

GEOG 3B
Land Water and Life
Summer 2016
Review Session

Gengchen Mai



Overview

- 882- E: Green scantron
- Multiple choice
- 35 questions

- Earth as a Reference System
- Wind and Atmospheric Circulations
- Climate
- Atmospheric Moisture & Water Resources
- River Systems and Landforms

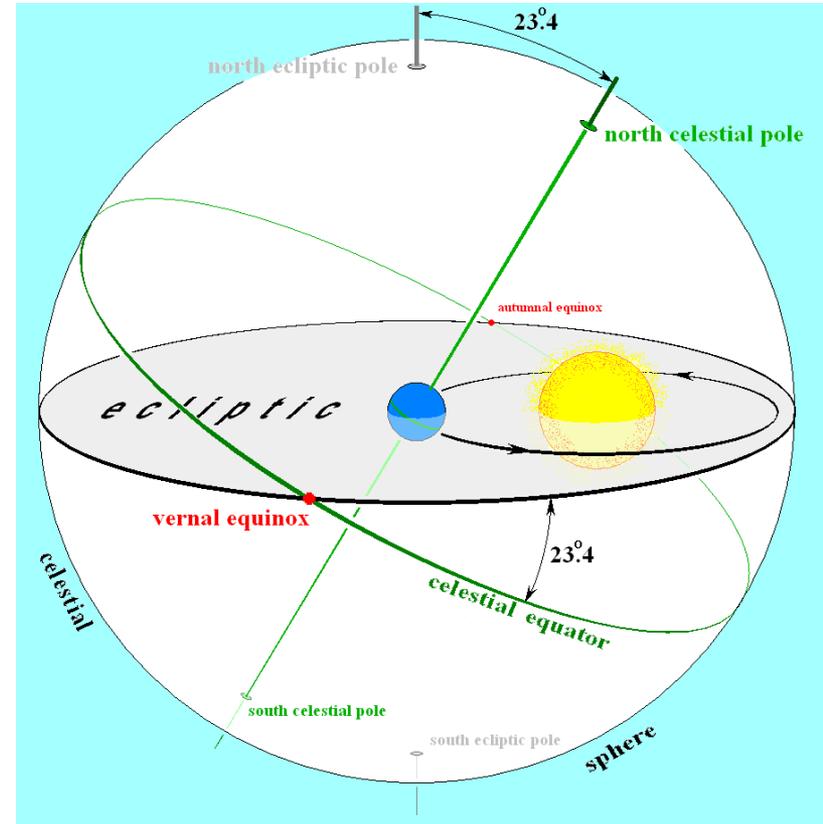
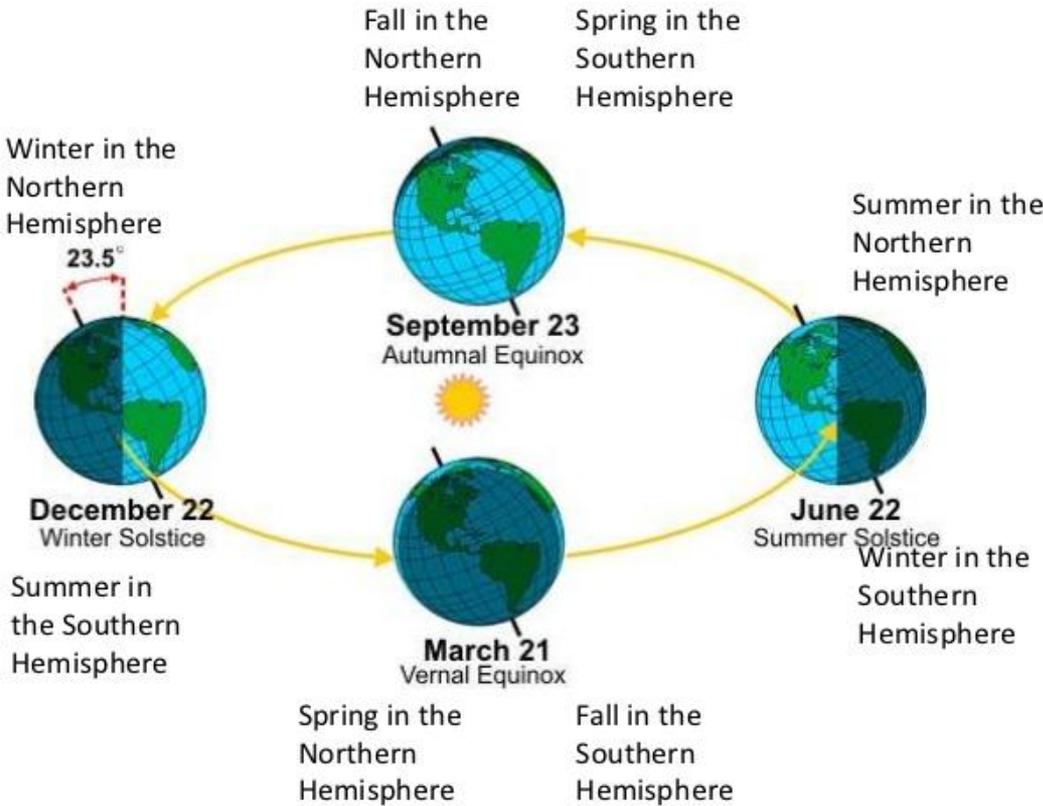


