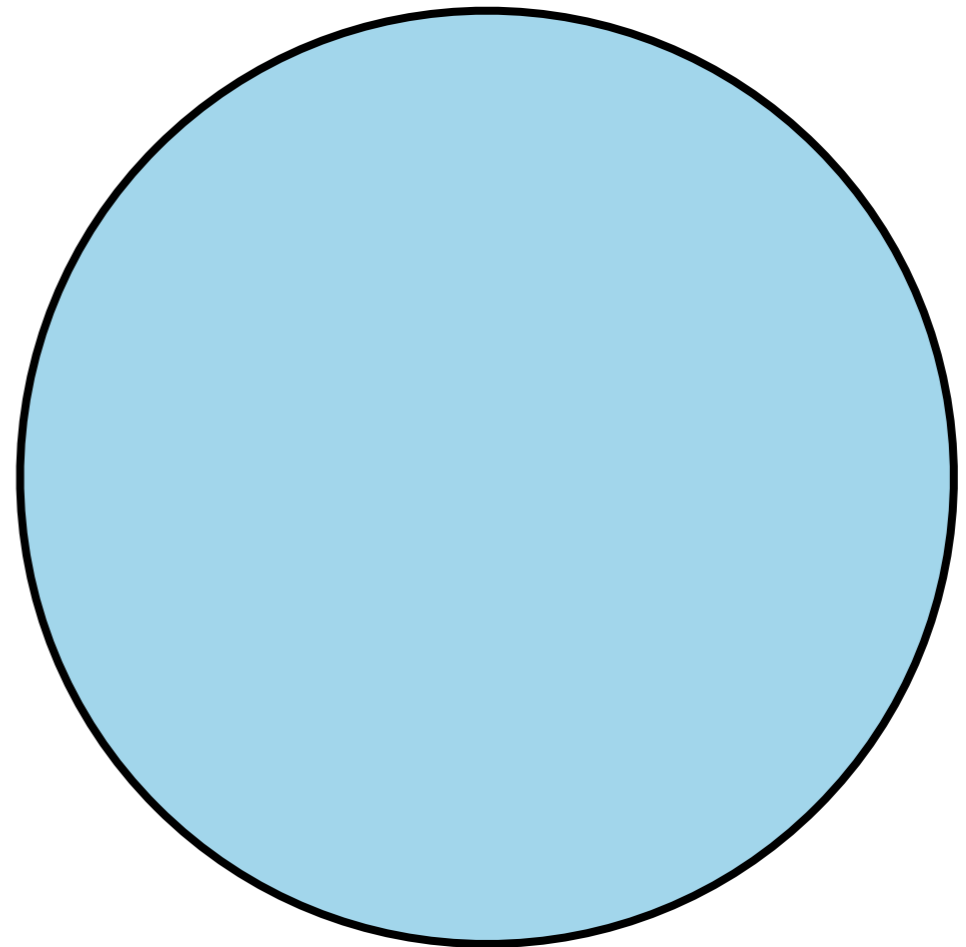
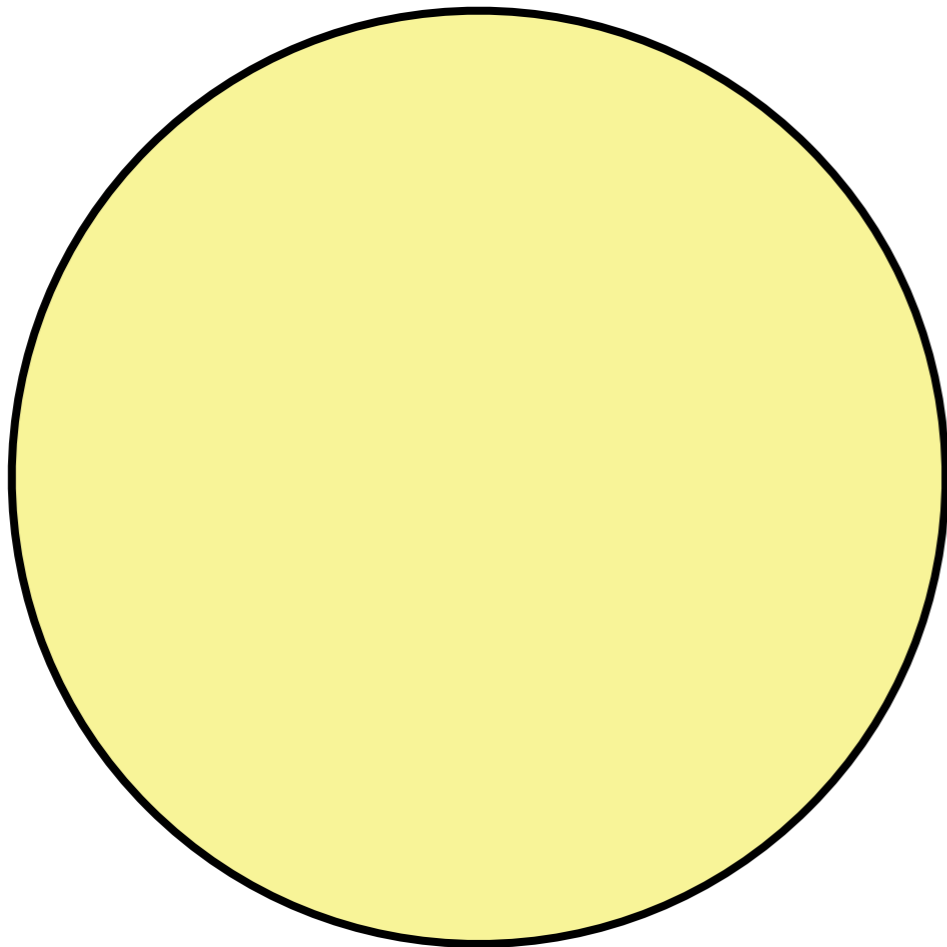
