Climatic Classification: Wladimir Peter Köppen

(UG Hons. 2nd year)

by

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Early Greek View of Earth's Climate

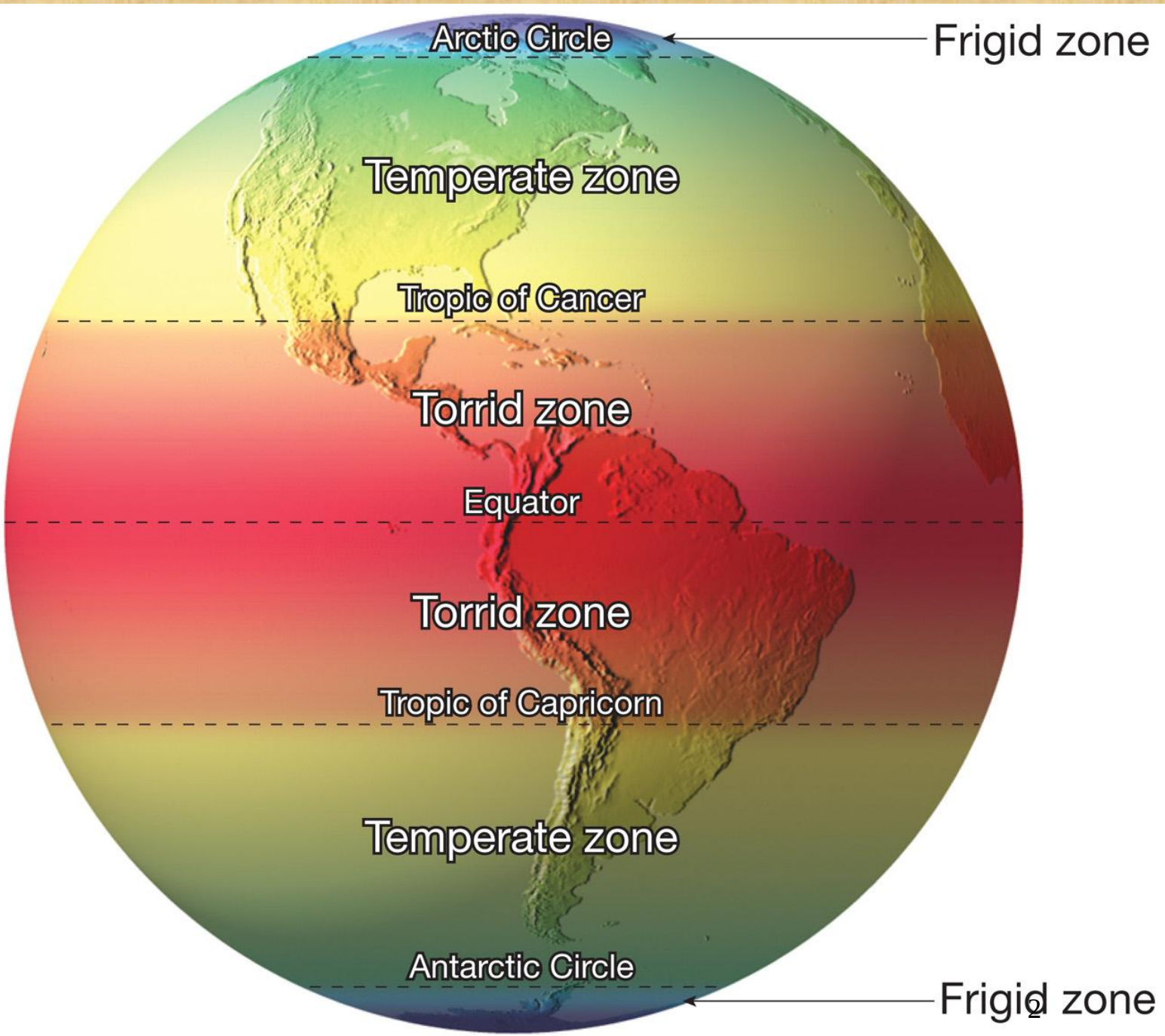

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Chart for Determining Köppen classification

TABLE 15-1 Köppen system of climate classification*

Letter symbol			
1st	**2nd**	**3rd**	
A			Average temperature of the coldest month is 18°C or higher.
	f		Every month has 6 cm of precipitation or more.
	m		Short dry season; precipitation in driest month less than 6 cm but equal to or greater than 10 – R/25 (R is annual rainfall in cm).
	w		Well-defined winter dry season; precipitation in driest month less than 10 – R/25.
	s		Well-defined summer dry season (rare).
B			Potential evaporation exceeds precipitation. The dry–humid boundary is defined by the following formulas: (*Note:* R is the average annual precipitation in cm, and T is the average annual temperature in °C.) R < 2T + 28 when 70% or more of rain falls in warmer 6 months. R < 2T when 70% or more of rain falls in cooler 6 months. R < 2T + 14 when neither half year has 70% or more of rain.
	S		Steppe — The BS–BW boundary is 1/2 the dry–humid boundary.
	W		Desert
		h	Average annual temperature is 18°C or greater.
		k	Average annual temperature is less than 18°C.
C			Average temperature of the coldest month is under 18°C and above −3°C.
	w		At least 10 times as much precipitation in a summer month as in the driest winter month.
	s		At least three times as much precipitation in a winter month as in the driest summer month; precipitation in driest summer month less than 4 cm.
	f		Criteria for w and s cannot be met.
		a	Warmest month is over 22°C; at least 4 months over 10°C.
		b	No month above 22°C; at least 4 months over 10°C.
		c	One to 3 months above 10°C.
D			Average temperature of coldest month is −3°C or below; average temperature of warmest month is greater than 10°C.
	s		Same as under C
	w		Same as under C
	f		Same as under C
		a	Same as under C
		b	Same as under C
		c	Same as under C
		d	Average temperature of the coldest month is −38°C or below.
E			Average temperature of the warmest month is below 10°C.
	T		Average temperature of the warmest month is greater than 0°C and less than 10°C.
	F		Average temperature of the warmest month is 0°C or below.

*When classifying climate data using Table 15–1, you should first determine whether the data meet the criteria for the *E* climates. If the station is not a polar climate, proceed to the criteria for *B* climates. If your data do not fit into either the *E* or *B* groups, check the data against the criteria for *A*, *C*, and *D* climates, in that order.

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The Köppen system uses a series of letters to designate climate:

