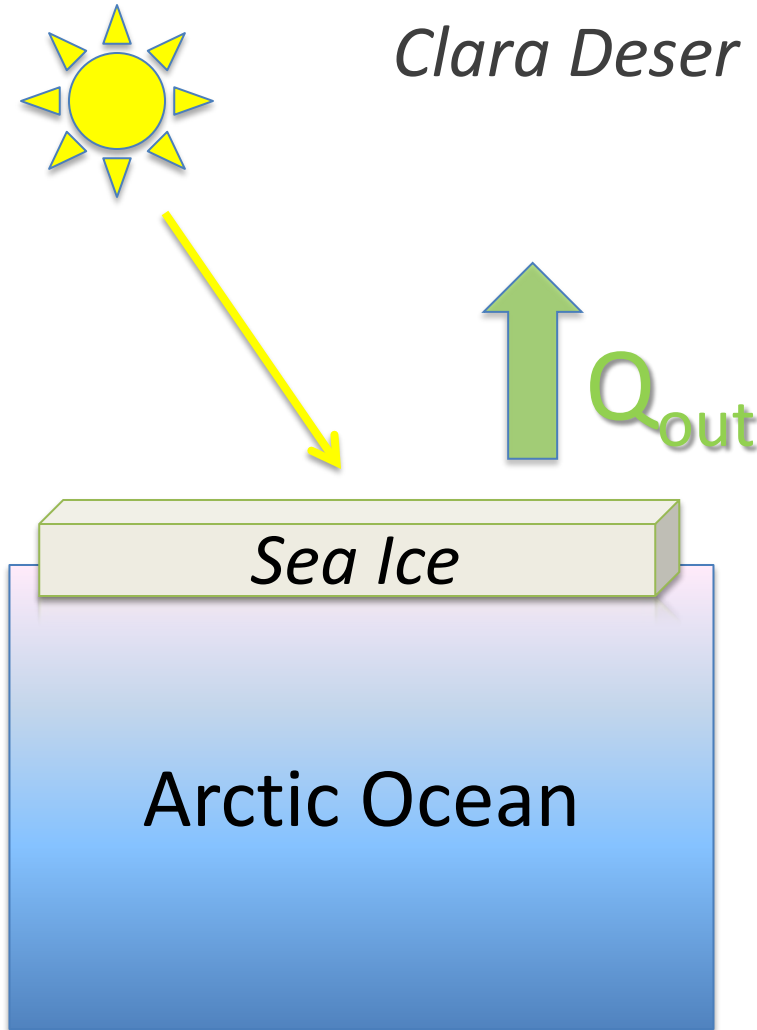
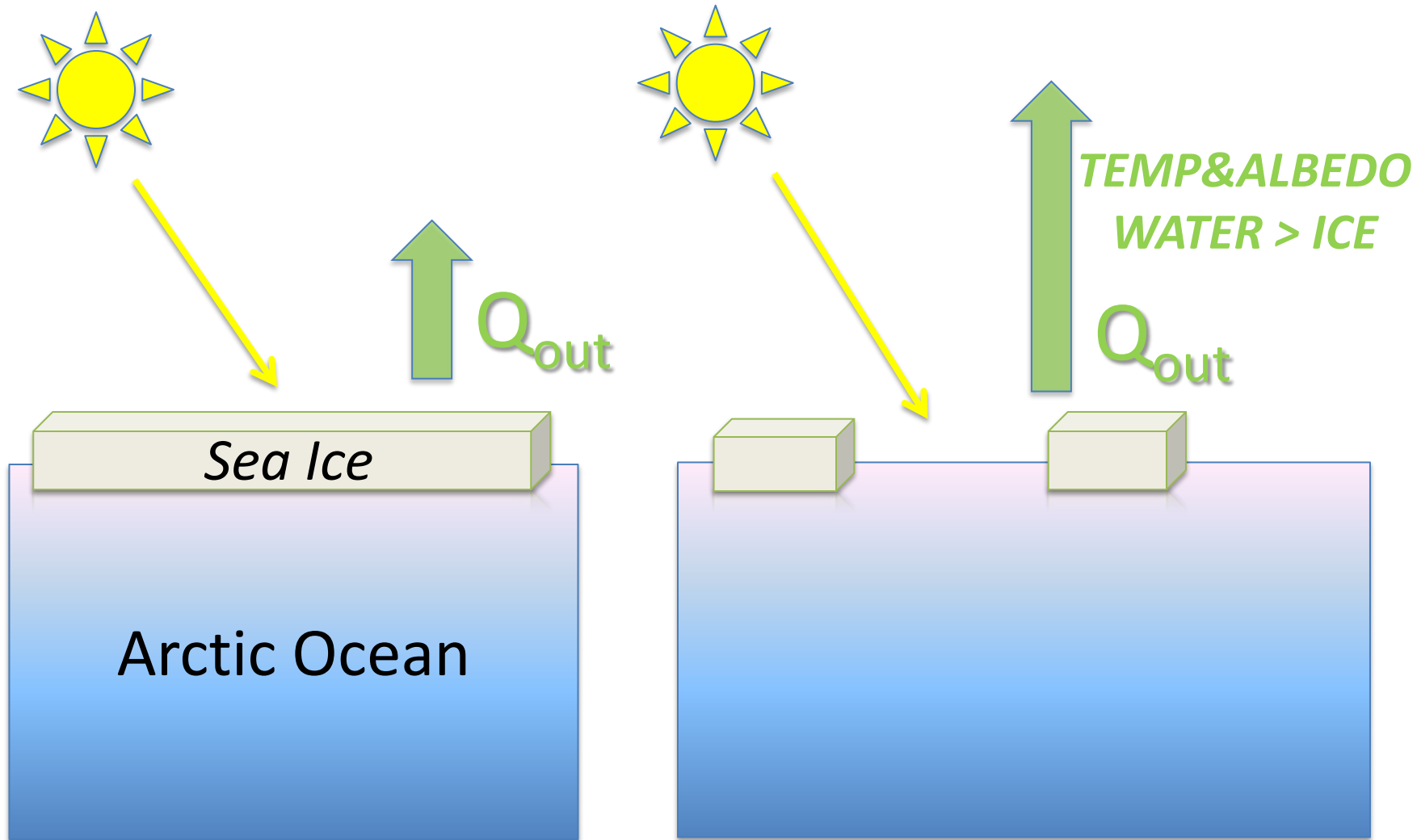