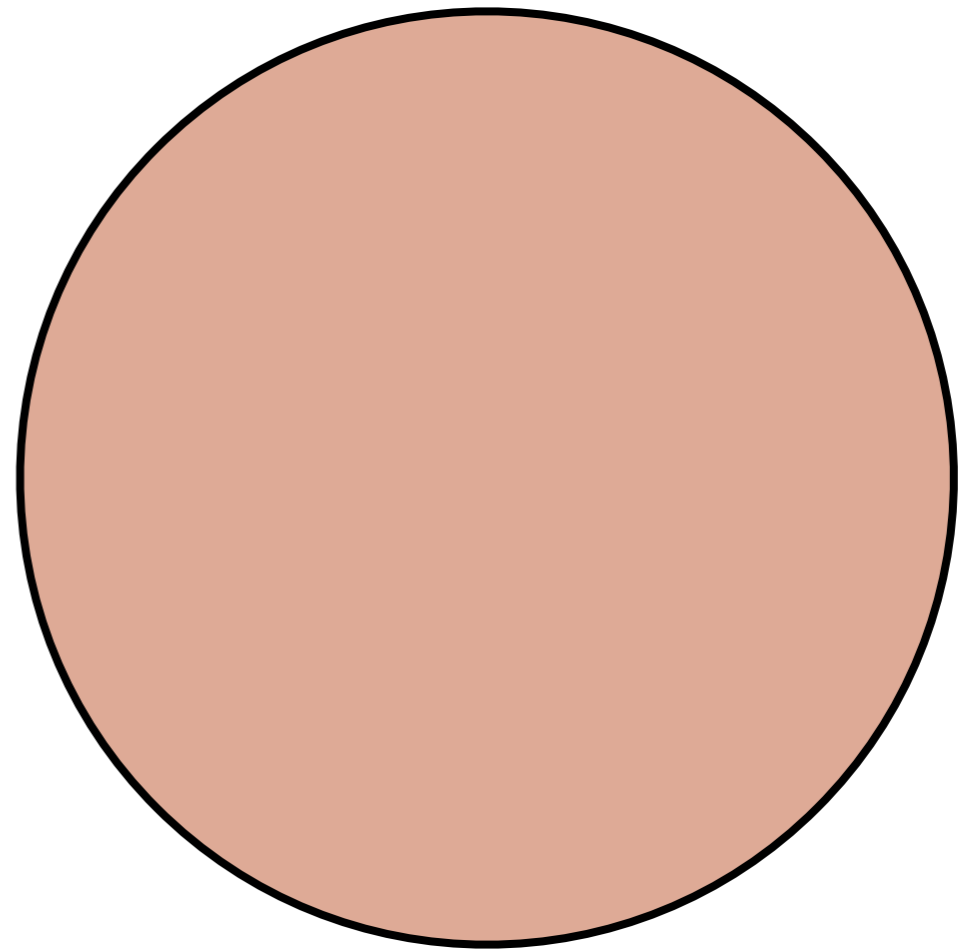
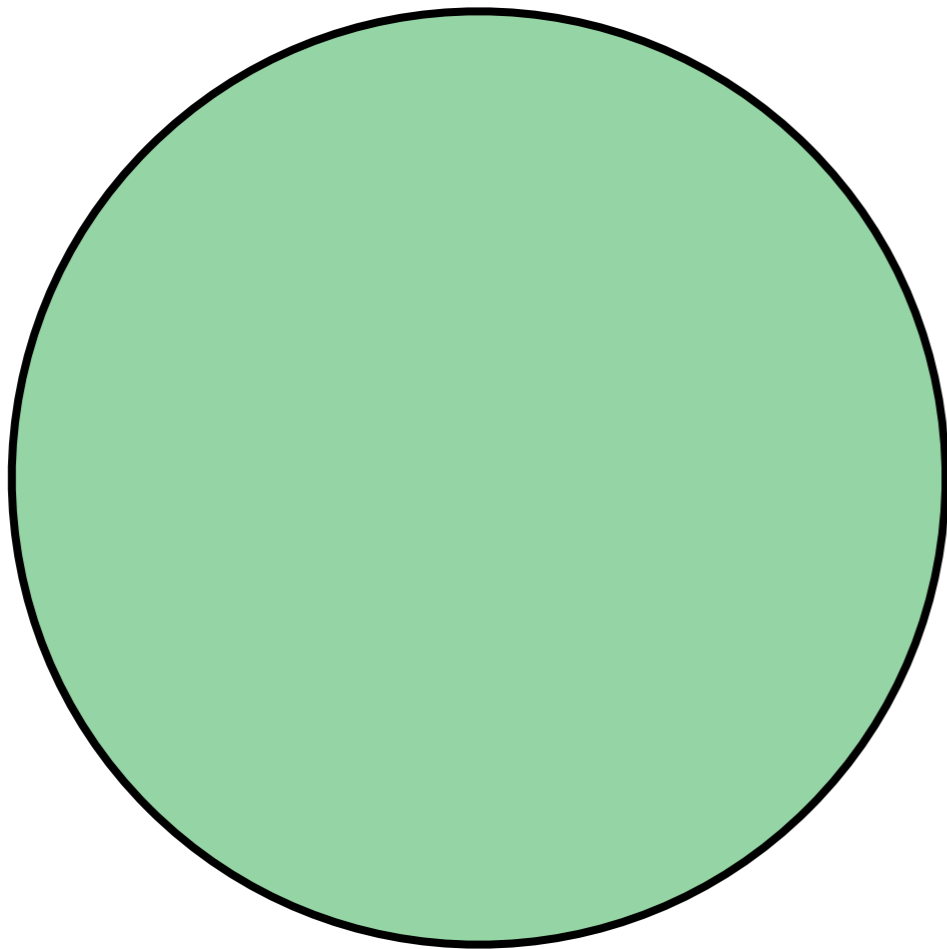