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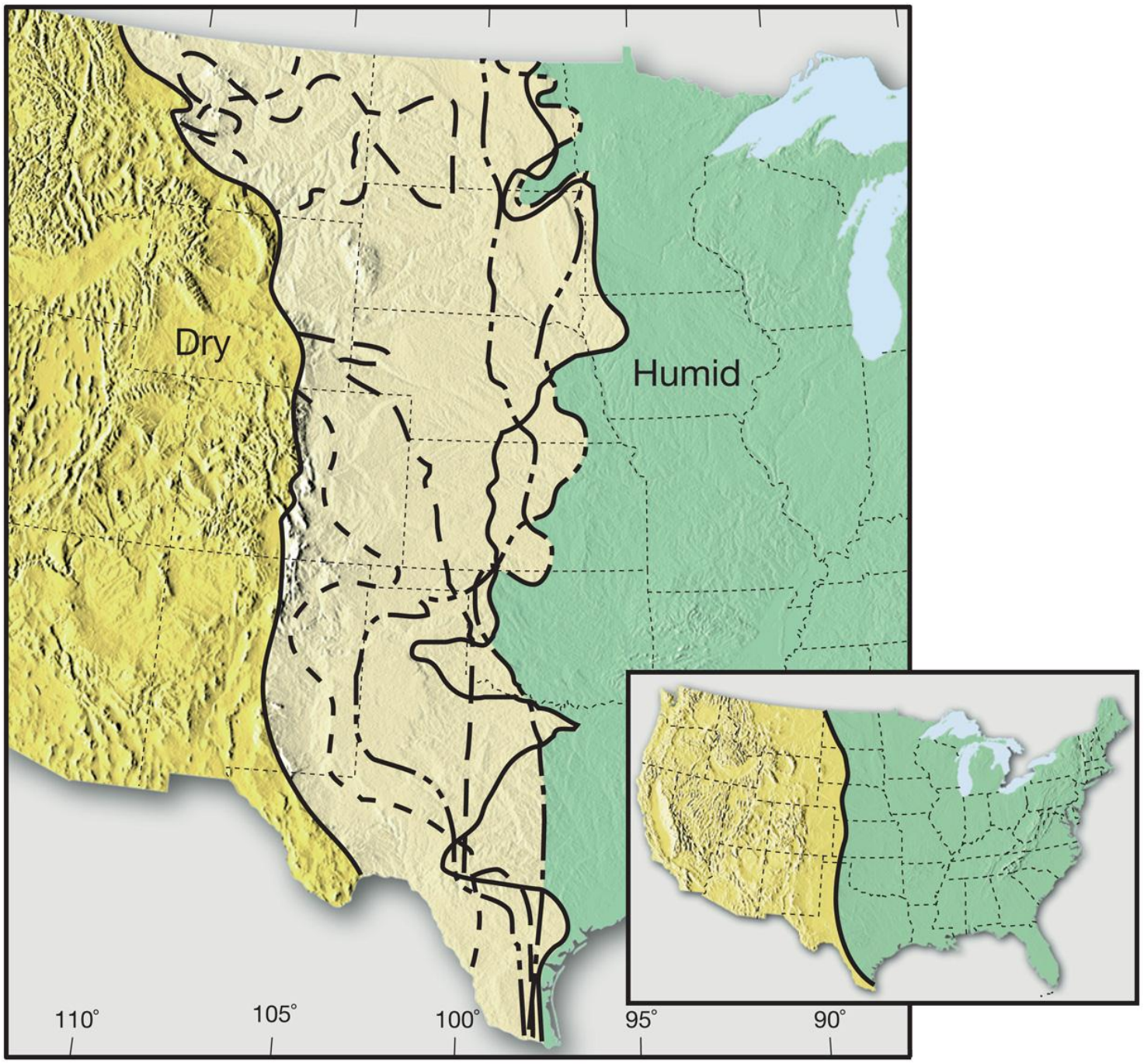

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(a)

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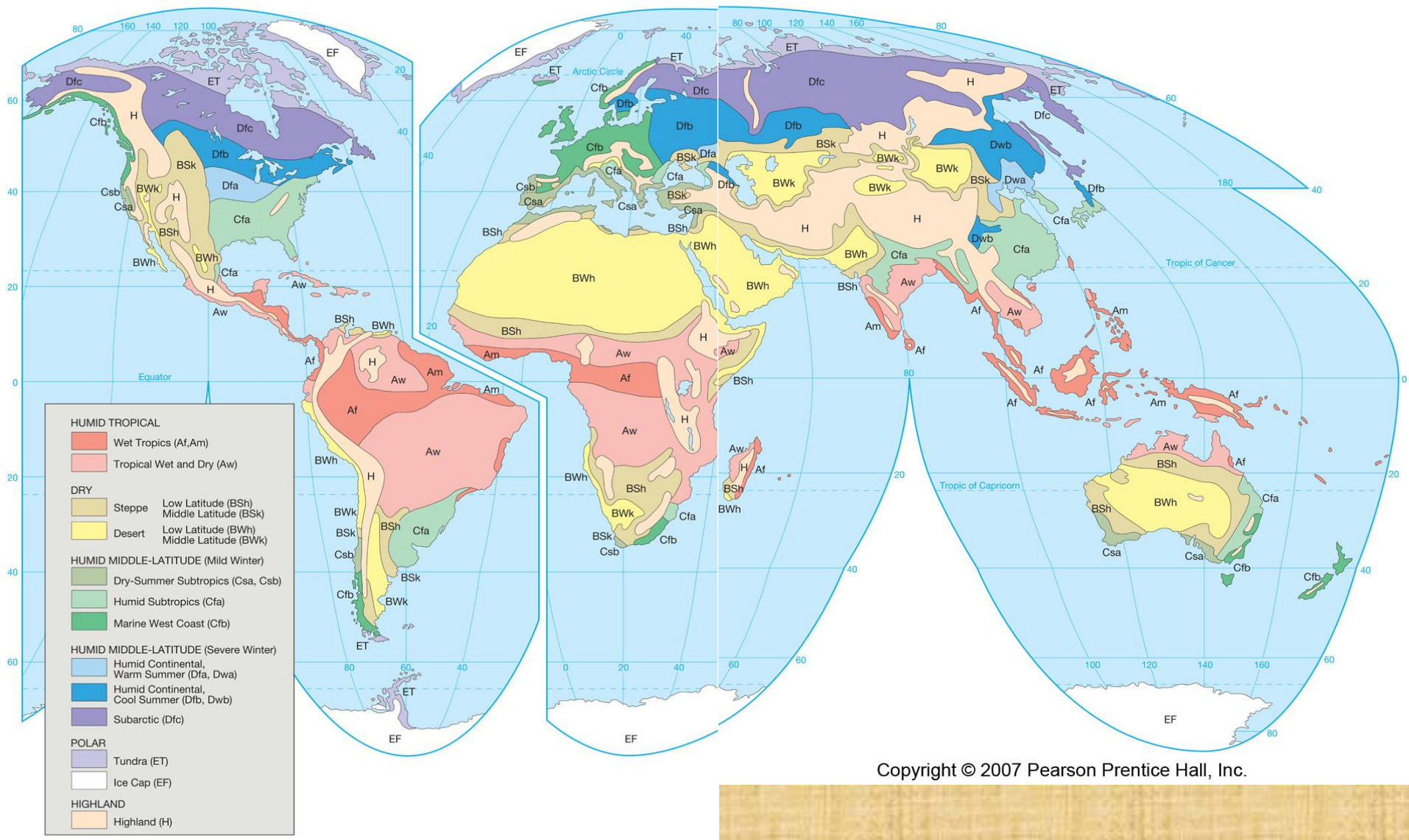

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Koppen 2nd and 3rd letter designations

A climates

m – short dry season (monsoon)

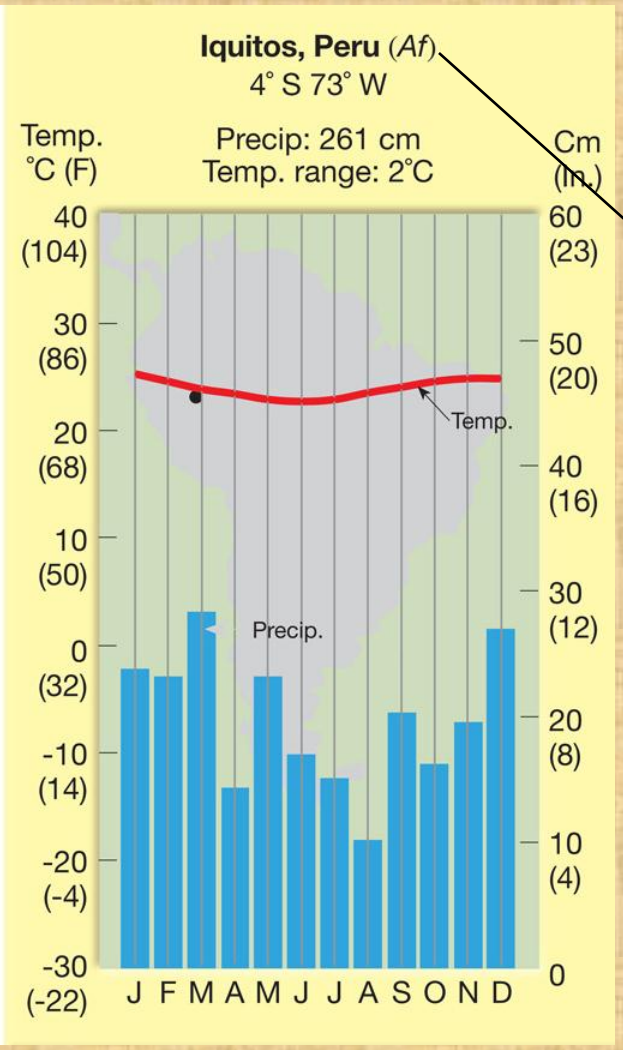
s – dry summer (rare)