Earth as a Reference System

- Latitude (Equator)
- Longitude (Prime Meridian)
- Degree Conversion
- Map projection
- Earth's tilt and rotation, revolution
- Albedo
- season



Earth's axial tilt and season



<http://www.srh.noaa.gov><http://www.srh.noaa.gov>

When are the equinox, solstice?
Where is the subsolar point?

- **Albedo**(reflectivity): percentage of insolation *reflected* by a surface

TABLE 2-3 Albedo (reflectivity) of various surfaces

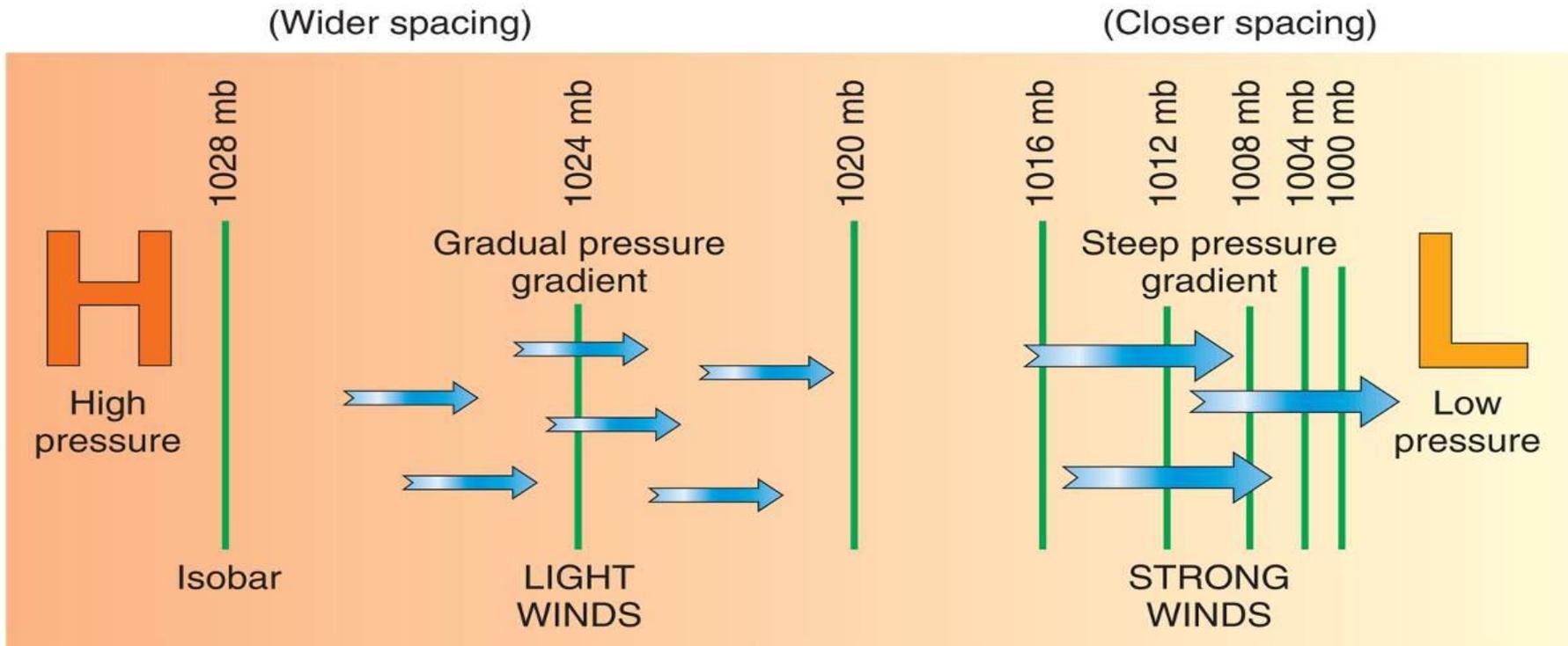
Surface	Percent Reflected
Fresh snow	80–90
Old snow	50–60
Sand (beach, desert)	20–40
Grass	5–25
Dry soil (plowed field)	15–25
Wet earth (plowed field)	10
Forest	5–10
Water (Sun near horizon)	50–80
Water (Sun near zenith)	5–10
Thick cloud	70–85
Thin cloud	25–30
Earth and atmosphere (overall total)	30