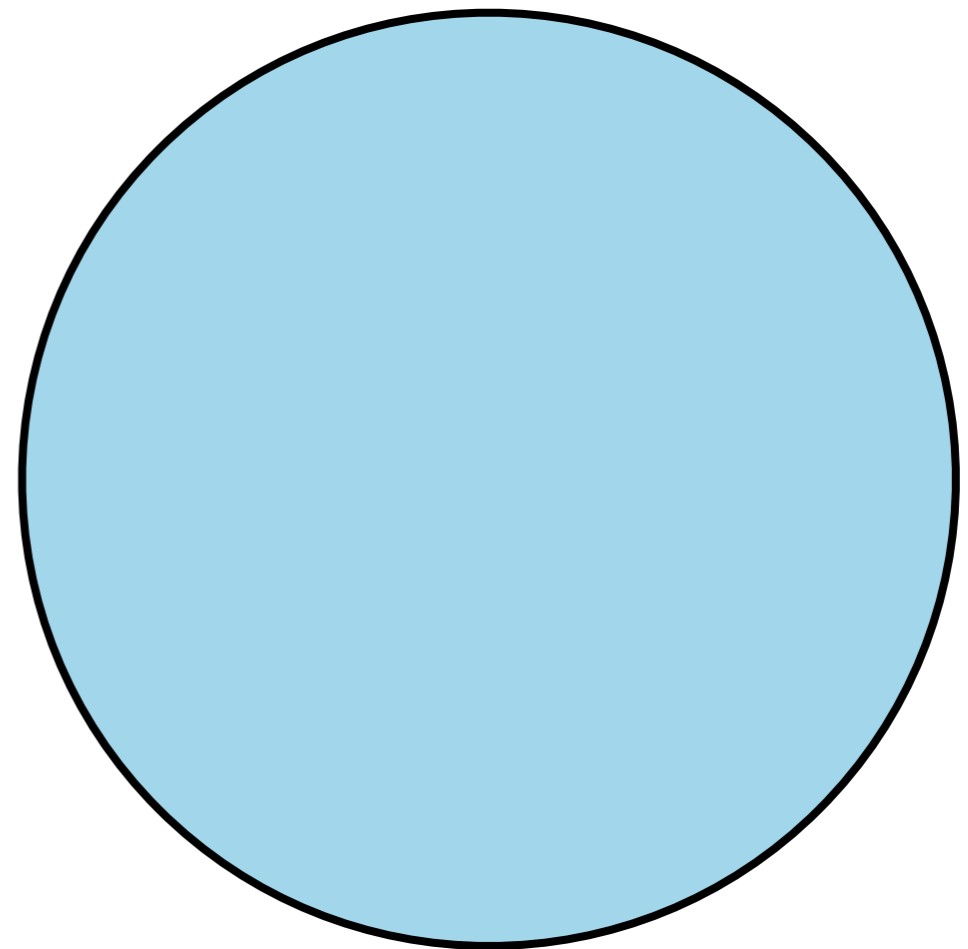
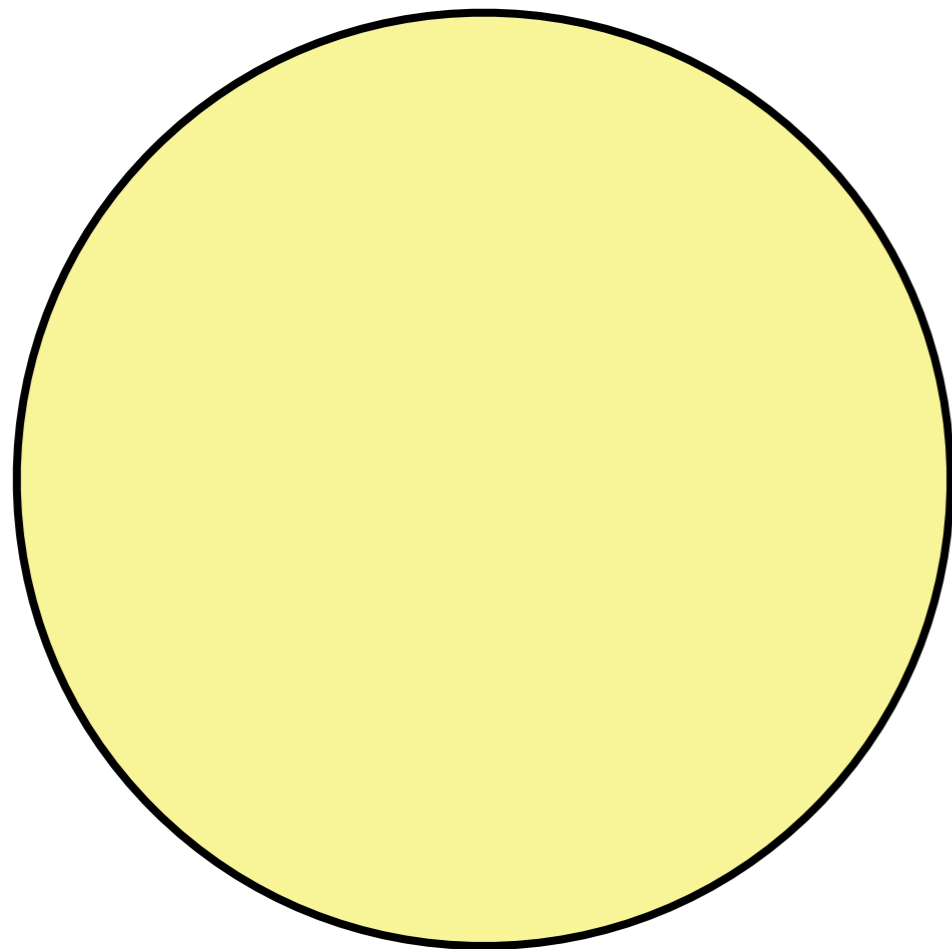
