

NCAR Land Surface Model (NCAR LSM version 1)

Analyzed Model Data

Surface Air Temperature Differences

The following four figures show the difference in 2 meter height surface air temperature simulated by NCAR LSM coupled to CCM3 compared to the Legates and Willmott climatology. Results are for a 14 year simulation using observed SST's from 1979 to 1992. Initial conditions for this simulation were obtained from a 10-year simulation with climatological SST's. Stippled areas show where the difference between simulated and observed temperatures is more than twice the standard deviation based on the model's 14 year climatology.

TEMPERATURE FIGURES

[Winter \(DJF\)](#)

[Spring \(MAM\)](#)

[Summer \(JJA\)](#)

[Autumn \(SON\)](#)

Regional annual cycle graphs of 2 m surface air temperature and total precipitation

The following figures show the difference in 2 meter height surface air temperature and total precipitation simulated by NCAR LSM coupled to CCM3 compared to the Legates and Willmott climatology. Results are for a 14 year

simulation using observed SST's from 1979 to 1992. Initial conditions for this simulation were obtained from a 10-year simulation with climatological SST's. Data are averaged for all land points in each geographic region. Simulated data are shown with a solid line. The vertical bars indicate the model's 95% confidence interval for the mean based on the 14 year climatology. Observations are shown with a dashed line.

TEMPERATURE AND PRECIPITATION FIGURES

<u>Alaska and Northwest Canada</u>	<u>Western United States</u>	<u>Central United States</u>
<u>Eastern United States</u>	<u>Central Europe</u>	<u>Northern Europe</u>
<u>West Siberia</u>	<u>East Siberia</u>	<u>Amazon Basin</u>
<u>Congo basin</u>	<u>Indonesia</u>	<u>Central America</u>
<u>India</u>	<u>Indochina</u>	<u>Sahara Desert</u>
<u>Southern South America</u>	<u>South Africa</u>	<u>Australia</u>
<u>Tibetan Plateau</u>	<u>Greenland</u>	<u>Antarctica</u>

Regional annual cycle graphs of hydrology

The following figures show hydrologic fields averaged for all land points in each geographic region. Soil water is the volumetric water content of the first 3 soil layers (to a depth of 70 cm). Snow is depth of snow (liquid water) on the ground. Runoff is total runoff (surface + subsurface drainage). Results are for a 14 year simulation using observed SST's from 1979 to 1992. Initial conditions for this simulation were obtained from a 10-year simulation with climatological SST's. The vertical bars indicate the model's 95% confidence interval for the mean based on the

14 year climatology.

HYDROLOGY FIGURES

<u>Alaska and Northwest Canada</u>	<u>Western United States</u>	<u>Central United States</u>
<u>Eastern United States</u>	<u>Central Europe</u>	<u>Northern Europe</u>
<u>West Siberia</u>	<u>East Siberia</u>	<u>Amazon Basin</u>
<u>Congo basin</u>	<u>Indonesia</u>	<u>Central America</u>
<u>India</u>	<u>Indochina</u>	<u>Sahara Desert</u>
<u>Southern South America</u>	<u>South Africa</u>	<u>Australia</u>
<u>Tibetan Plateau</u>	<u>Greenland</u>	<u>Antarctica</u>

Regional annual cycle graphs of CO2 fluxes

The following figures show CO2 fluxes averaged for all land points in each geographic region. Plant respiration includes both maintenance and growth respiration. Results are for a 14 year simulation using observed SST's from 1979 to 1992. Initial conditions for this simulation were obtained from a 10-year simulation with climatological SST's. The vertical bars indicate the model's 95% confidence interval for the mean based on the 14 year climatology.

CARBON DIOXIDE FLUX FIGURES

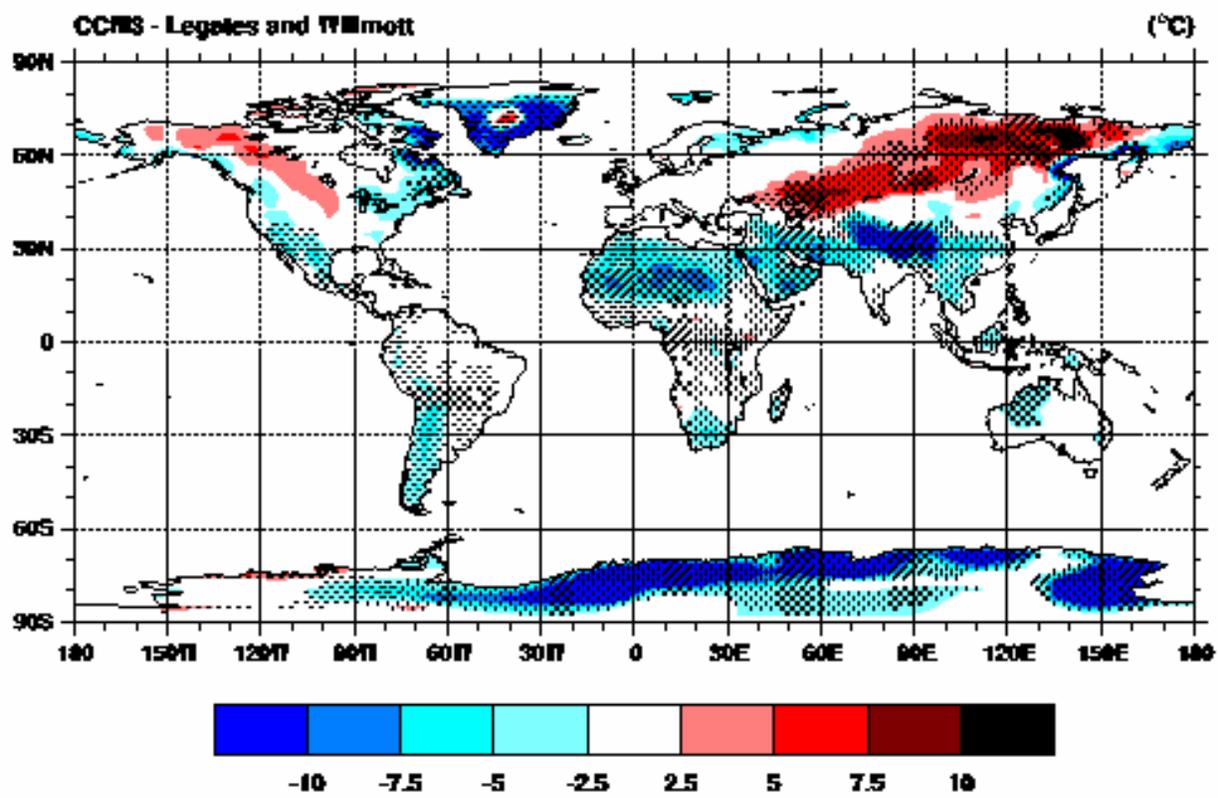
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<u>Eastern United States</u>	<u>Central Europe</u>	<u>Northern Europe</u>
<u>West Siberia</u>	<u>East Siberia</u>	<u>Amazon Basin</u>
<u>Congo basin</u>	<u>Indonesia</u>	<u>Central America</u>

<u>India</u>	<u>Indochina</u>	<u>Sahara Desert</u>
<u>Southern South America</u>	<u>South Africa</u>	<u>Australia</u>
<u>Tibetan Plateau</u>	<u>Greenland</u>	<u>Antarctica</u>

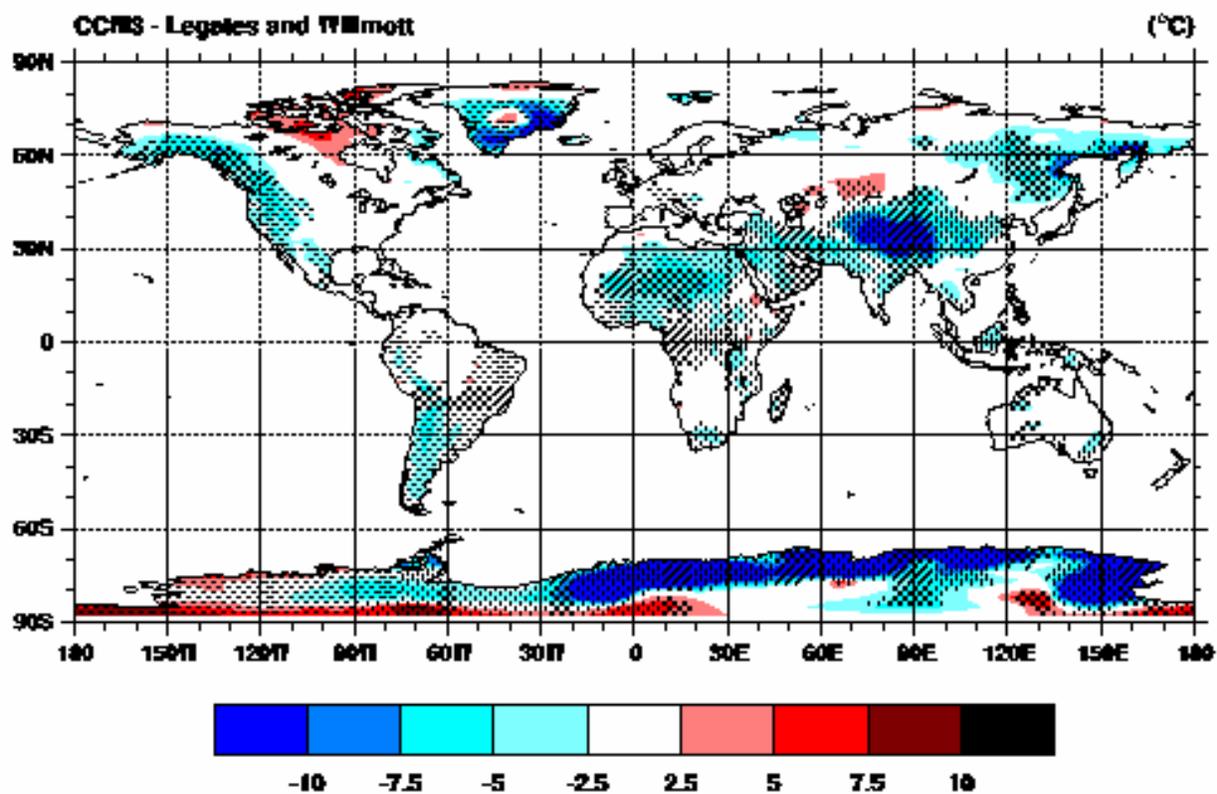
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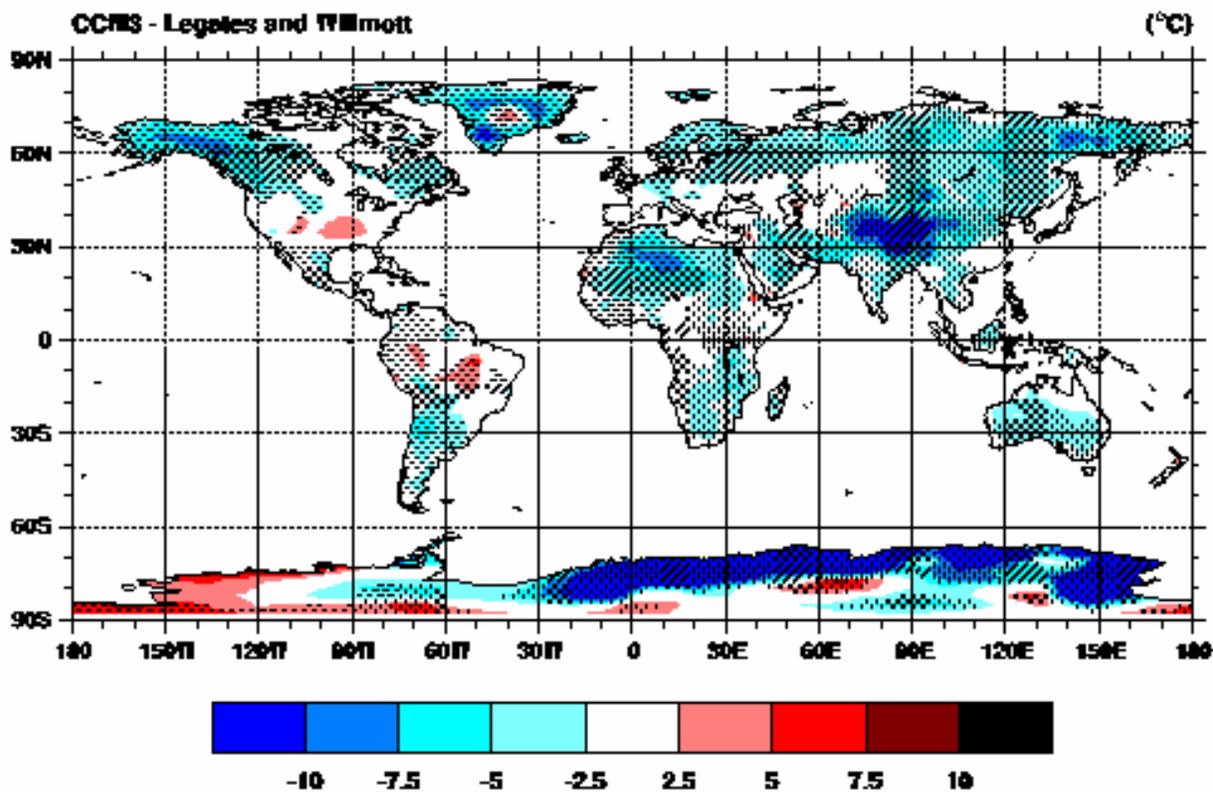
DJF Surface Air Temperature Difference



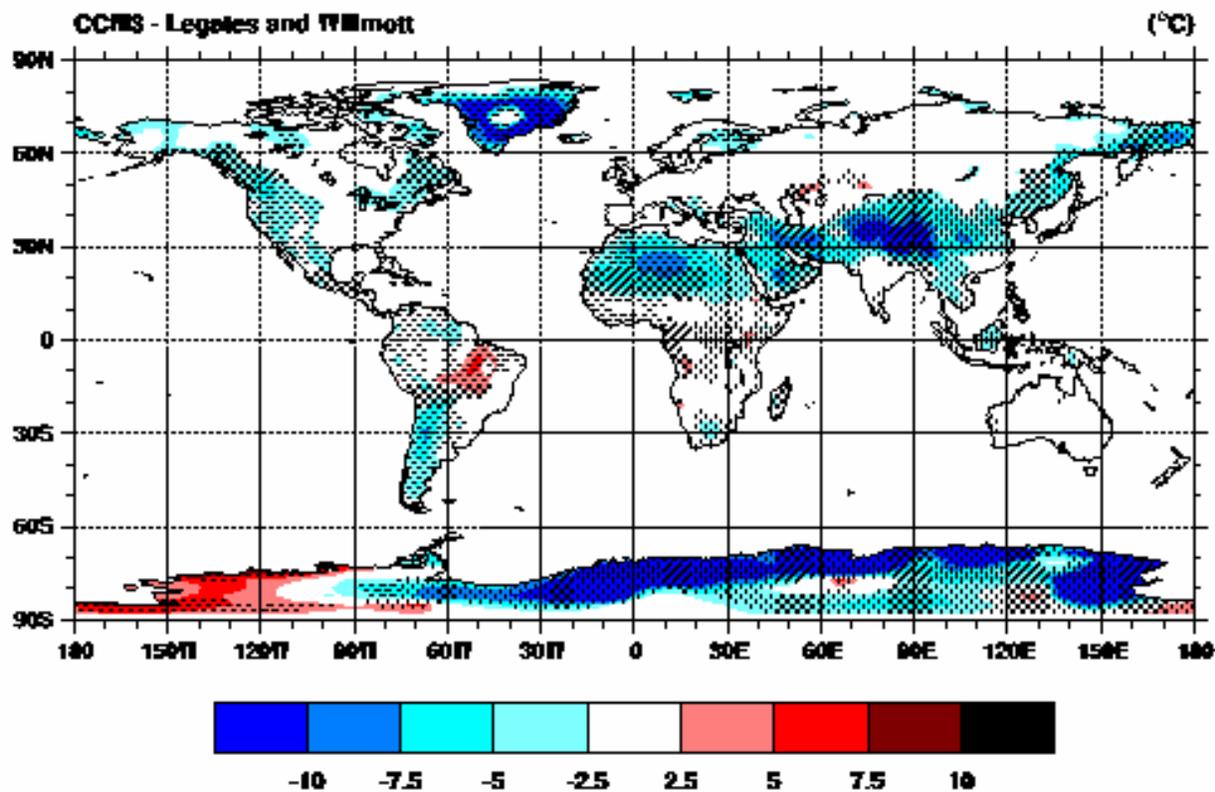
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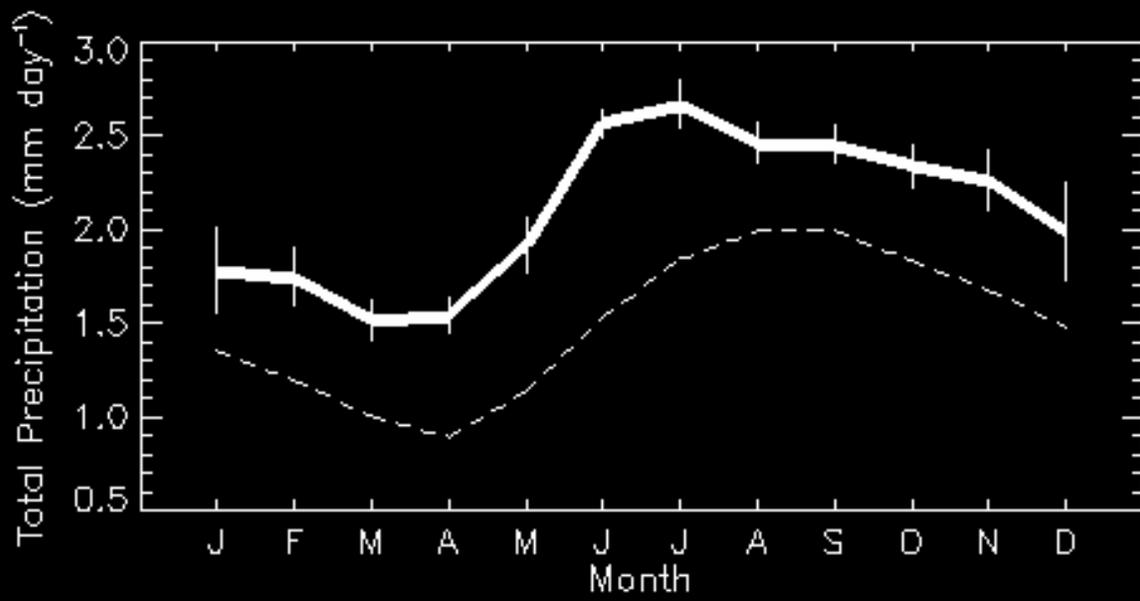
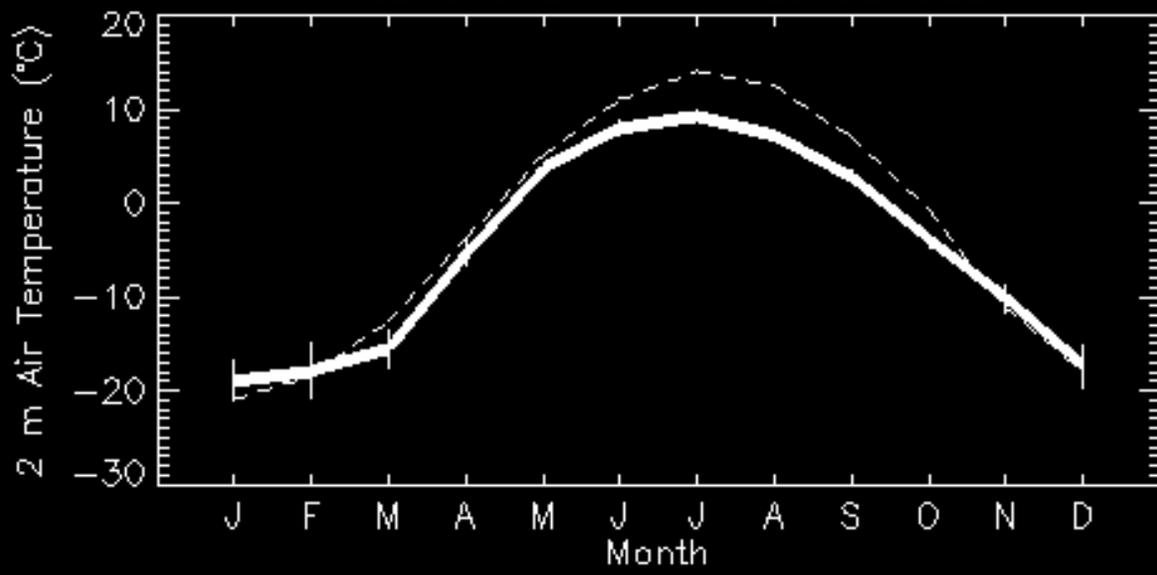
JJA Surface Air Temperature Difference



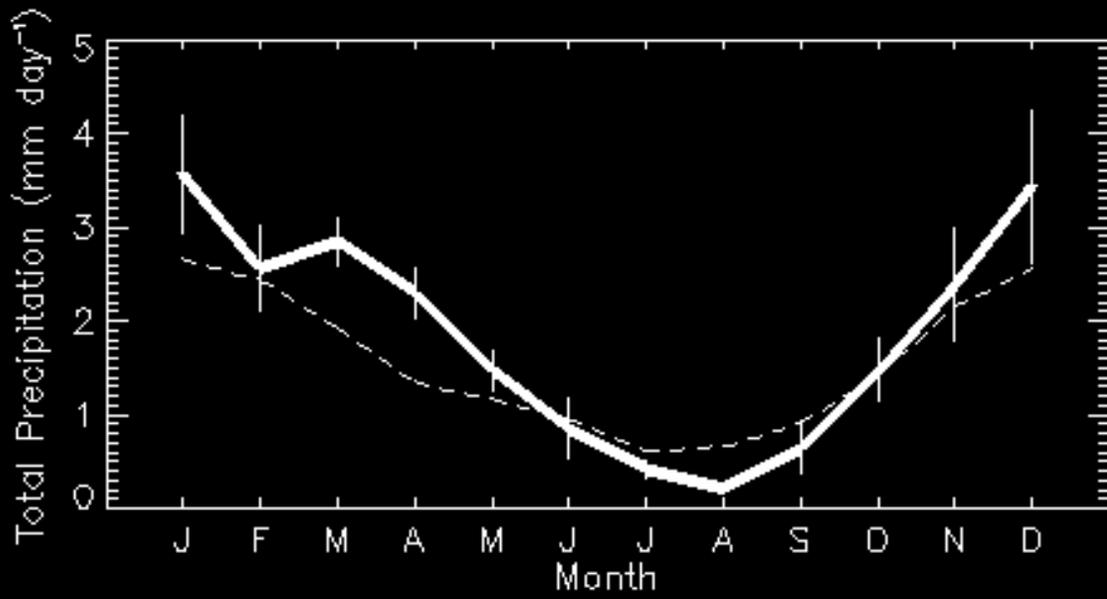
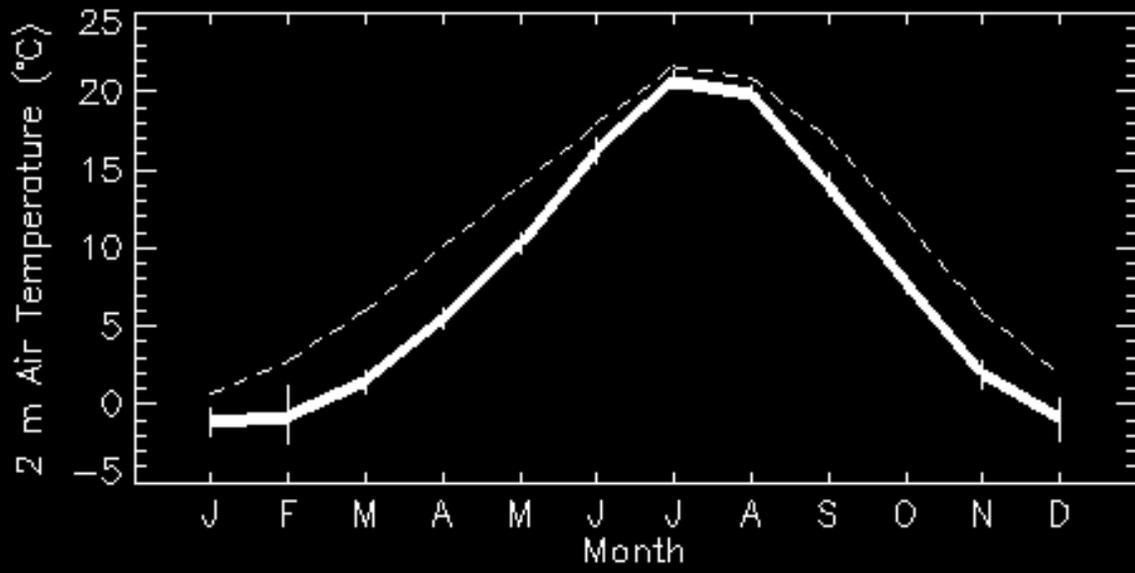
SON Surface Air Temperature Difference