Wind and Atmospheric Circulations



1. Pressure Gradient Force

- Air moves from High pressure to Low pressure
- Required to have wind

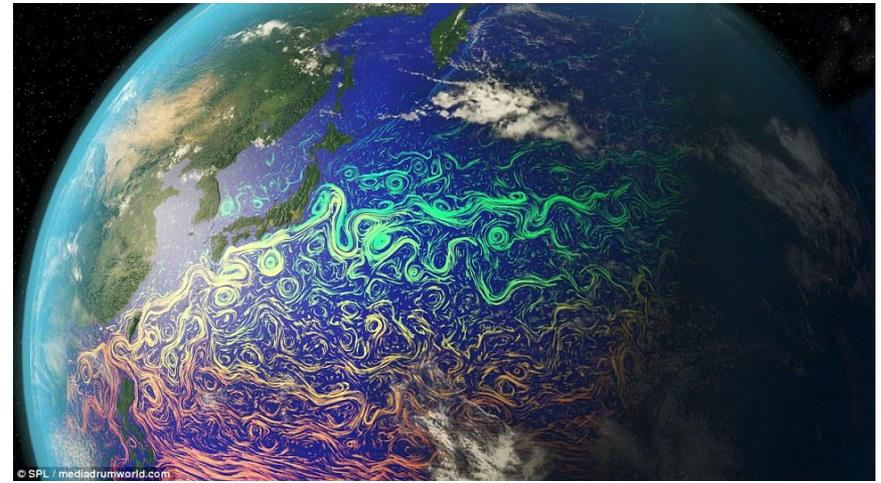
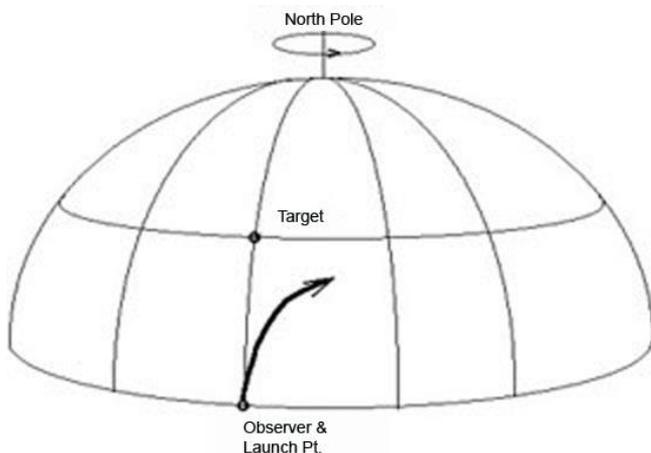


Wind and Atmospheric Circulations



2. Coriolis Force

- As Earth rotates wind is deflected
- An apparent force caused by the rotation of the earth
 - 1) deflects
 - **To the right in N. Hemisphere**
 - **To the left in the S. Hemisphere**
 - 2) **Maximum in the poles and zero in the equator**
 - 3) Proportional to the wind speed



