

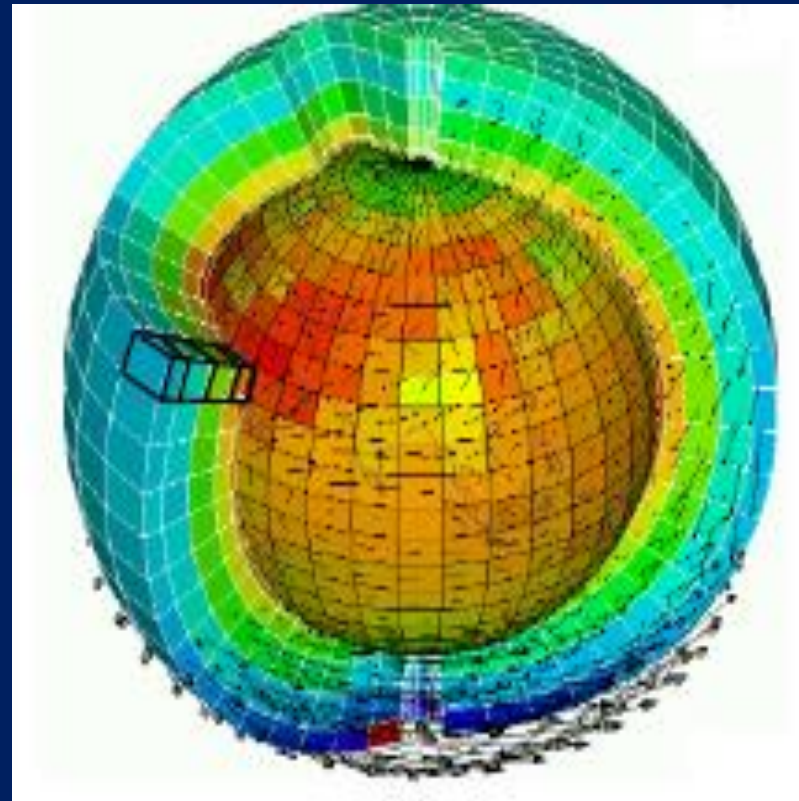
De la modélisation de l'atmosphère aux modèles du système Terre.