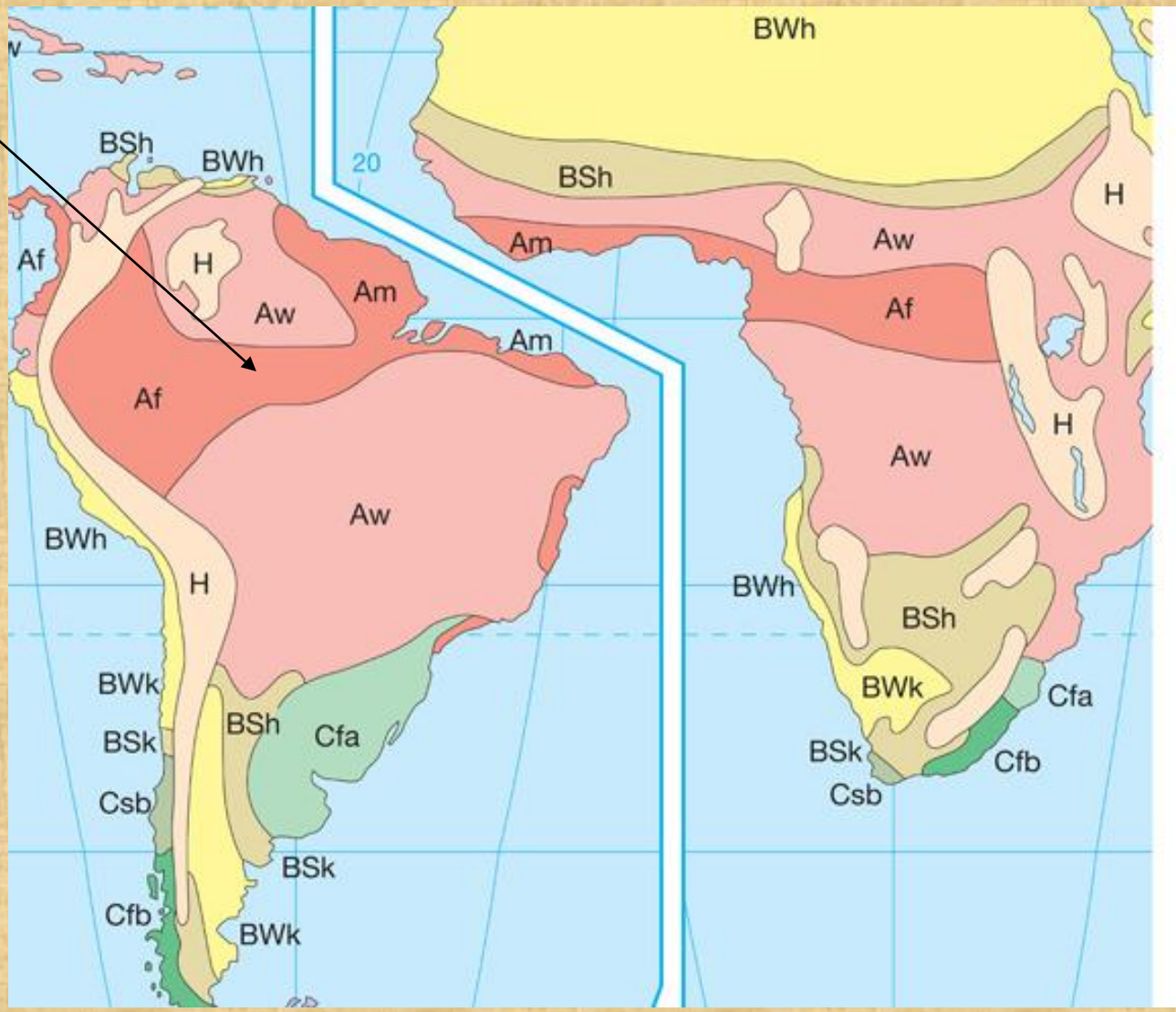
"Night is winter in the tropics"—

CLIMATE CLASSIFICATION

"Genetic" Classification	Köppen symbol
--warm, humid year-round --controls: ITCZ mT air masses	
--warm, humid year-round; short dry season --Controls: ITCZ, on-shore winds in rainy season	

--longer dry season than monsoon
--Controls:
ITCZ in rainy season (“summer”)
STH in dry season (“winter”)


Iquitos, Peru (Af)
4° S 73° W
Temp.
°C (F)
Precip: 261 cm
Temp. range: 2°C
Cm
(in.)
40 (104)
30 (86)
20 (68)
10 (50)
0 (32)
-10 (14)
-20 (-4)
-30 (-22)
60 (23)
50 (20)
40 (16)
30 (12)
20 (8)
10 (4)
0
Temp.
Precip.
J F M A M J J A S O N D


BWh
BSh
BWh
20
BSh
H
Am
Aw
Af
Af
H
Aw
Am
Am
Af
H
Aw
Aw
BWh
H
BWh
BSh
BWk
Cfa
BSh
Cfa
BSk
BWk
Csb
BSk
Cfb
Csb
BSk
Cfb
BWk

Monrovia, Liberia (*Am*)
6° N 10° W

Temp. °C (F)