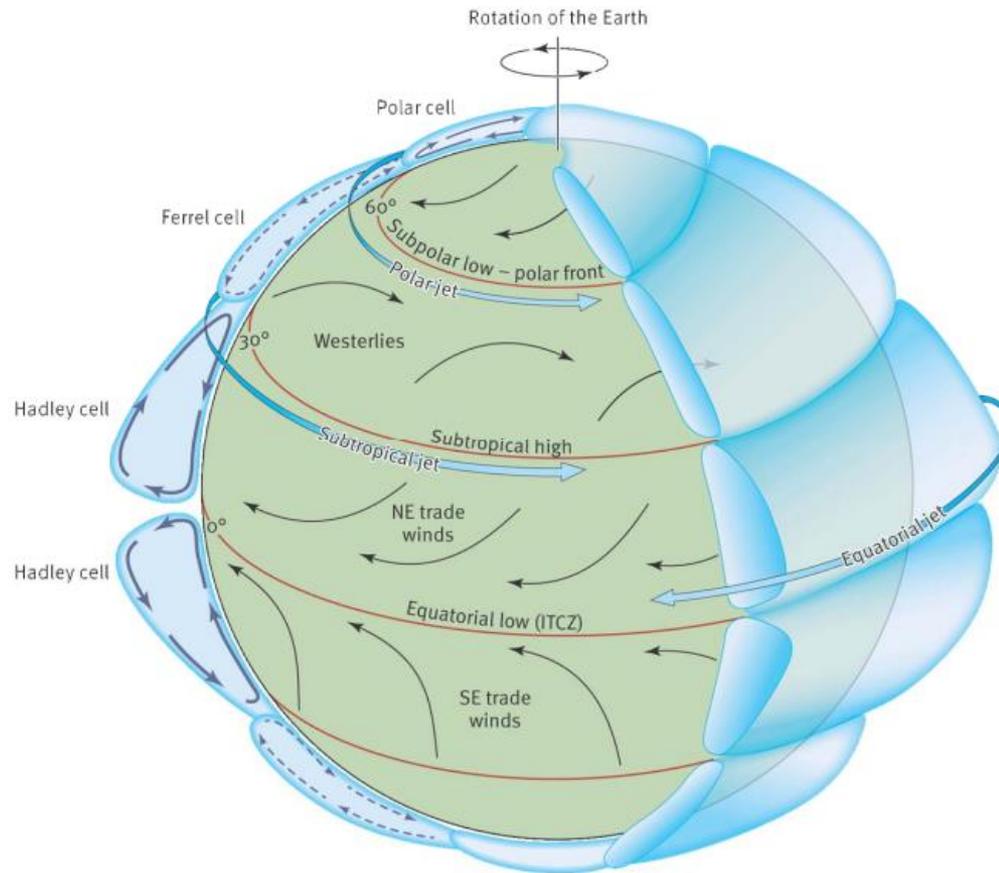
Wind and Atmospheric Circulations



3. Friction Force

- Opposite to the wind direction
- Slows down the wind speed
- Reduces Coriolis force
- Creates surface wind:
 - Flows from high to low pressure across isobars at an angle

Simplified Model of Atmospheric Circulation in Three Dimensions

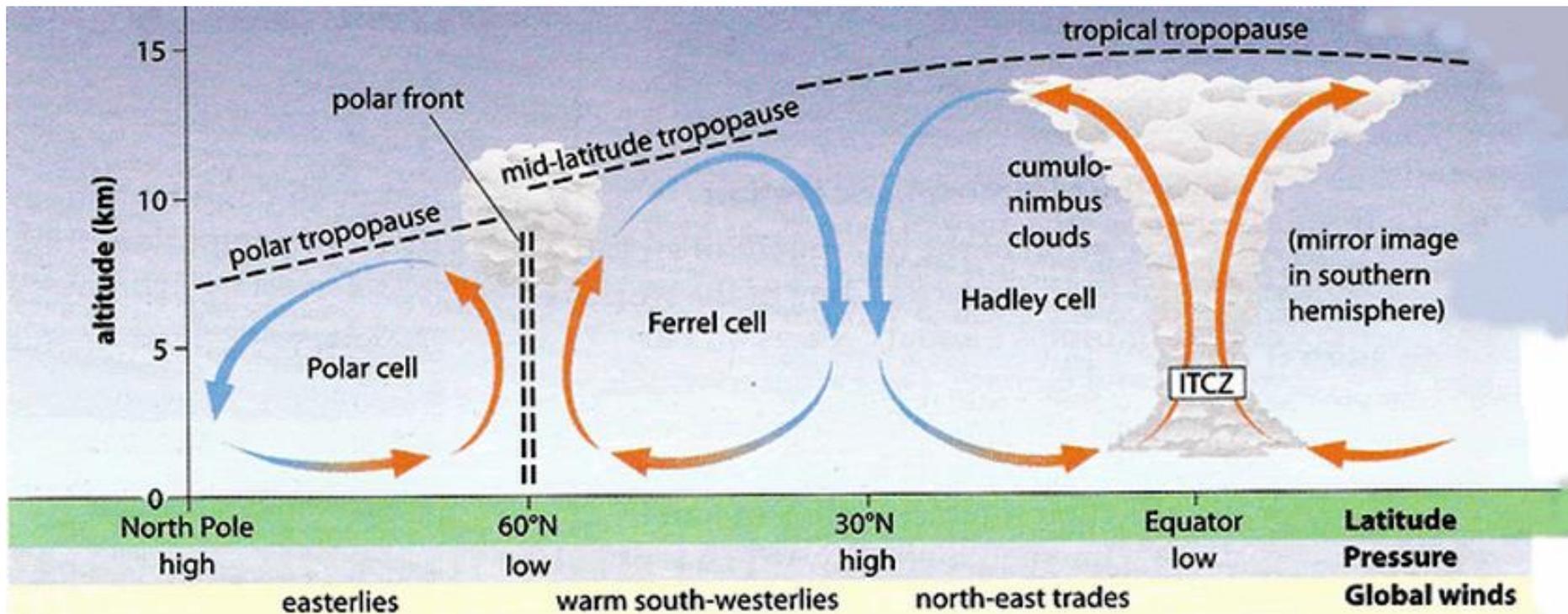


Conceptual model of global atmospheric circulation pattern showing the major surface pressure belts, the prevailing surface wind systems, the upper-level jet streams, and the Coriolis deflection of surface winds.

Wind and Atmospheric Circulations

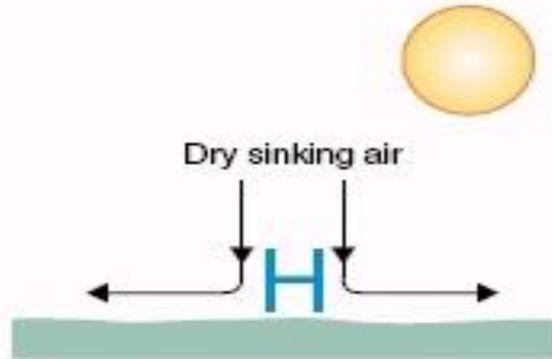
Primary High-Pressure and Low-Pressure Areas