F. Cheruy , E. Vignon , A. Sima, A. Idelkadi
Laboratoire de Météorologie Dynamique , CNRS

The development of climate models, past, present and future

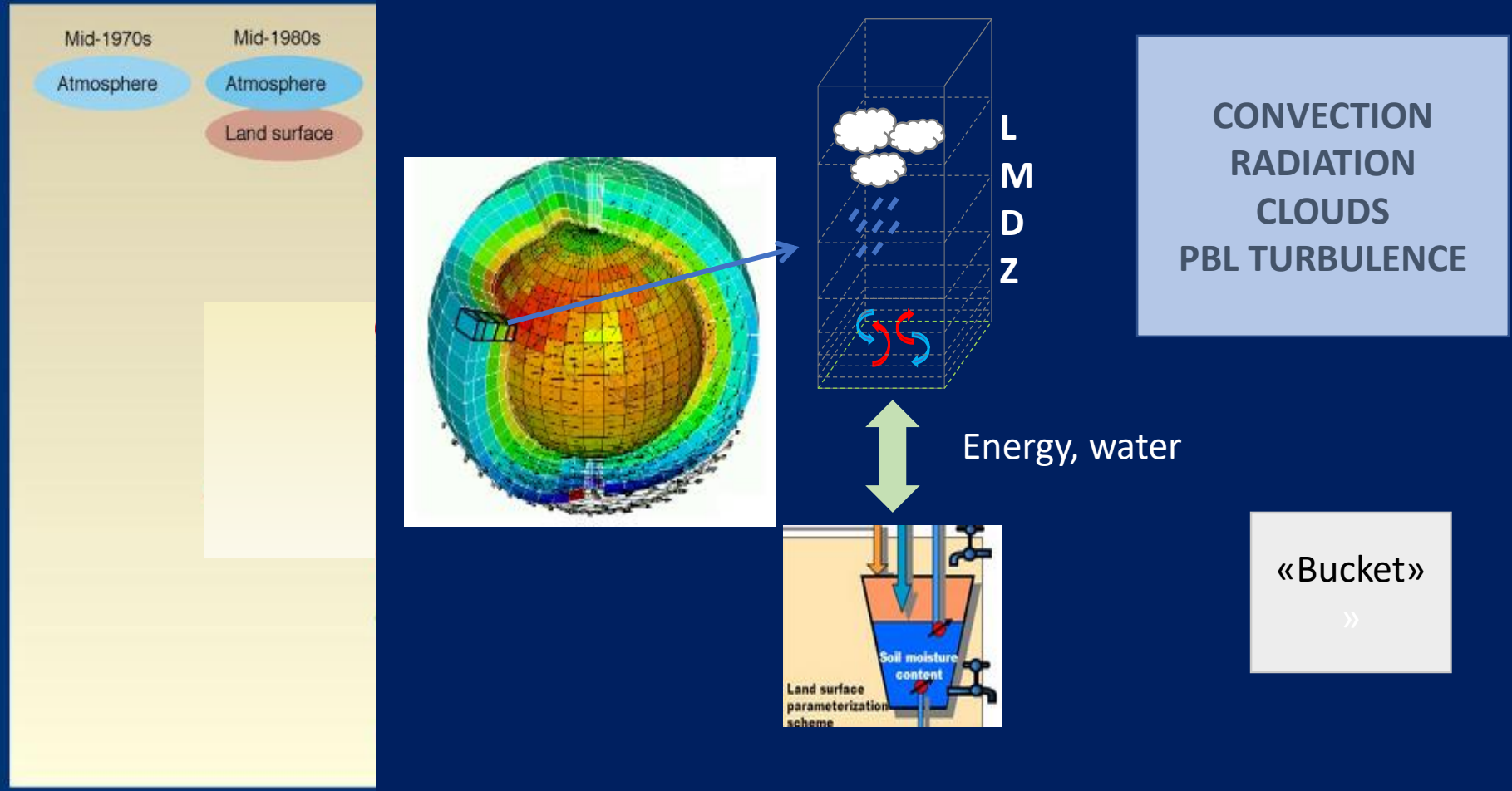
Mid-1970s

Atmosphere

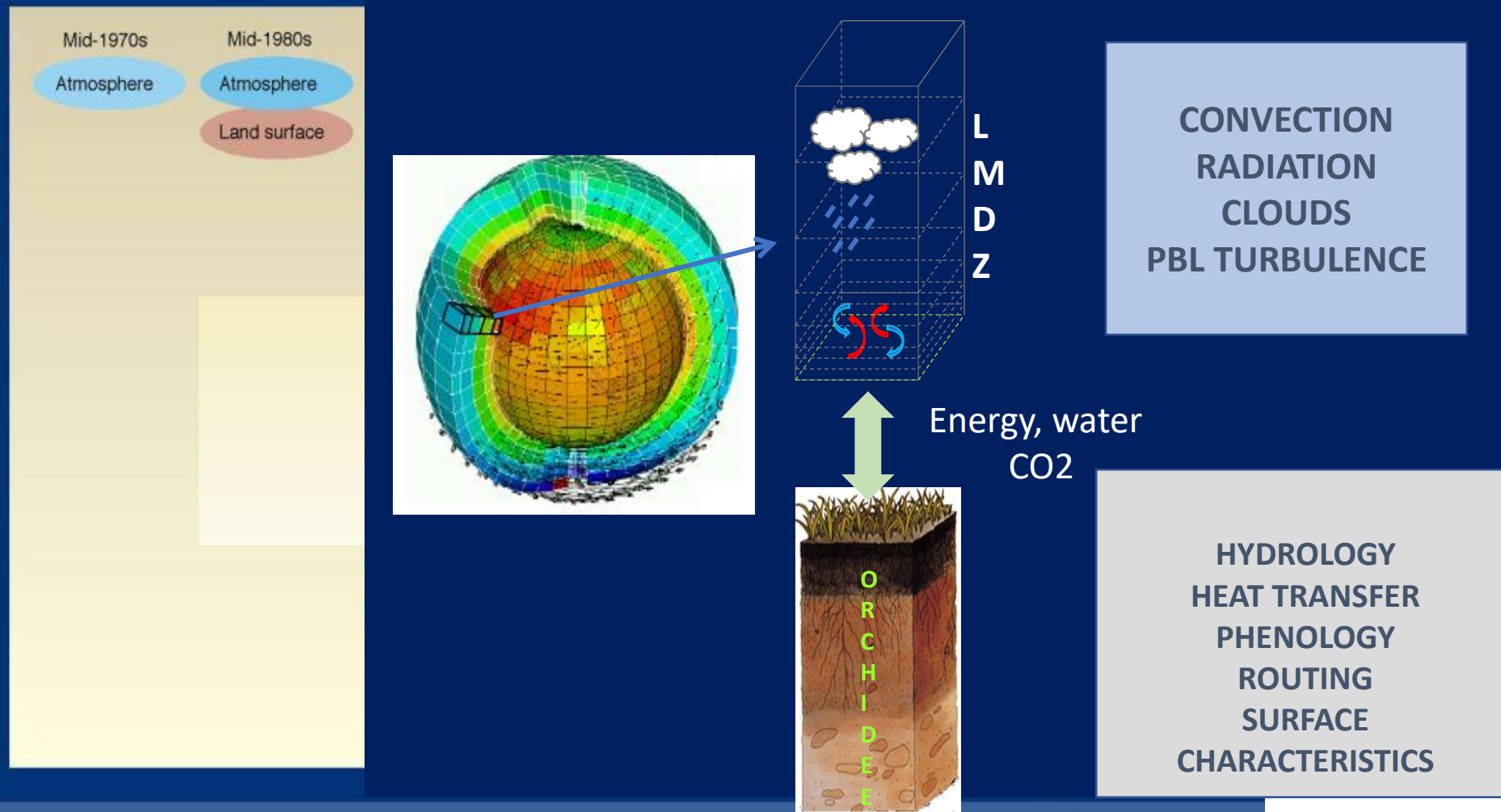


WG1 - TS BOX 3
FIGURE 1

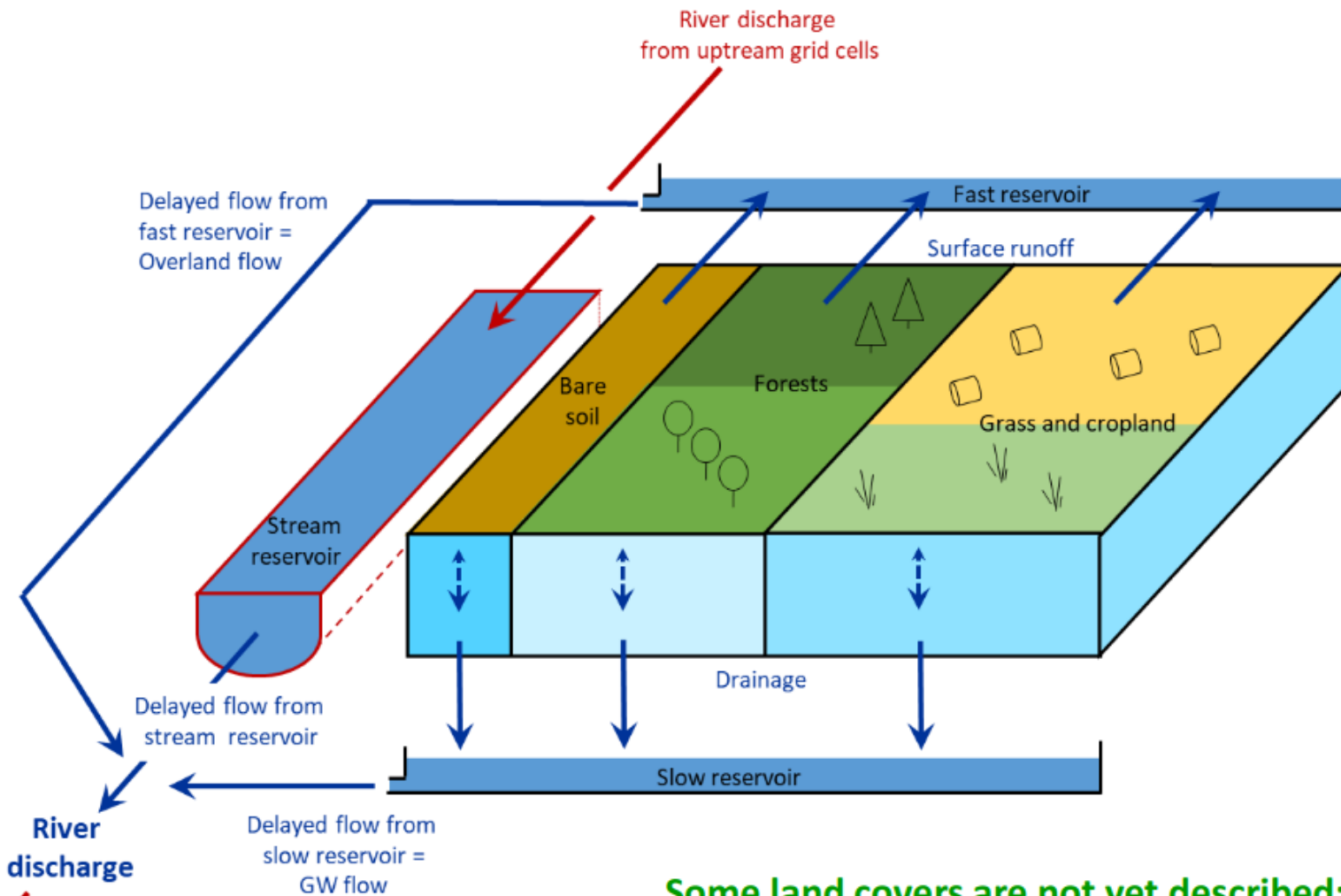
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The development of climate models, past, present and future