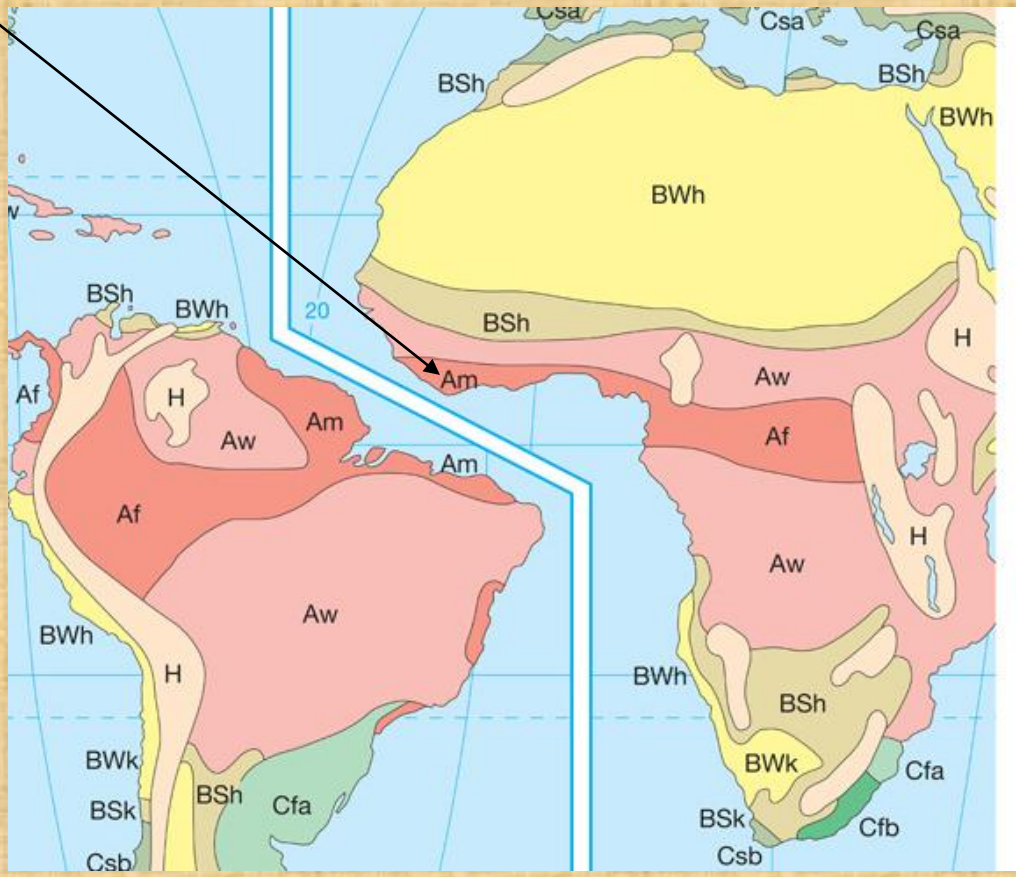
Precip: 300 cm
Temp. range: 2°C

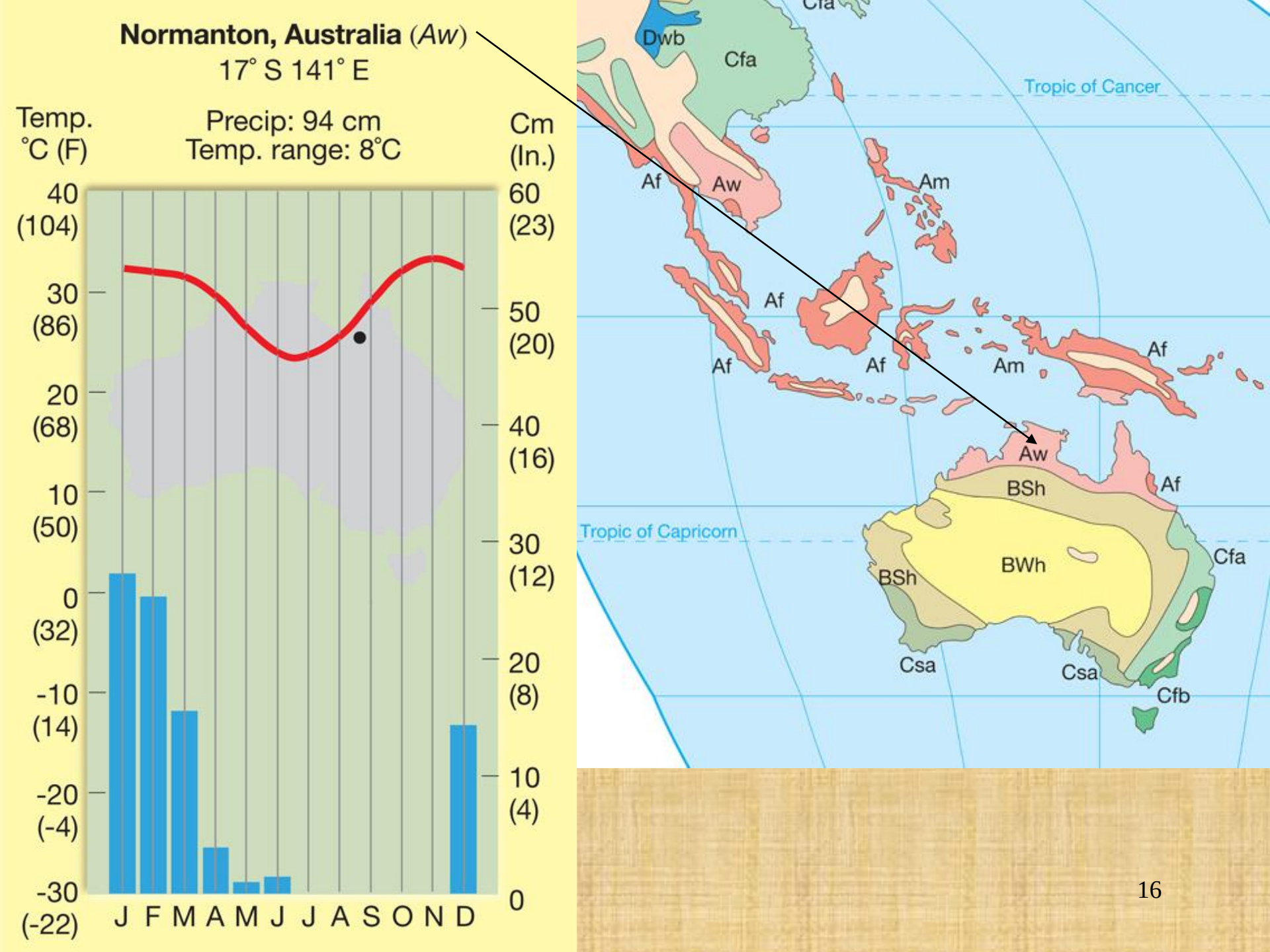
Cm (In.)

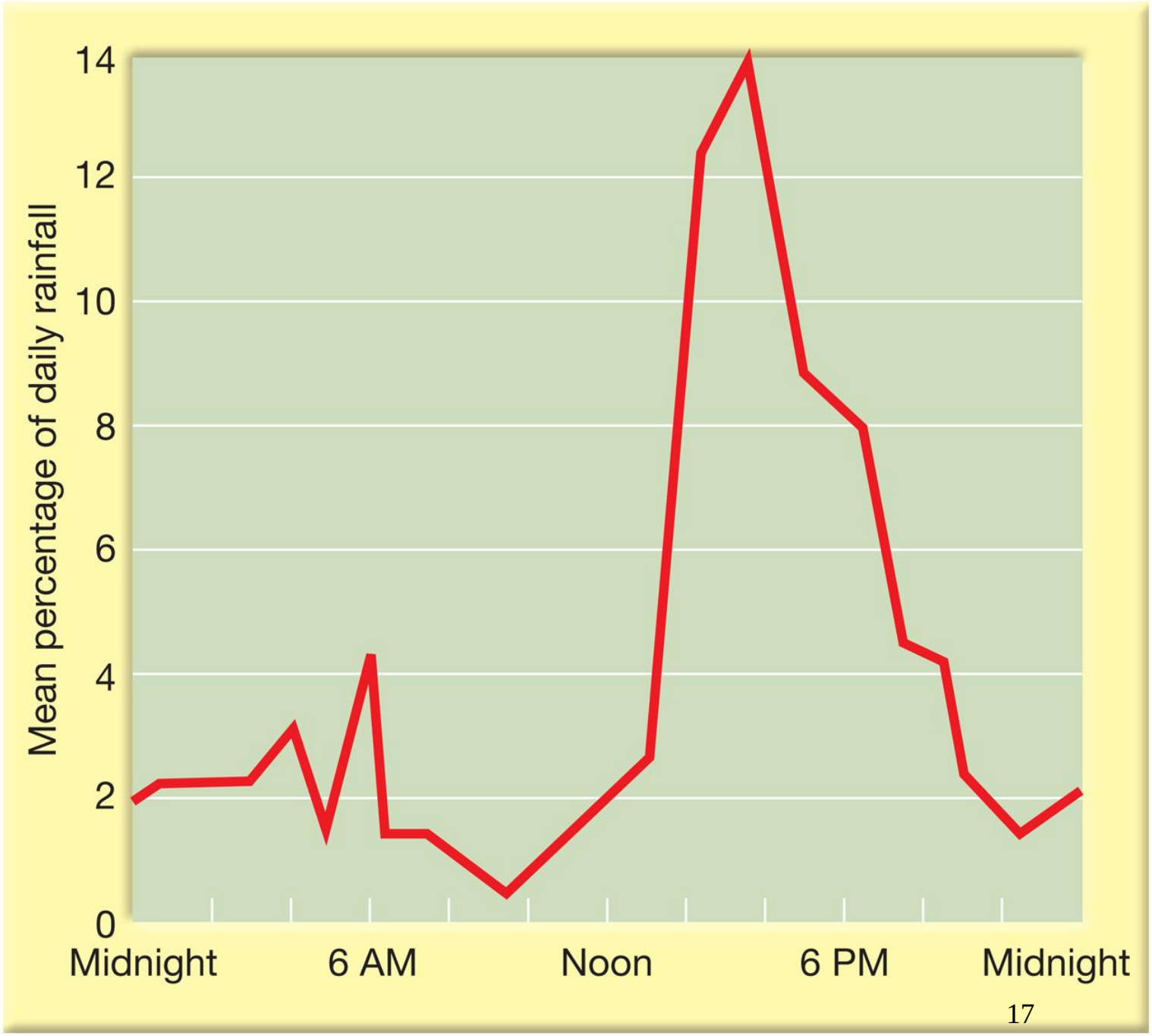
40 (104)
30 (86)
20 (68)
10 (50)
0 (32)
-10 (14)
-20 (-4)
-30 (-22)