The Role of Ocean Coupling in the Atmospheric Response to Arctic Sea Ice Loss

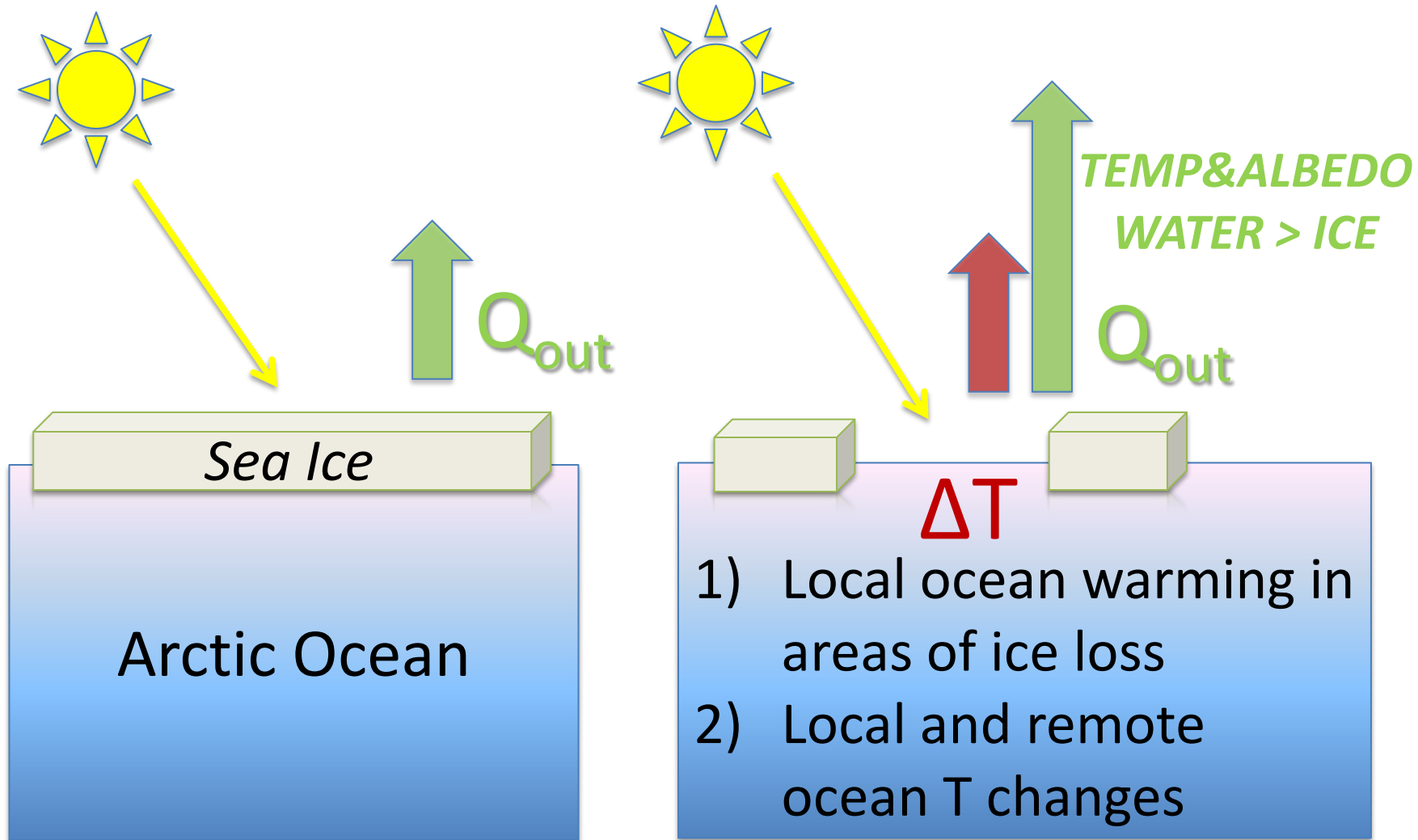
Clara Deser and Bob Tomas



The Role of Ocean Coupling in the Atmospheric Response to Arctic Sea Ice Loss

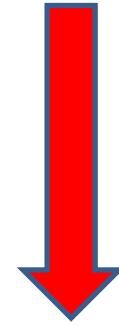


The Role of Ocean Coupling in the Atmospheric Response to Arctic Sea Ice Loss