- **Polar High Pressure (poles)**
- **Subpolar Low-Pressure cells (60N/S)**
- **Subtropical High Pressure (30N/S)**
- **Inter-tropical Convergence Zone-ITCZ (equator)**



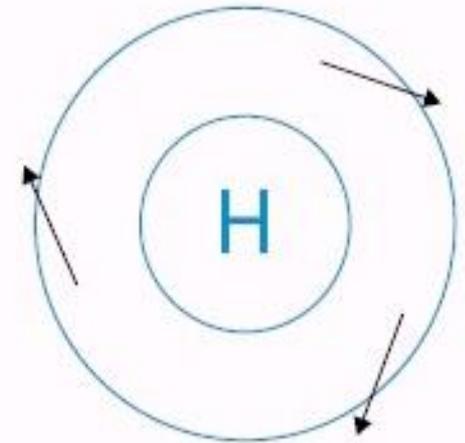
- High Pressure
 - Clear skies
 - Dry weather
- Low Pressure
 - Often associated with wind and rain
 - Unstable weather

- Where are tropical Cyclone?
- What is the requirement of Hurricane

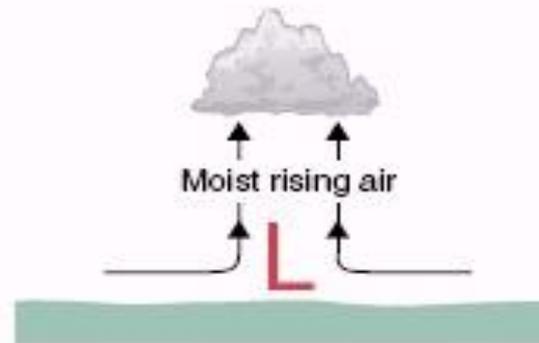


View from side

Surface winds blow clockwise around a high pressure and diverge.

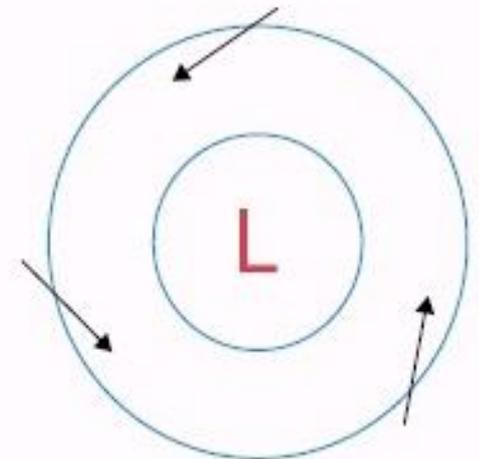


View from above



View from side

Surface winds blow counterclockwise around a low pressure and converge.



View from above

- **Köppen Classification Categories**

- **Based on Temperature**

- Capital letter

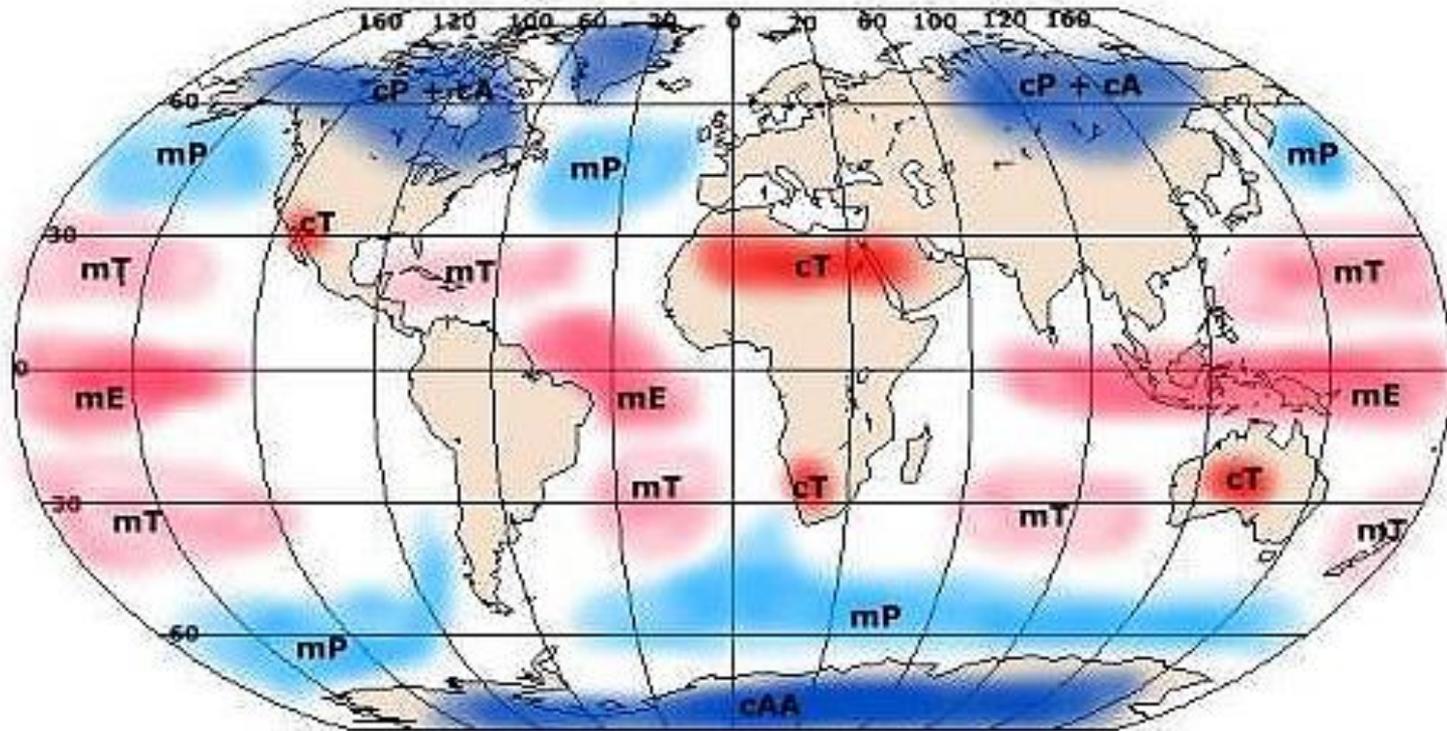
- **Tropical (A)**
 - **Mesothermal (C)**
 - **Microthermal (D)**
 - **Polar (E)**
 - **Highland (H)**
 - **Desert (B)**

