Depending on their altitude, structure, and composition (ice or water), clouds will regulate energy differently. One cloud may trap heat by reflecting energy back to the surface while another may reflect sunlight and cause the surface to cool.

Counting clouds is difficult. From space the clouds are often smaller than the satellite footprint. The horizontal dimensions of a satellite measurement and from the surface, cloud observations have traditionally been made by a human observer. Now we have new technology programs to study clouds with specialized field programs.

The Arctic is a critical climate zone due to the extreme of solar energy it receives and the effects it can have on the surrounding oceans. The Arctic heat budget of the Arctic Ocean was designed to address the scarcity of climate data in the Arctic. The Tropical Western Pacific is measured by PSD, MIRC, and DABUL. The cloud measurements are important because the TWP is considered the furnace of the planet. Climate change in the TWP impacts wide scale weather as has been demonstrated by El Niño.