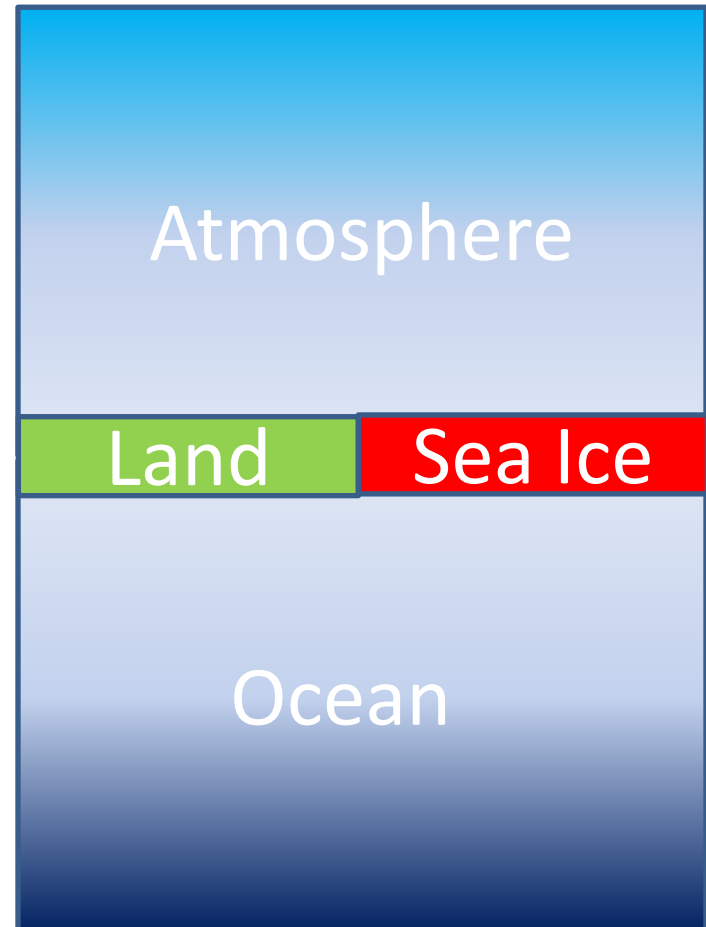


1) Experiments with CAM4-1°

GHG (*RCP8.5*)
& ozone, aerosols,
solar

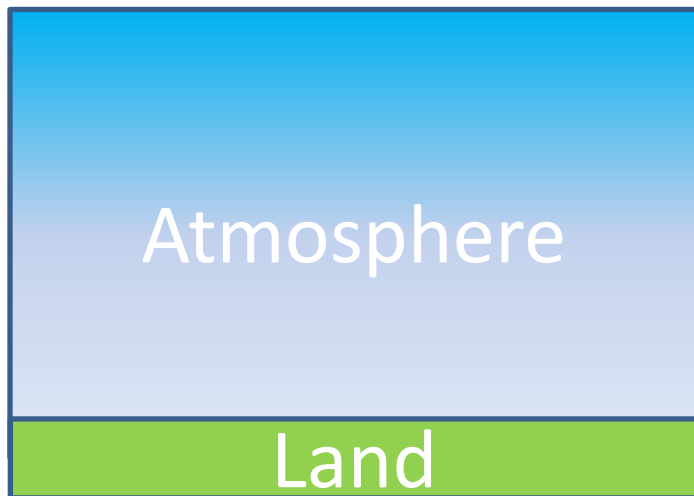


CCSM4-1° 20th & 21st C



No GHG Change

CAM4-1°



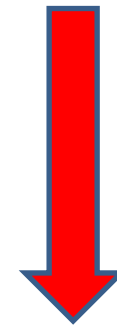
Land

Arctic Sea Ice

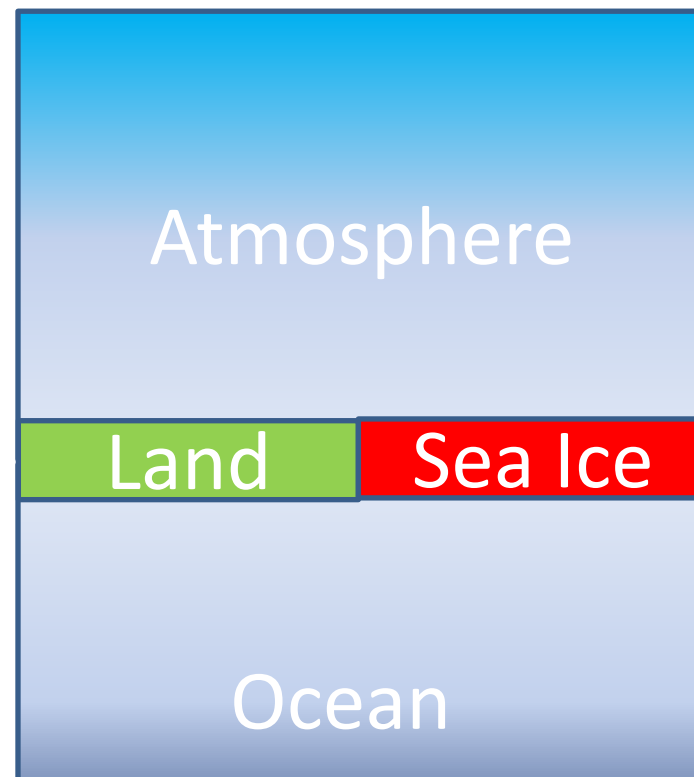
Arctic Sea Ice + "Local" SST

GHG (RCP8.5)