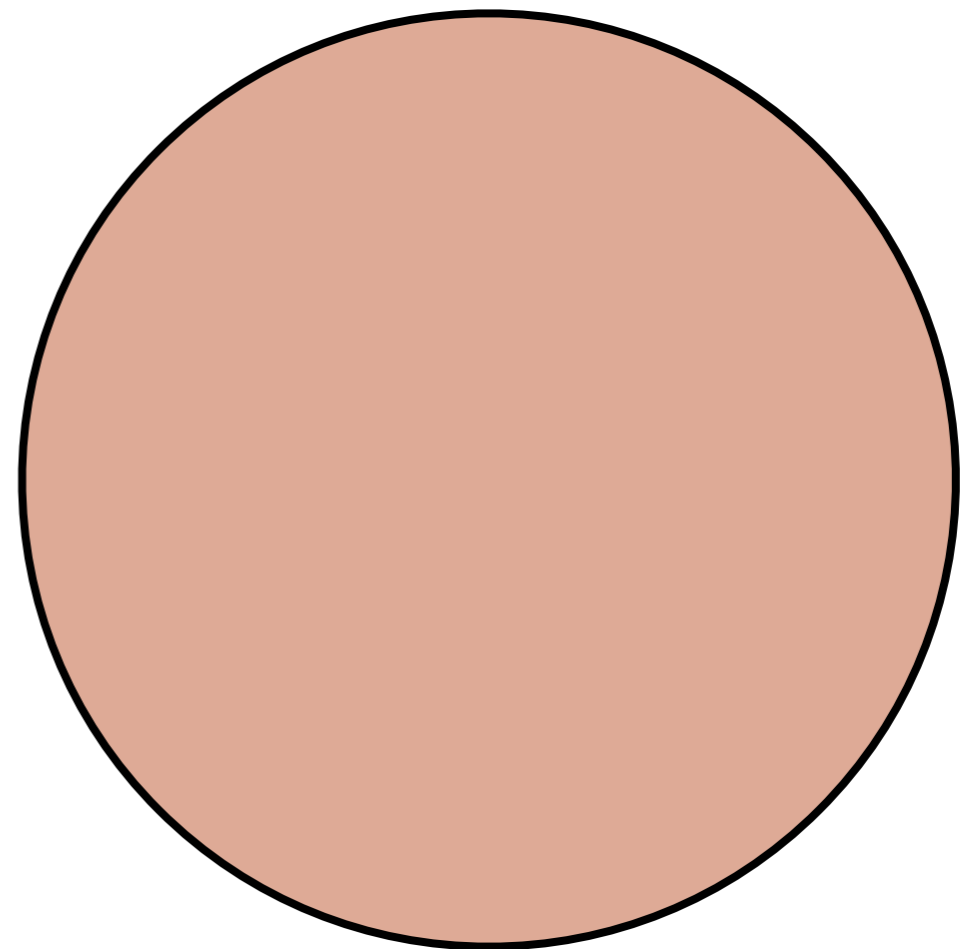
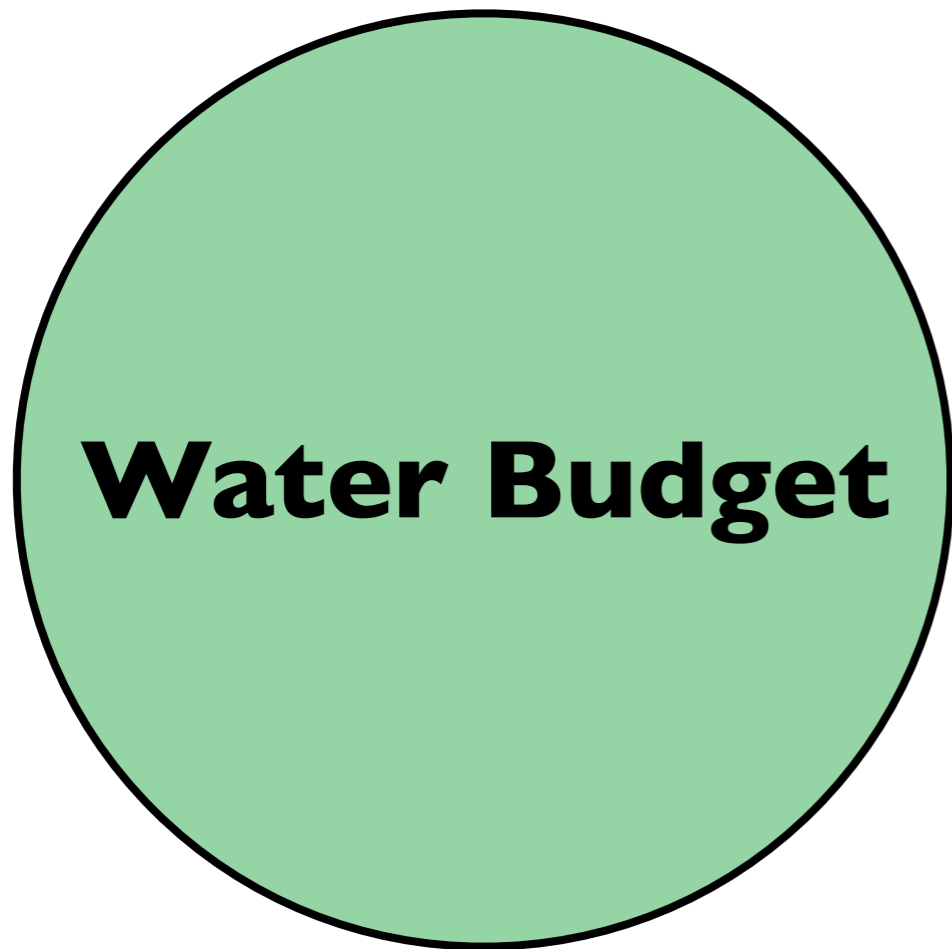