- **Primarily based on precipitation patterns**

- 2nd letter
 - f, w, and s
 - precipitation patterns
 - only applicable to A, C, and D climates
 - m for monsoon applies to A
 - W and S
 - desert (arid) or steppe (semiarid)
 - Only B climates

- **Air mass classifications**

- mT, mP, mE
- cT, cP, cA
- m= maritime (moist), c= continental (dry)
- T= tropical (warm), P = Polar (cold)
- E= equatorial, A= Arctic, AA=Antarctic



Phase changes

Humidity

- Vapor pressure
- Relative humidity
- Dew point

The Hydrologic Cycle

Soil-Water-Budget Concept

- Evaporation
- Transpiration
- Evapotranspiration (ET):

Groundwater Resources

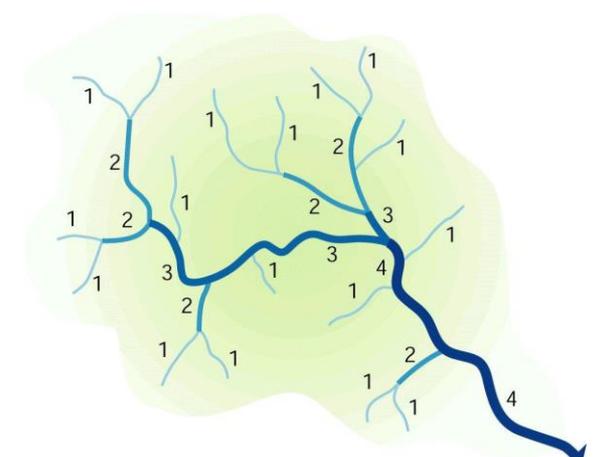
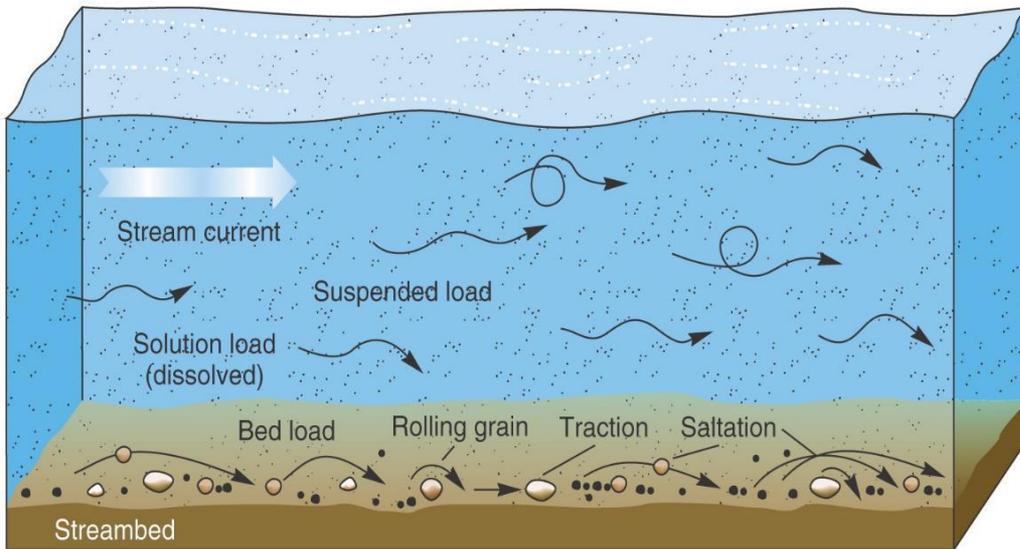
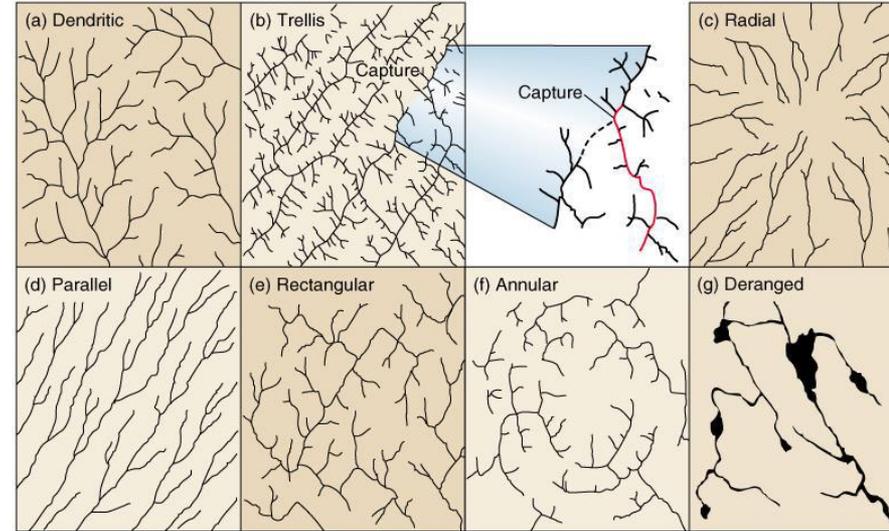
- Aquifer
- Zone of Aeration
- Zone of Saturation