*& ozone, aerosols,
solar*



CCSM4-1° 20th & 21st C



Land

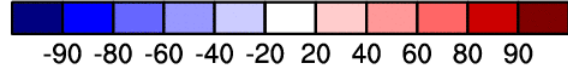
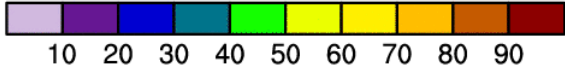
Sea Ice

Ocean

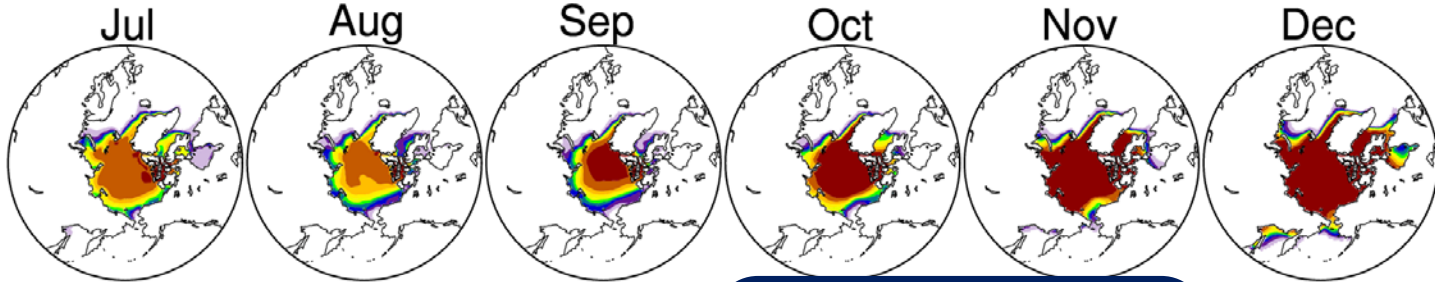
Specify average seasonal cycle: 1980-1999, 2080-2099

60 runs each (perturbed initial conditions)

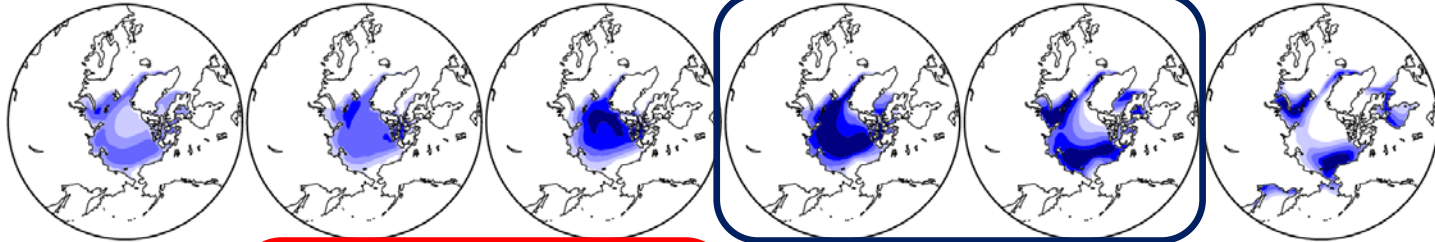
Ice Fraction (%)