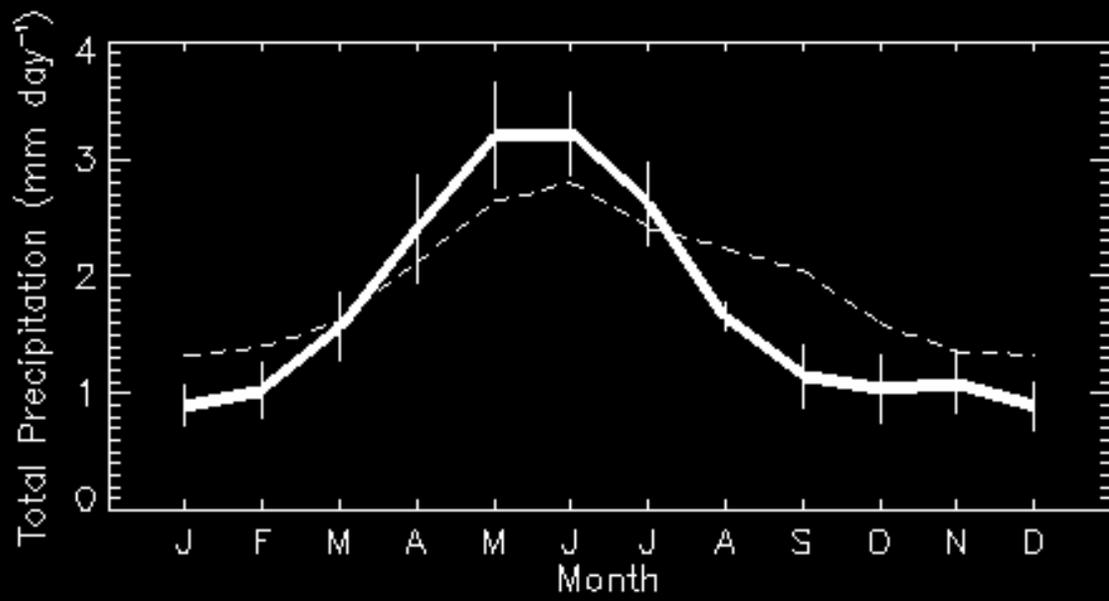
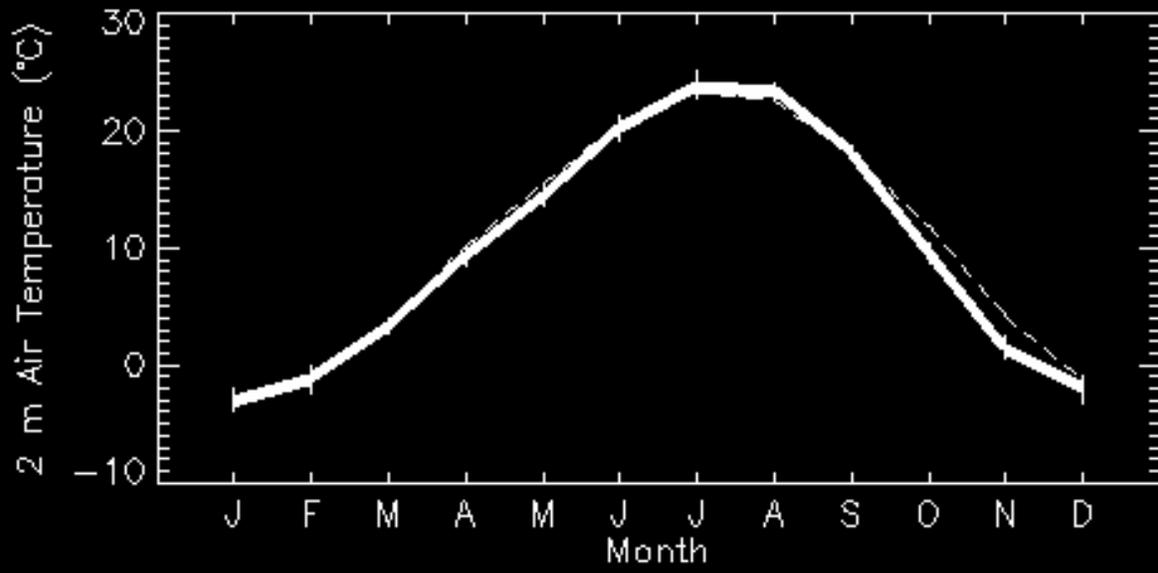
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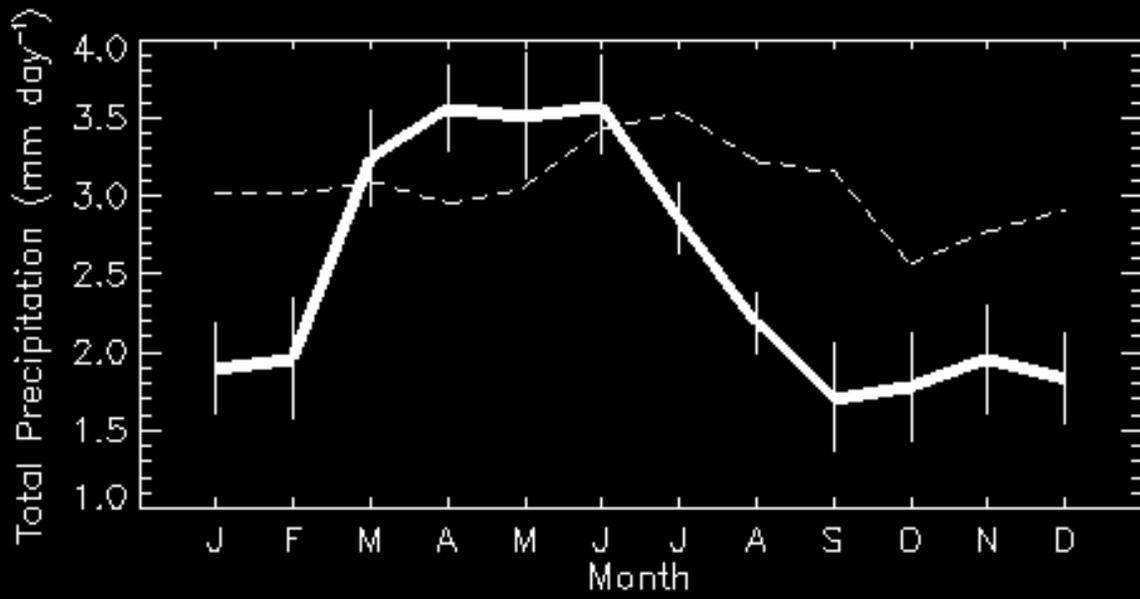
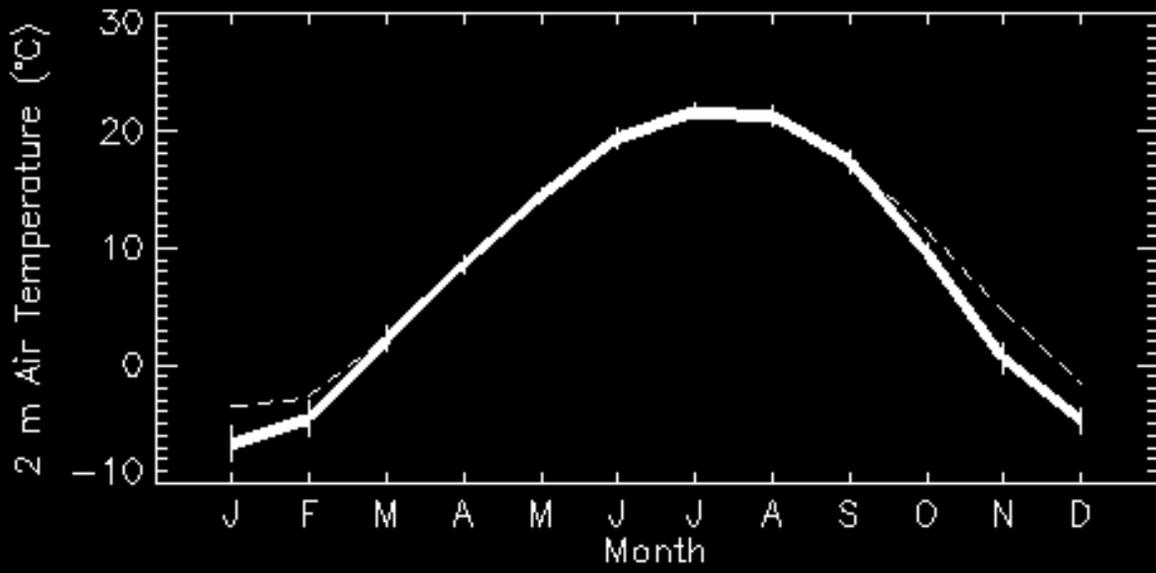
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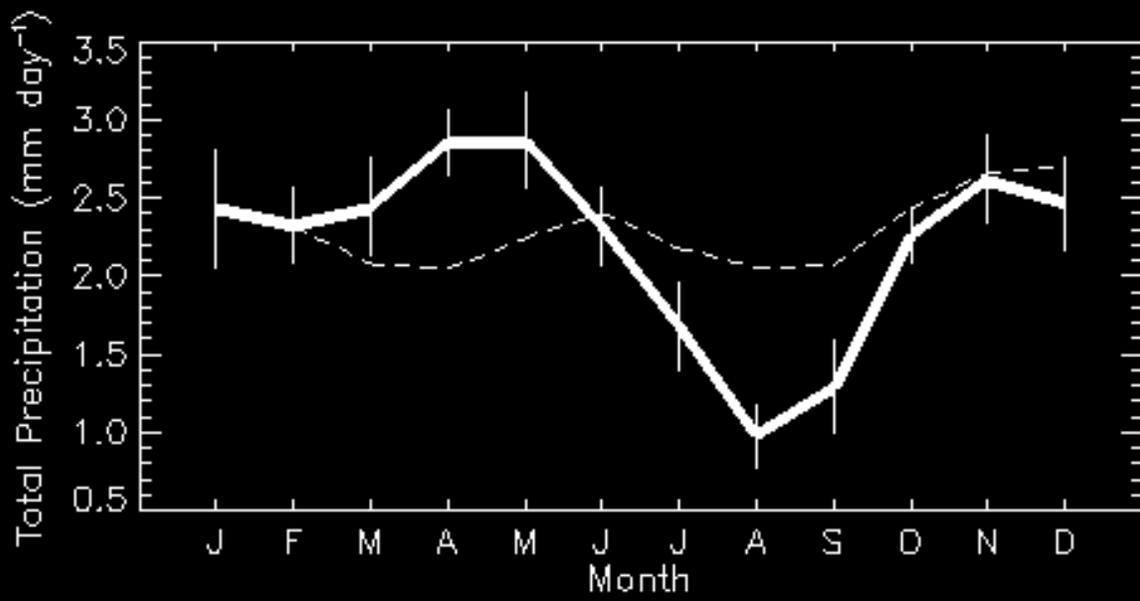
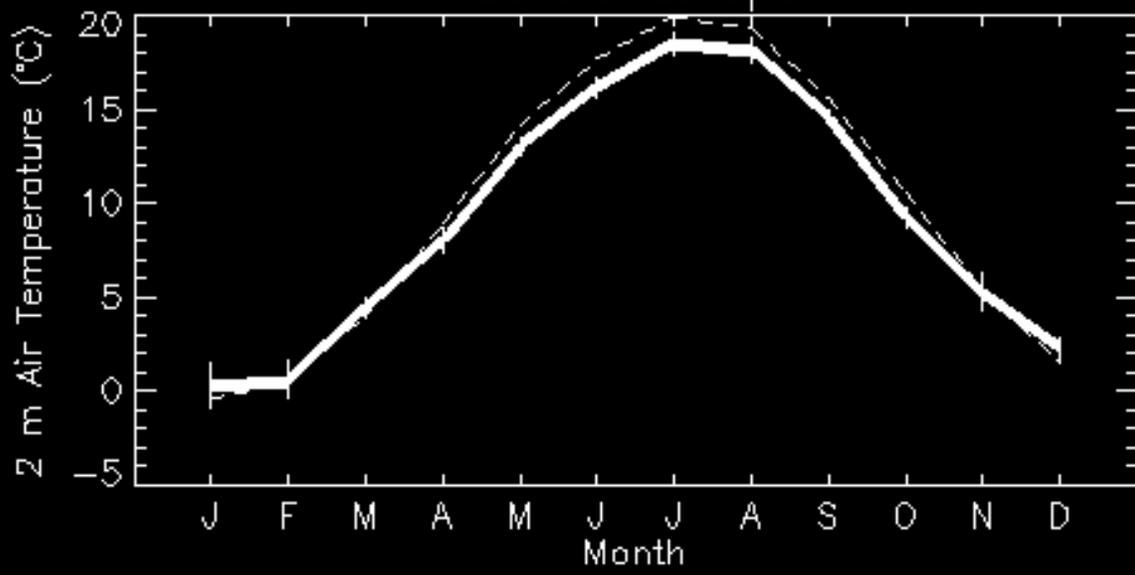
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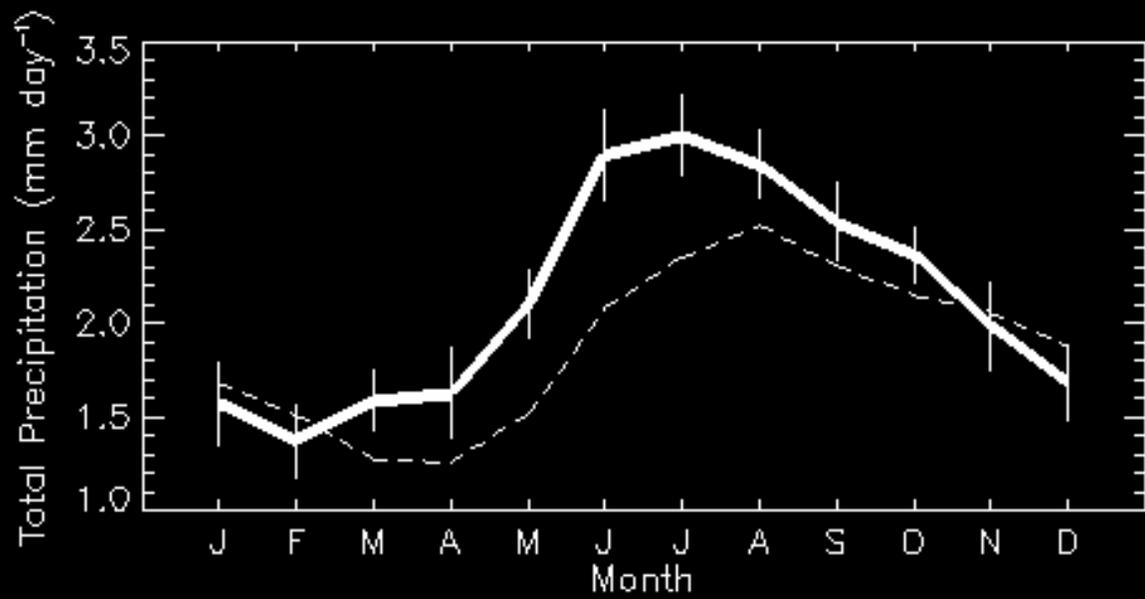
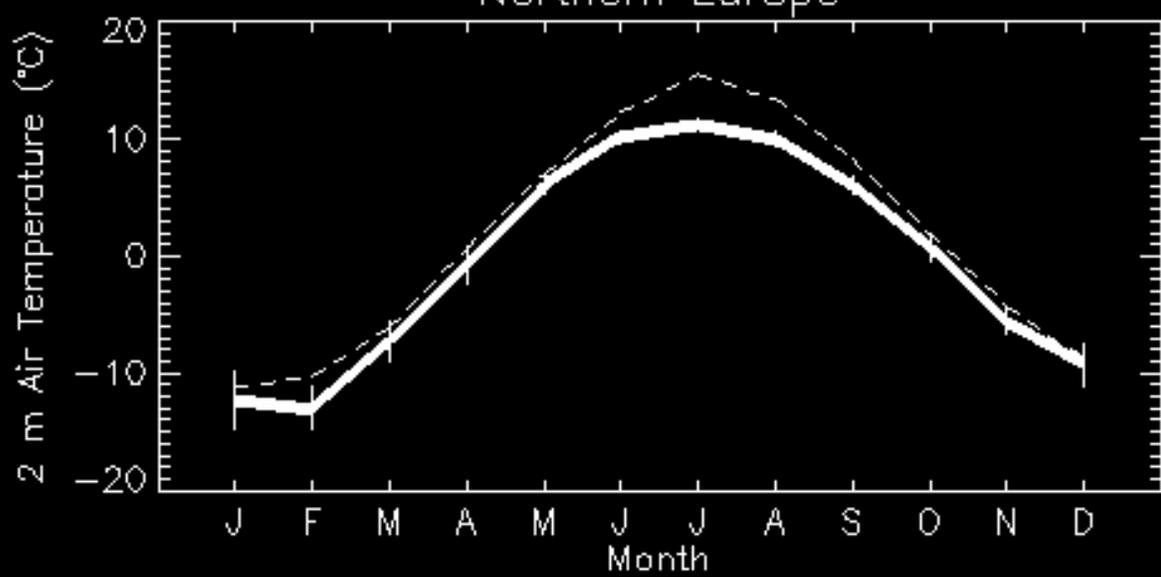
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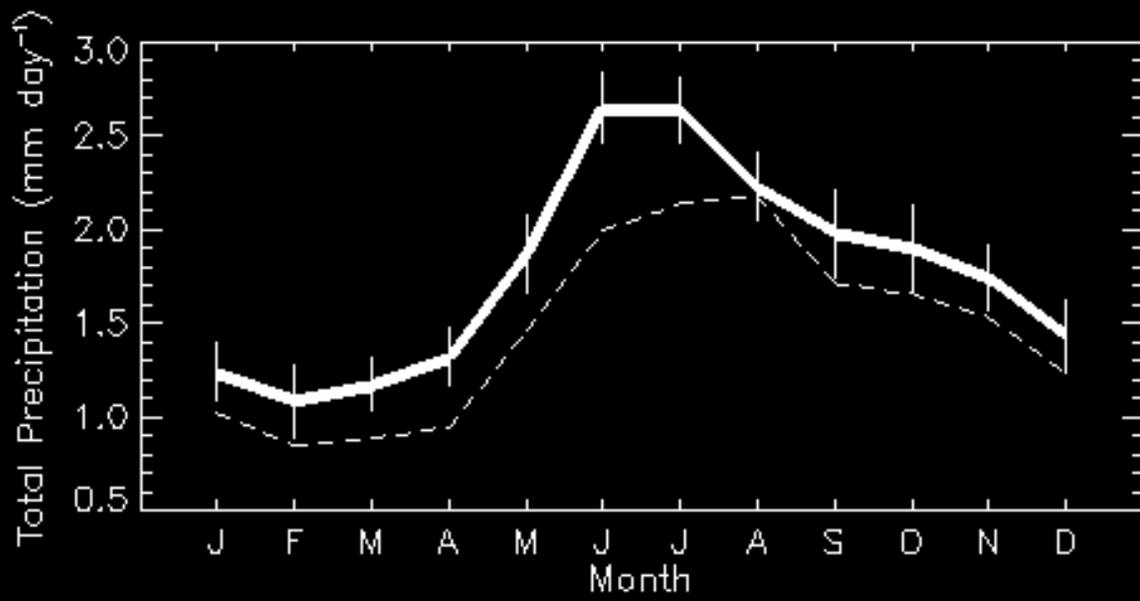
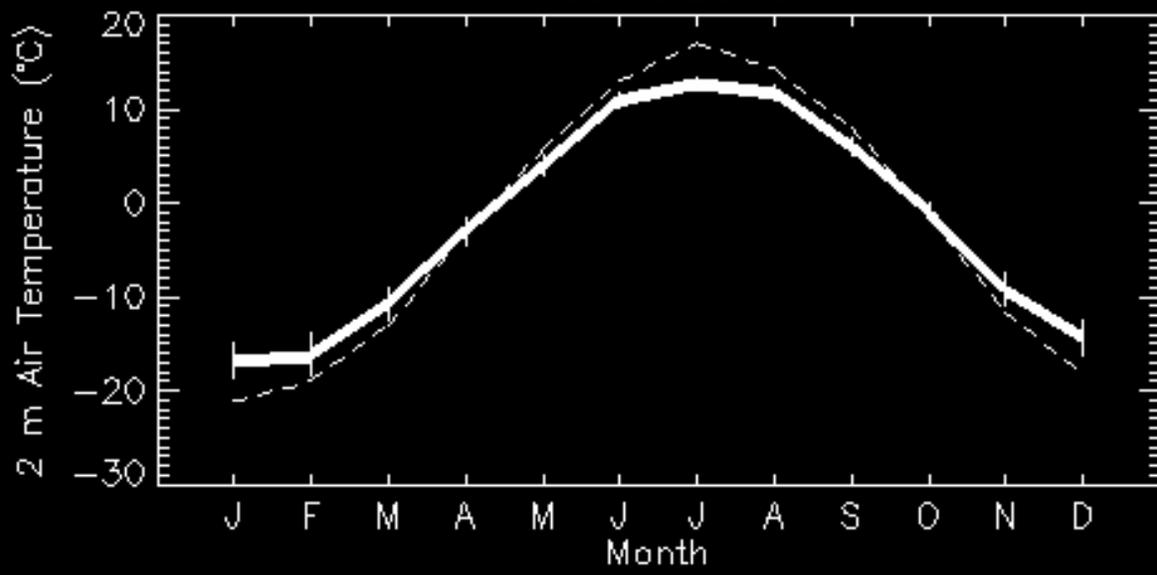
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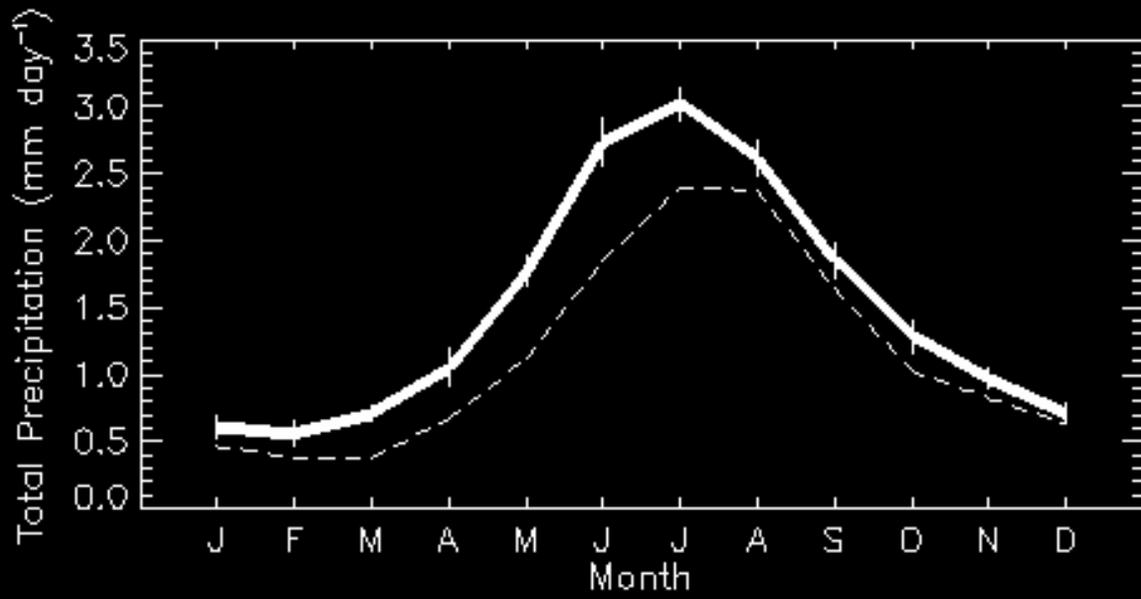
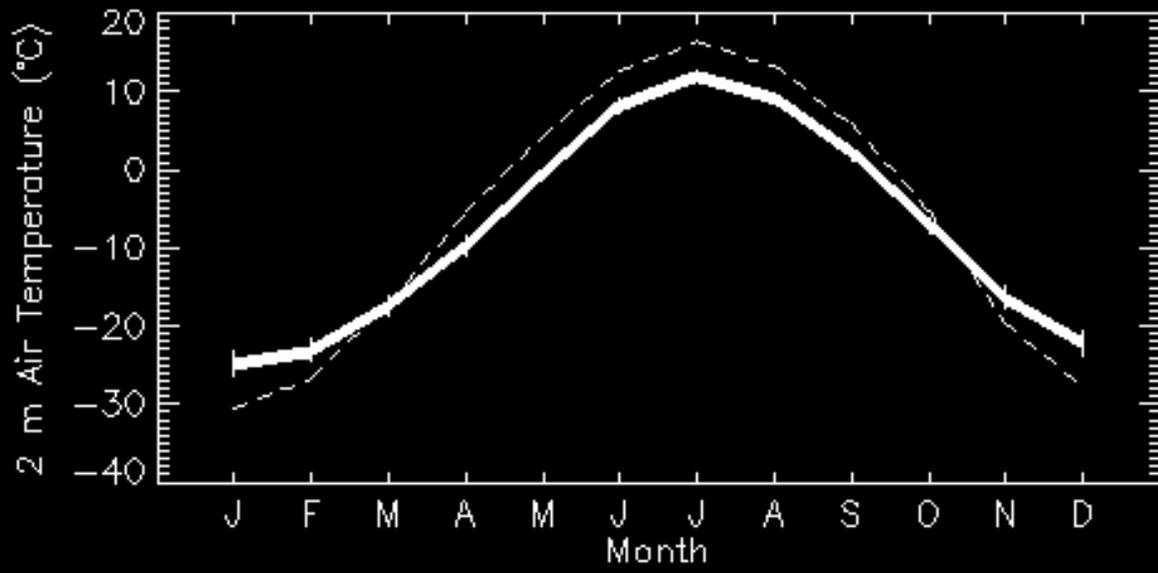
Northern Europe