Land surface hydrology

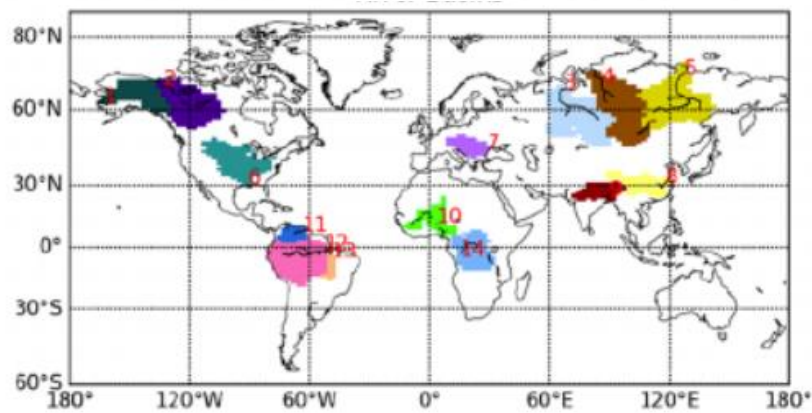
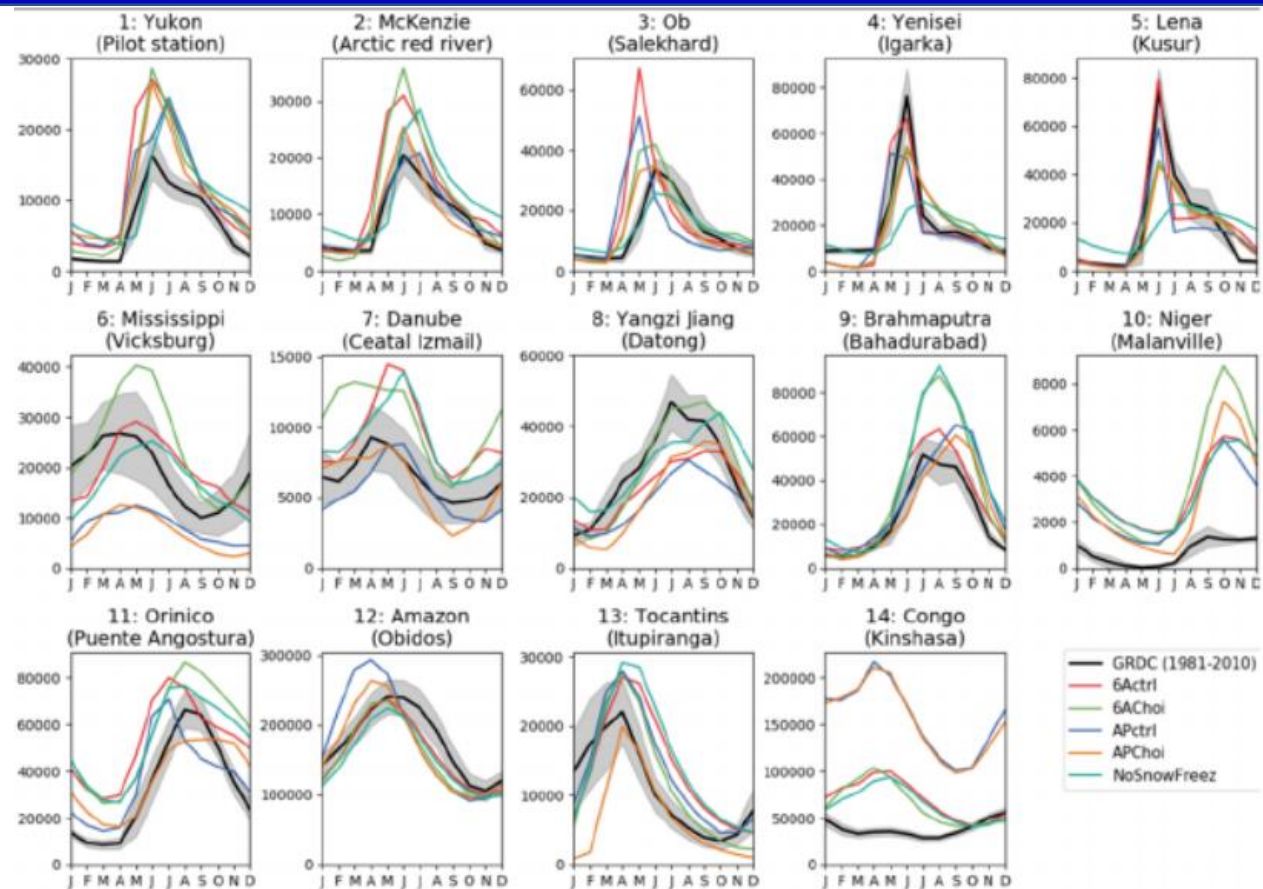
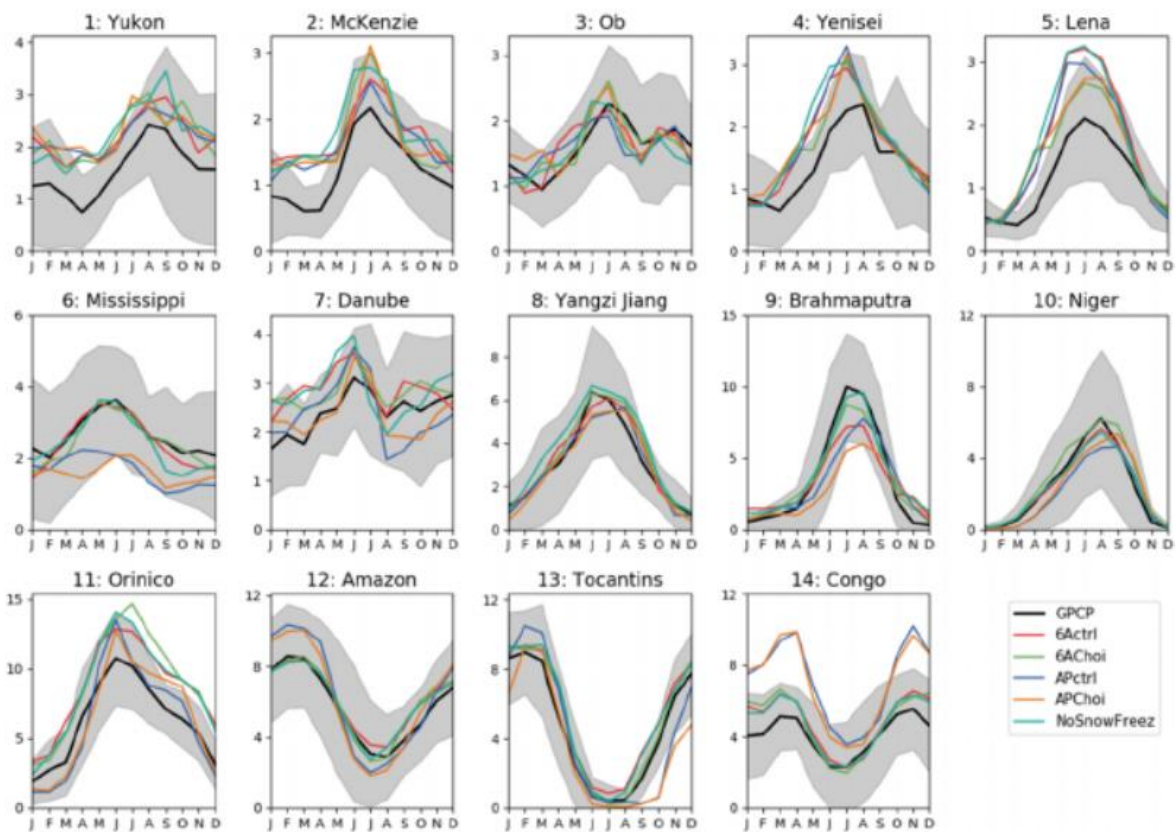


Some land covers are not yet described:
mixed biomes, shrubs, mosses,
urban areas, lakes, glaciers (very simplified)