60 (23)
50 (20)
40 (16)
30 (12)
20 (8)
10 (4)
0

J F M A M J J A S O N D




Normanton, Australia (Aw)
17° S 141° E
Temp.
°C (F)
Precip: 94 cm
Temp. range: 8°C
Cm
(In.)
40 (104)
30 (86)
20 (68)
10 (50)
0 (32)
-10 (14)
-20 (-4)
-30 (-22)
60 (23)
50 (20)
40 (16)
30 (12)
20 (8)
10 (4)
0
J F M A M J J A S O N D
Dwb
Cfa
Tropic of Cancer
Af
Aw
Am
Af
Af
Af
Am
Af
Aw
BSh
Af
Tropic of Capricorn
BWh
Cfa
BSh
Csa
Csa
Cfb



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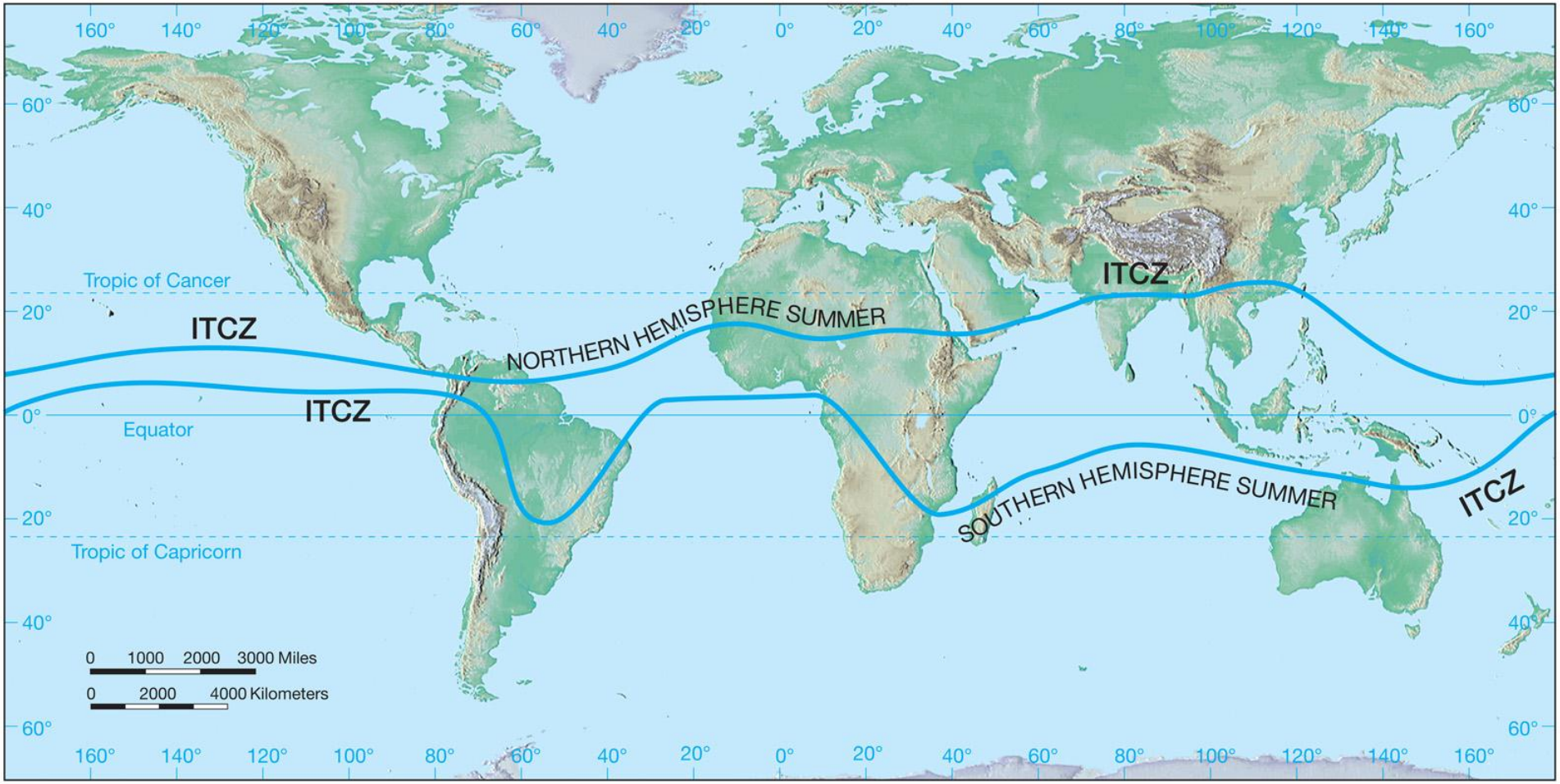
Main control on A climates:



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B climates

S– potential evapotranspiration exceeds precipitation

W– potential evapotranspiration is 2x precipitation

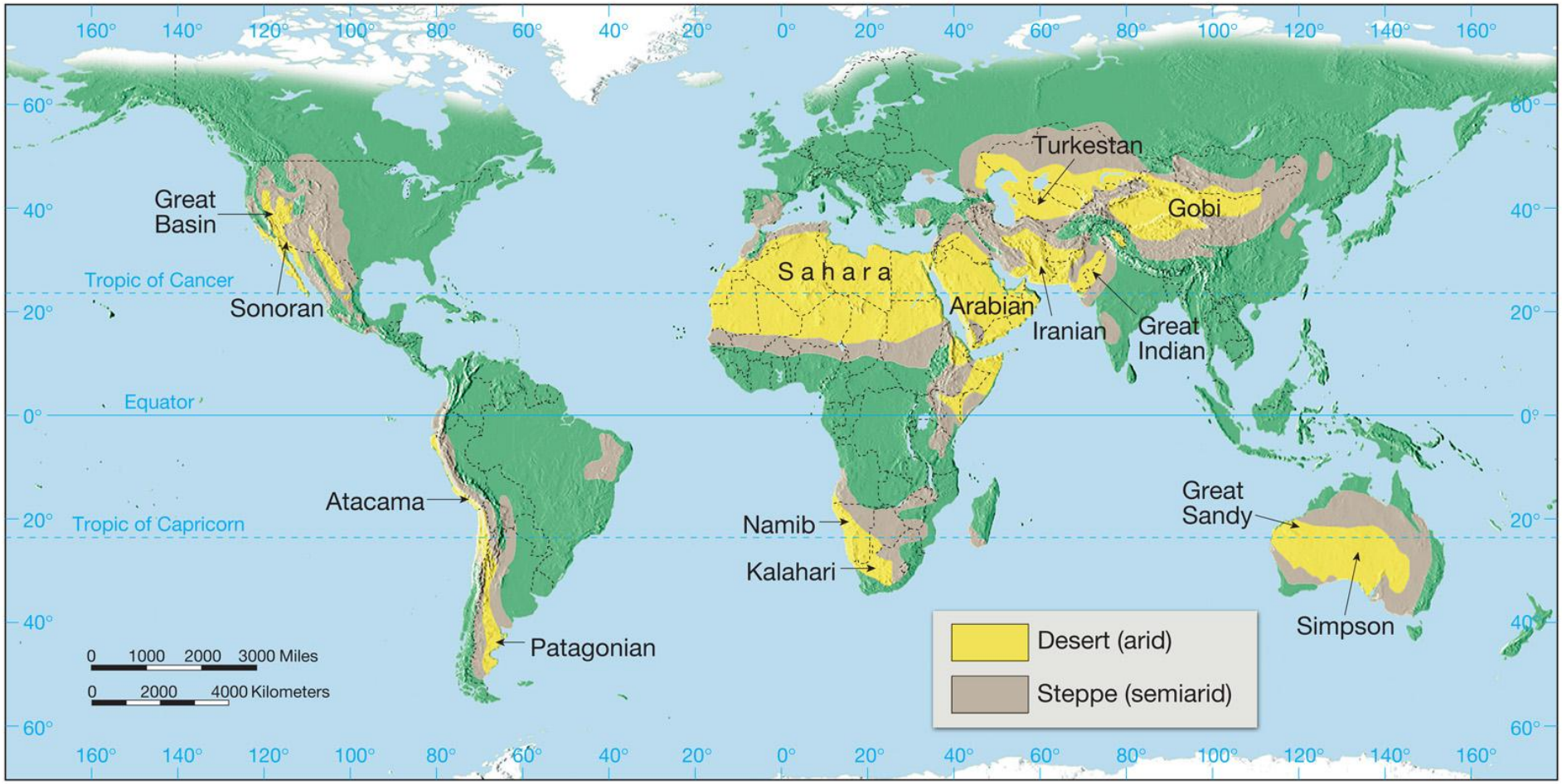
--hot, dry year round
--Controls: STH
cT air masses