Ice Fraction

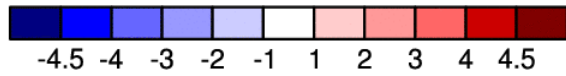
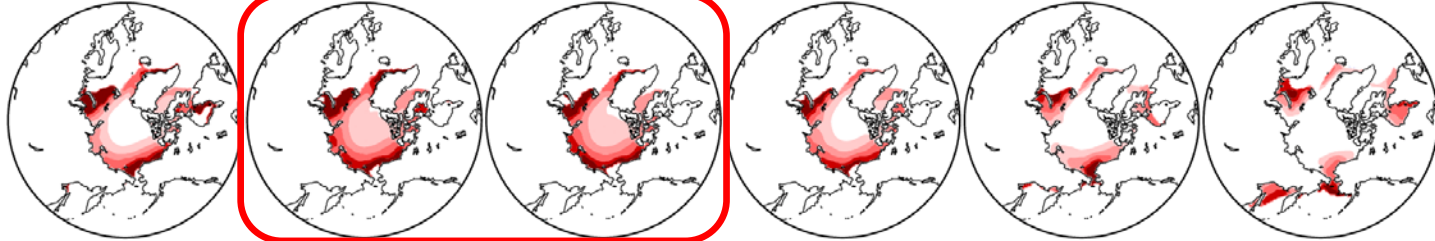


20th C



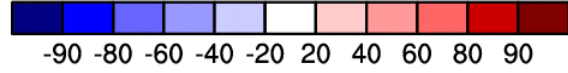
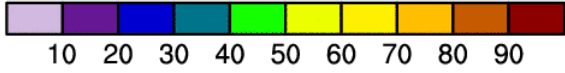
21st - 20th C

“Local”
SST

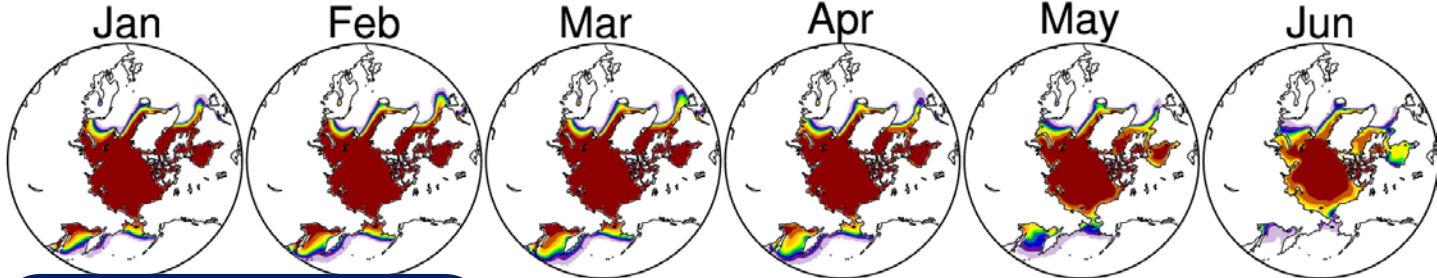


SST (°C)

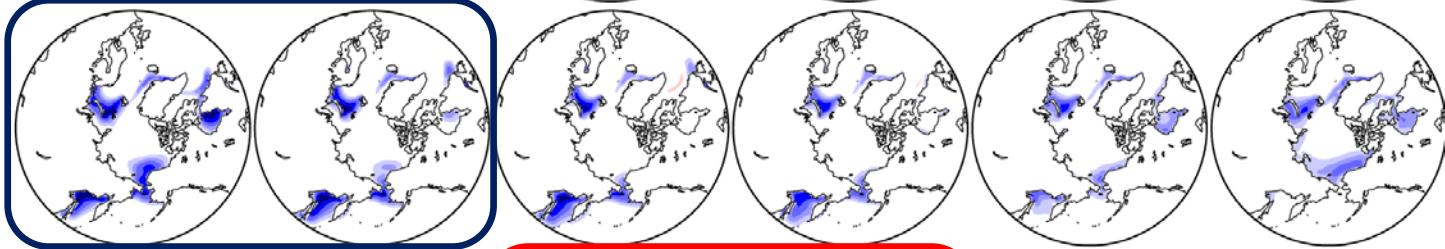
Ice Fraction (%)