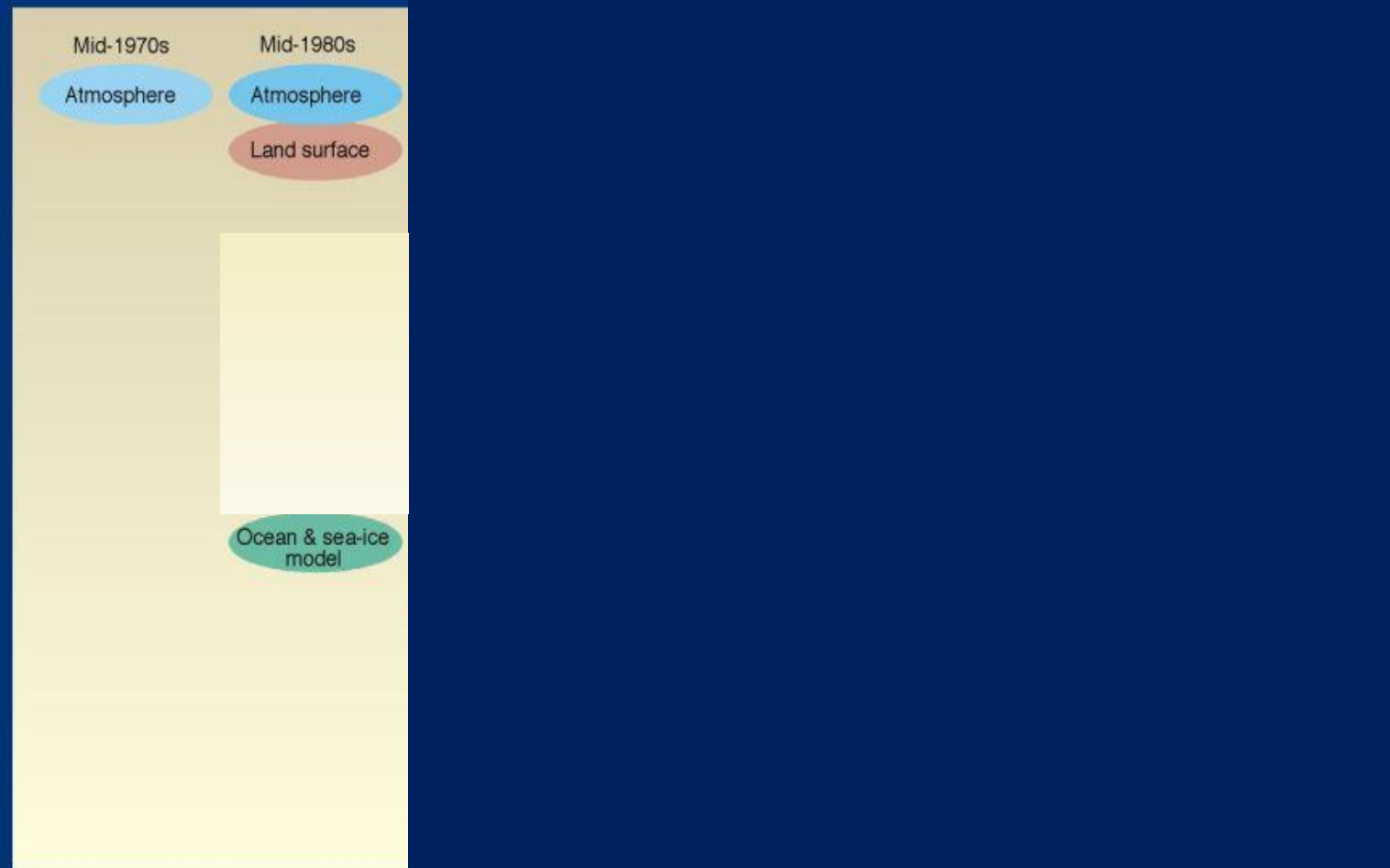
Courtesy A. Ducharne

To downstream
grid cell

Earth System Model : Atmosphere-Land surface model



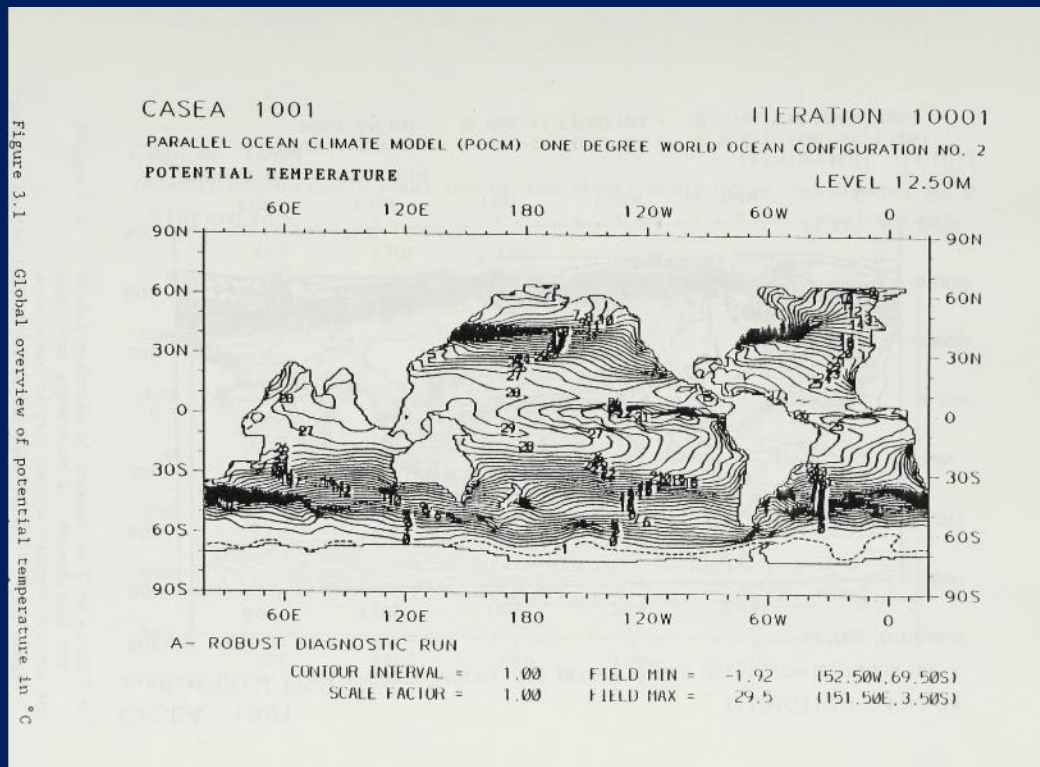
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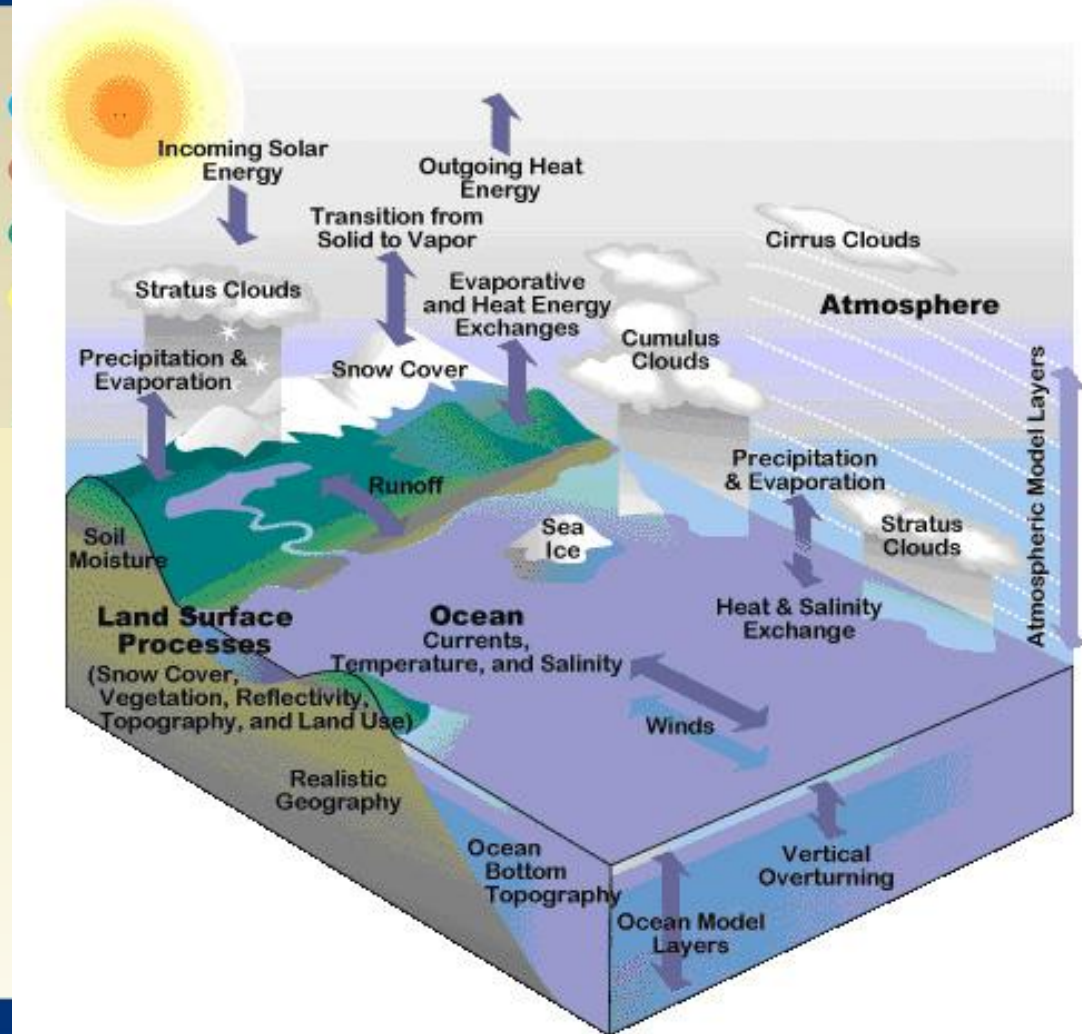
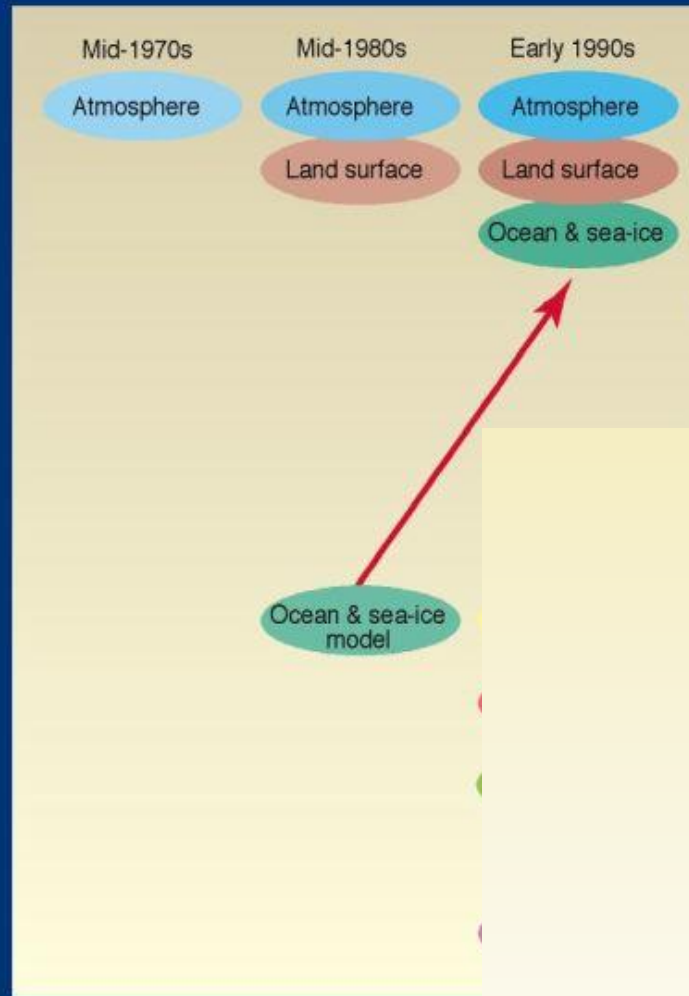
The development of climate models, past, present and future