--not as dry as #4
--Controls: same as #4
-- seasonal rainfall due
to either ITCZ or Mid-latitude
cyclones

--Controls --cold ocean currents
--e.g. Atacama Desert, Chile

--colder than #5 due to
higher latitude
--Controls: long distance
to moisture source; rainshadows

--similar to #7, but with more
summer *convective* rainfall



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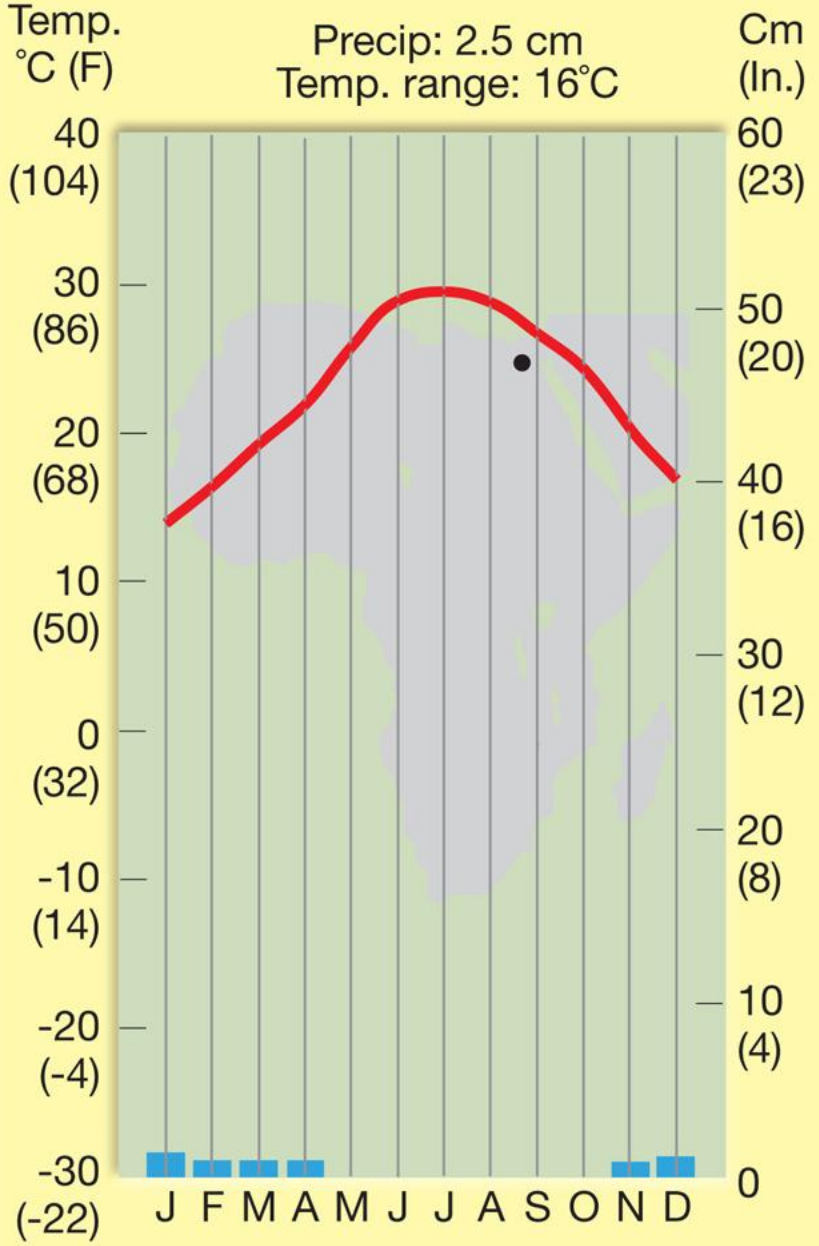
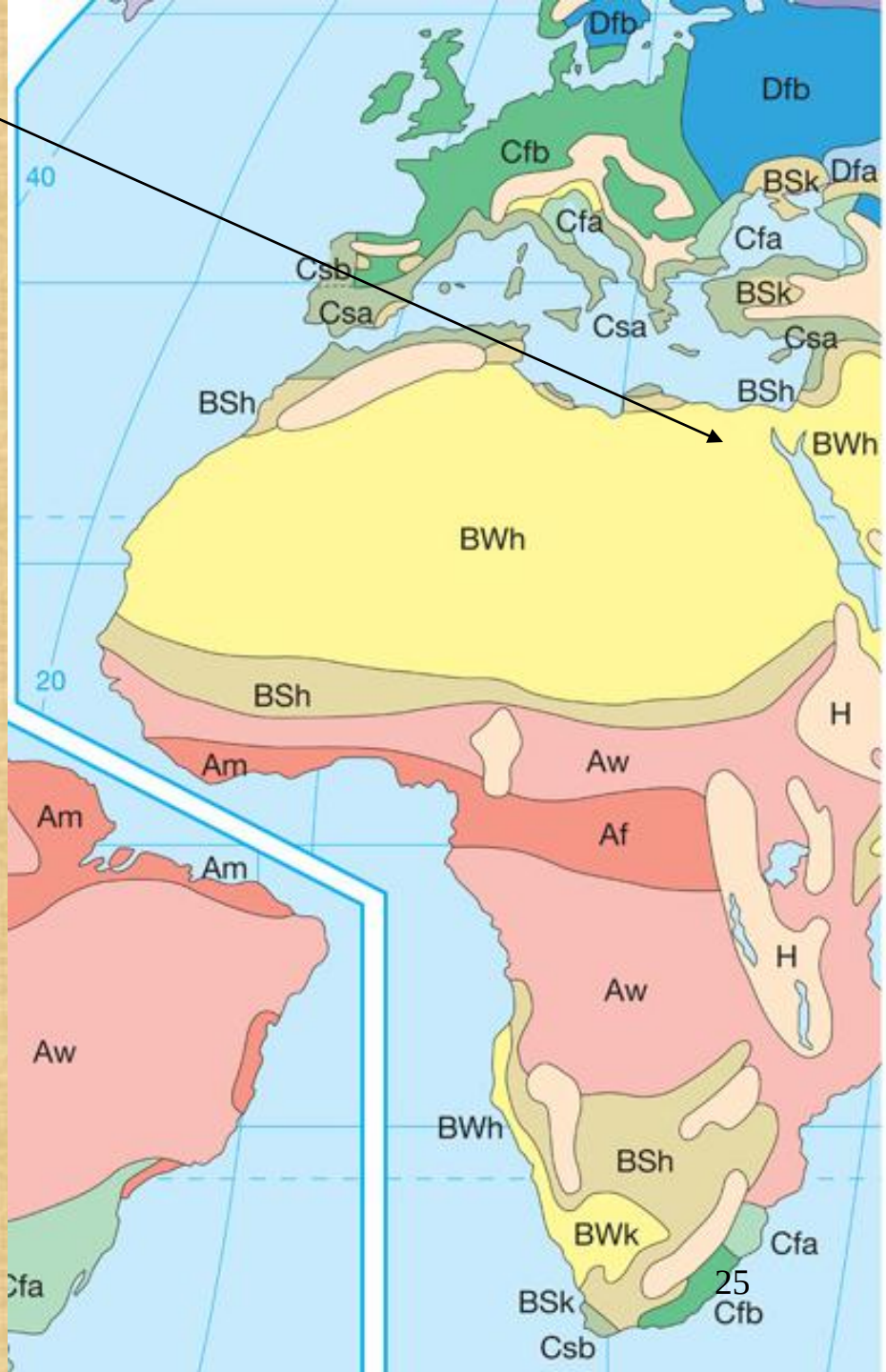
Cairo, Egypt *(BWh)*
31° N 31° E