Ice Fraction

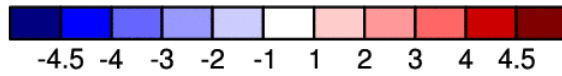
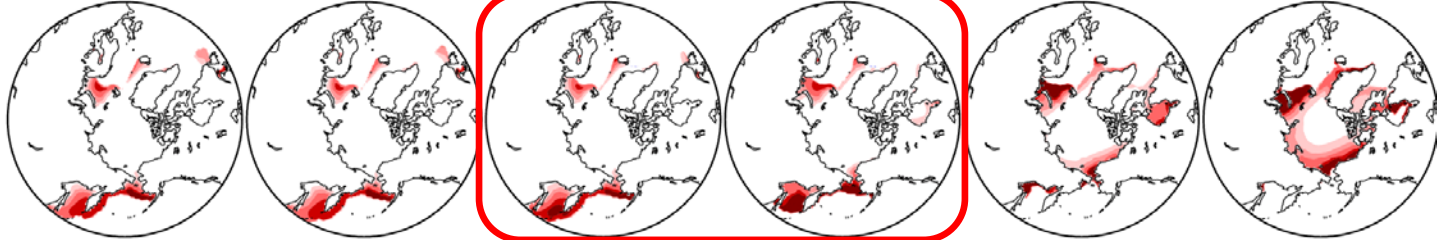


20th C



21st - 20th C

“Local”
SST



SST (°C)

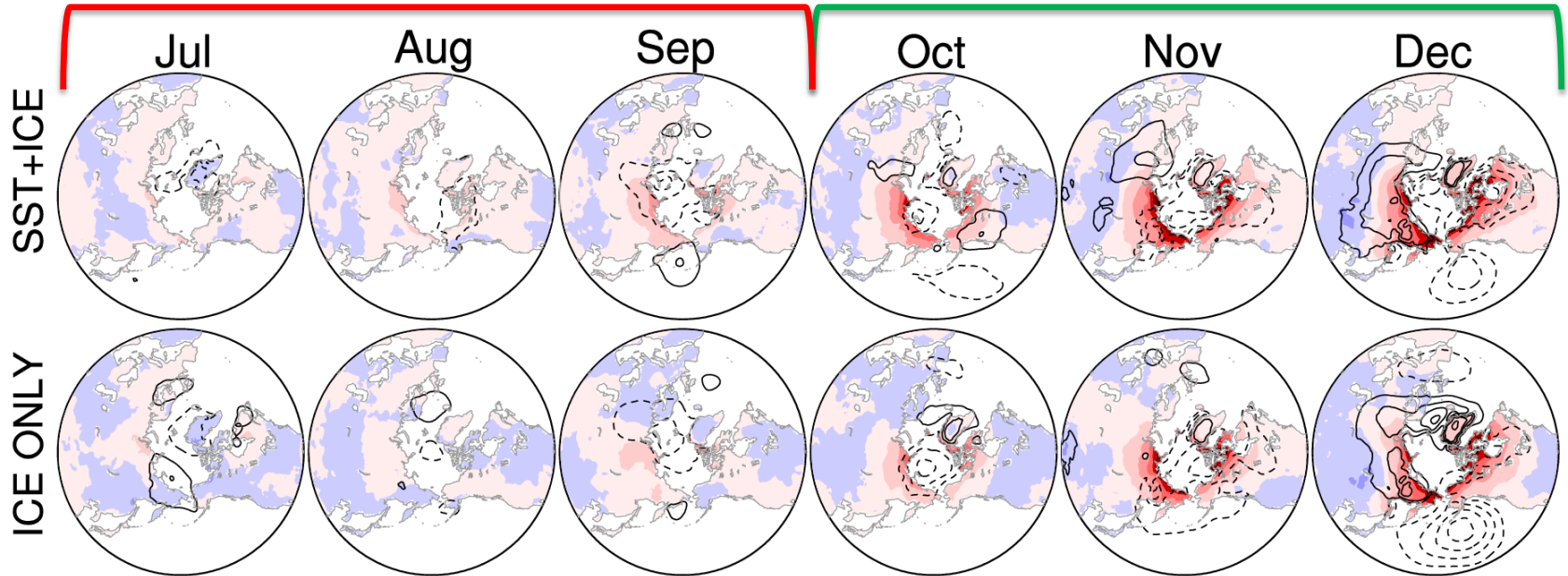
CAM4 Temperature and Sea Level Pressure Response to Sea Ice Loss:

Sensitivity to Local SST Increase

CAM4 Response: SLP and Terrestrial Air Temperature

Weak response despite SST increase

Stronger T response w/SST'