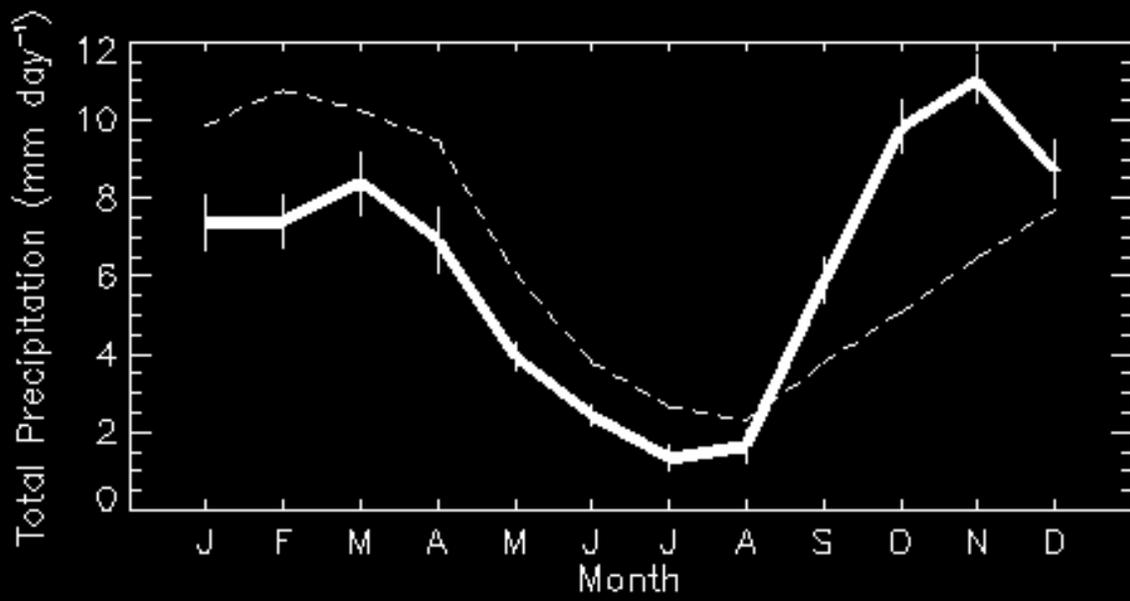
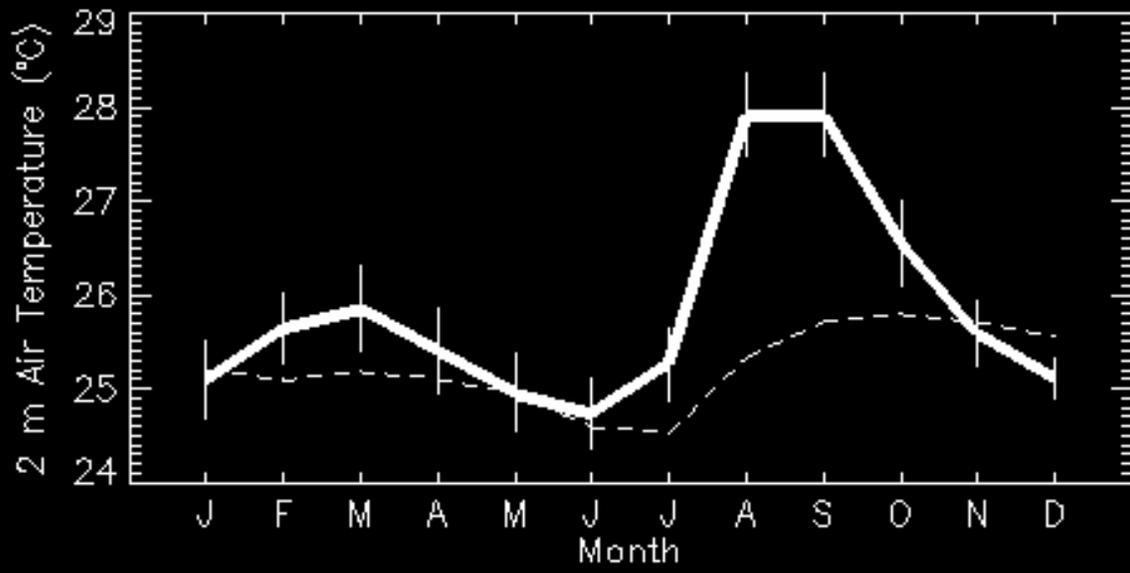
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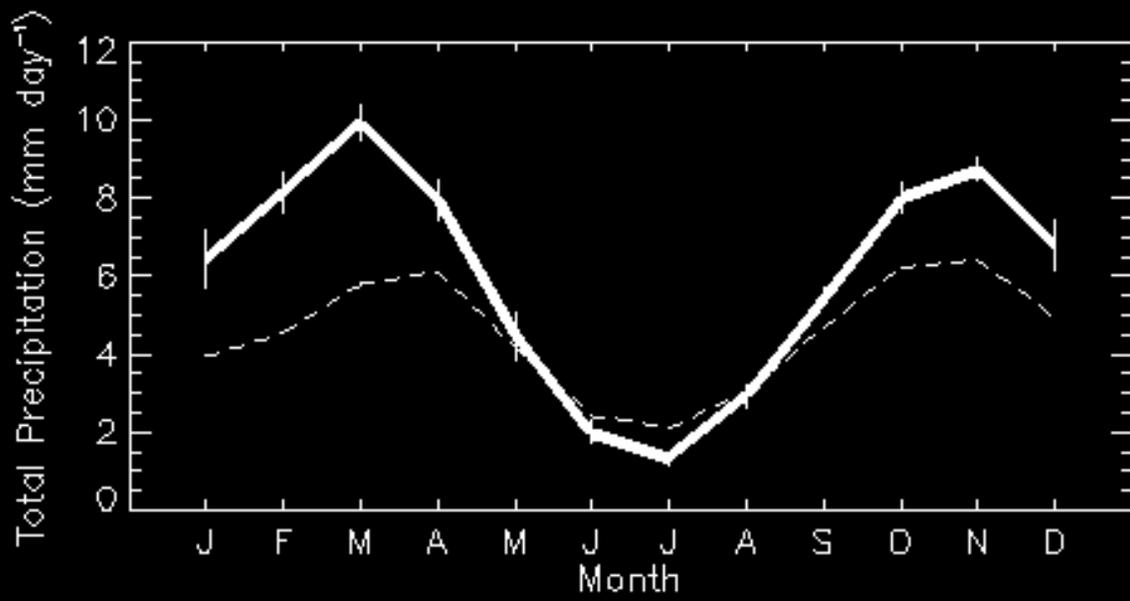
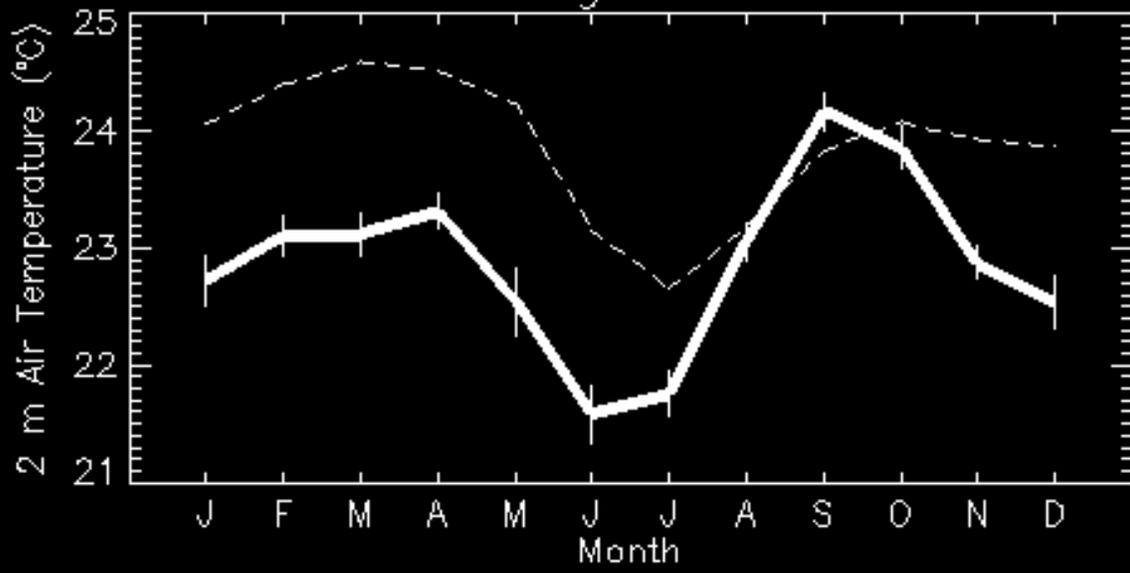
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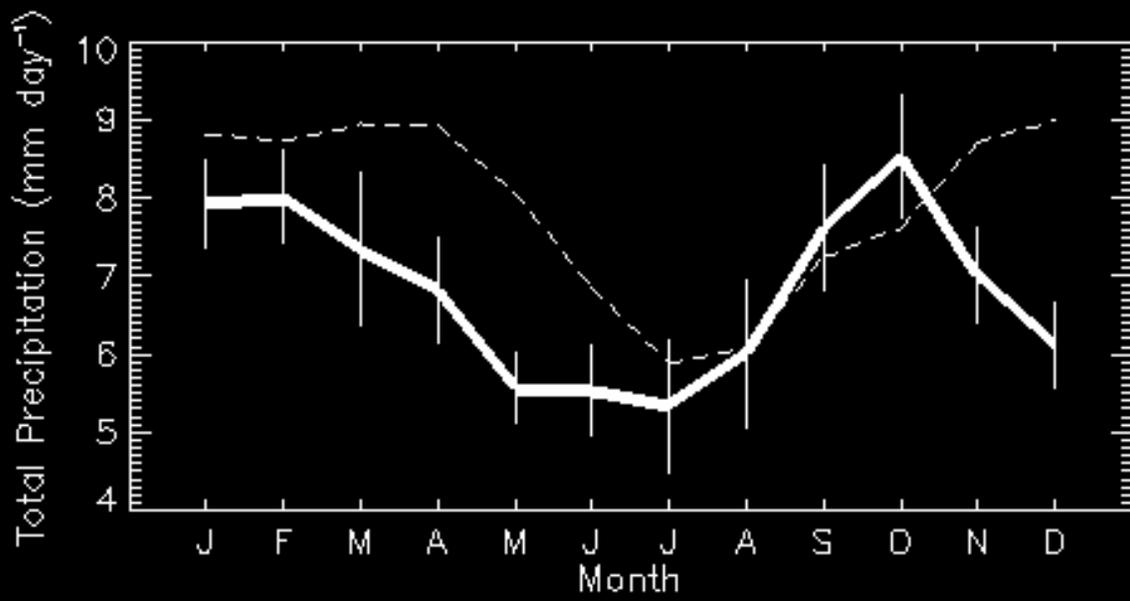
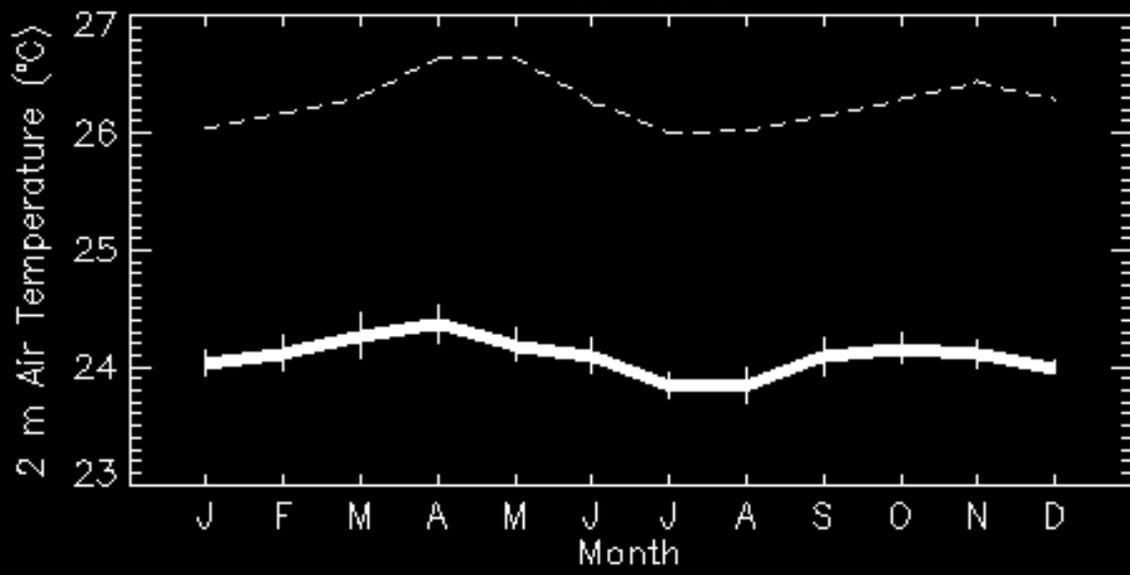
Amazon Basin



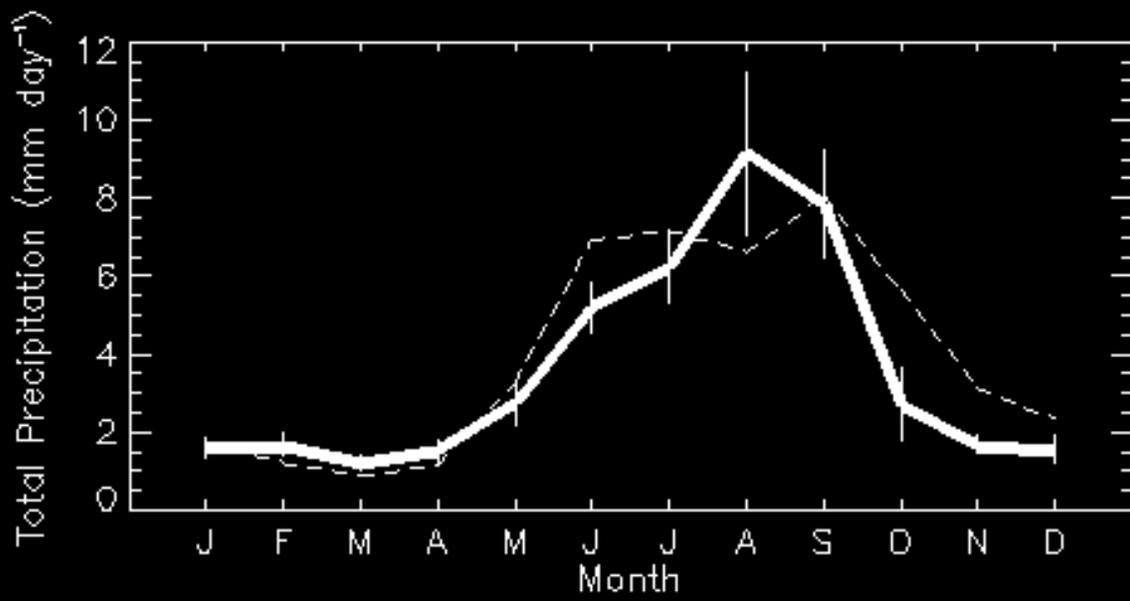
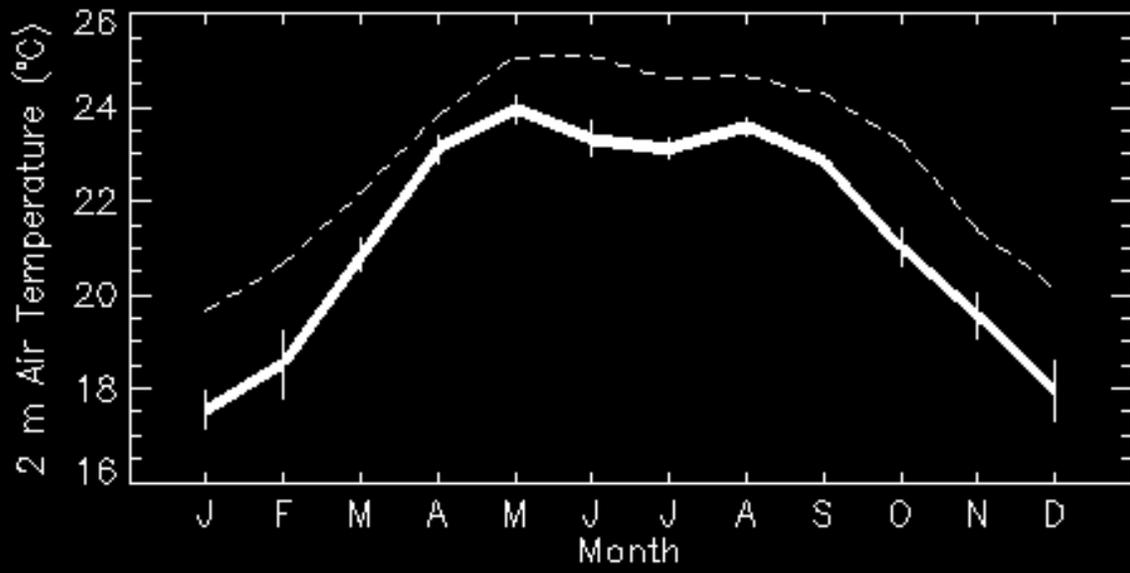
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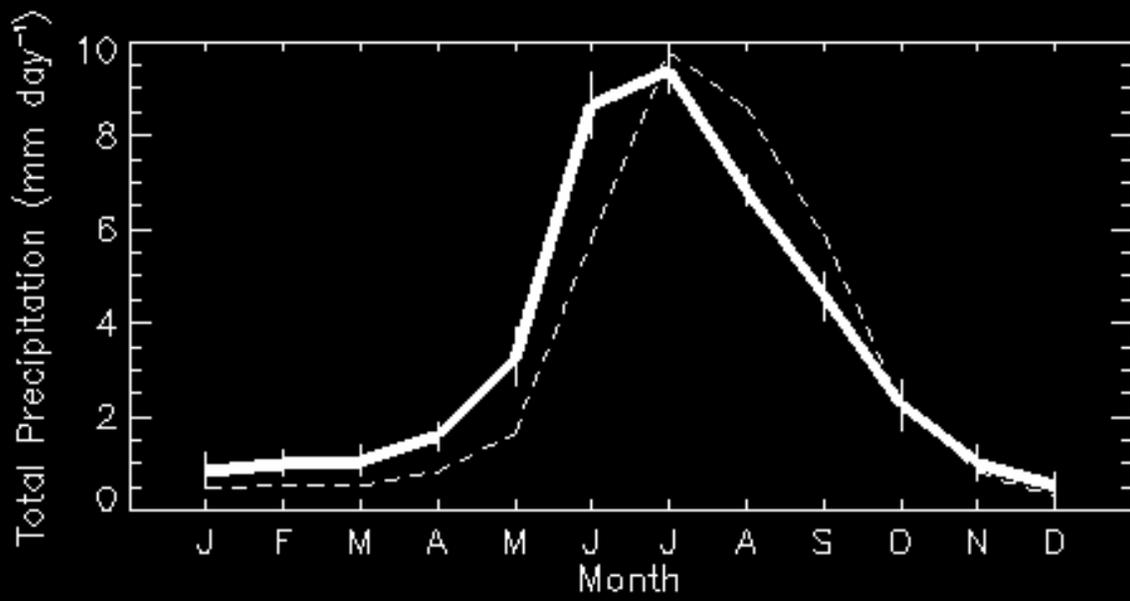
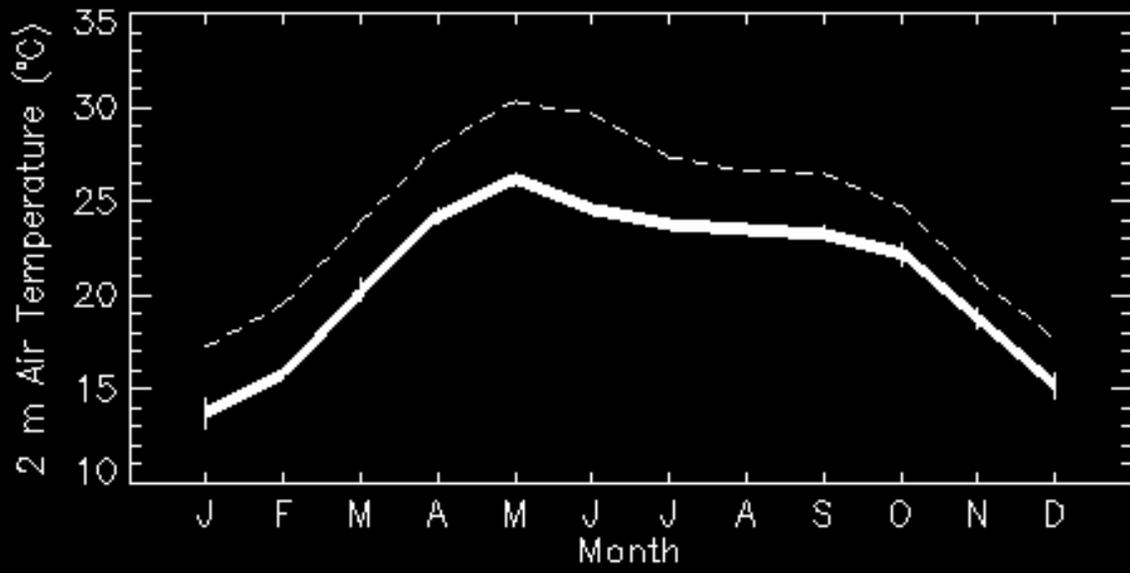
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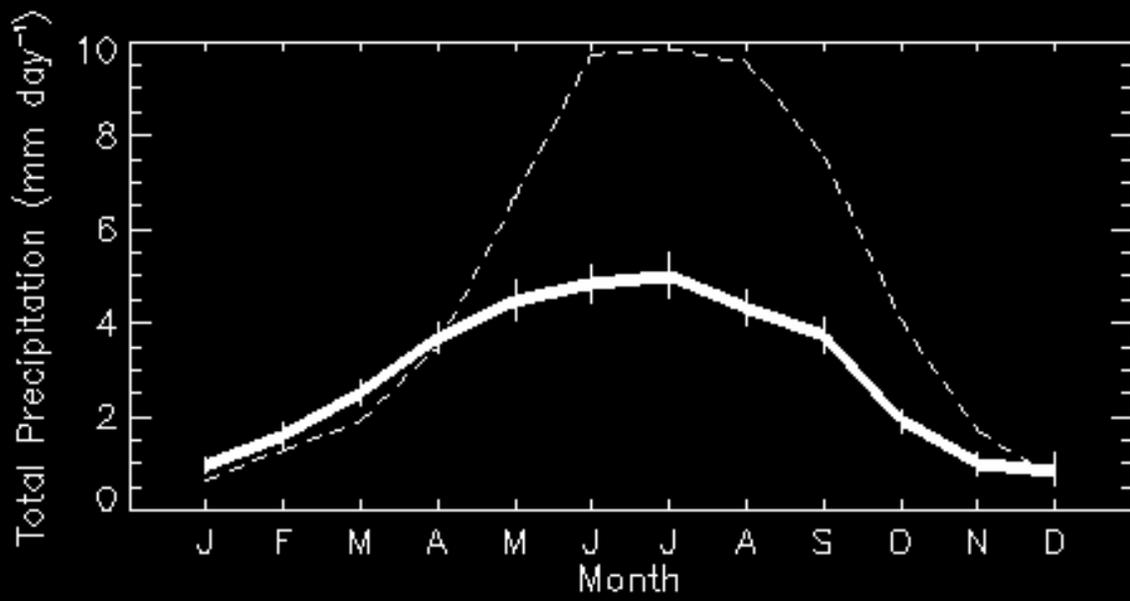
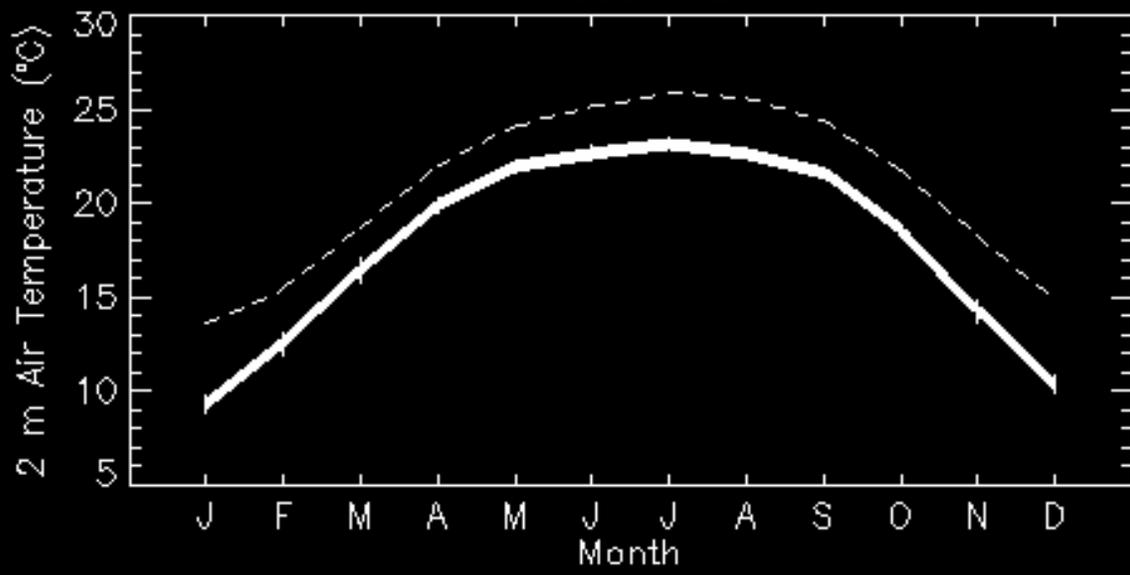
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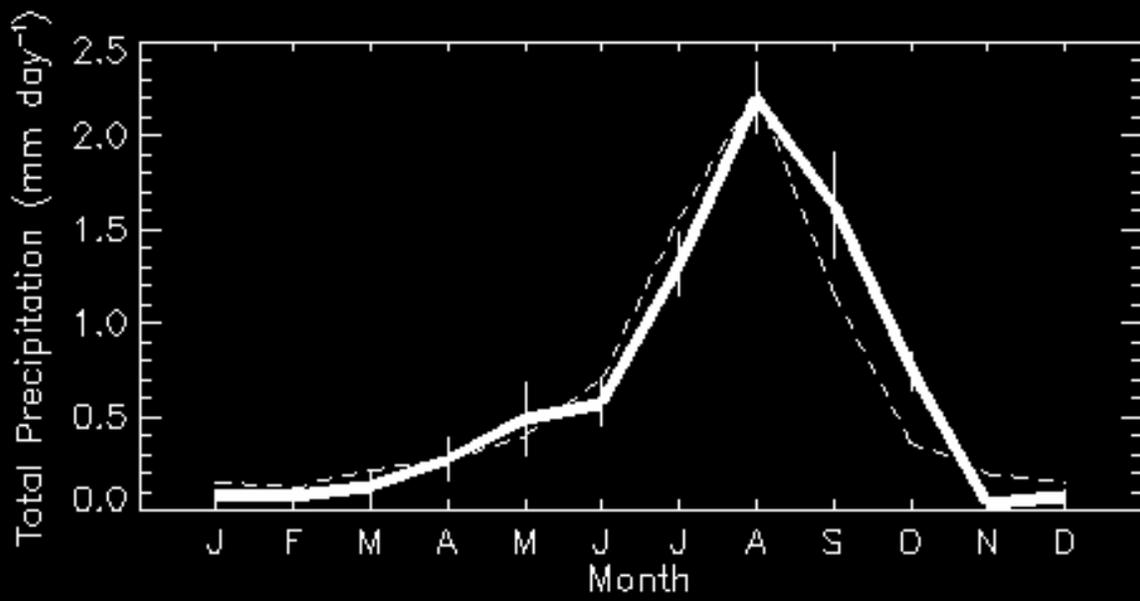
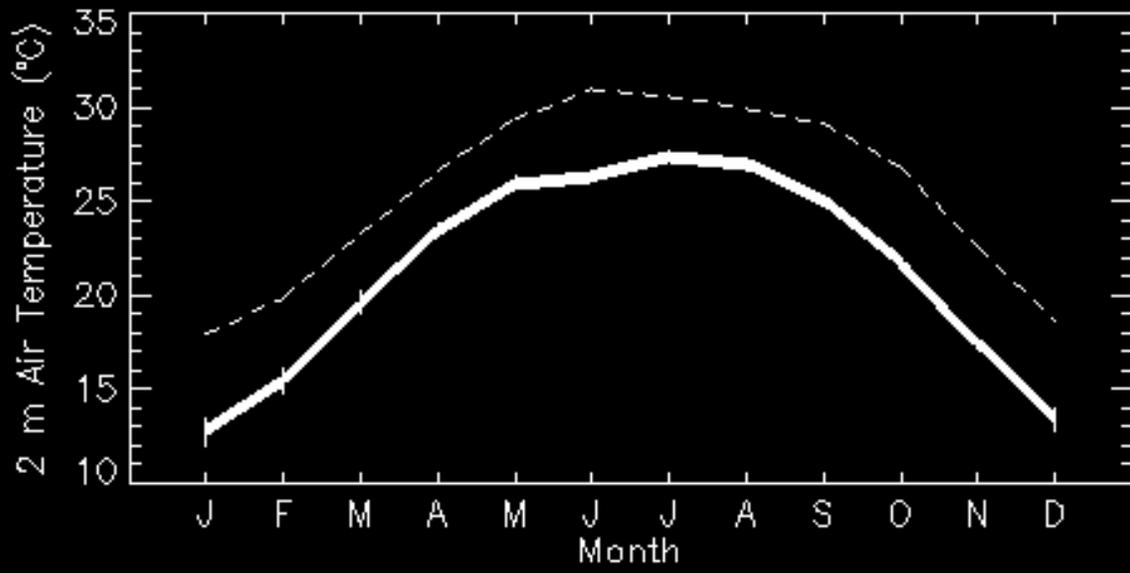
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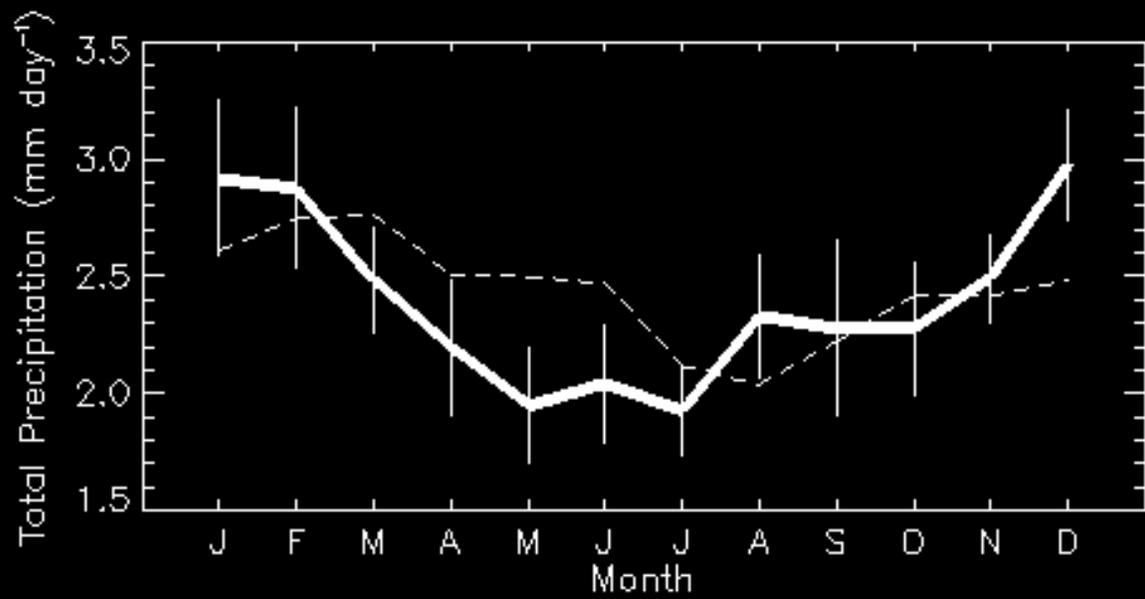
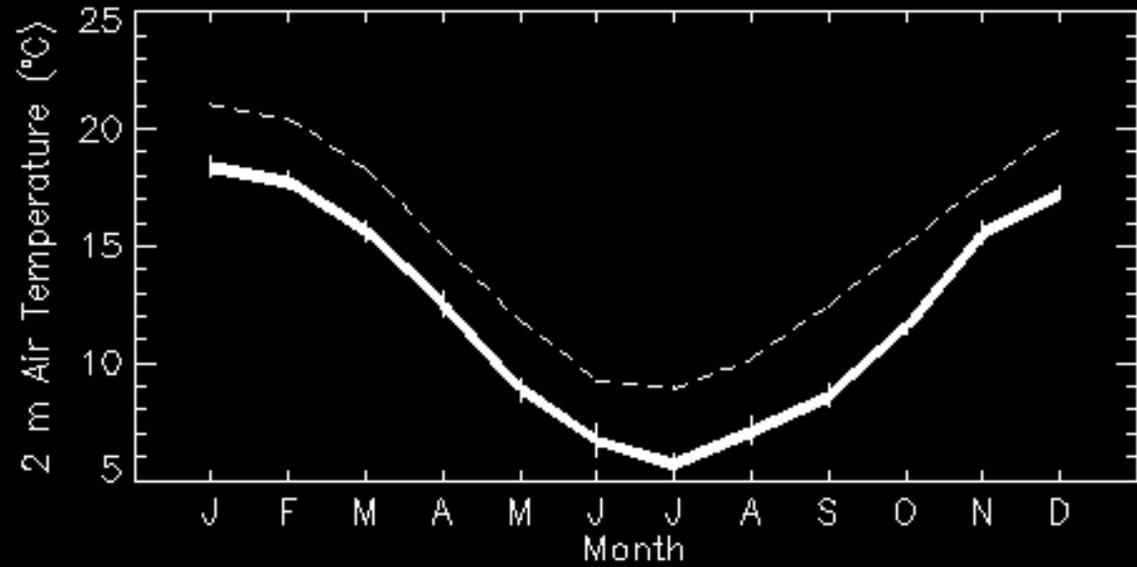
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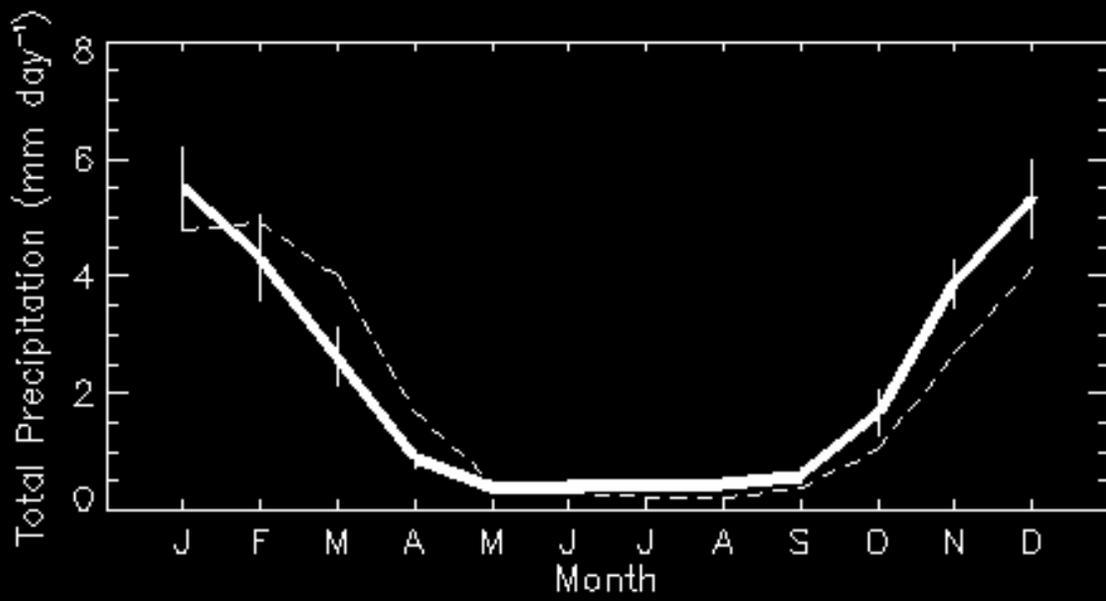
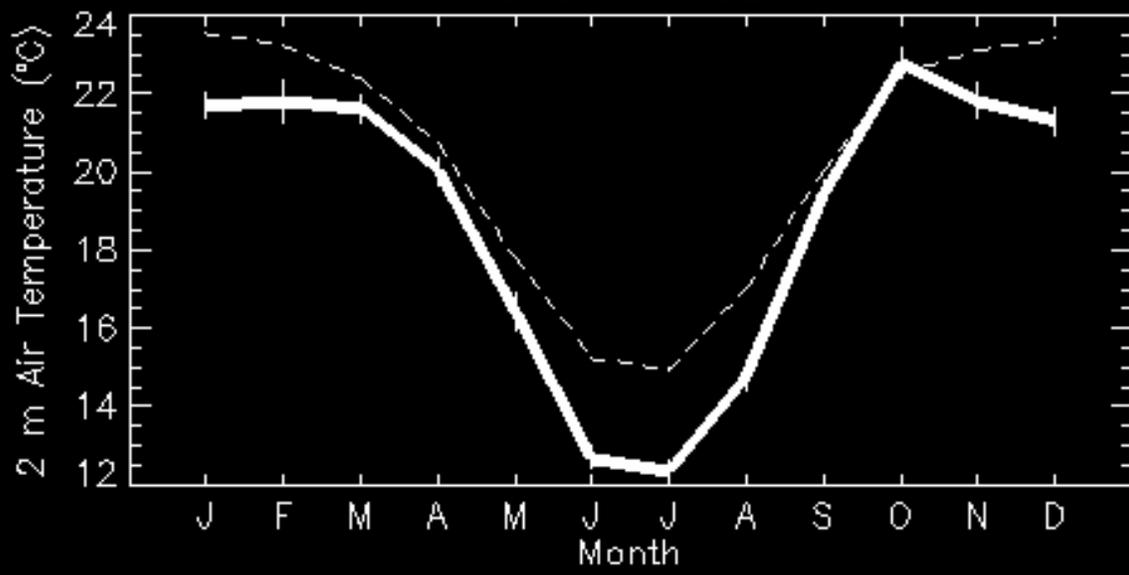
Sahara Desert