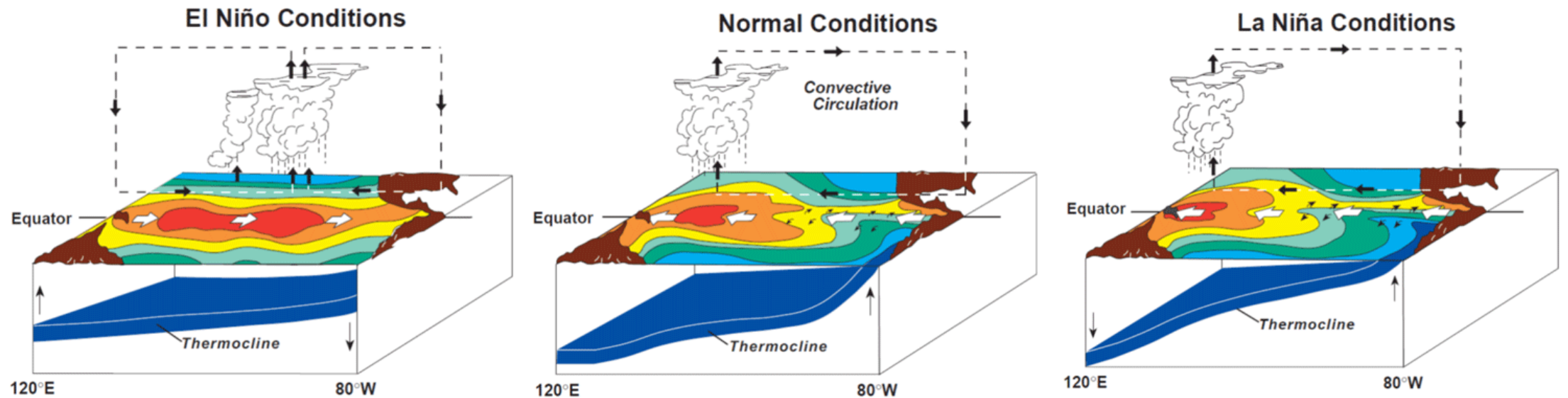
Figure 3.1 Global overview of potential temperature in °C



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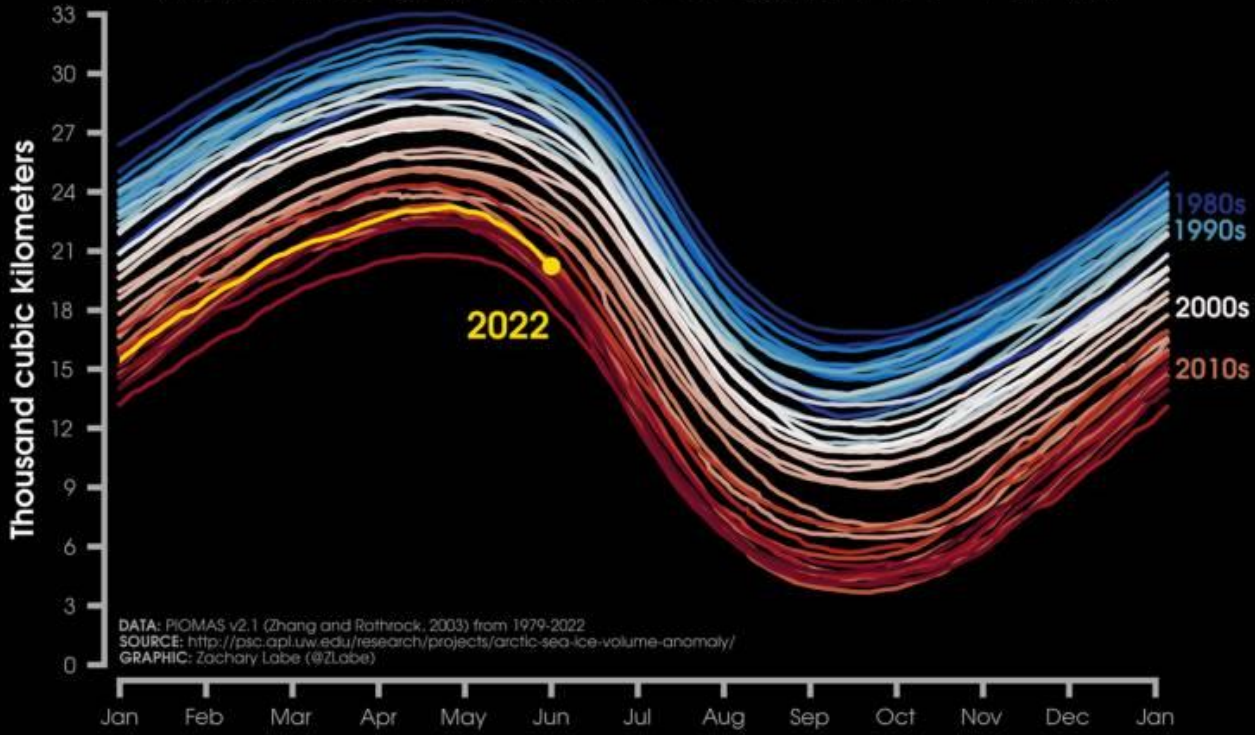