Like 
CAM3

SLP contour interval = 1 hPa

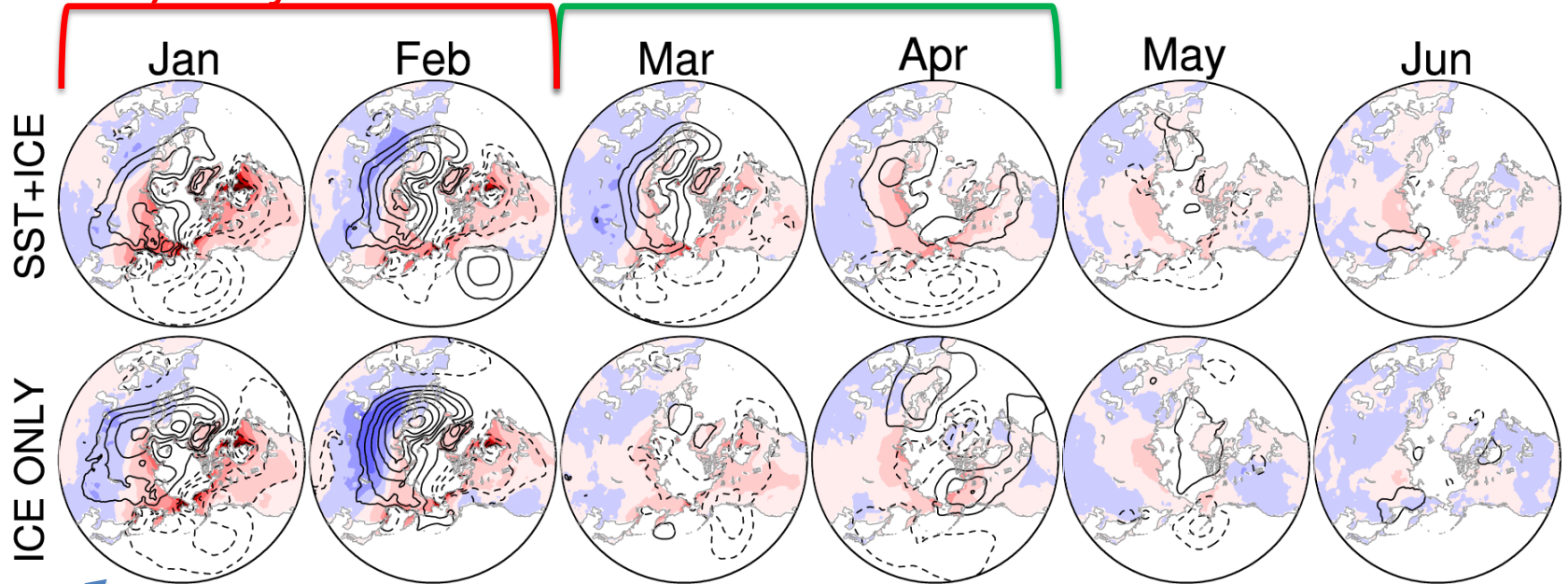


CAM4 Response: SLP and Terrestrial Air Temperature

Weaker High Pressure

w/SST feedback

SLP' lasts longer with SST'