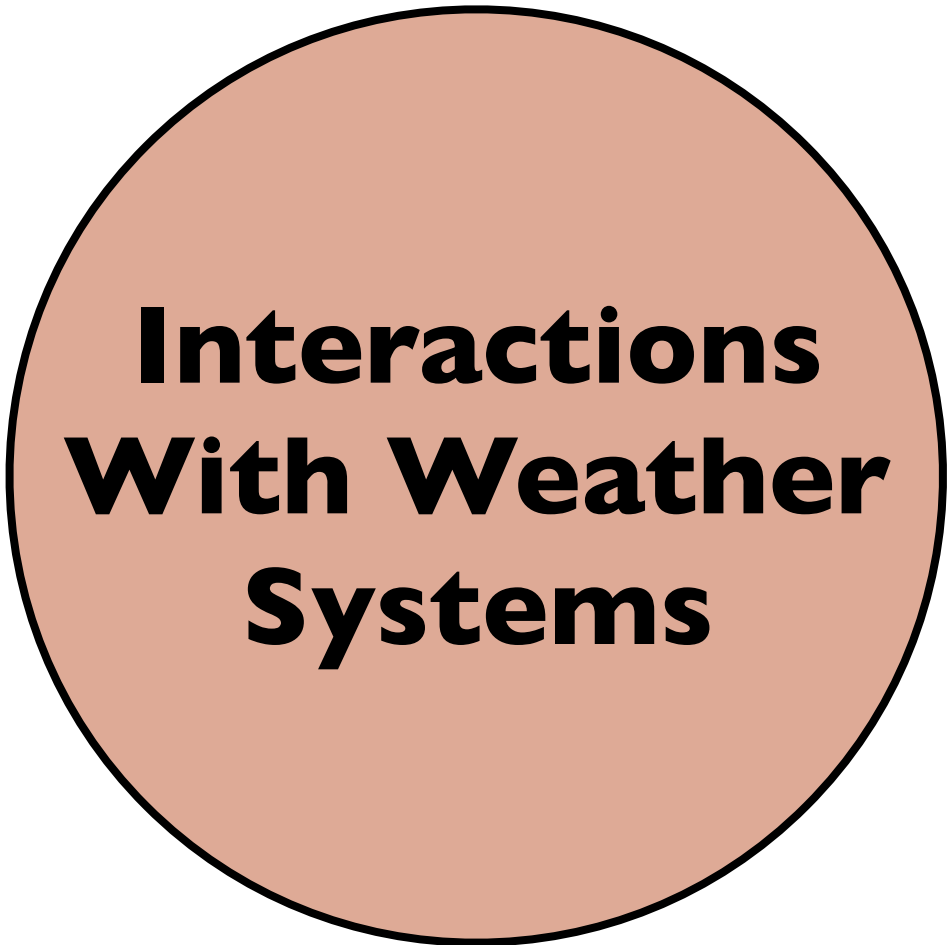
MOSAiC Atmosphere Breakout Notes







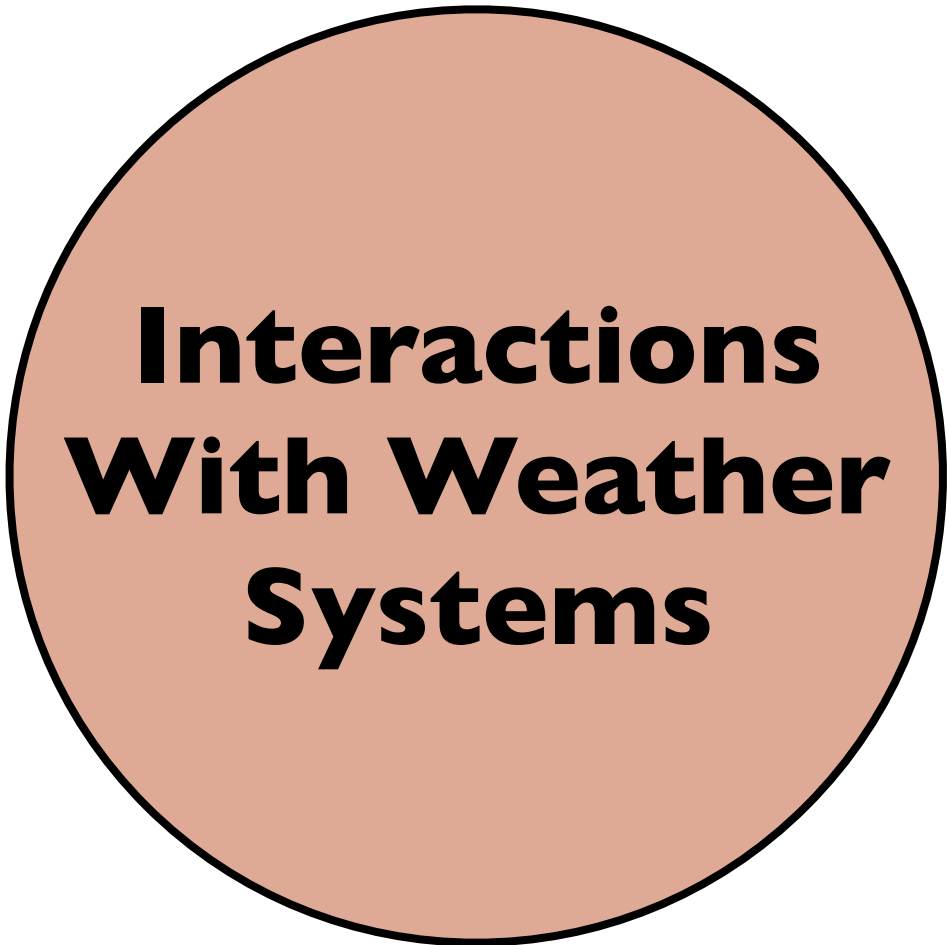
Water Budget



**Interactions
With Weather
Systems**



Water Budget



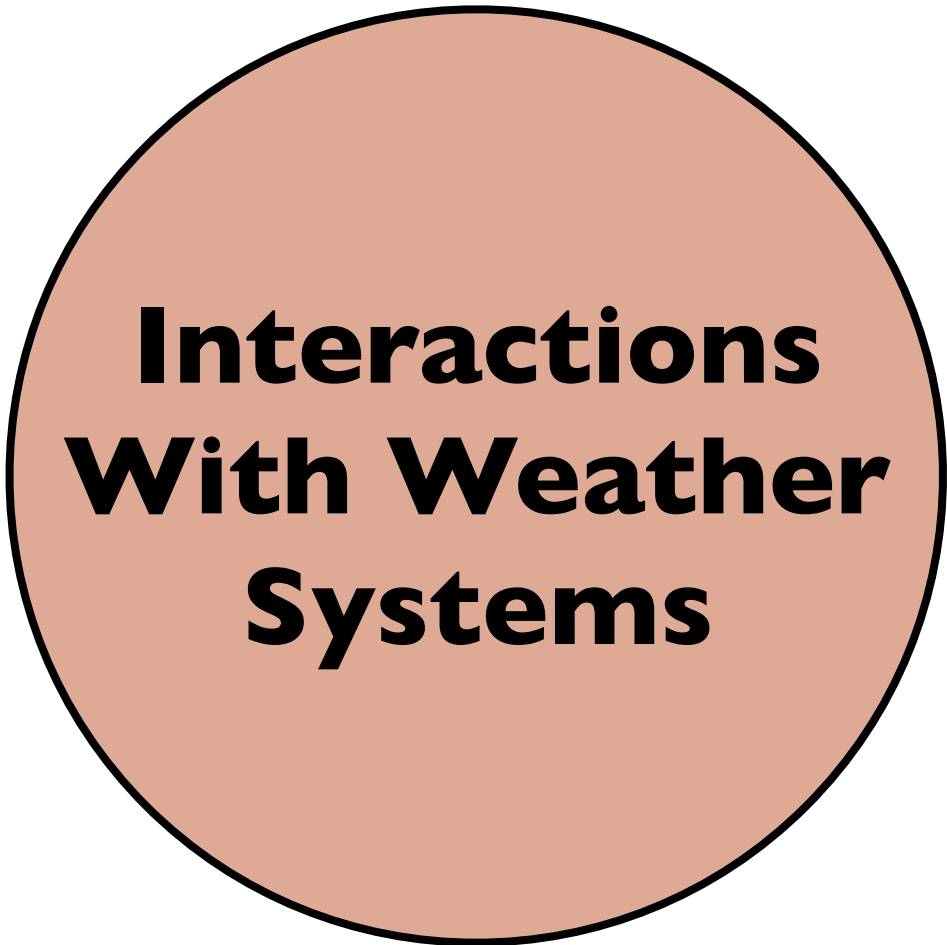
**Interactions
With Weather
Systems**



**Boundary
Layer**



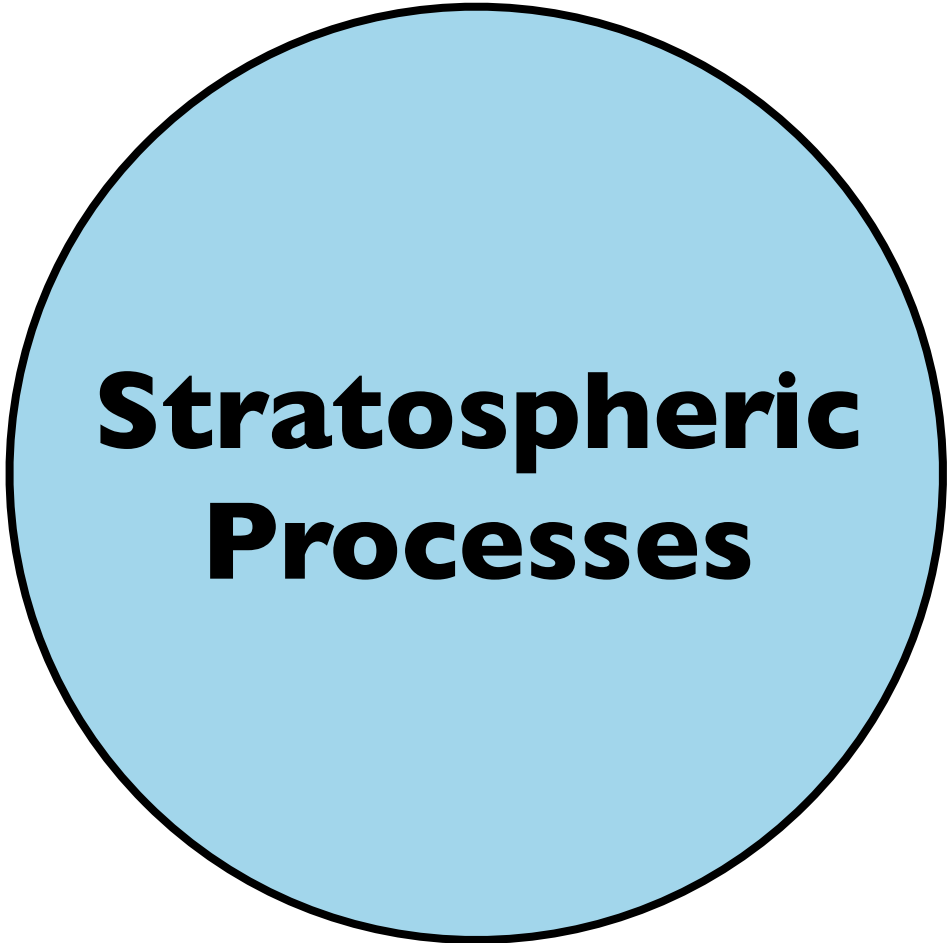
Water Budget



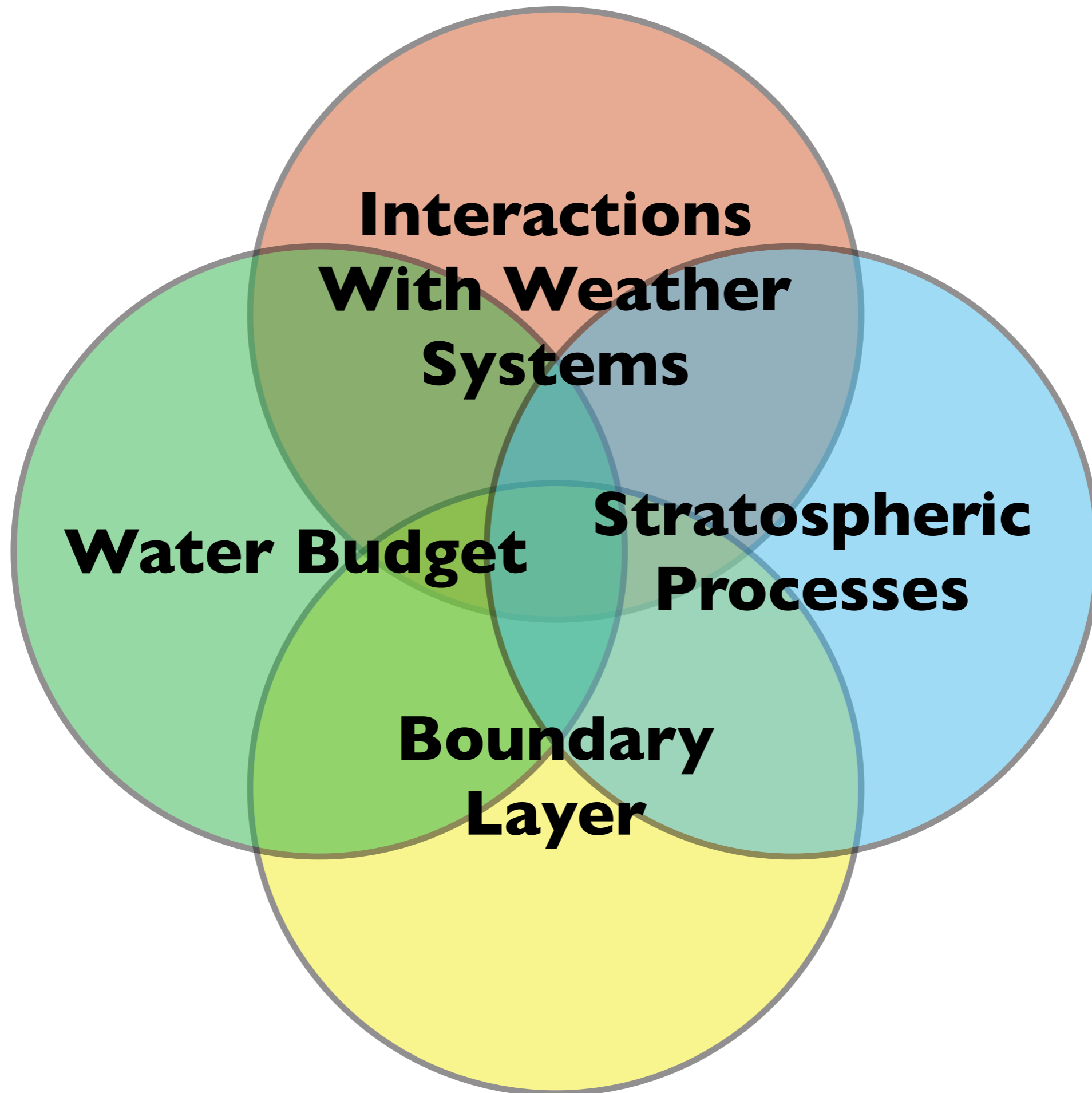
**Interactions
With Weather
Systems**



**Boundary
Layer**



**Stratospheric
Processes**



Water Budget

Net Precipitation

- Precipitation Formation and vertical structure
- Precipitation Phase (rain vs. snow)
- Wet deposition of aerosols and climatic impact (e.g. BC on snow, CCN transport)
- Timing of precipitation
- Precipitation rate (Synoptic vs. Stratus clouds)
- Impact of precipitation on surface radiation/conduction
- Evaporation
- Surface accumulation of precipitation

Cloud Evolution and Phase

- Mixed phase cloud formation and maintenance