El Niño: Un phénomène couplé Océan-Atmosphère



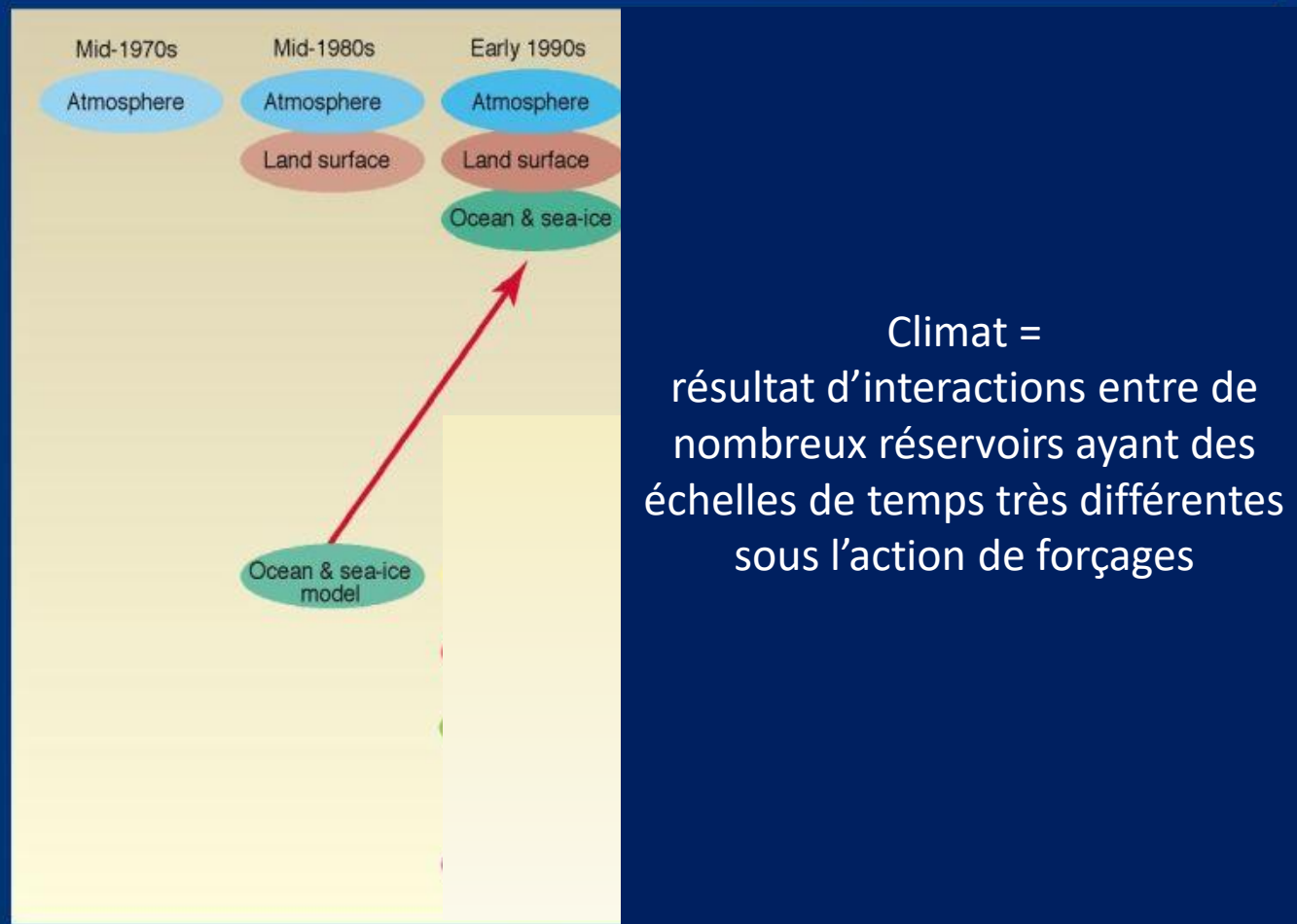


ARCTIC SEA ICE VOLUME BY YEAR



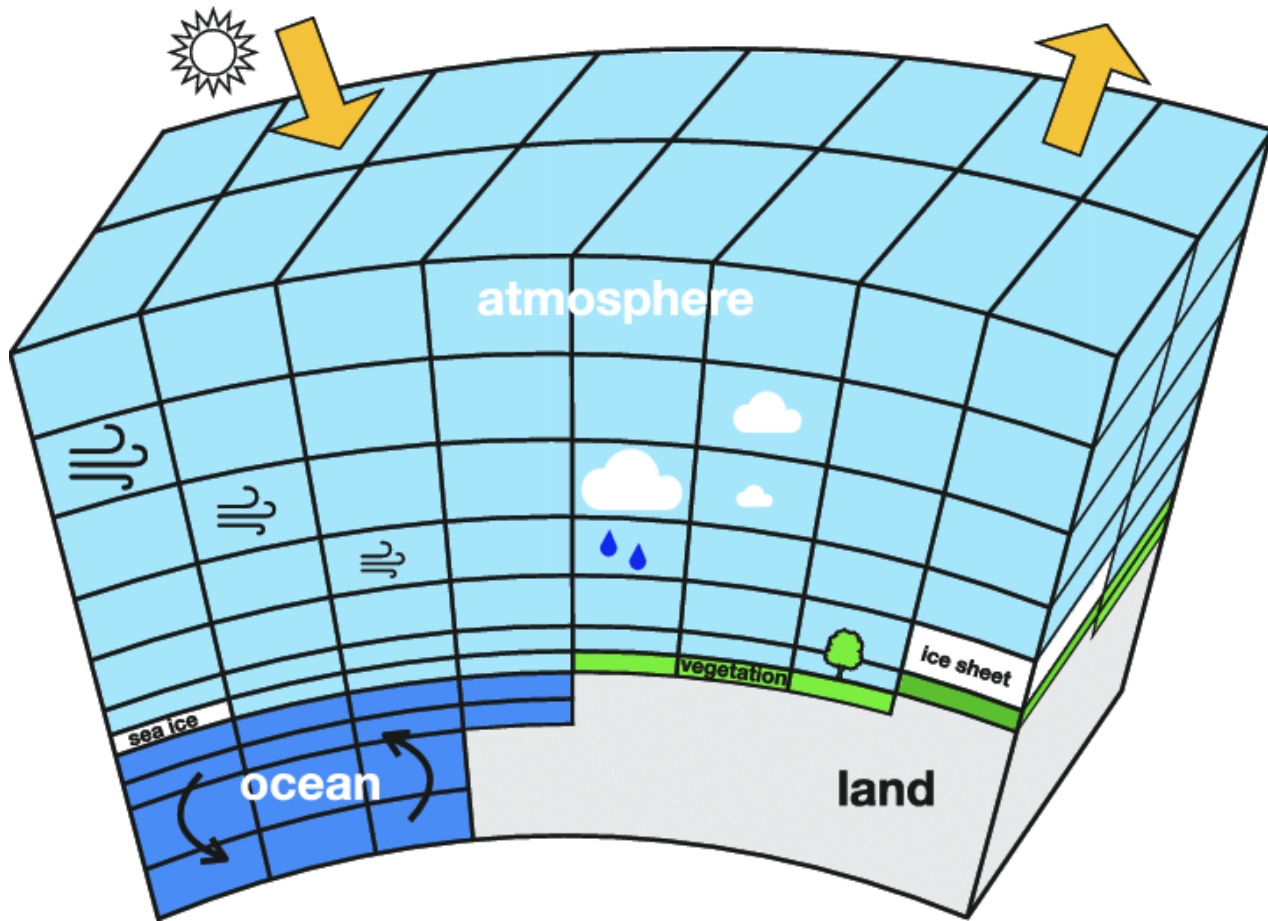
DATA: PIOMAS v2.1 (Zhang and Rothrock, 2003) from 1979-2022
SOURCE: <http://psc.apl.uw.edu/research/projects/arctic-sea-ice-volume-anomaly/>
GRAPHIC: Zachary Labe (@ZLabe)

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FIGURE 1

Un ESM: Modèle numérique des 5 composantes essentielles qui évoluent conjointement sous l'action de forçages.



Concentrations des gaz à effet de serre (CO₂, CH₄ ...)