River Systems and Landforms

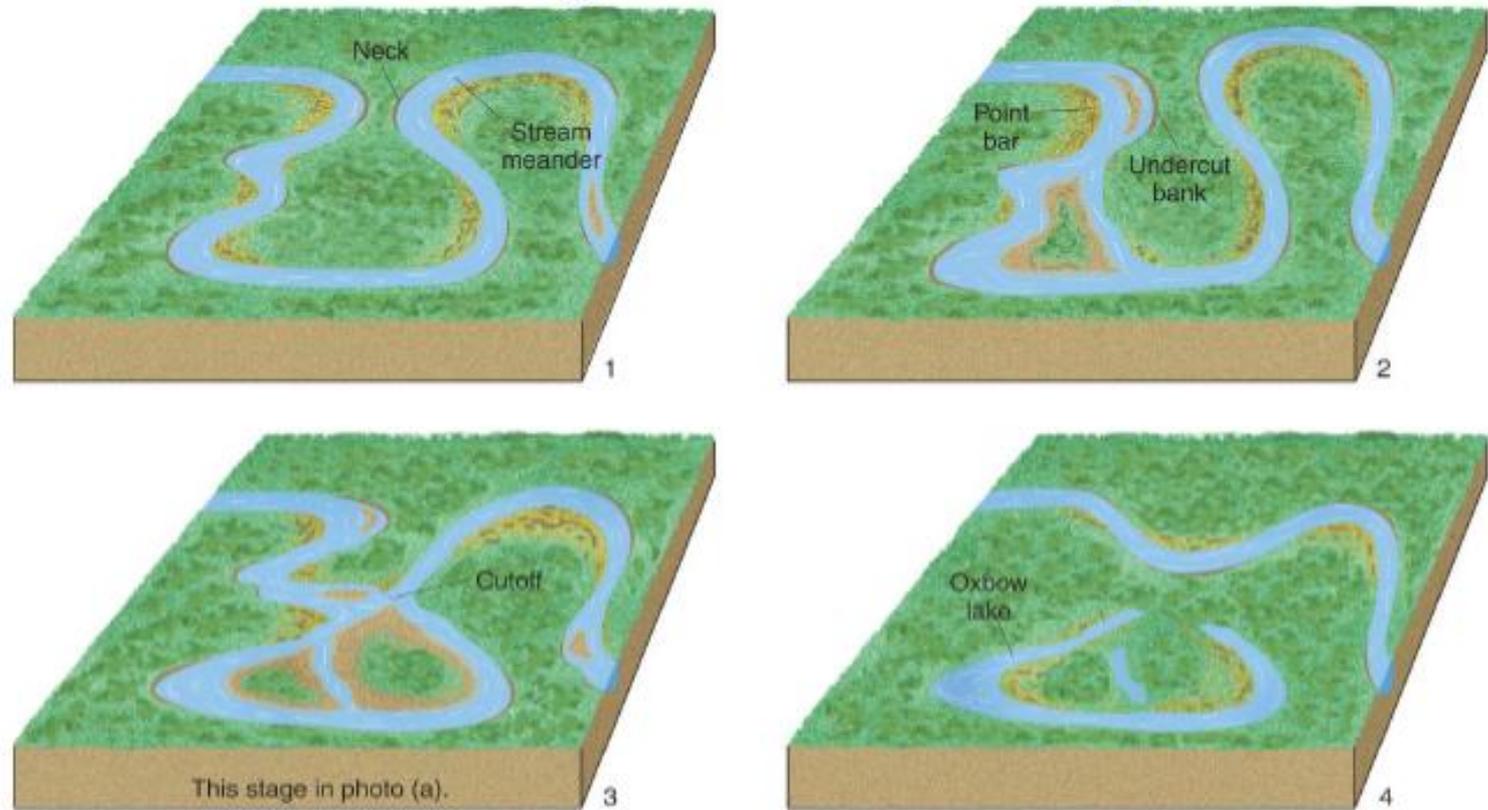
Alluvial Fan Drainage Basin and Watershed Drainage Patterns