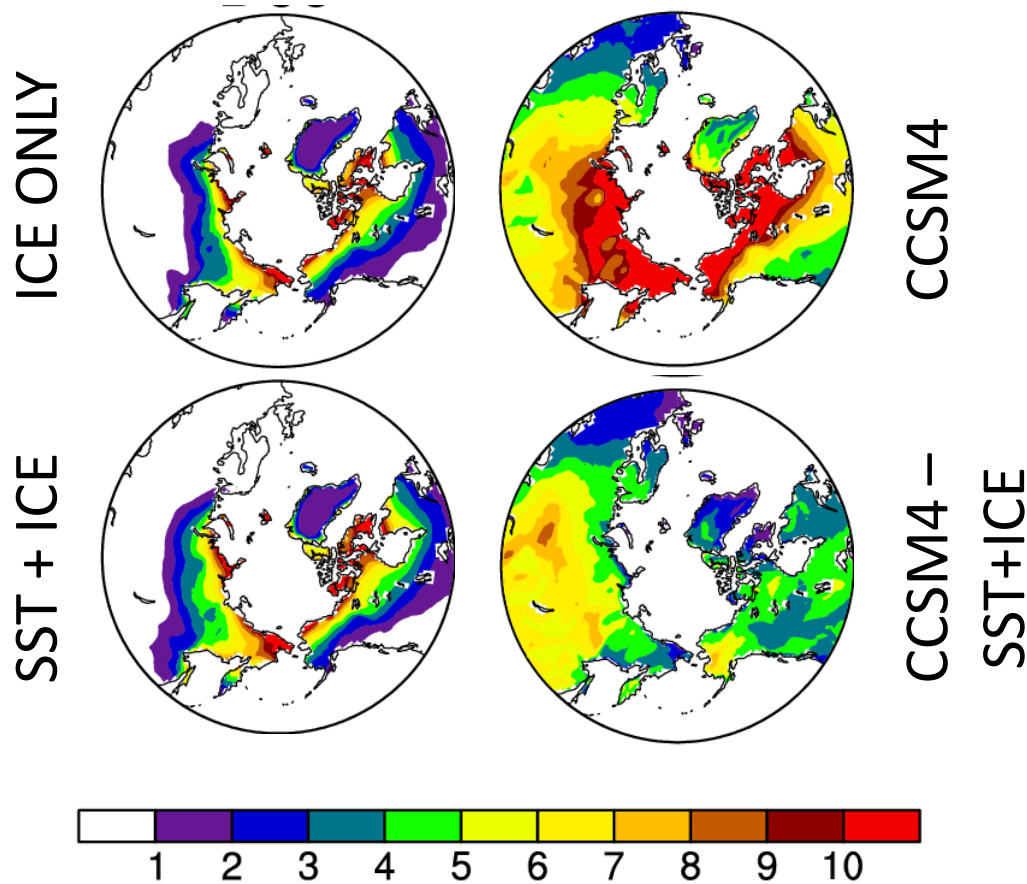
Like  *CAM3*

SLP contour interval = 1 hPa



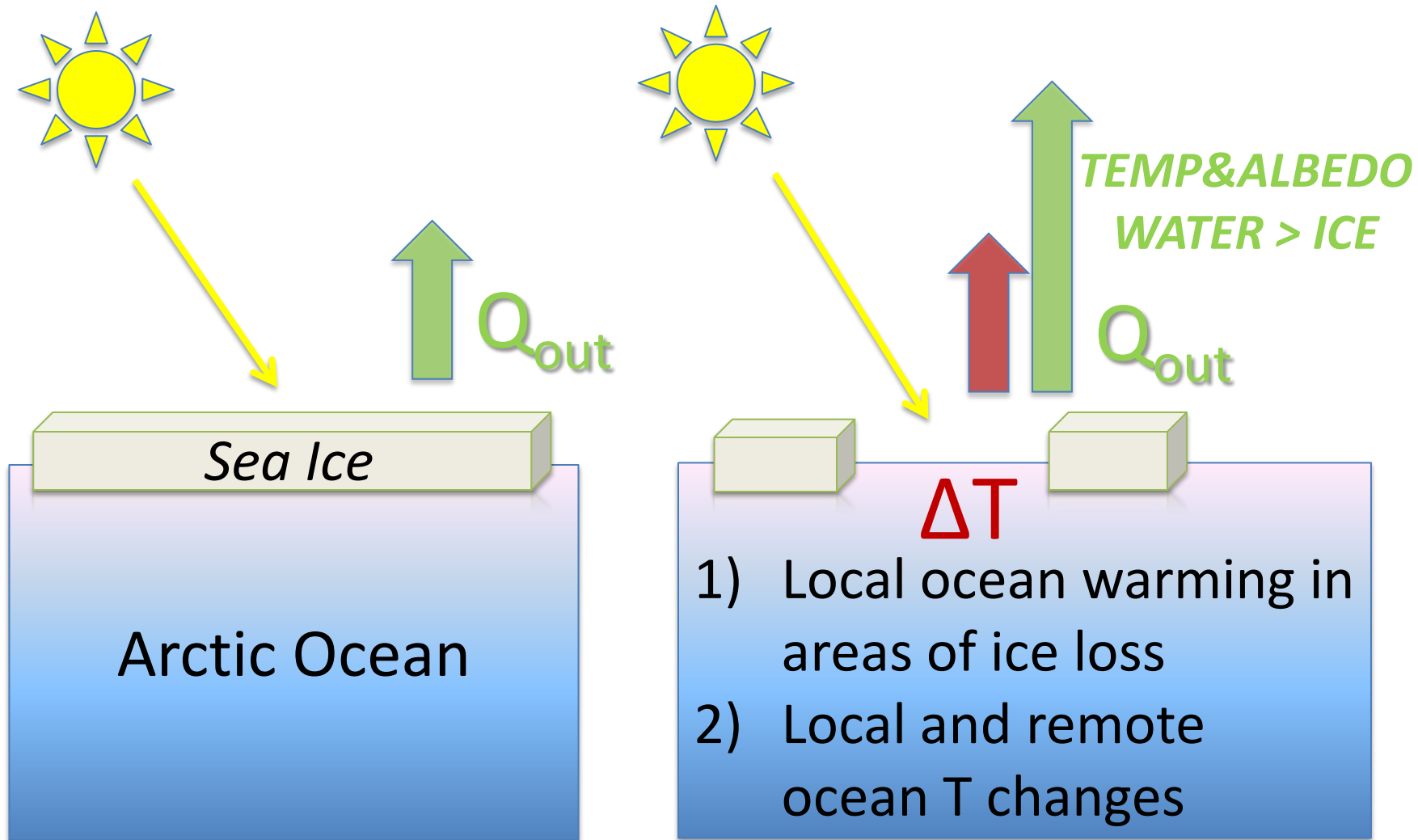
*Intensification of Negative T' over Central Eurasia
Associated with High Pressure Anomaly*

Arctic Amplification: Role of Sea Ice Loss and Local SST Feedback



December Air Temperature (Land only) °C

The Role of Ocean Coupling in the Atmospheric Response to Arctic Sea Ice Loss



2) Experiments with CCSM4-1° (Laura Landrum)