La charge en aérosols

La répartition de la végétation

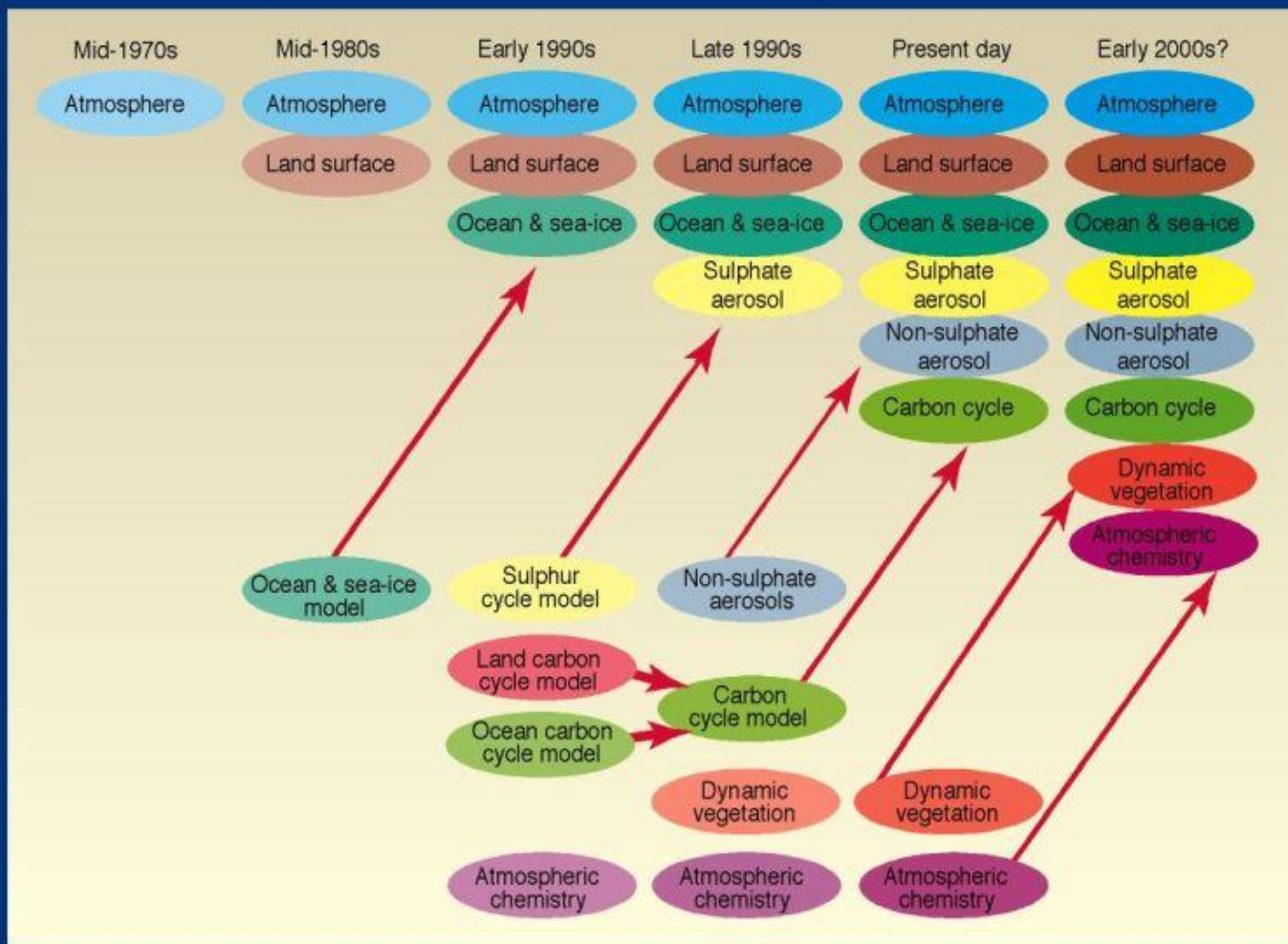
Les éruptions volcaniques

l'énergie solaire

Occupation des sols

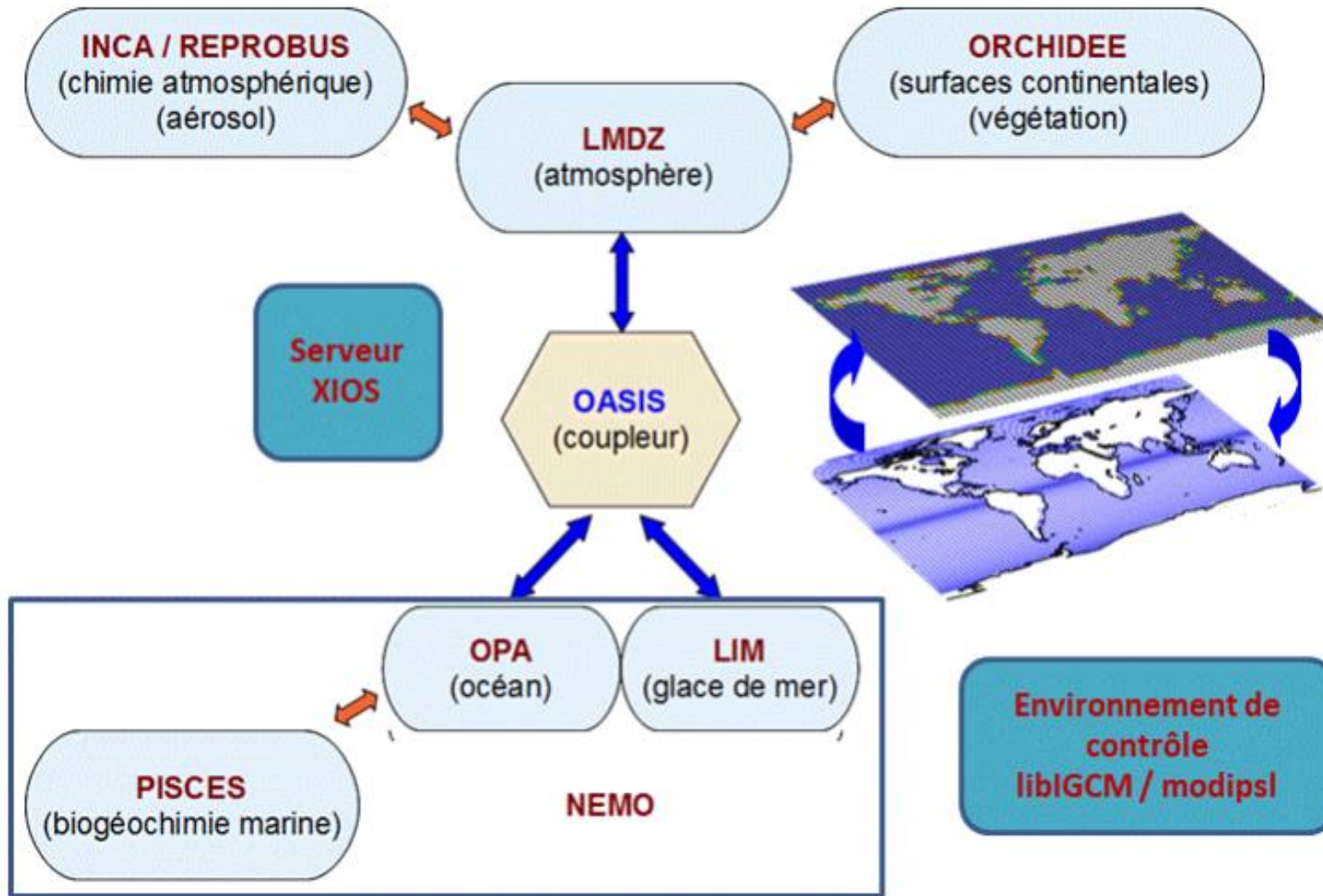
anthropisation

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WG1 - TS BOX 3
FIGURE 1

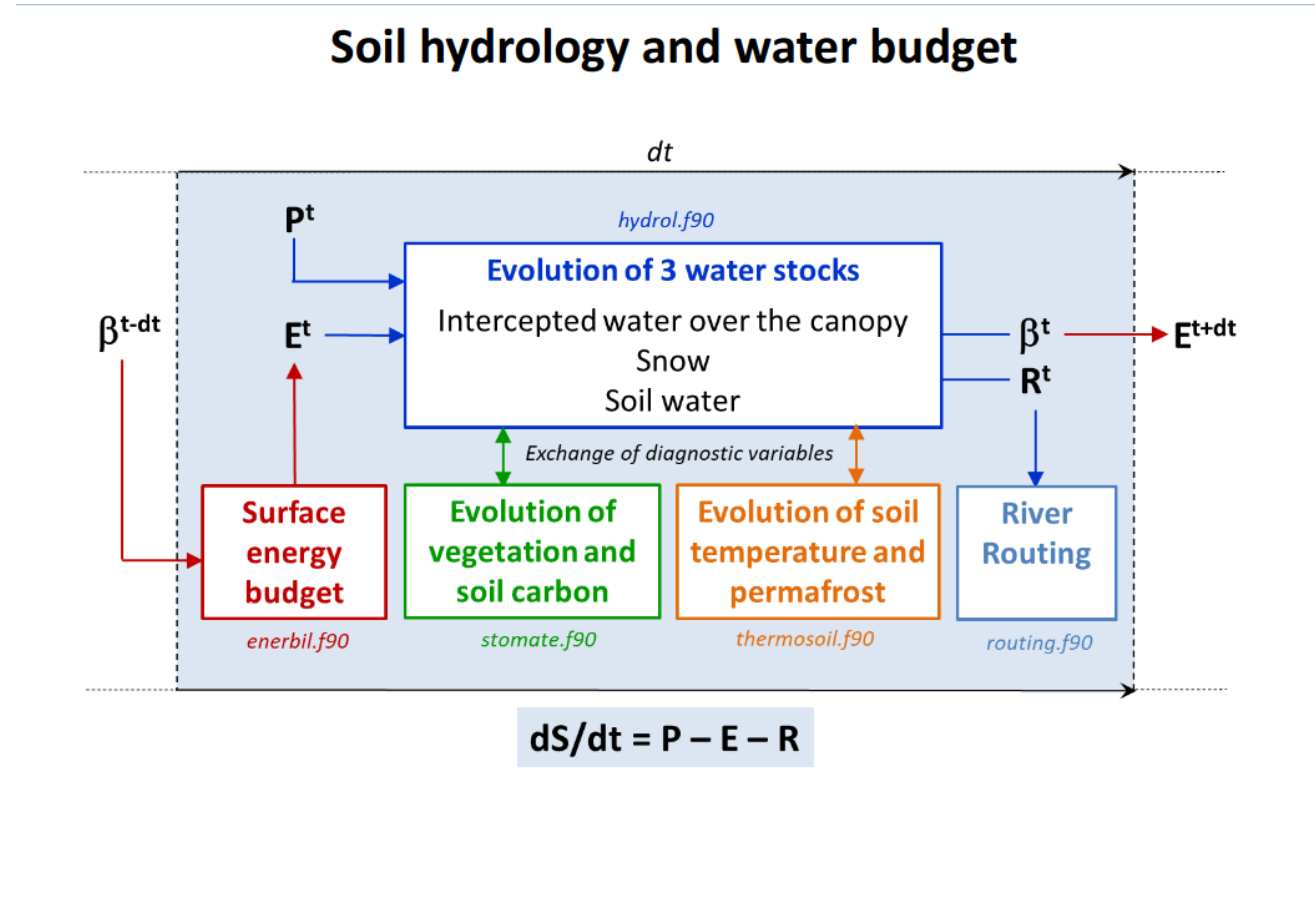
Le modèle de climat de l'IPSL



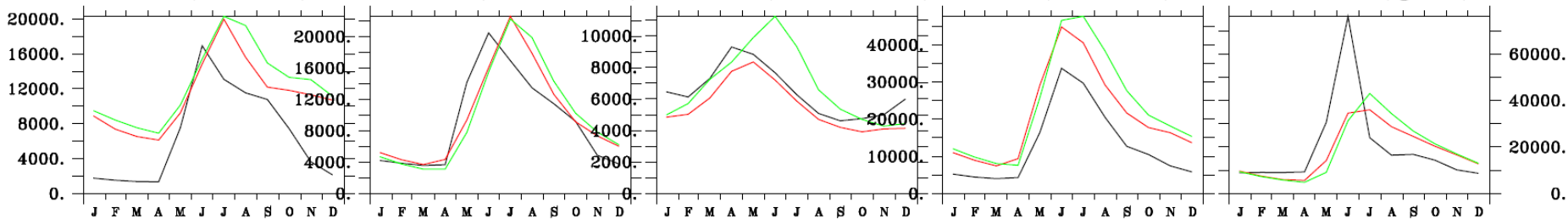
شَكَرًا



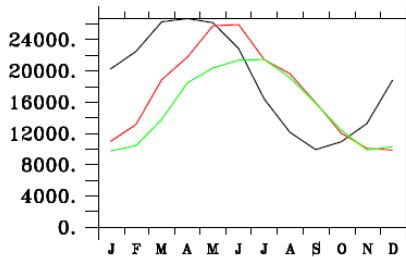
Surface continentales dans le modèle de l'IPSL