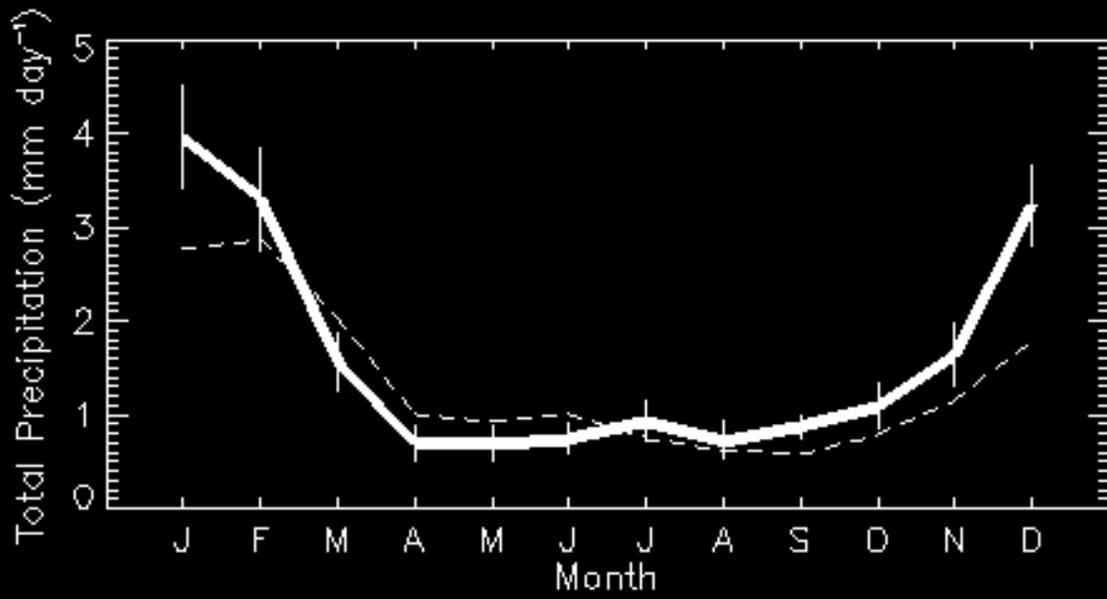
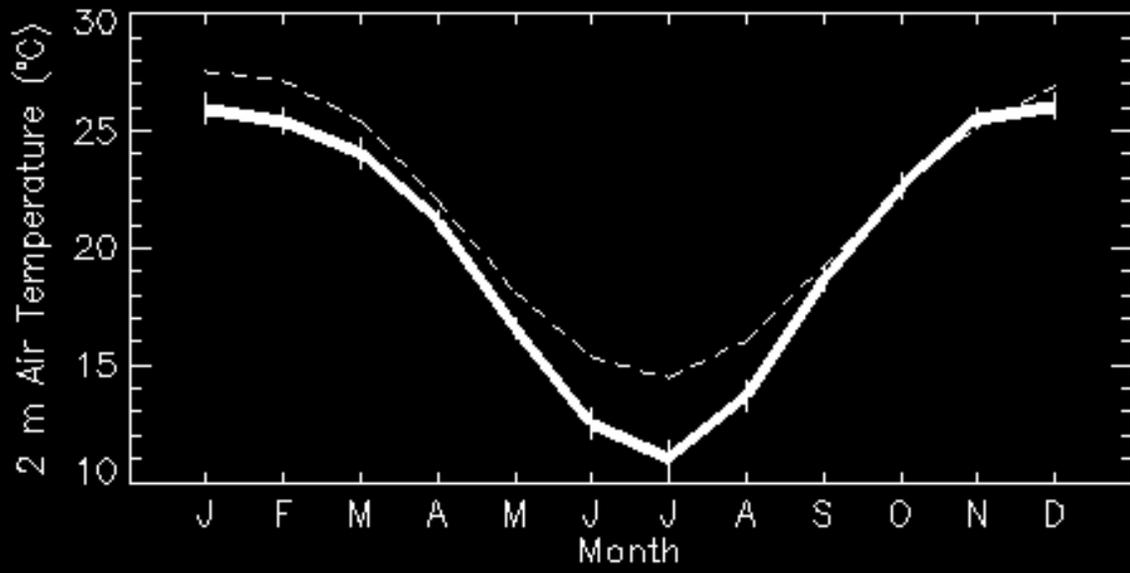
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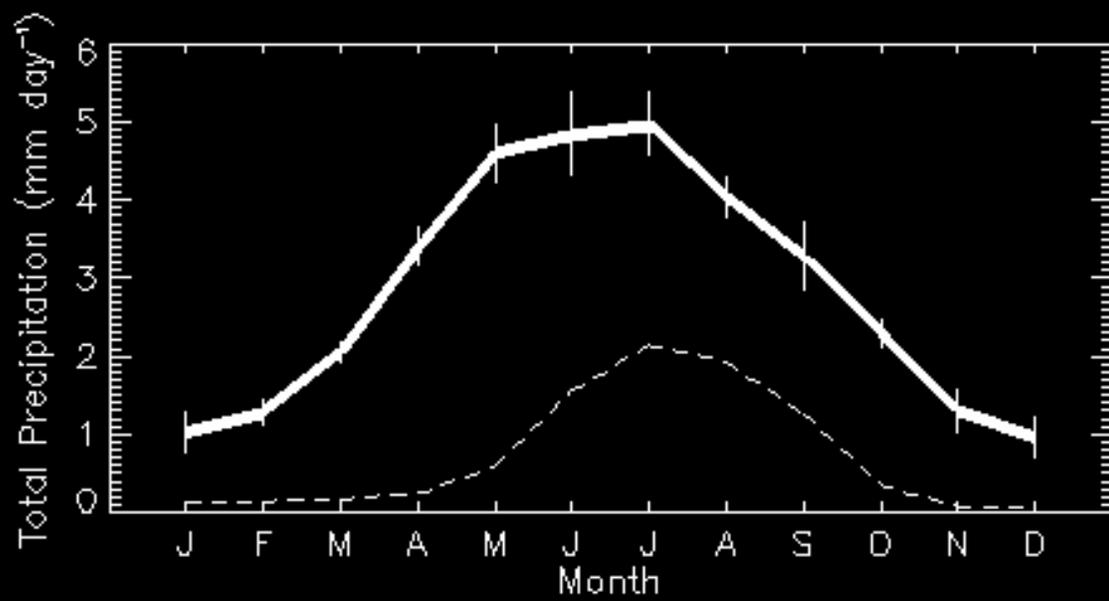
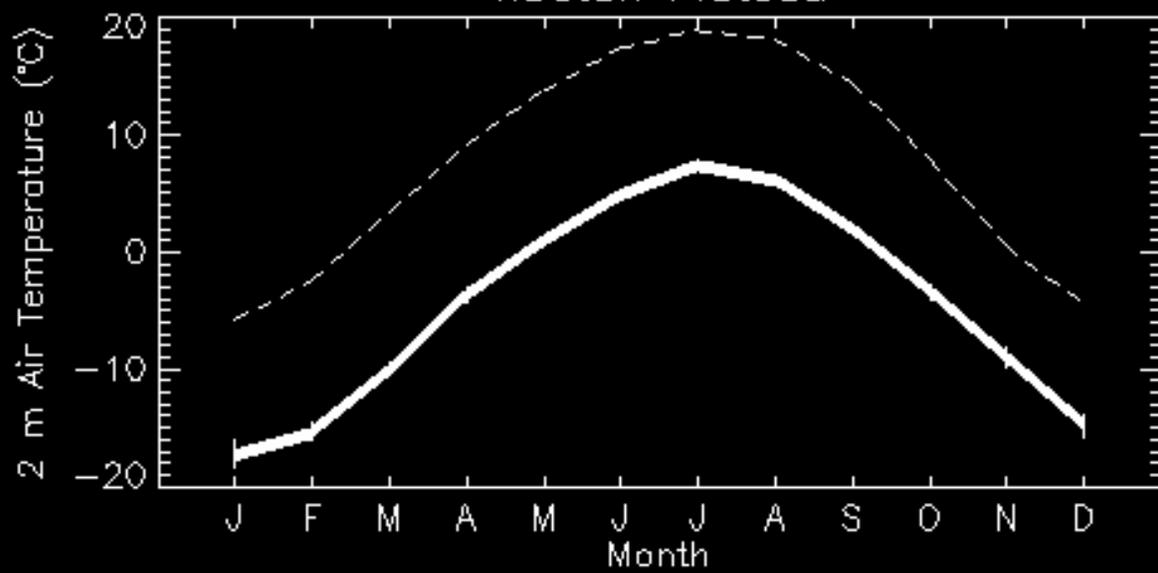
South Africa



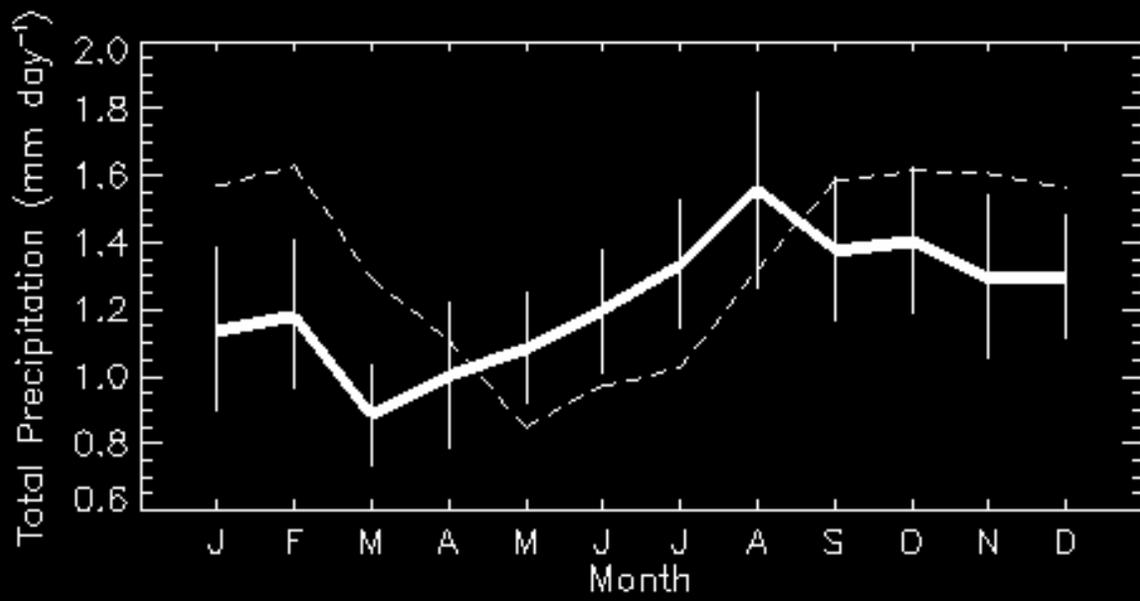
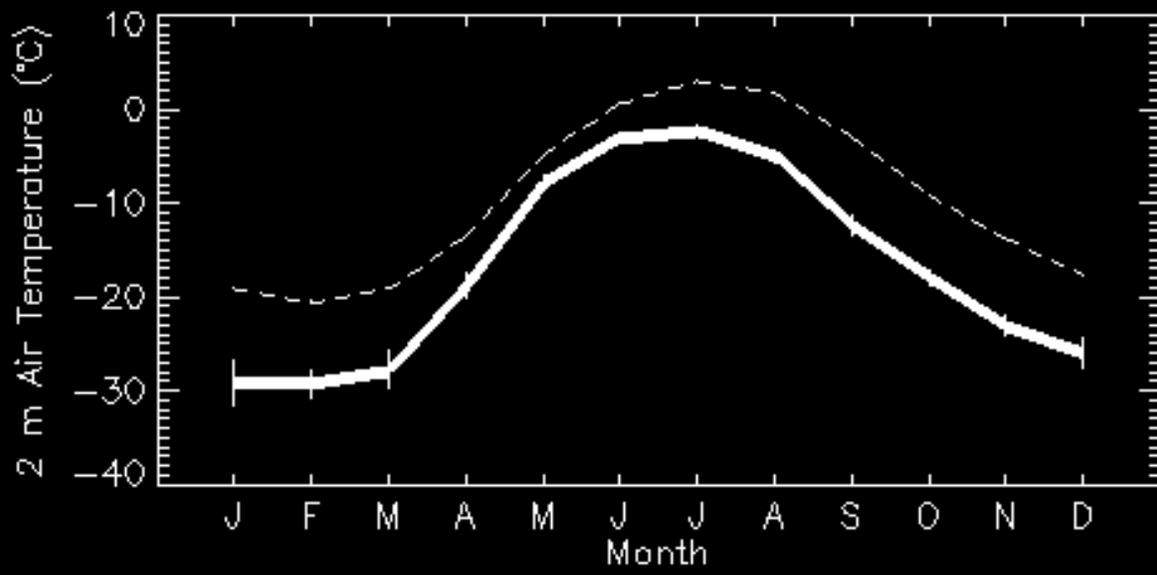
Australia



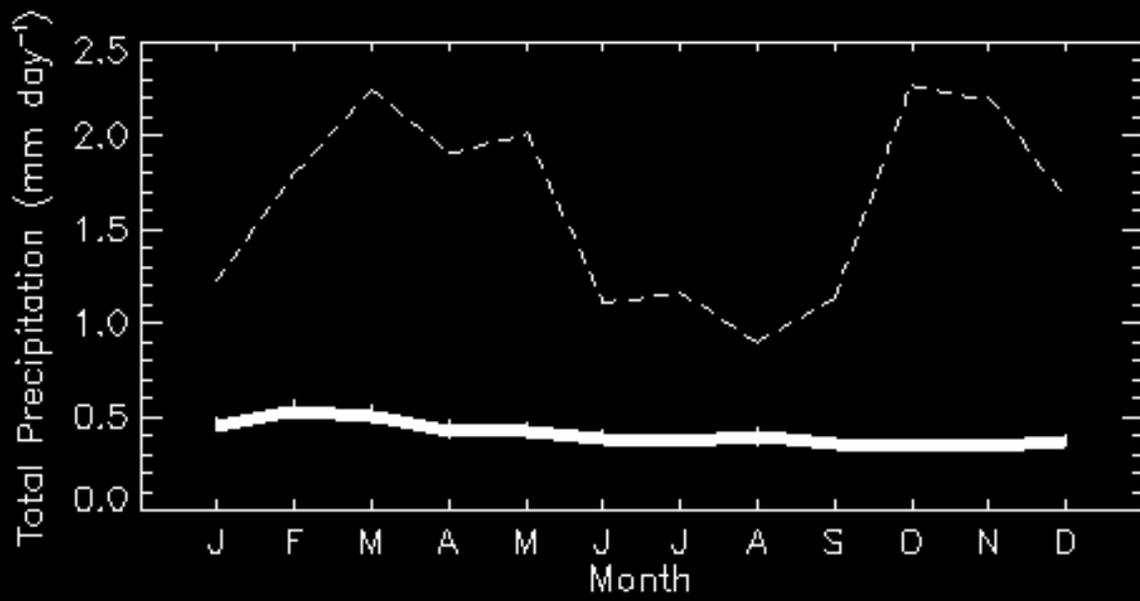
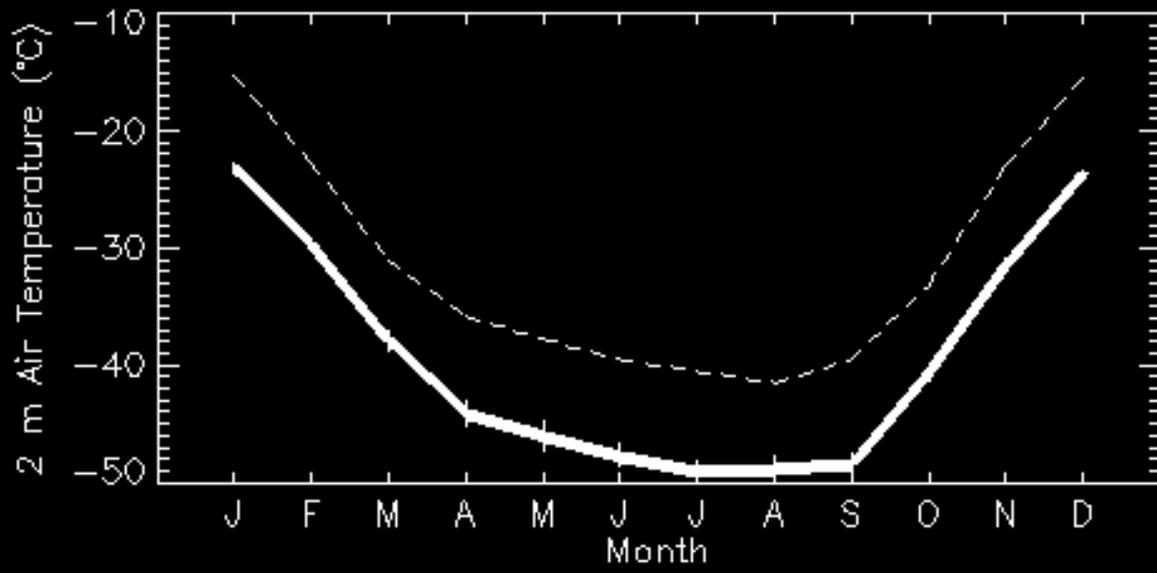
Tibetan Plateau



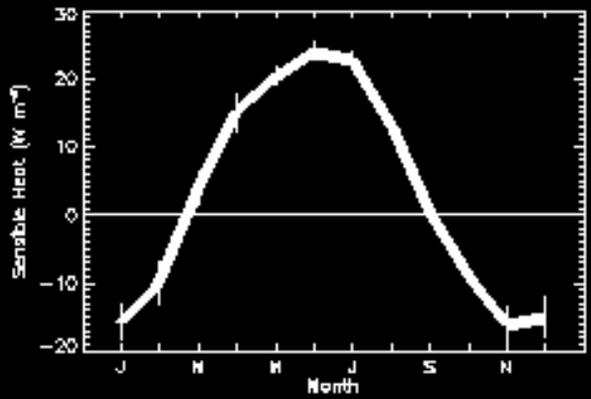
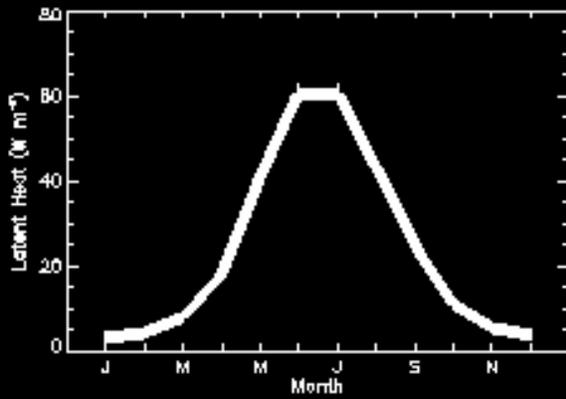
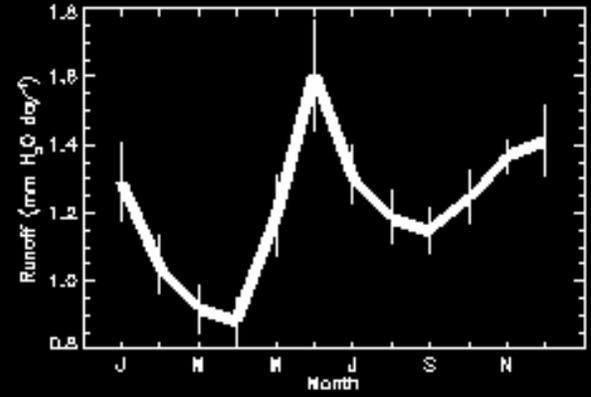
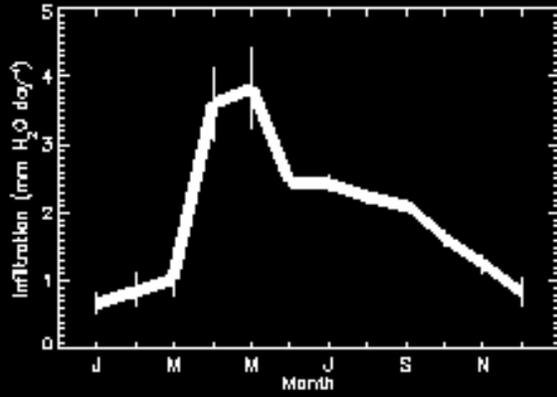
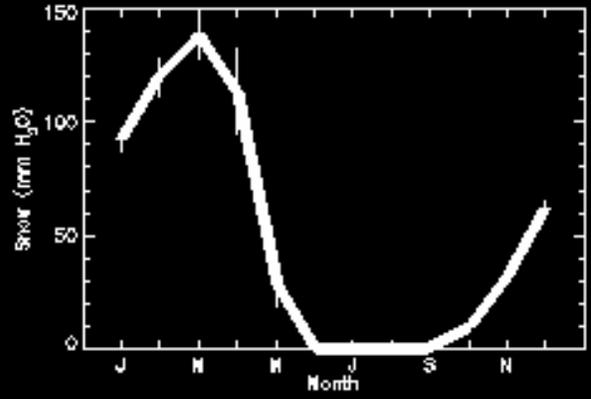
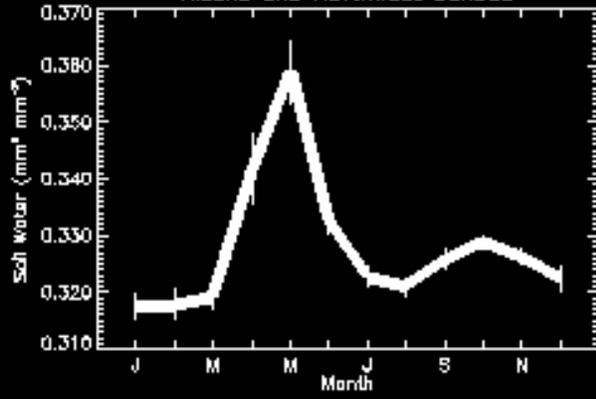
Greenland