Precip: 2.5 cm
Temp. range: 16°C





Monterey, Mexico *(BSh)*
26° N 100° W

Temp. °C (F)

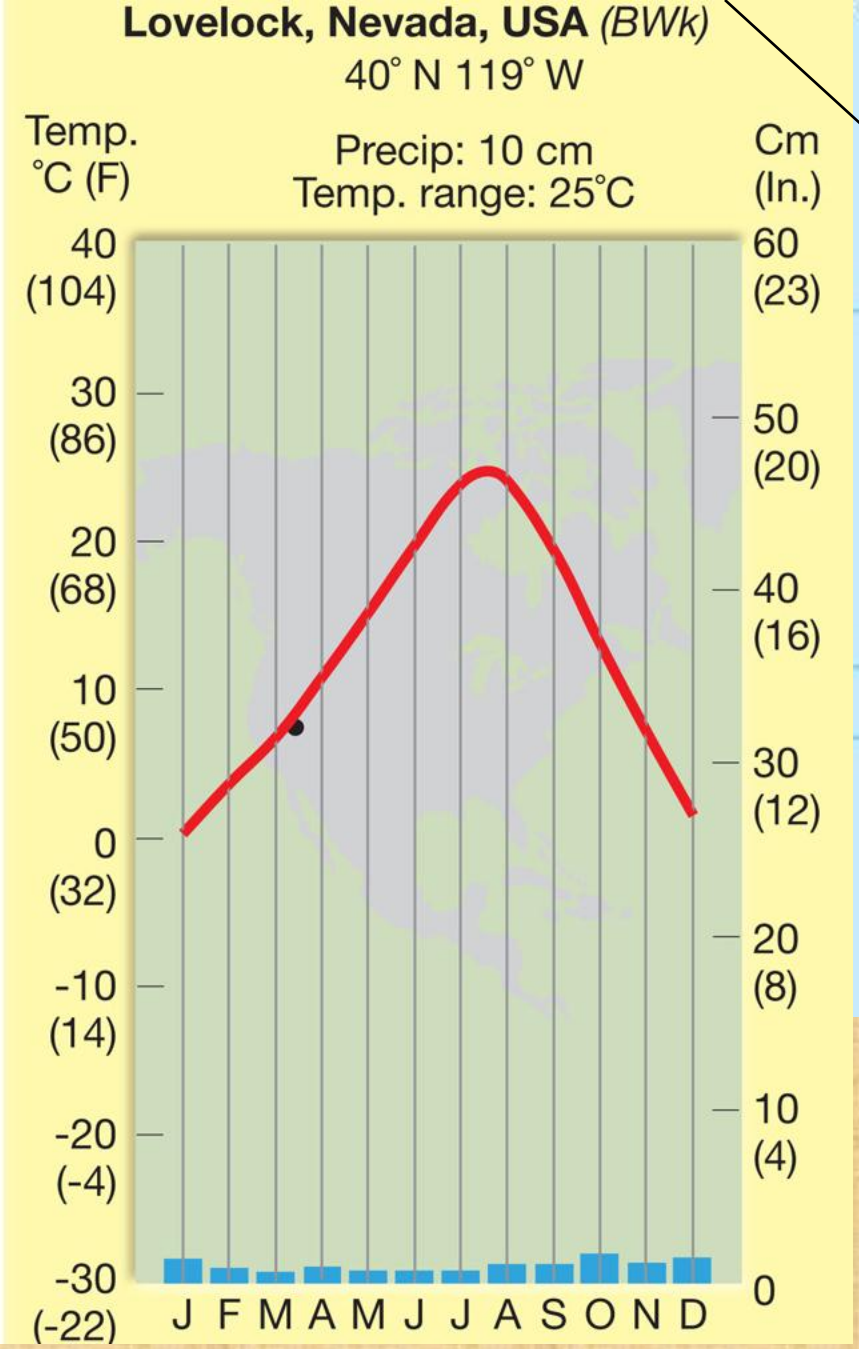
Precip: 51 cm
Temp. range: 14°C

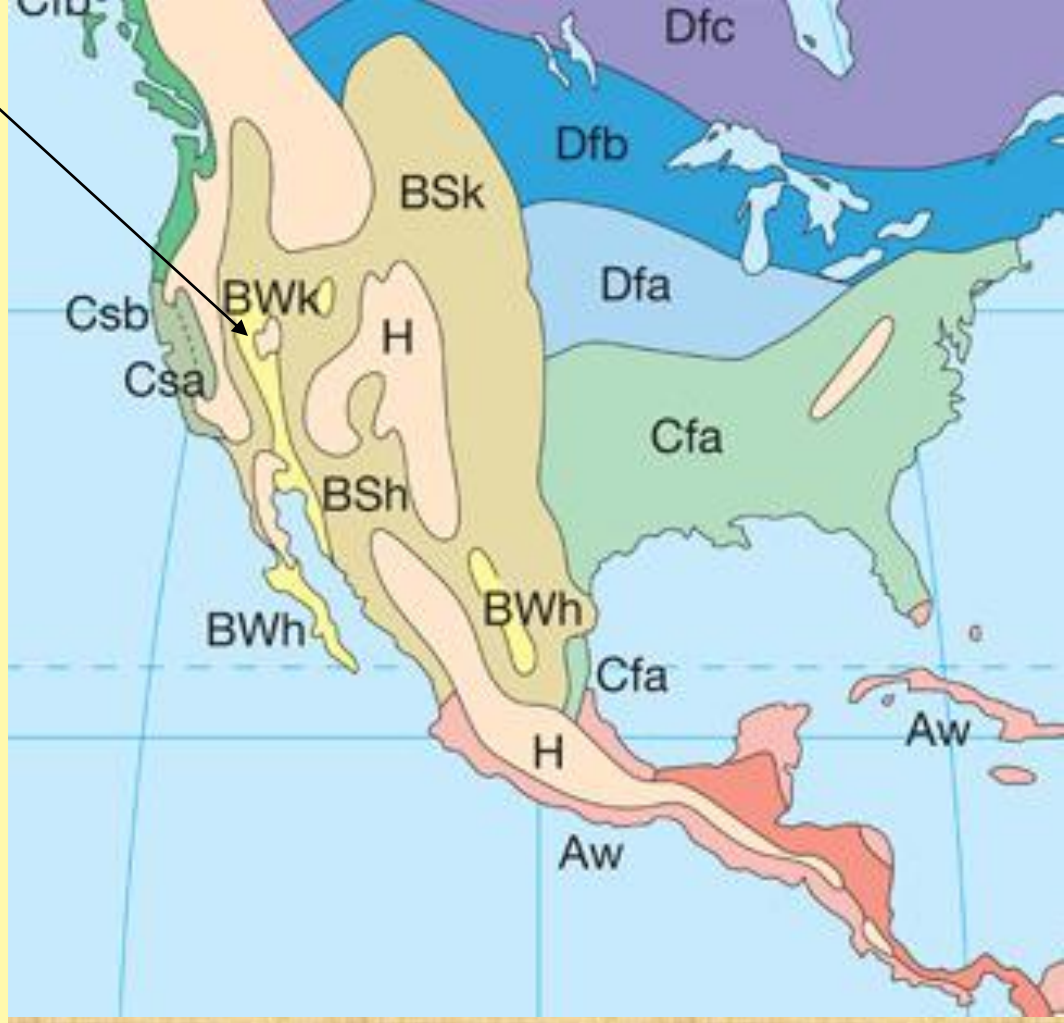
Cm (In.)