Stream order

Stream/River Transports



Meandering Stream Development

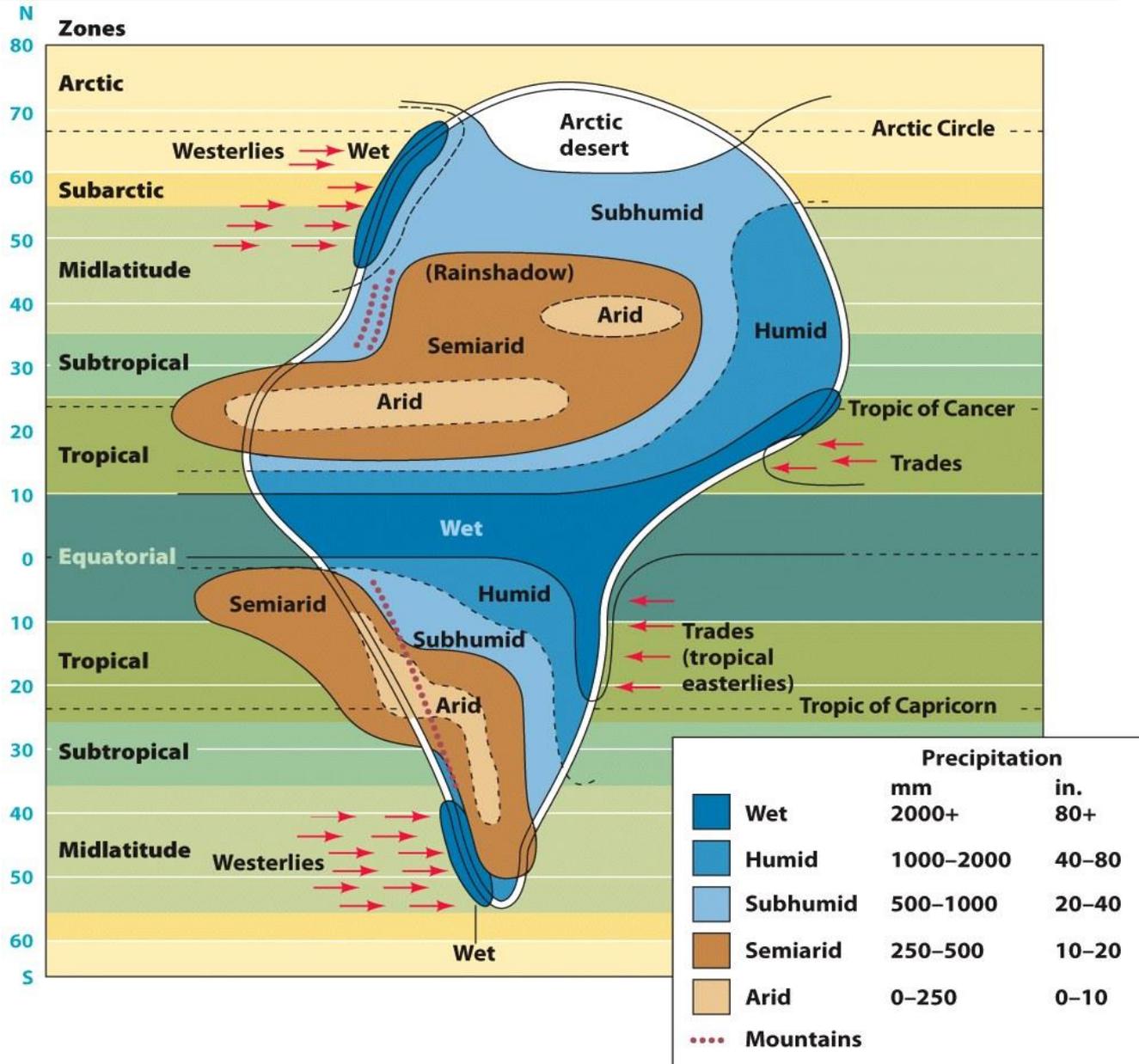


(b)

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- Oxbow lake: a lake that was formerly a part of the channel of a meandering stream
 - ☒ Isolated when cut off at the neck of a looping meander

The schematic continent



HW3

A)



B)

