**Climate Center Lecturer Series: Fall 2008**
**17 - 20 November 2008**
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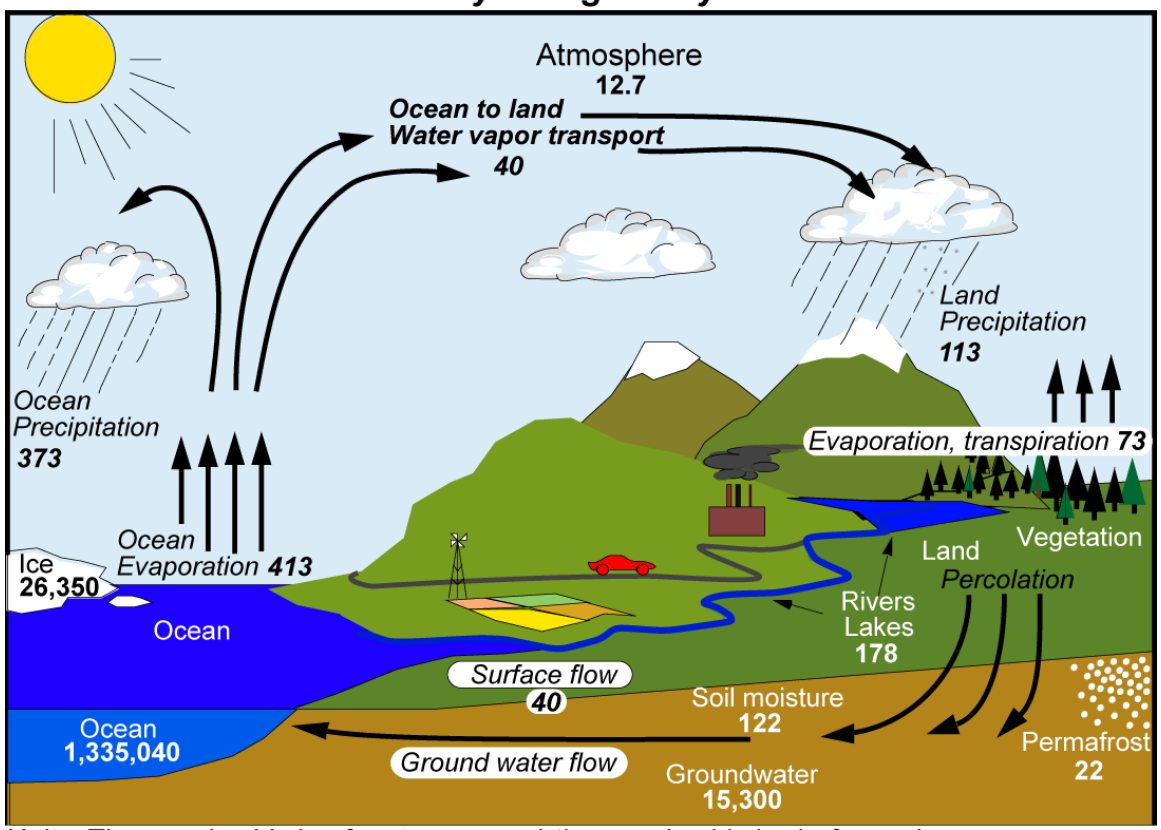
**National Center for Atmospheric Research (NCAR)**

# The Global Water Cycle and Its Changes

A review is given of the global hydrological cycle and its changes over time. A particular focus is on how precipitation changes as the climate changes and changes in extremes, including risk of flooding and drought. Net changes in surface evaporation are fairly modest and a much larger percentage change occurs in the water-holding capacity as atmospheric temperatures increase (4% per ºF). A consequence is increased water vapor in the atmosphere which feeds all storms and thus leads to more intense precipitation; increased water vapor, heavier rains and stronger storms are already observed to be happening. However, the disparity between modestly enhanced evaporation and heavier rains means decreases in frequency of precipitation and enhanced droughts. With more precipitation per unit of upward motion in the atmosphere, the atmospheric circulation weakens, causing monsoons to falter. Observed changes in Atlantic hurricanes will be used to illustrate some of these aspects. Understanding these profound consequences of climate change is especially important for water managers.

***Hydrological Cycle***




Units: Thousand cubic km for storage, and *thousand cubic km/yr* for exchanges

**Thursday, November 20 at 11am in the Monell Auditorium, IRI/LDEO Campus**