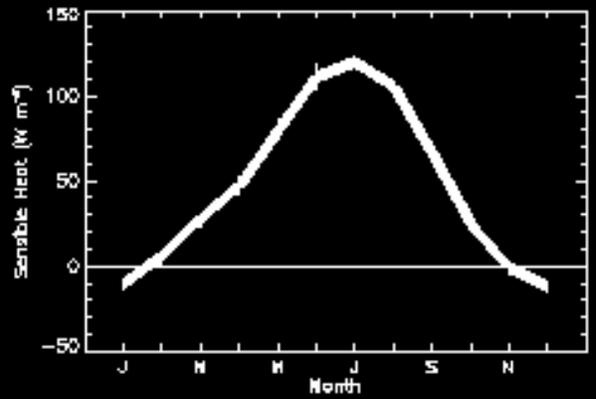
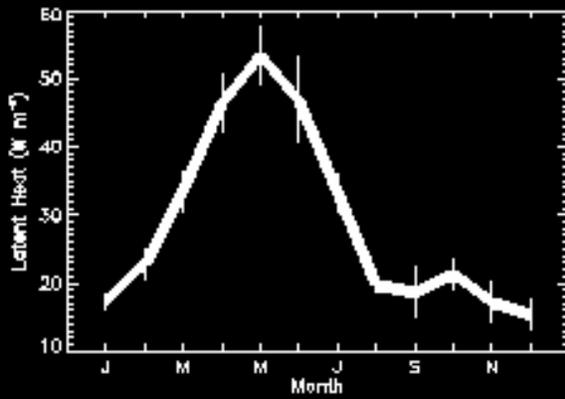
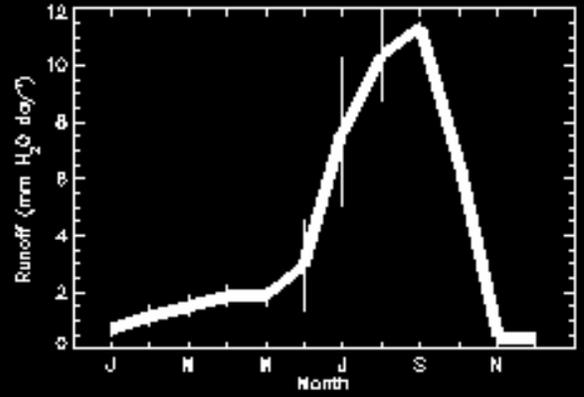
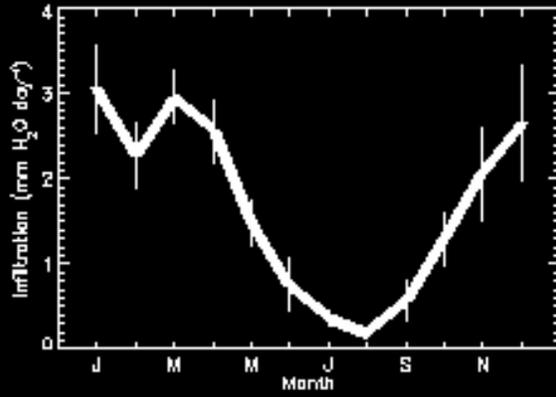
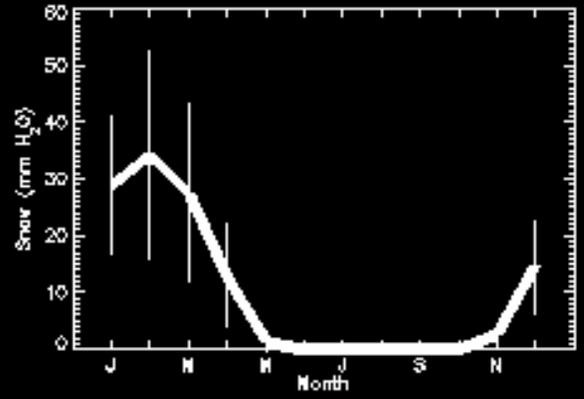
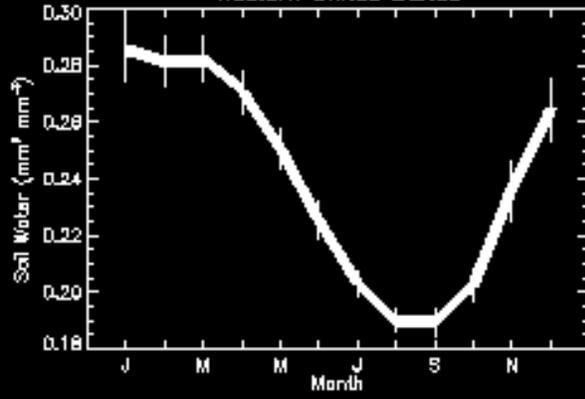
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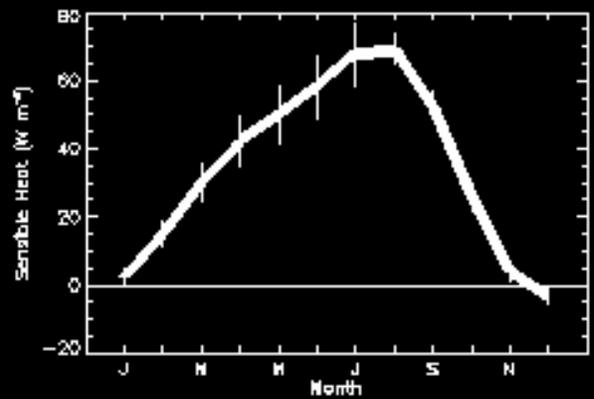
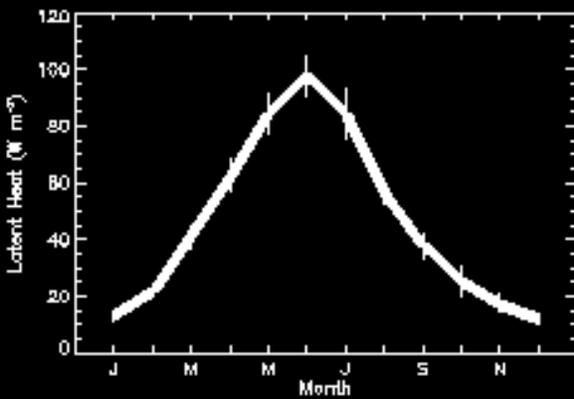
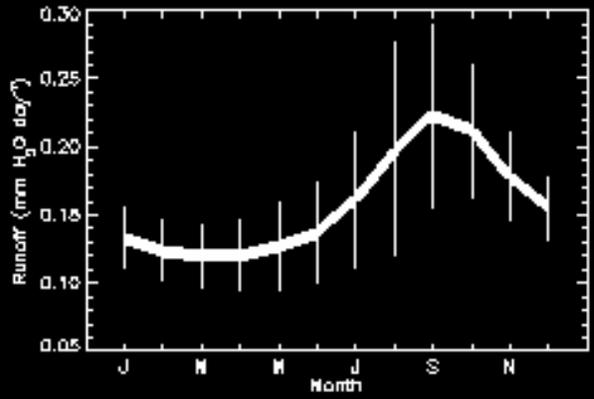
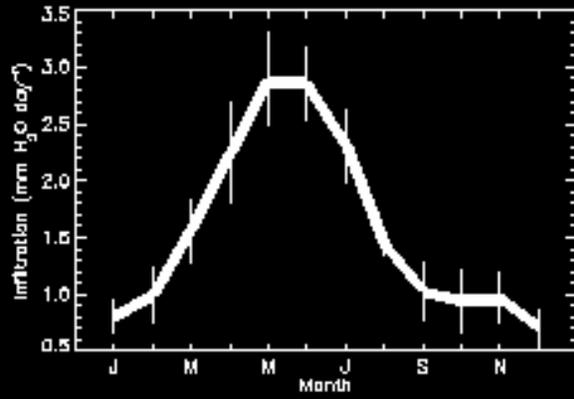
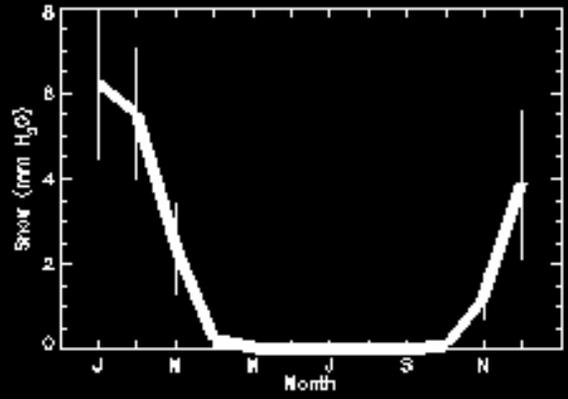
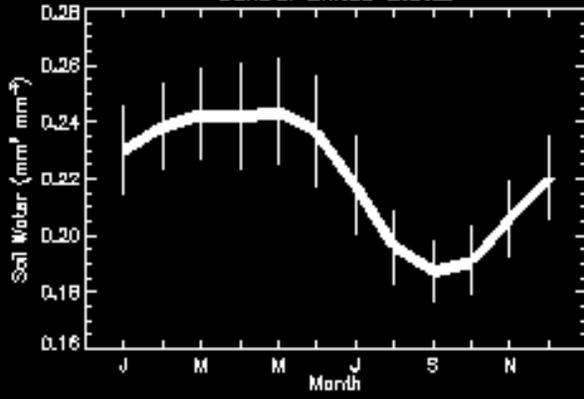
Alaska and Northwest Canada



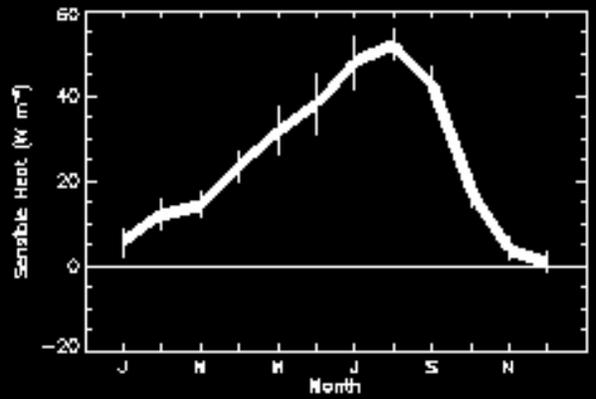
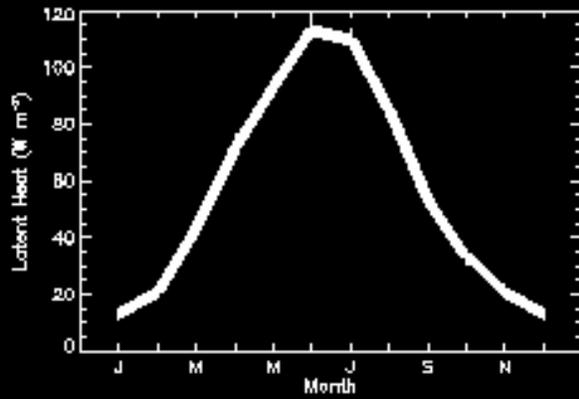
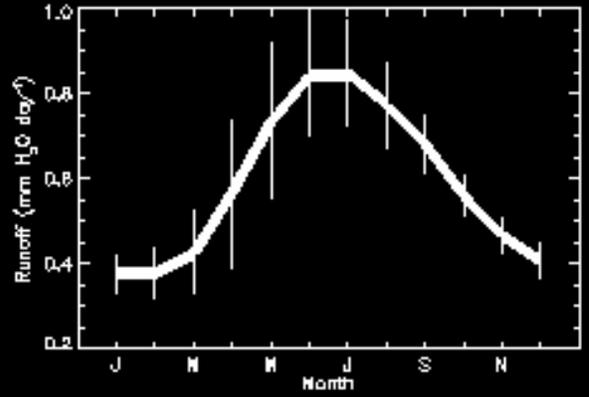
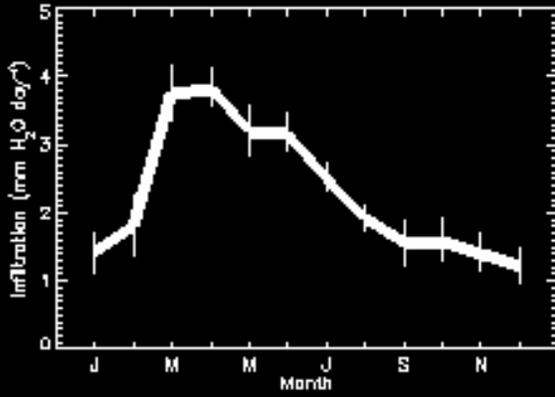
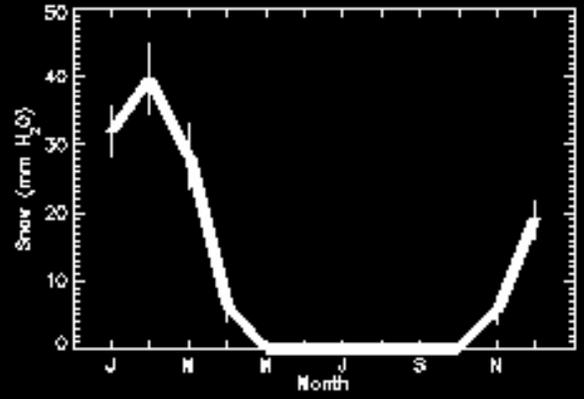
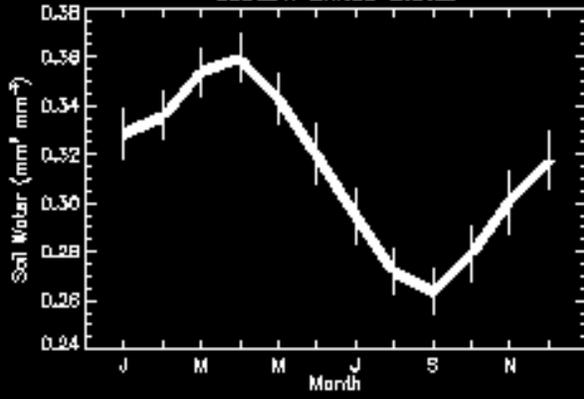
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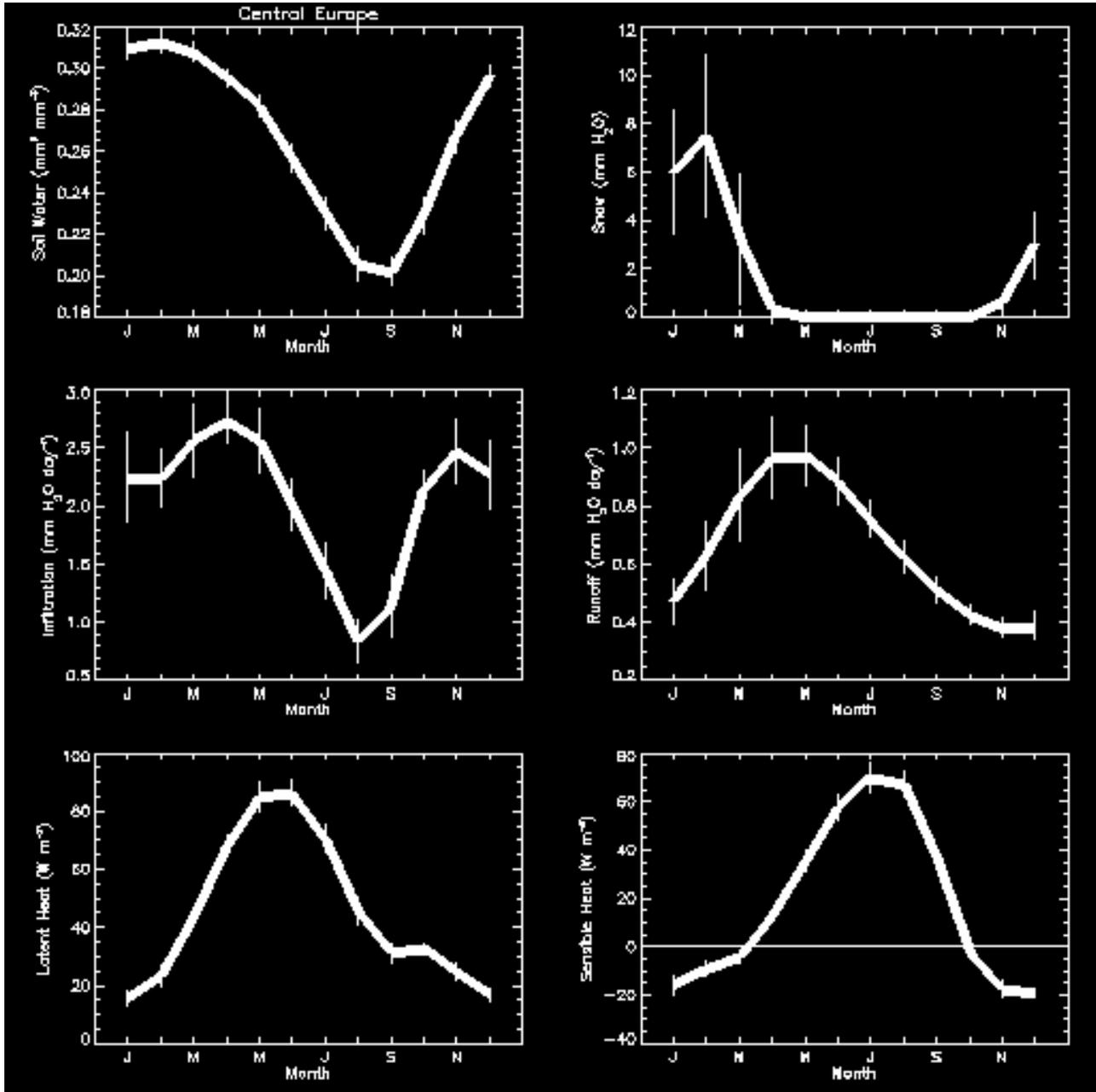


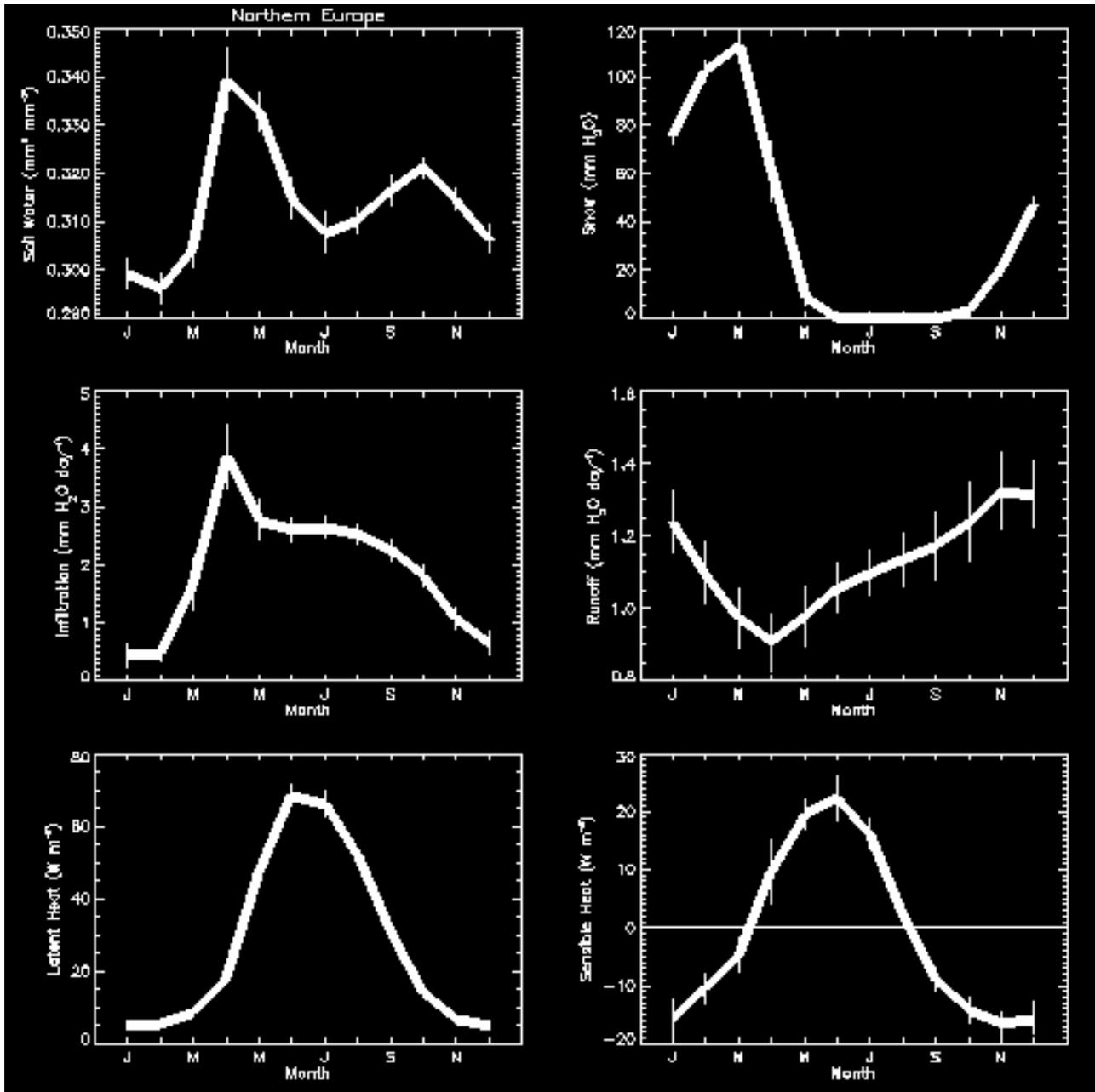
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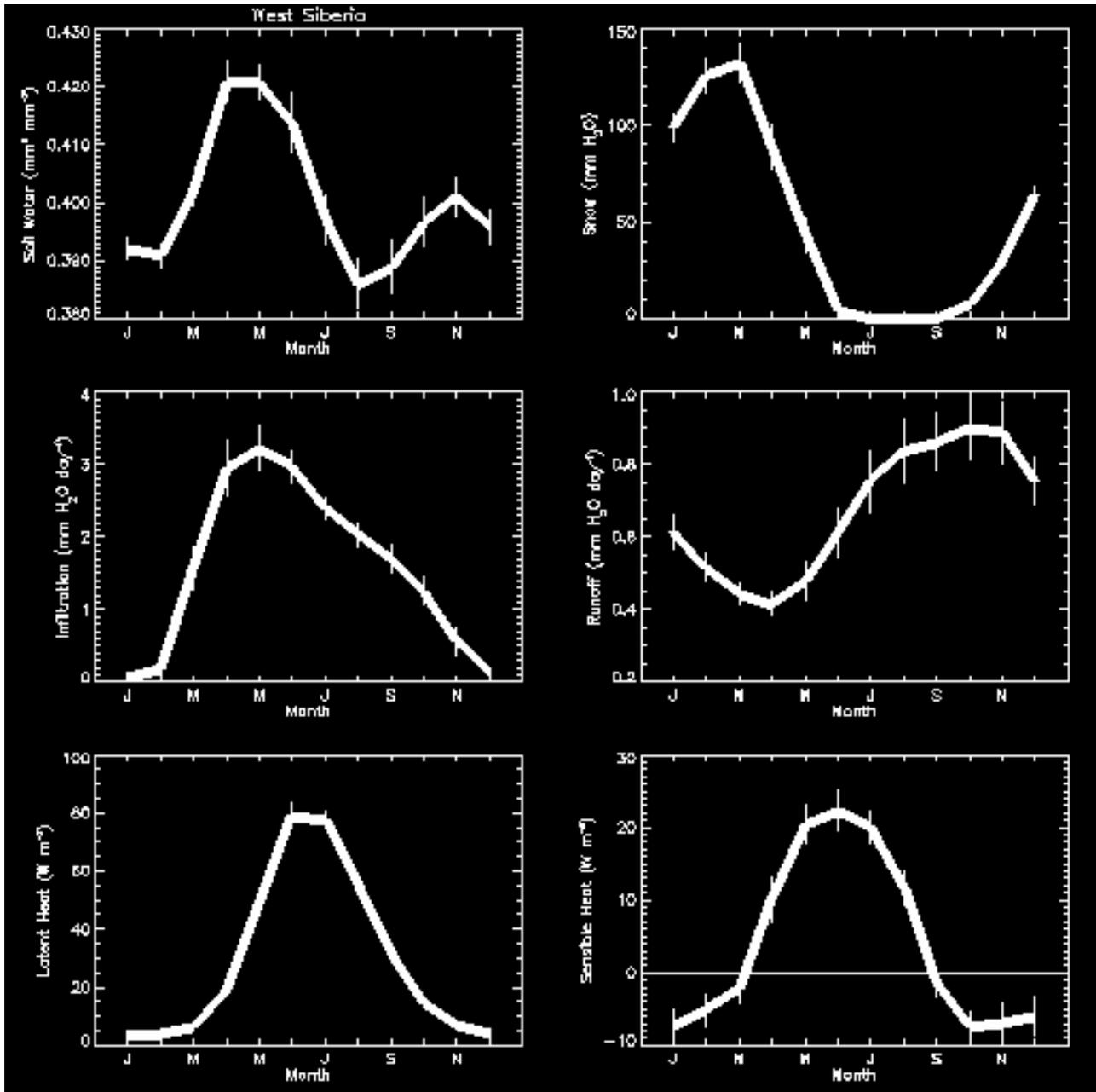