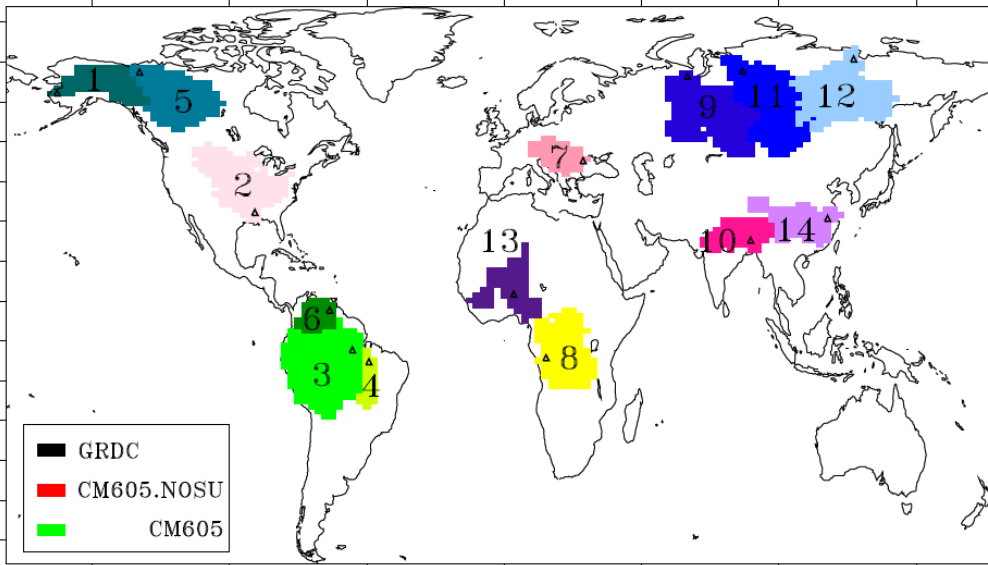
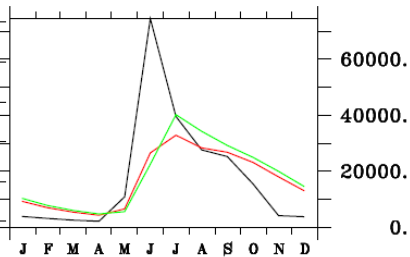
1: Yukon (Pilot sta.) 5: McKenzie (Arc. Red Riv.) 7: Danube (Ceatal Izmail) 9: Ob (Salekhard) 11: Yenisei (Igarka)



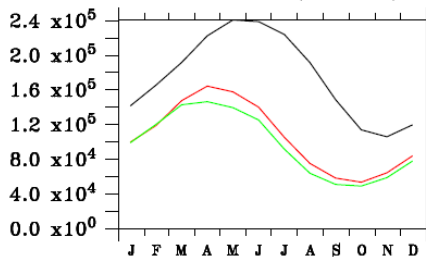
2: Mississippi (Vicksburg)



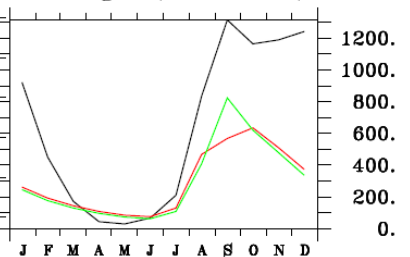
12: Lena (Kusur)



3: Amazon (Obidos)



13: Niger (Malanville)



4: Tocantins (Itupiranga) 6: Orinico (Puente Angostura) 8: Congo (Kinshasa) 10: Brahmaputra (Bahadurabad) 14: Changjiang (Datong)