- Liquid and ice nucleation

Arctic Water Vapor

- Sources and sinks
 - Long range transport vs. local surface evaporation
 - Bubble bursting and sea spray

Boundary Layer

Energy Budget

- Radiative and turbulent Fluxes

Vertical Structure, Transport, Mixing

Momentum Budget

- Impact by, and impact on cyclones
- Impact on surface (ice, ocean)

Aerosol Budget and processes

- Local vs. remote sources of aerosols
- Influence on surface albedo
- Impacts on the optical properties of clouds

Surface Layer Processes

Stable Boundary Layer Processes

Ozone Depletion

- Influence of increased bromine due to more leads and polynyas
- Impact on surface exchange processes

Interactions with Weather Systems

Influence of measurements on improving reanalyses

- Influence of location
- Influence of frequency of data assimilation
- Influence of having a point (or numerous points) in the central Arctic

Impact of large scale systems on local processes

- Boundary layer structure
- Cloud and precipitation properties
- Aerosol and water vapor transport

Influence of “new Arctic” on weather systems

- Increased heat and/or moisture fluxes
- Potential to capture detailed measurements of polar lows

Stratospheric Processes

Interactions between the stratosphere and tropospheric AO events

- Investigation of system memory

Long range teleconnections

Ozone hole

- Characterization of ozone hole in central Arctic
- Effect of tropospheric coupling on Ozone depletion

Additional Discussions

Scale:

- Spatial scales relevant to GCM parameterizations
- Derive not only spatial/temporal distributions, but also joint distributions of related processes
- Sufficient temporal scale for statistically significant relationships.
- Correct scales for satellite validation efforts
- Use of UAVs

Models:

- What are the parameterizations that really need improvements?
- How can we best compare to models of various scales while implementing “apples-to-apples” comparisons? Simulators?
- Can we use single column models in relation to MOSAiC efforts?
Boundary conditions?

Previously Undocumented Events:

- Detailed, long term measurements in the central Arctic are unprecedented
- Polar night measurements (e.g. longwave radiation in central Arctic)

Additional Discussions (cont.)

Influence of the changing Arctic:

- Changes to heat fluxes?
- Different precipitation/albedo properties?
- Different boundary layer structure?
- Atmospheric convection at high latitudes?
- Changes to amount of momentum transfer from atmosphere to sfc?
- Increase local aerosol emissions?
- Changed large scale gradients/poleward transport?

Links to other system components

- Surface energy budget (Ice, Ocean, BGC)
- Heat and momentum transfer (Ocean)
- Precipitation impacts (Ice)
- Aerosol sources (Ocean, BGC)
- Low level ozone depletion (BGC)