Eastern United States

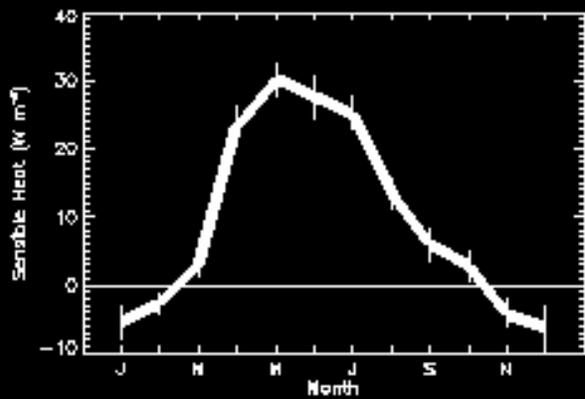
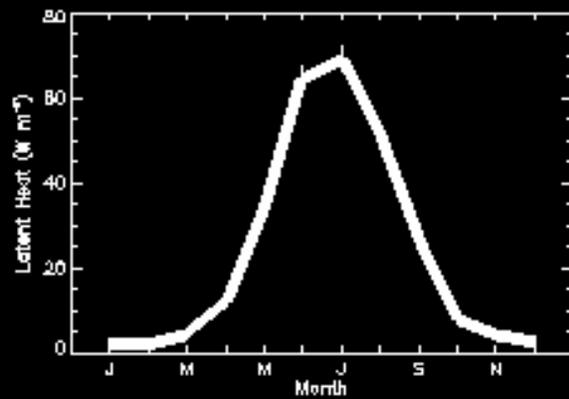
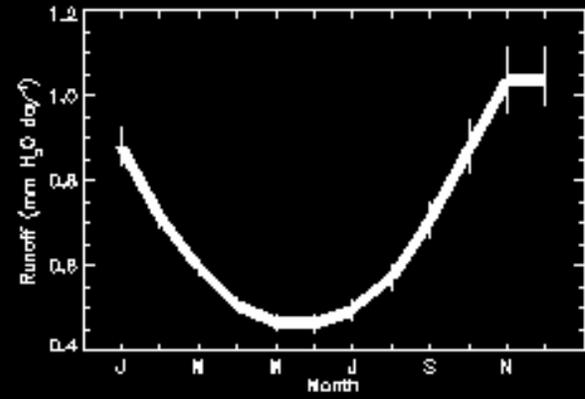
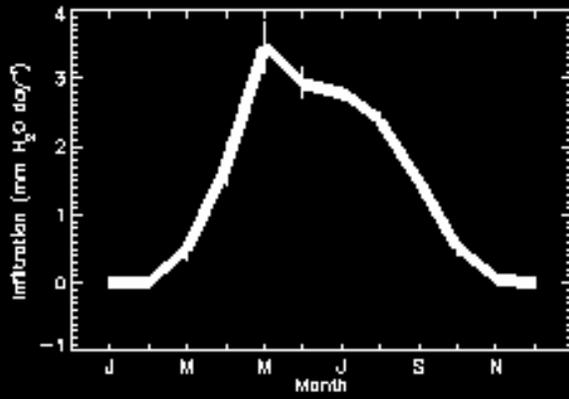
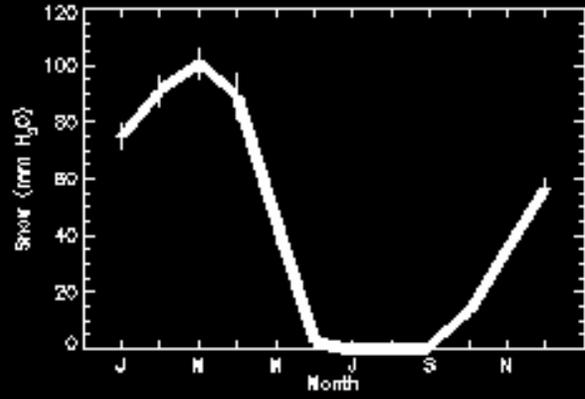
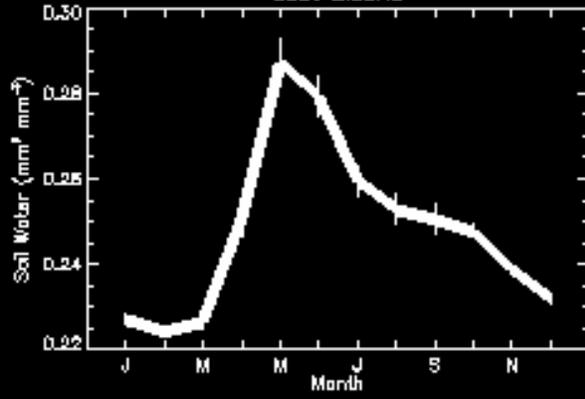




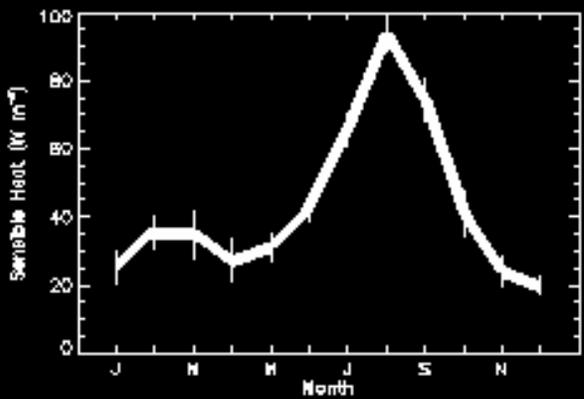
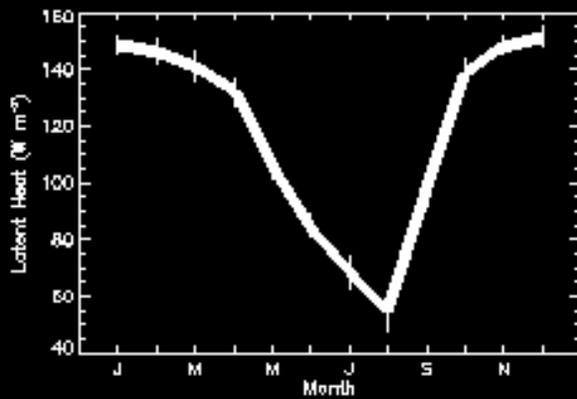
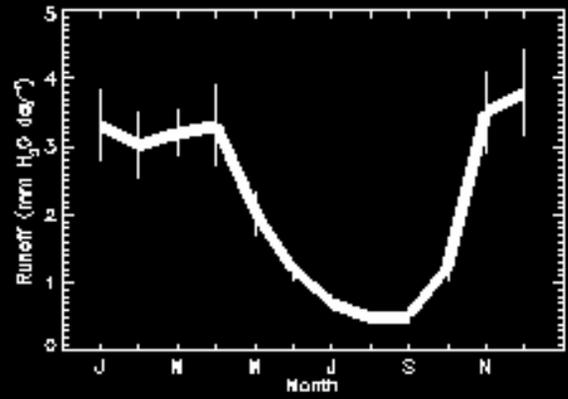
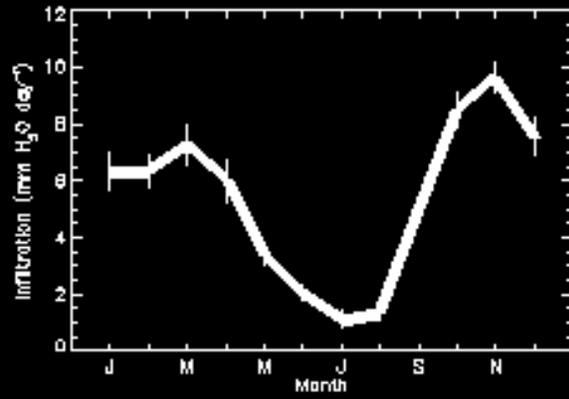
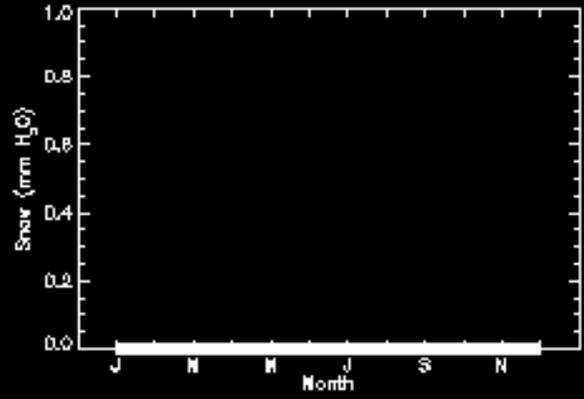
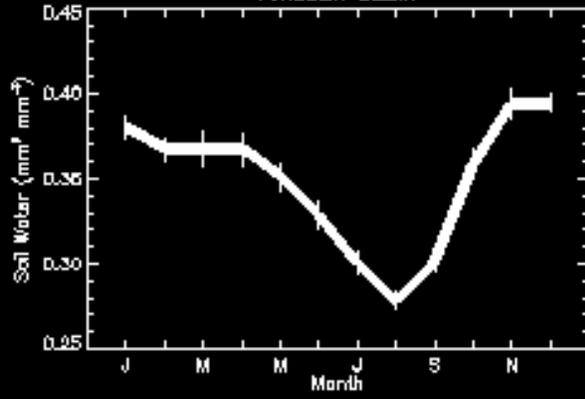


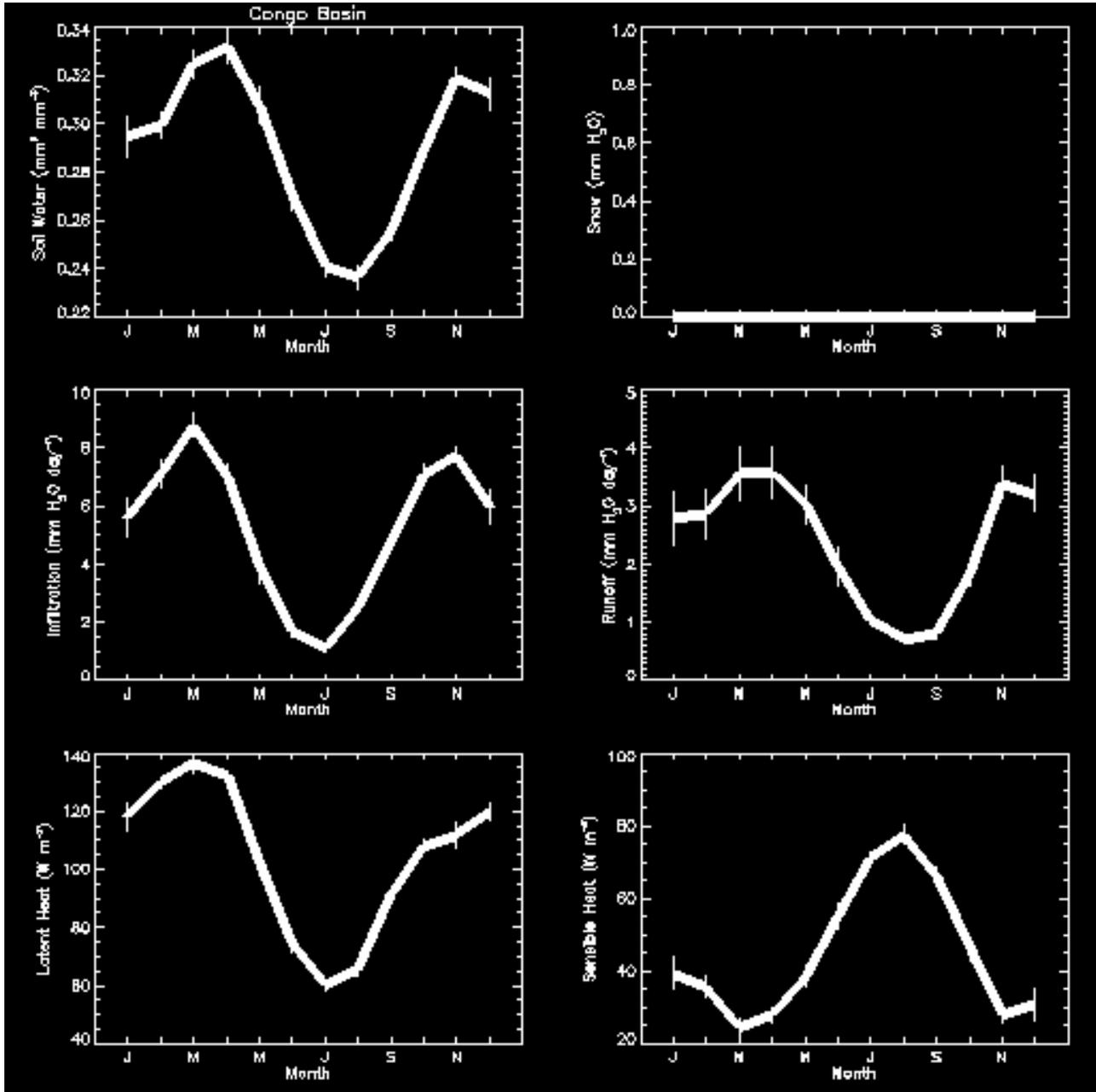


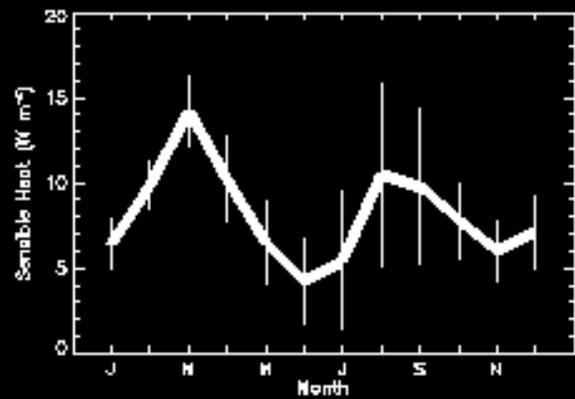
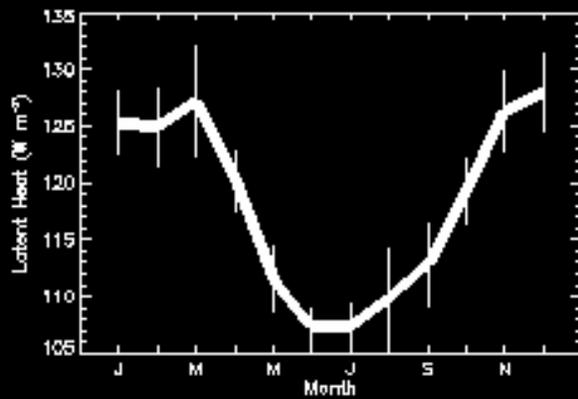
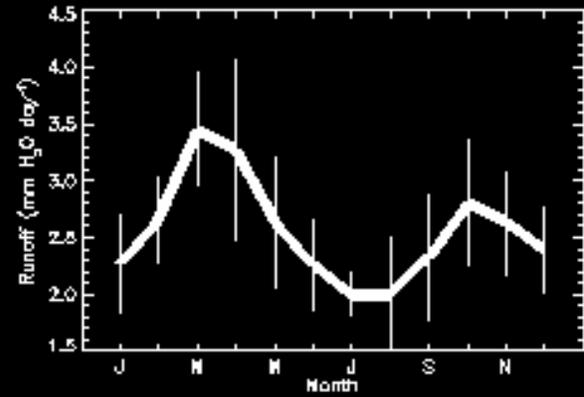
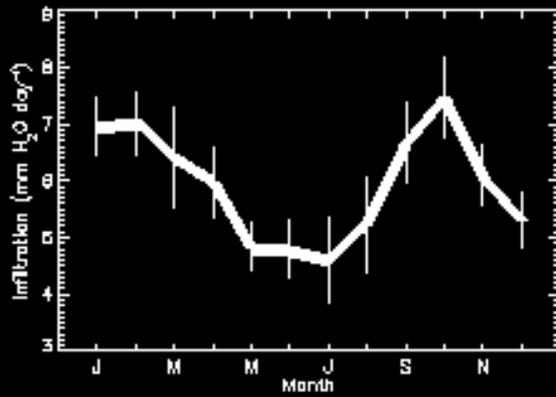
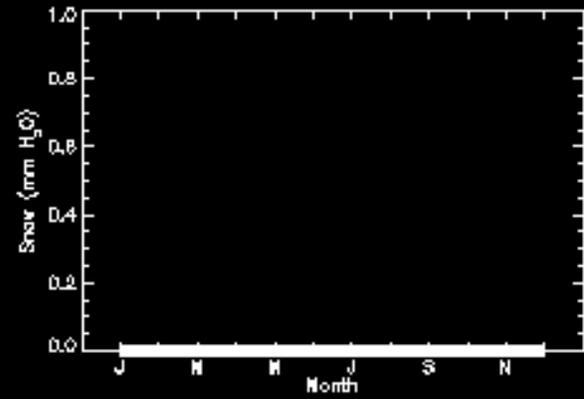
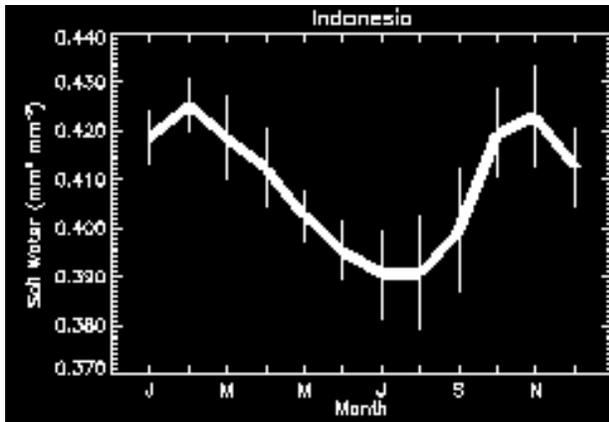
East Siberia



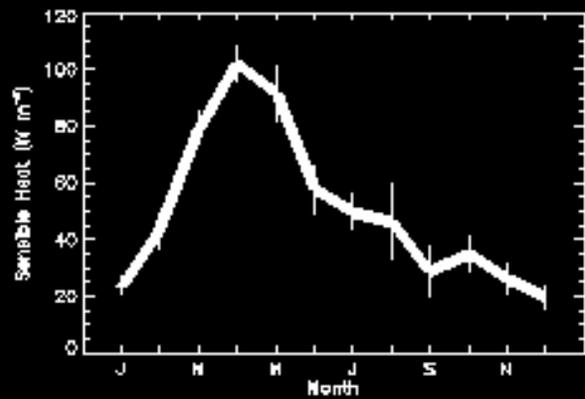
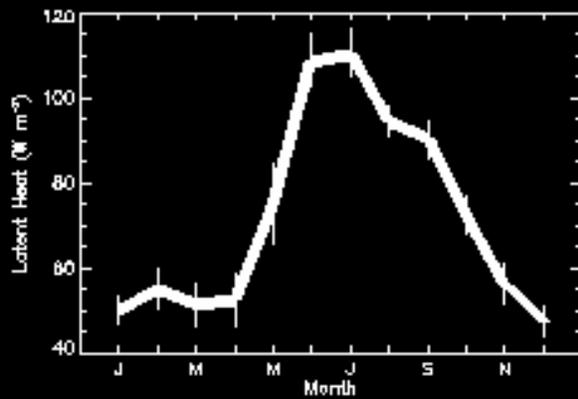
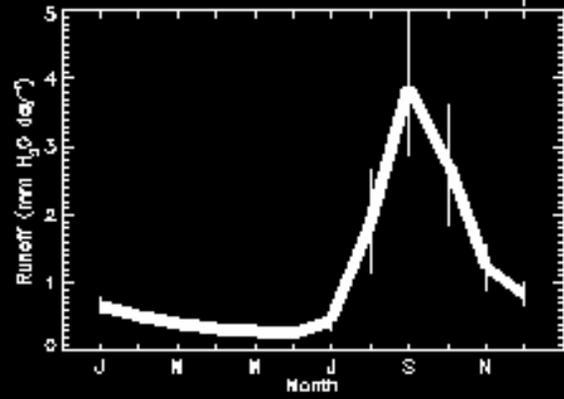
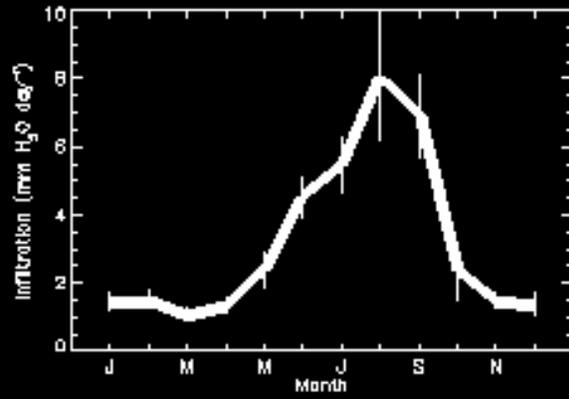
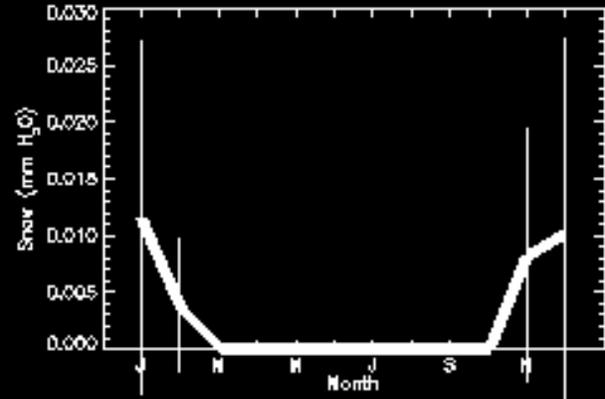
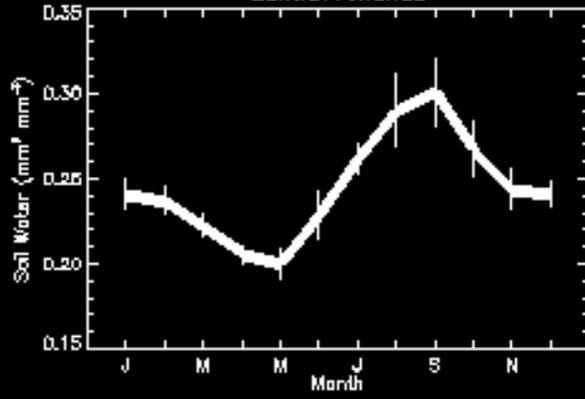
Amazon Basin

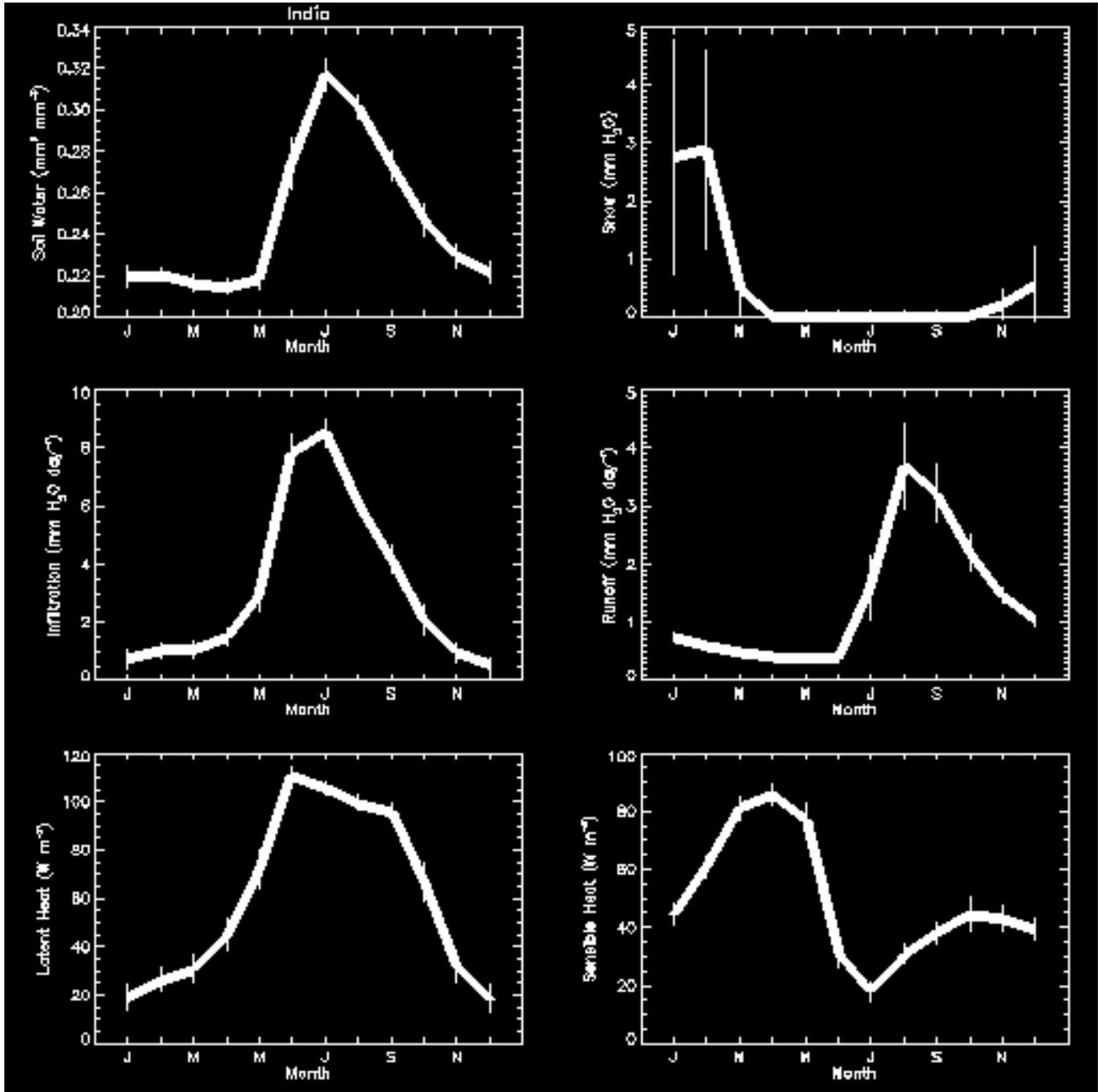


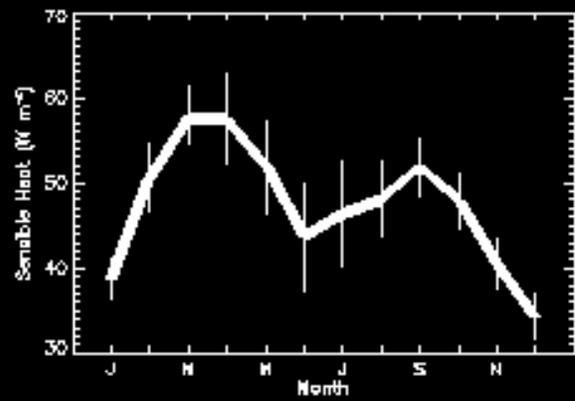
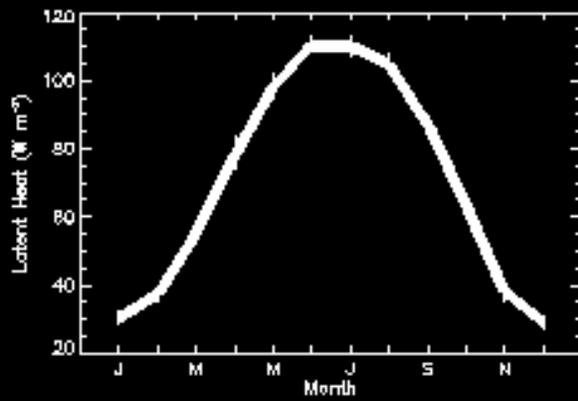
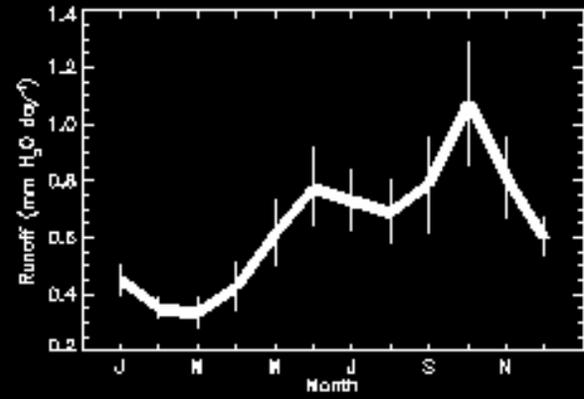
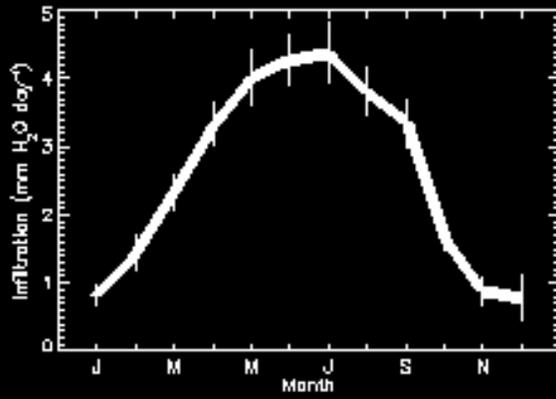
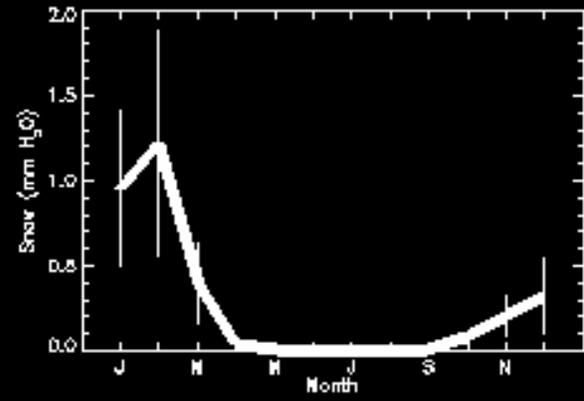
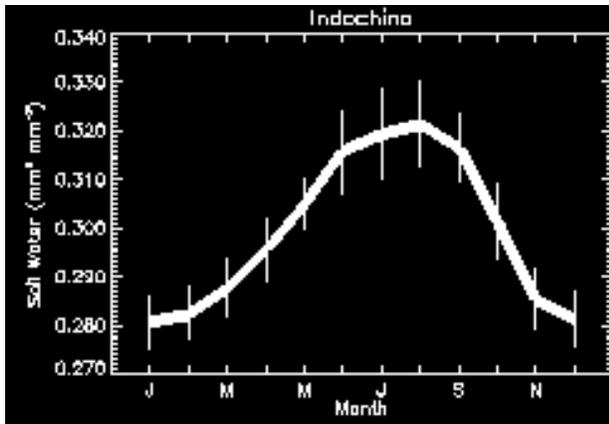