40 (104)
30 (86)
20 (68)
10 (50)
0 (32)
-10 (14)
-20 (-4)
-30 (-22)

60 (23)
50 (20)
40 (16)
30 (12)
20 (8)
10 (4)
0

J F M A M J J A S O N D


Lovelock, Nevada, USA (BWk)
40° N 119° W
Temp. °C (F)
Precip: 10 cm
Temp. range: 25°C
Cm (In.)
40 (104)
30 (86)
20 (68)
10 (50)
0 (32)
-10 (14)
-20 (-4)
-30 (-22)
60 (23)
50 (20)
40 (16)
30 (12)
20 (8)
10 (4)
0
J F M A M J J A S O N D

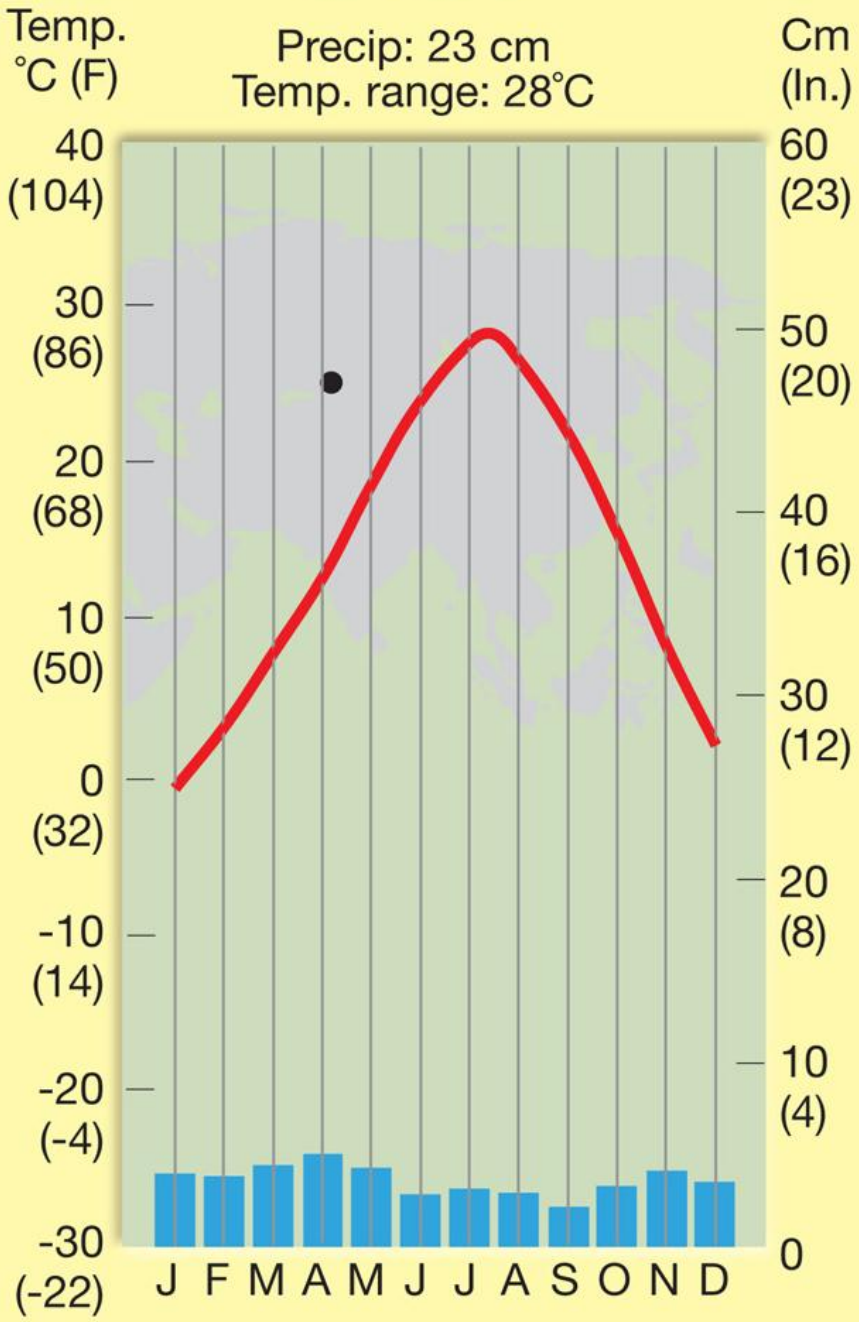

Dfc
Dfb
BSk
Dfa
BWk
Csb
Csa
H
Cfa
BSh
BWh
BWh
Cfa
H
Aw
Aw

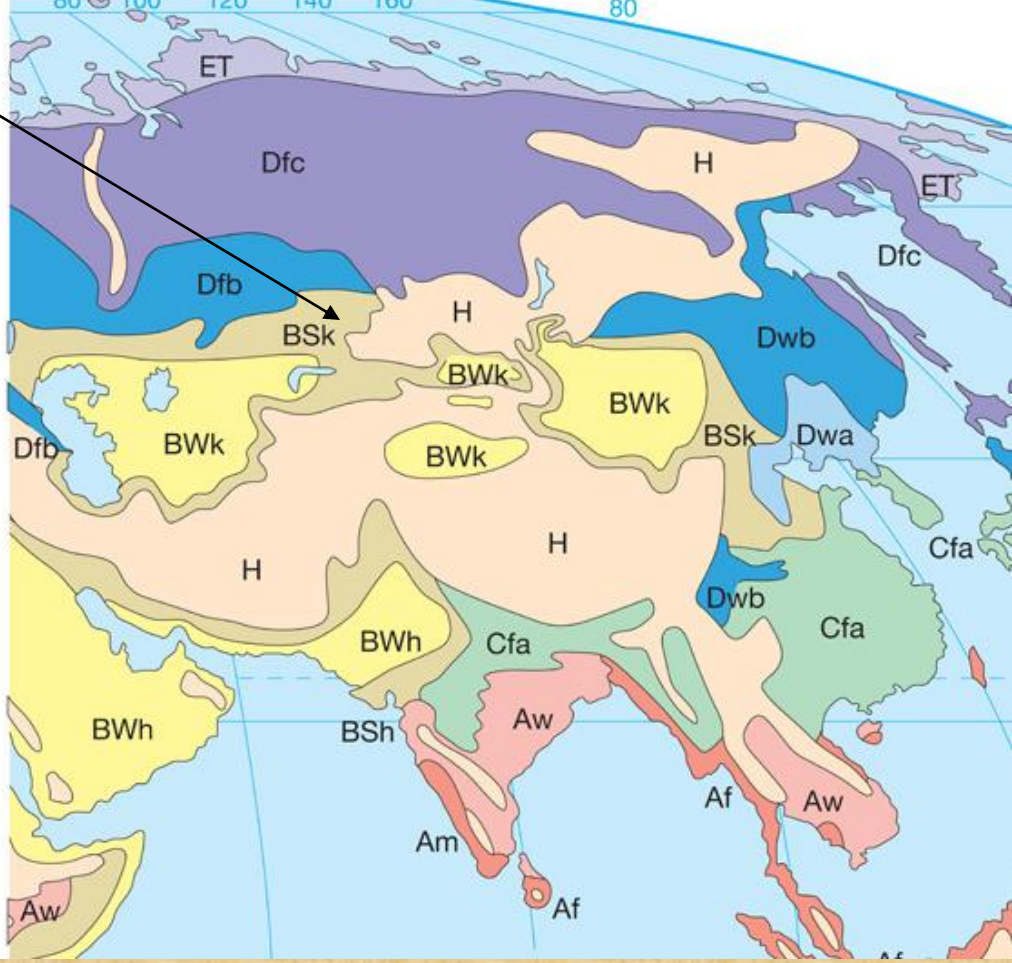
Semipalatinsk, Russia *(BSk)*

50° N 80° E

Precip: 23 cm

Temp. range: 28°C





THANK YOU