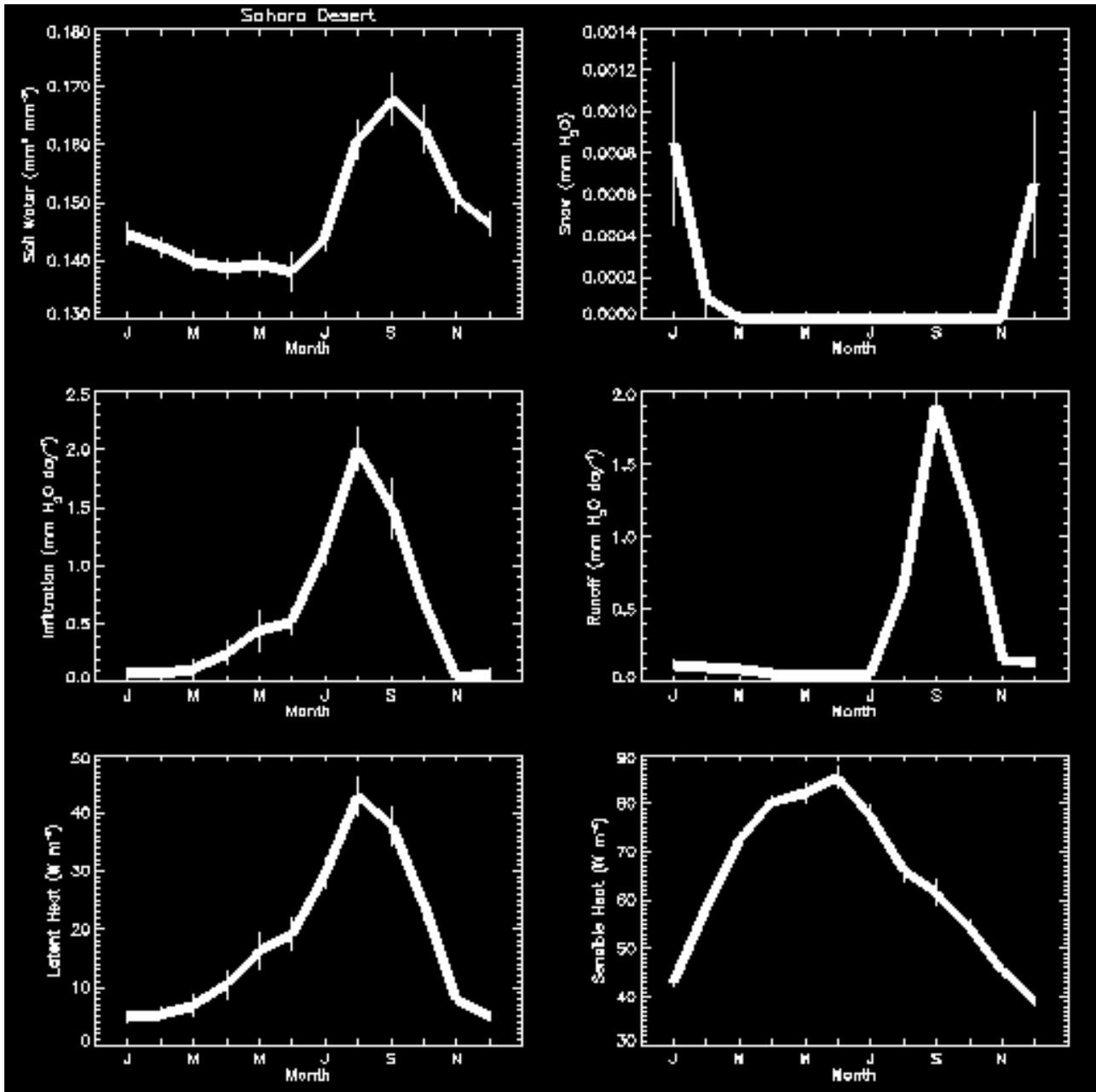


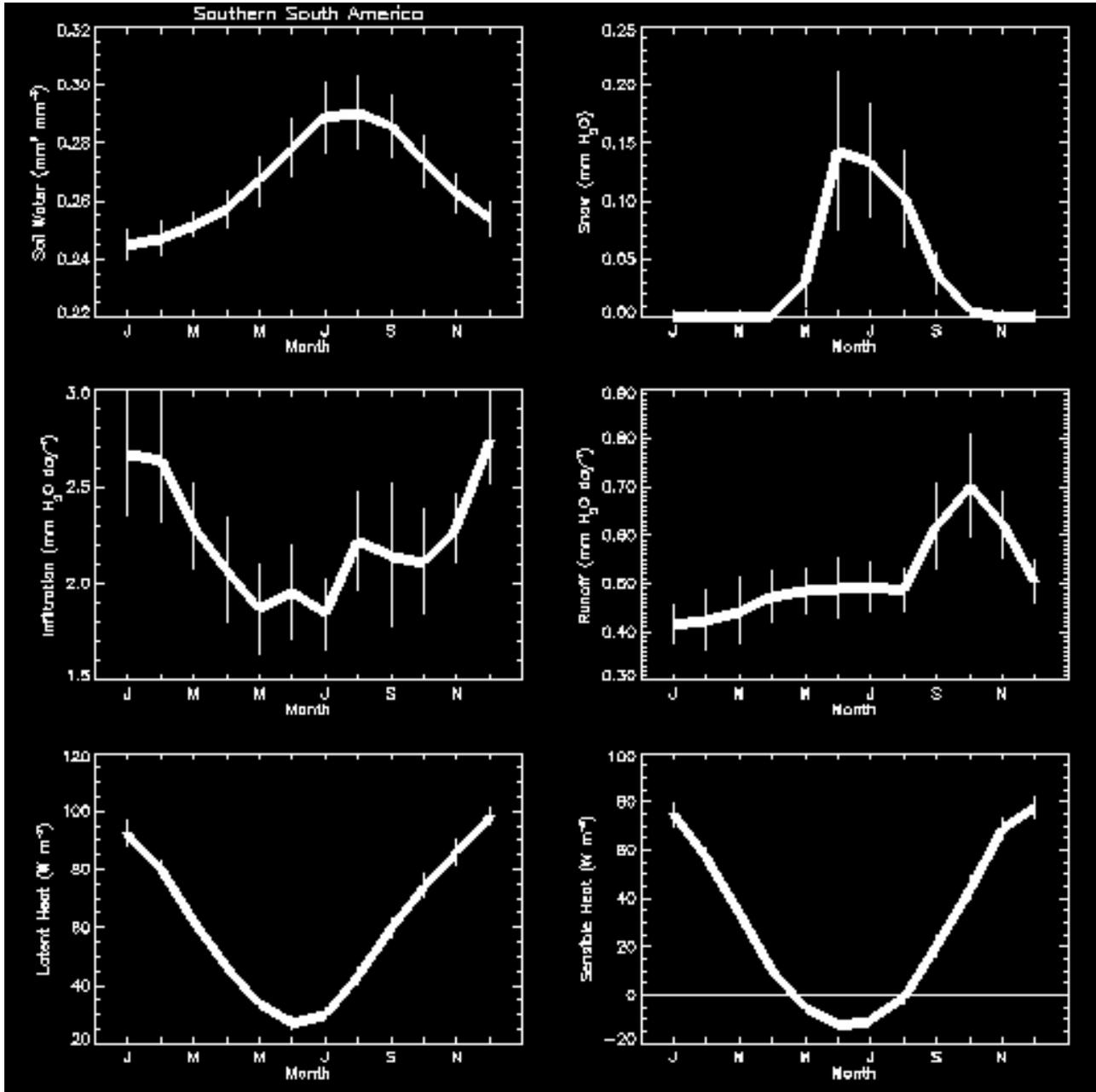
Central America



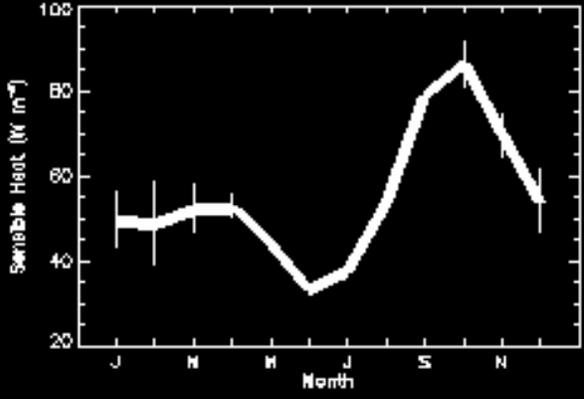
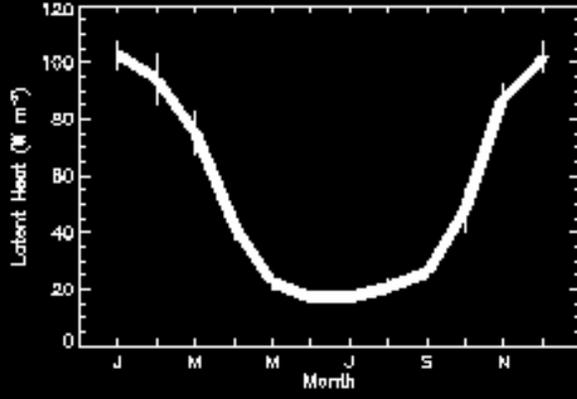
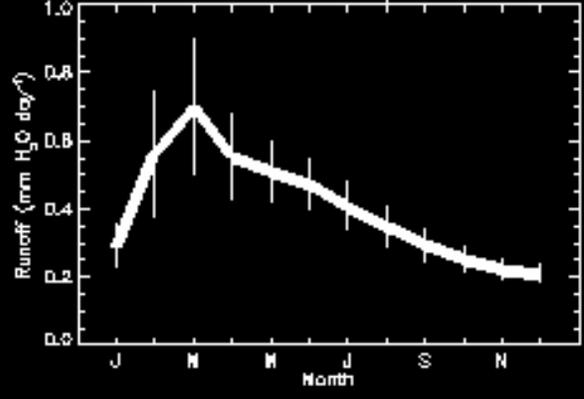
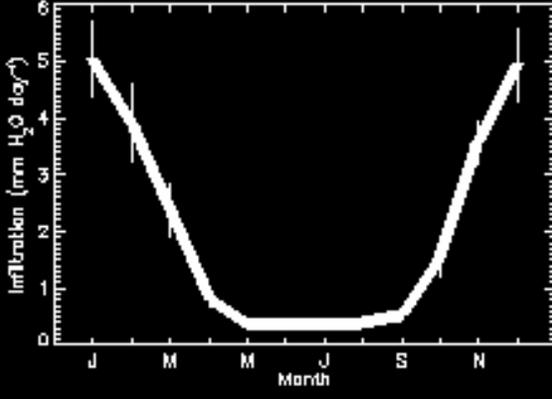
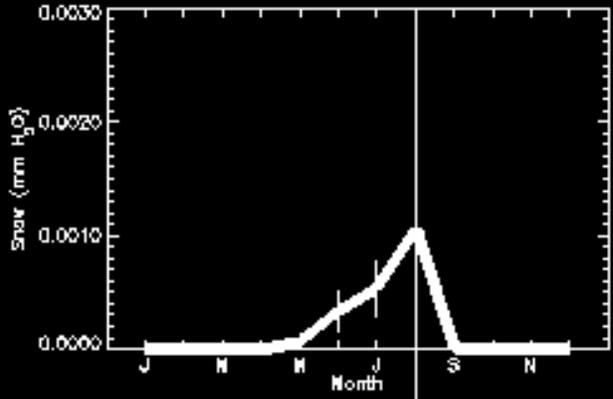
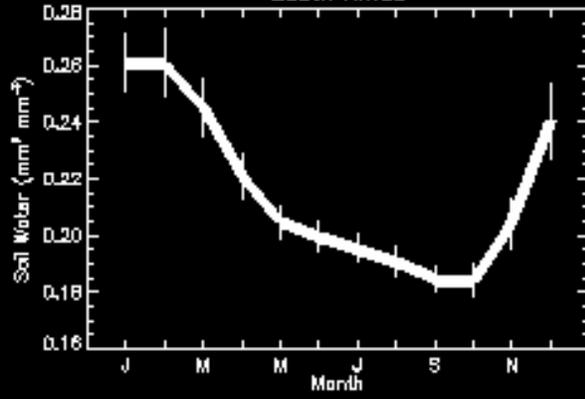


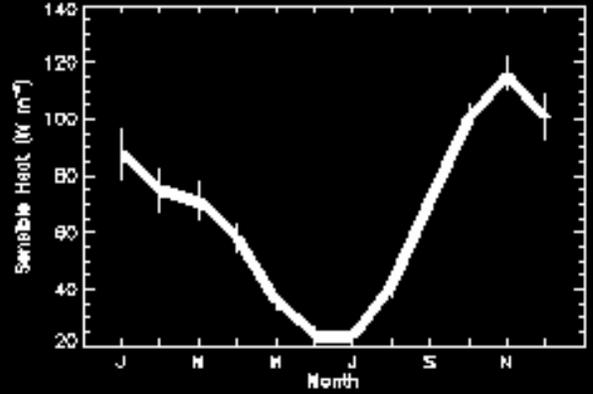
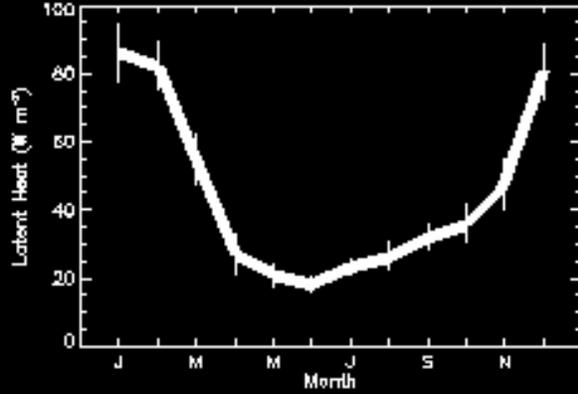
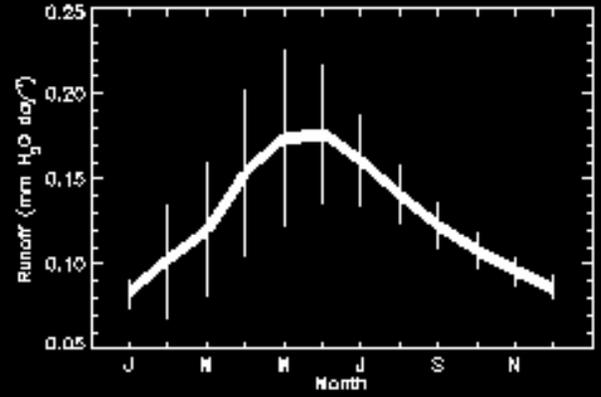
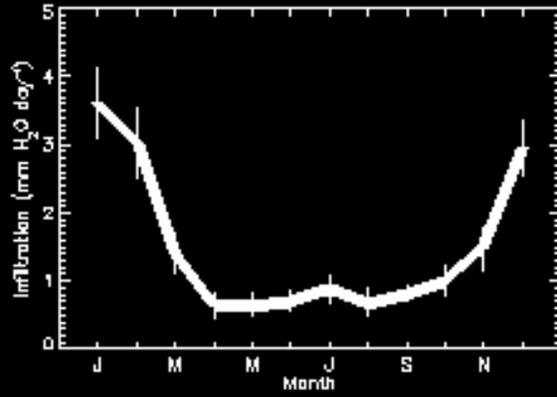
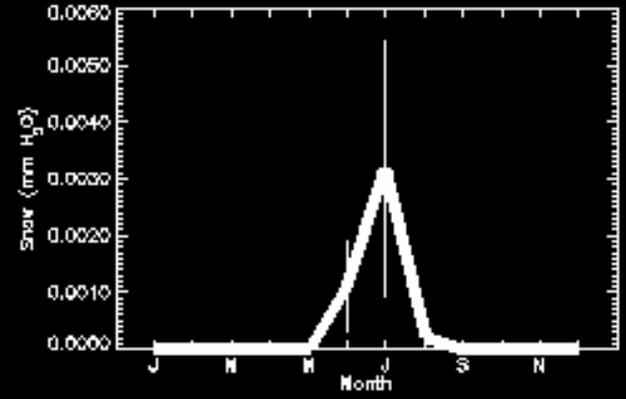
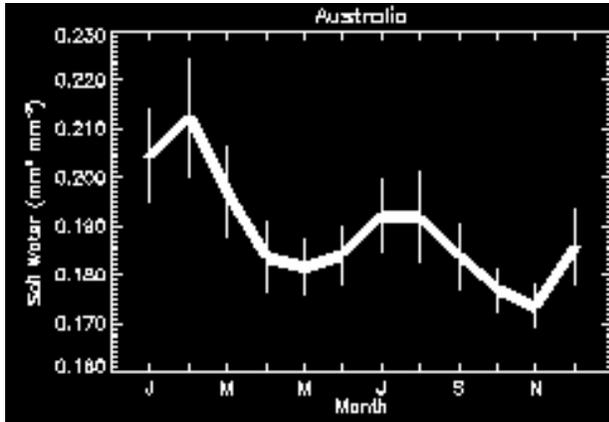


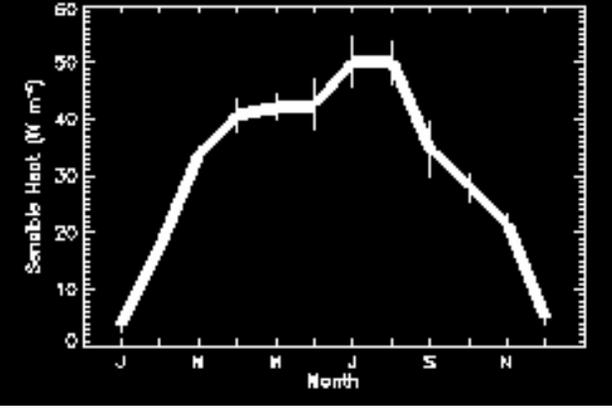
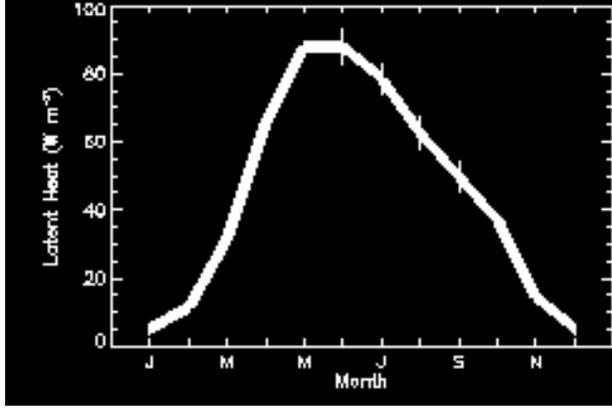
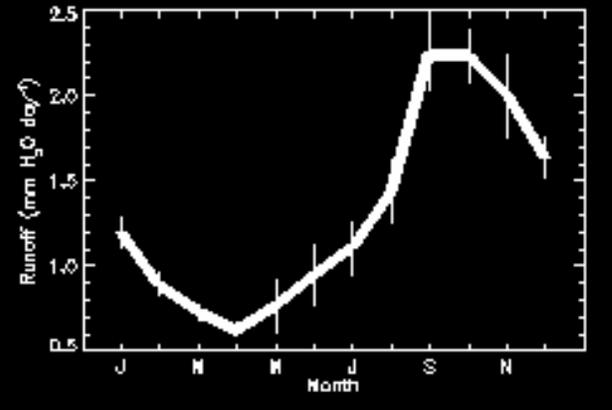
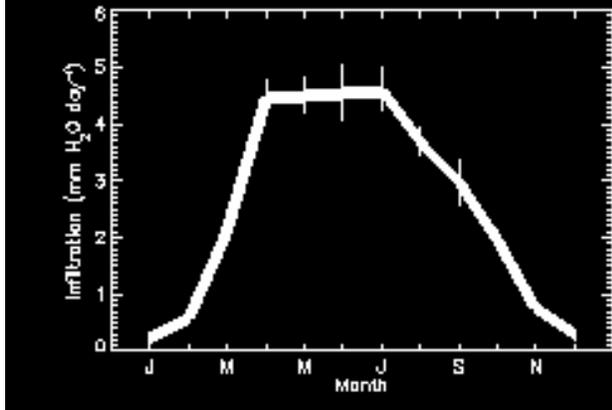
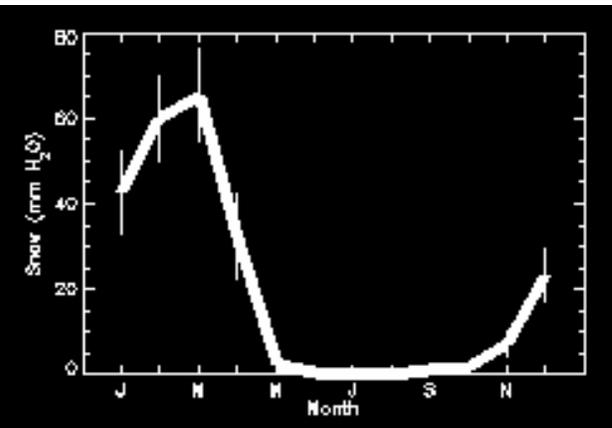
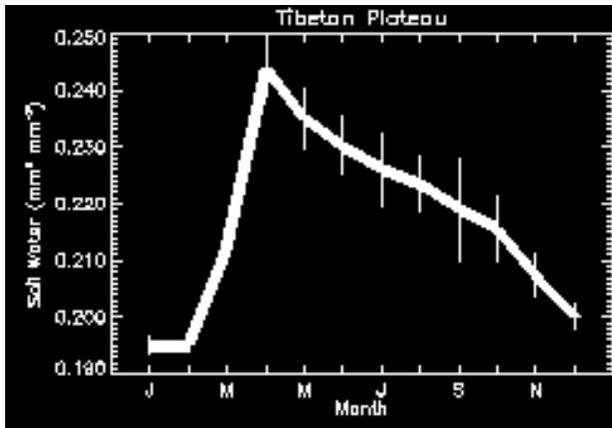


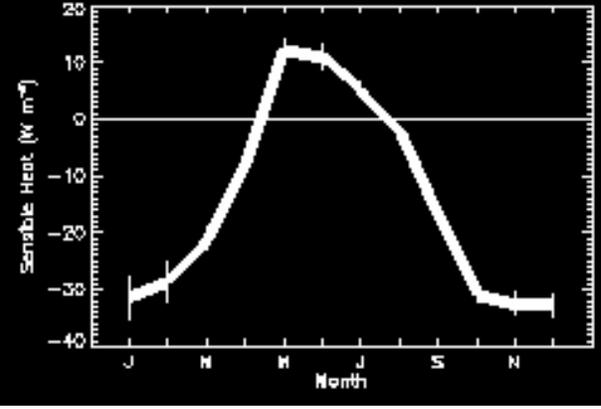
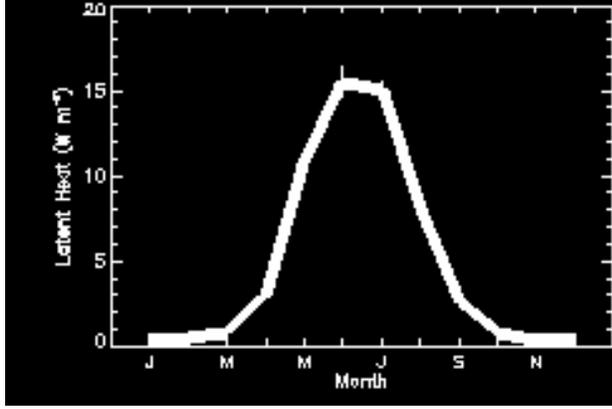
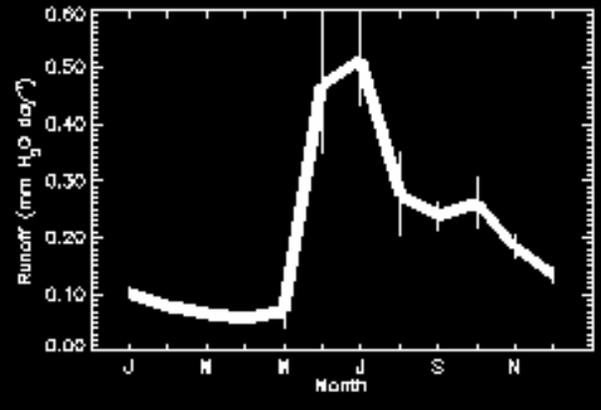
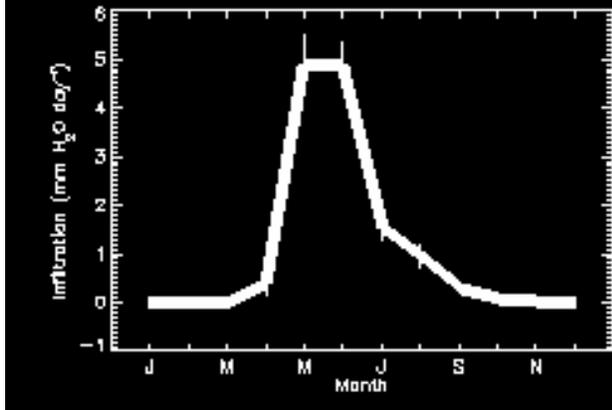
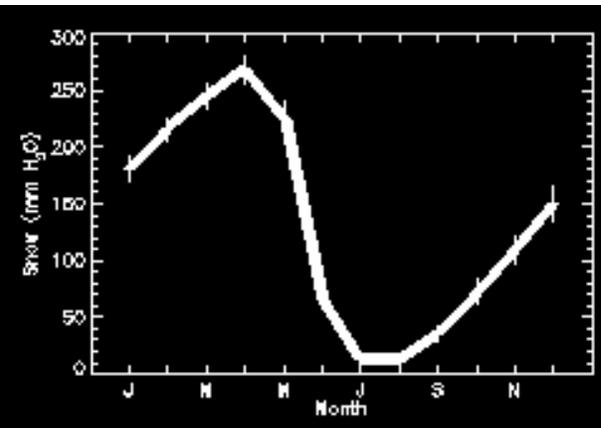
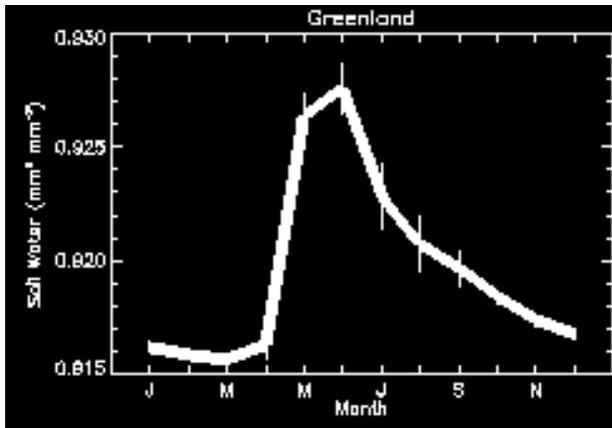


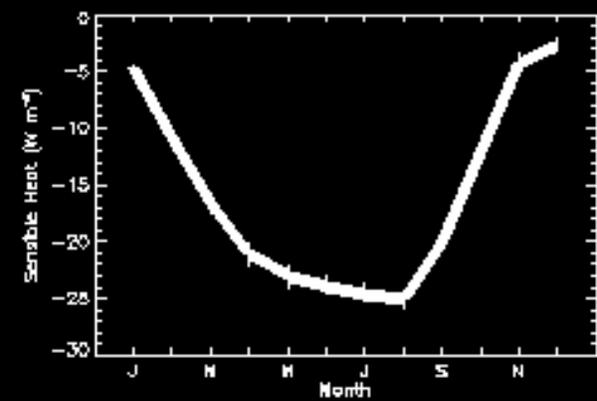
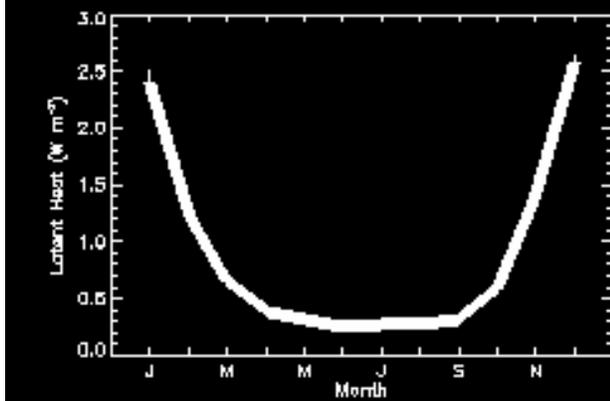
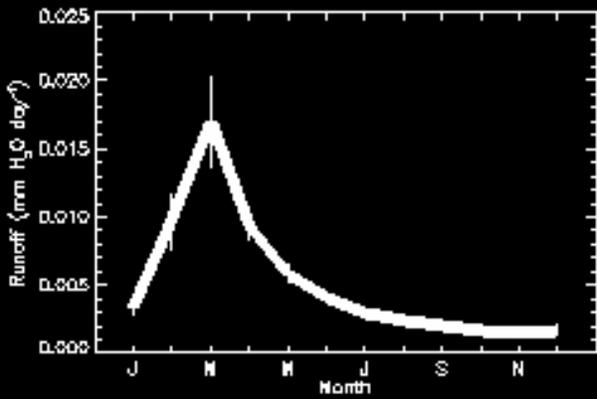
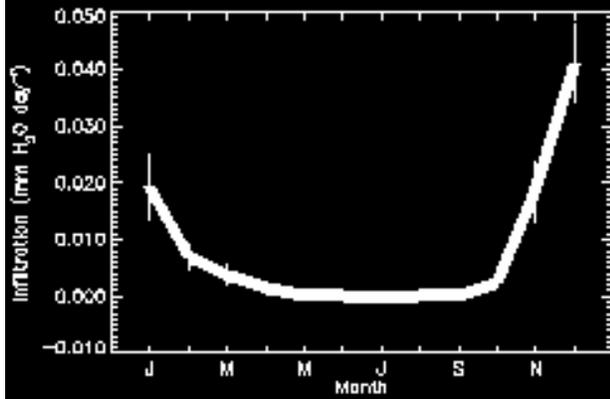
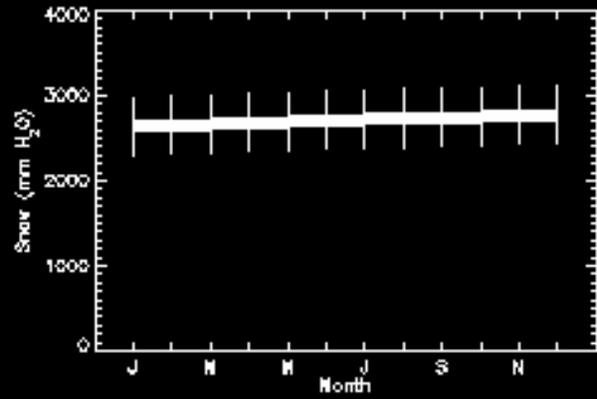
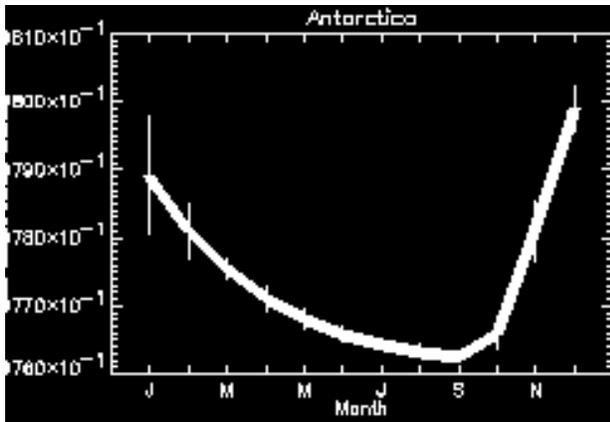
South Africa



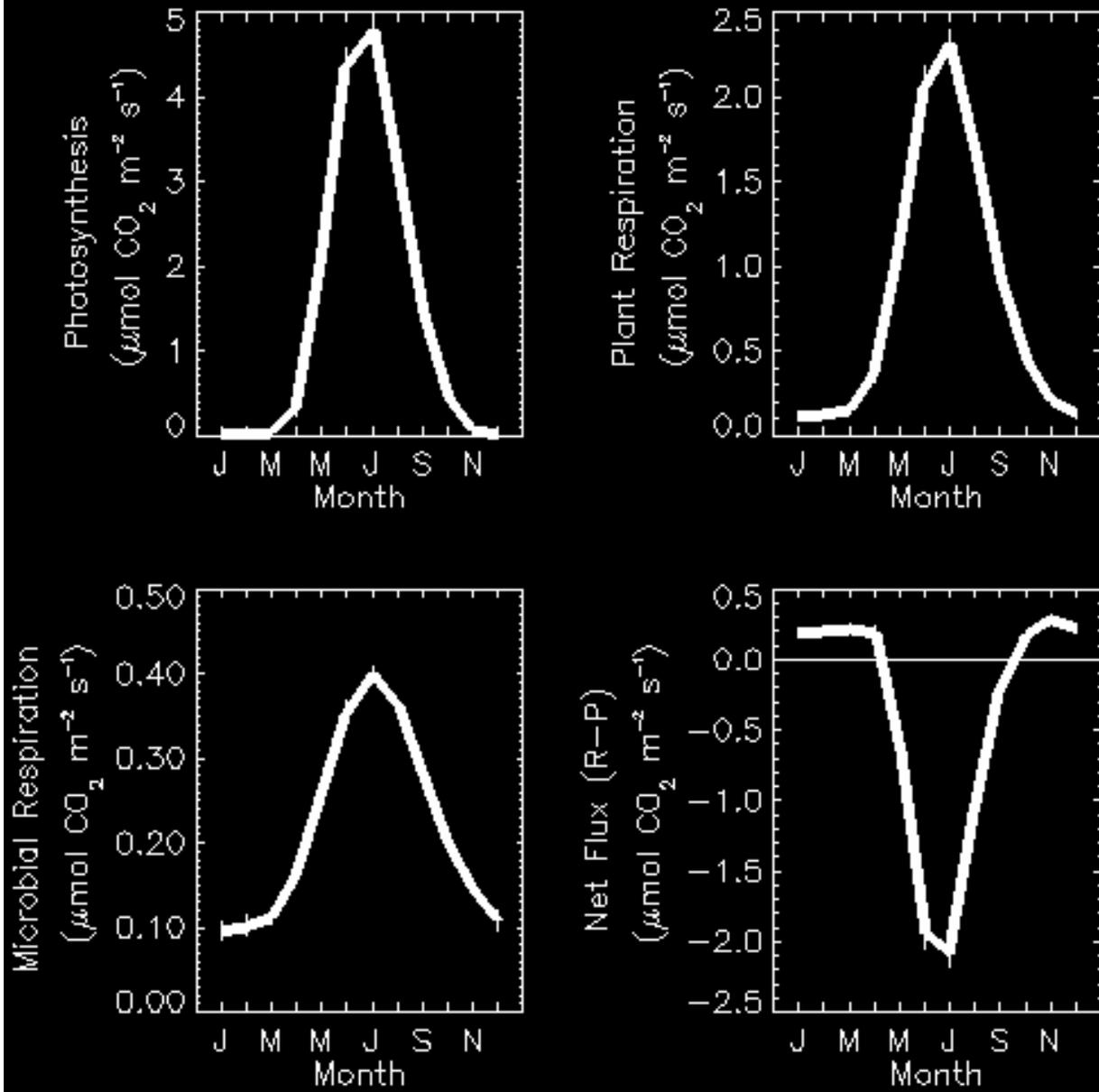




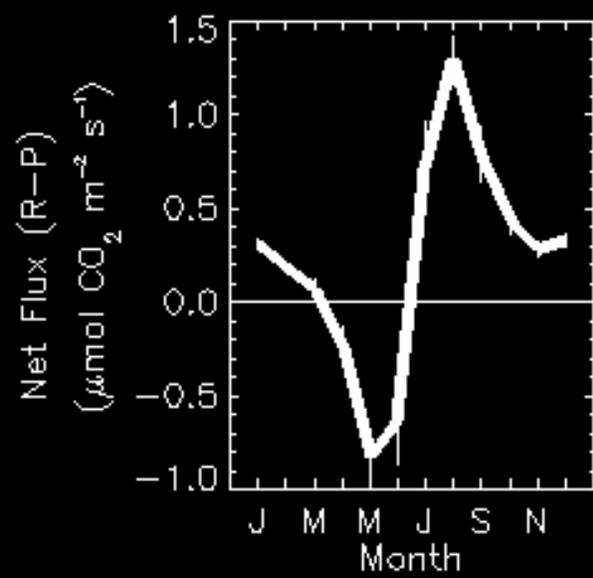
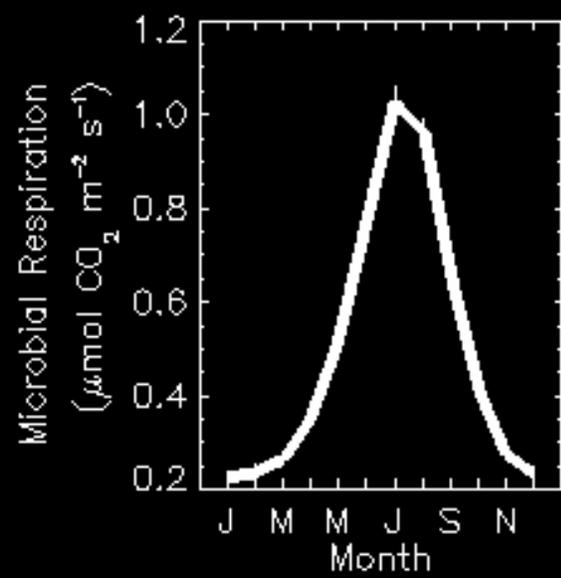
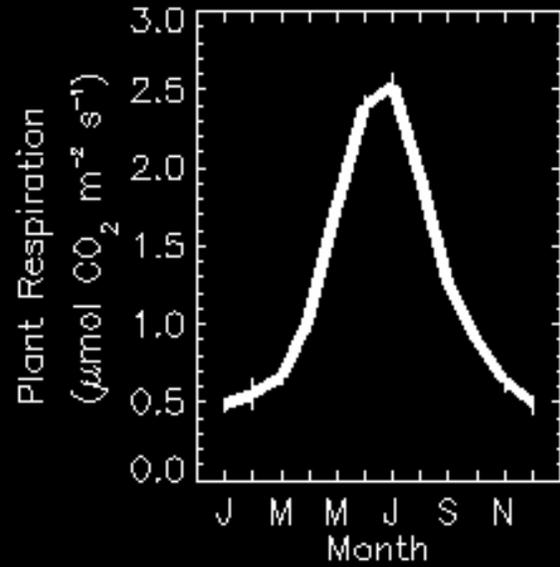
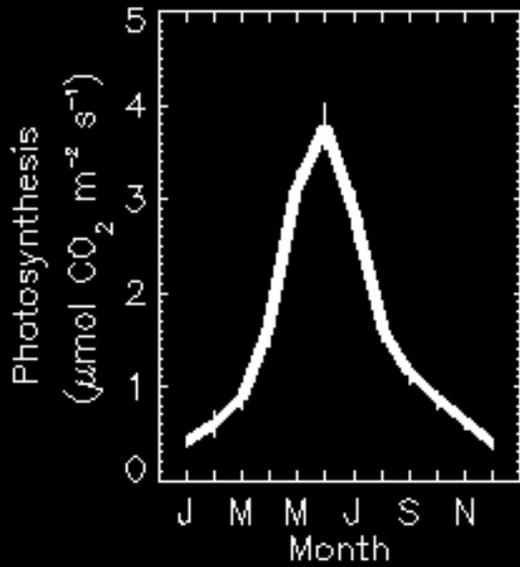




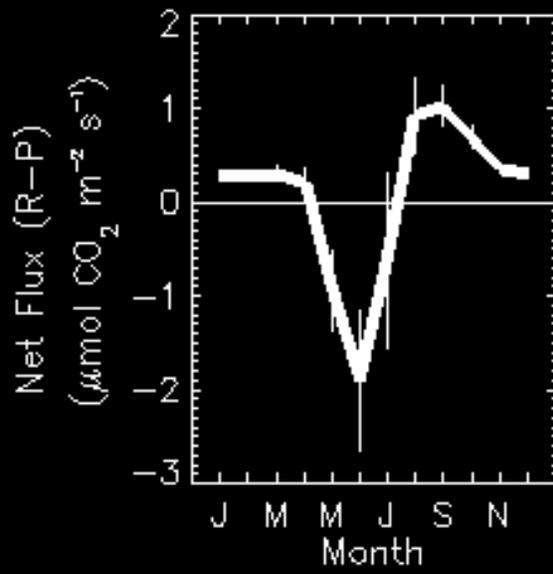
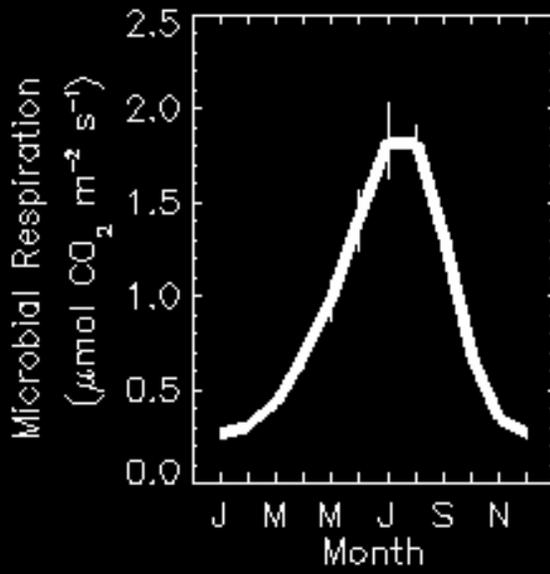
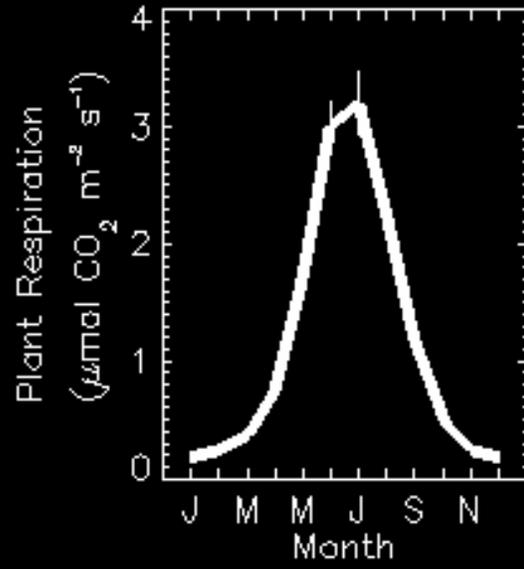
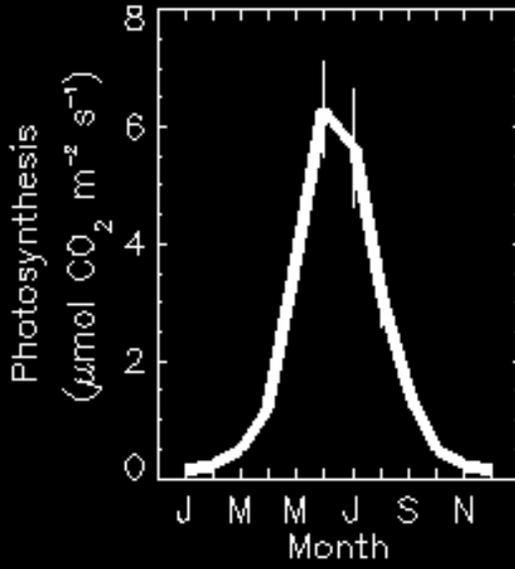
Alaska and Northwest Canada



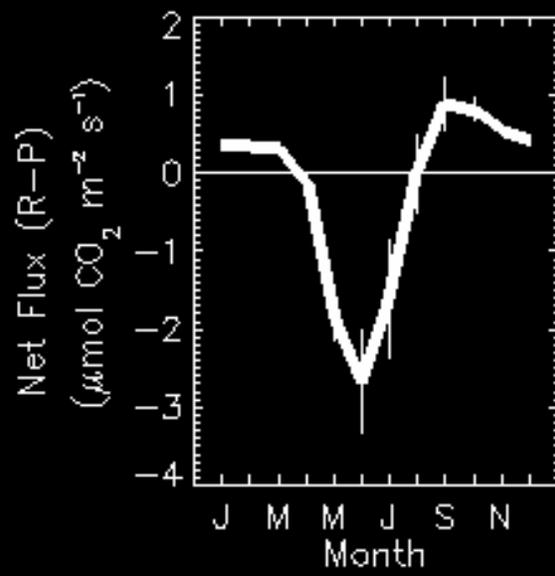
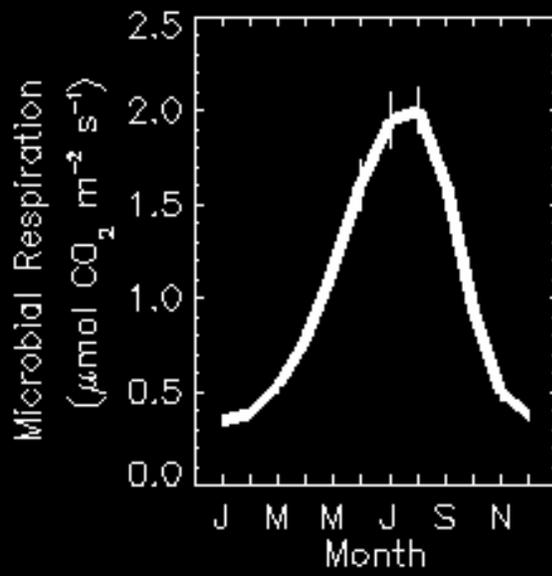
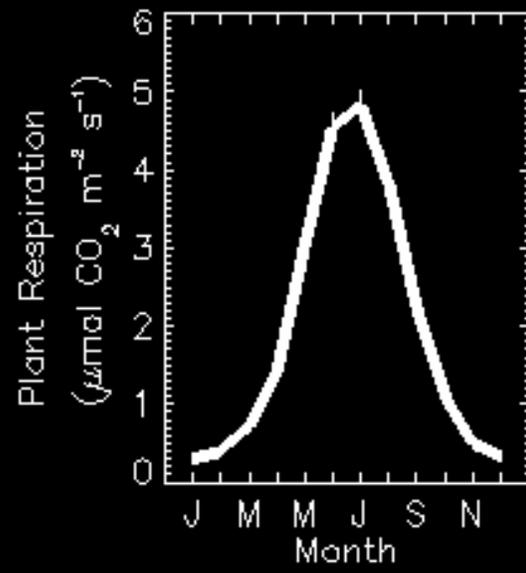
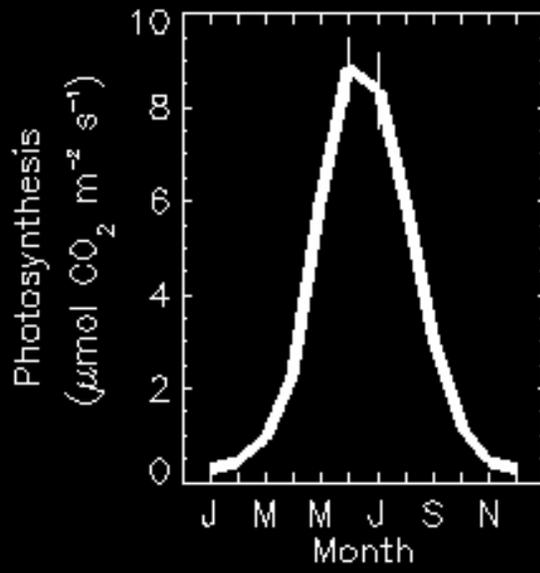
Western United States



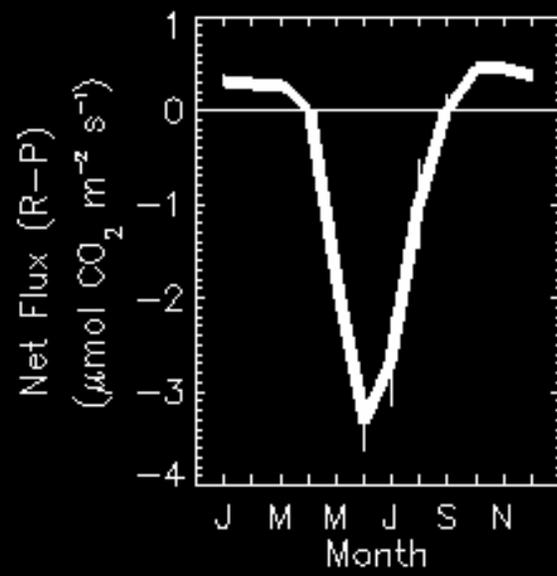
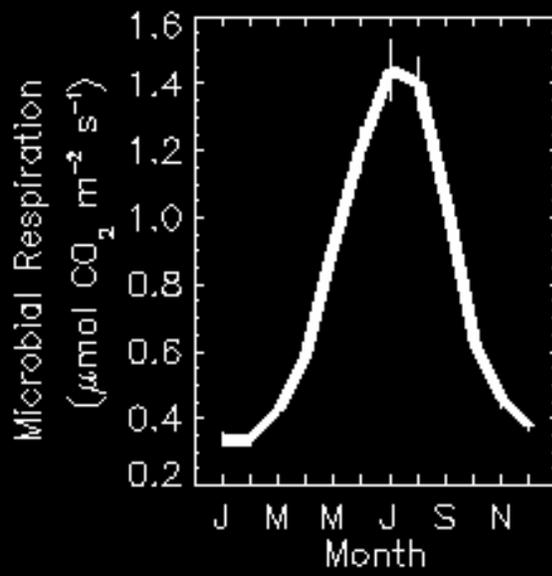
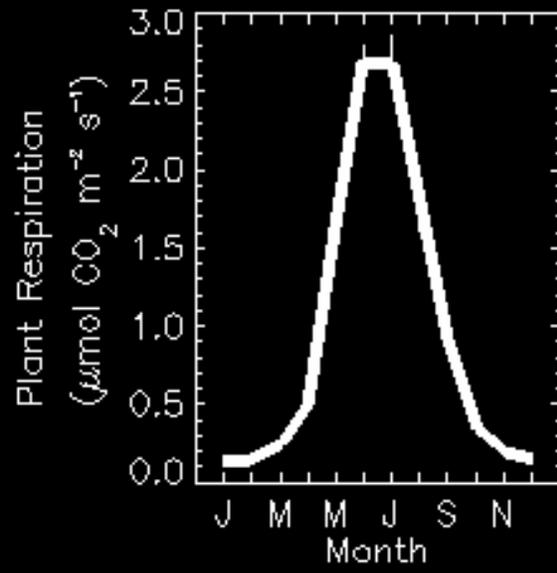
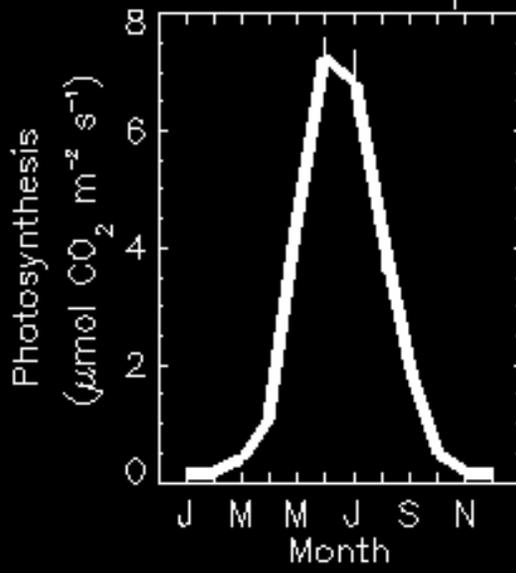
Central United States



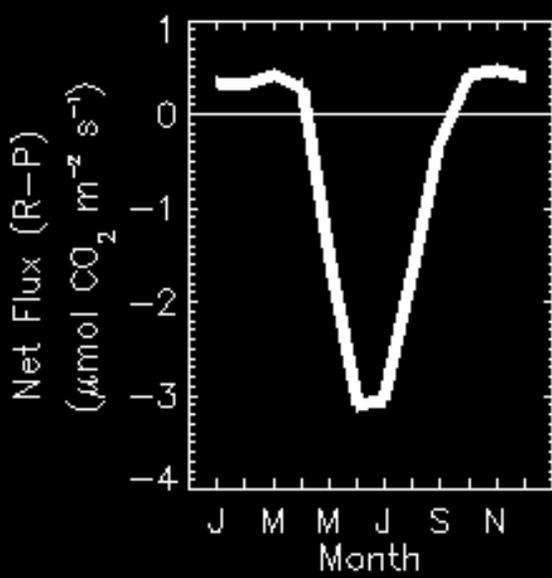
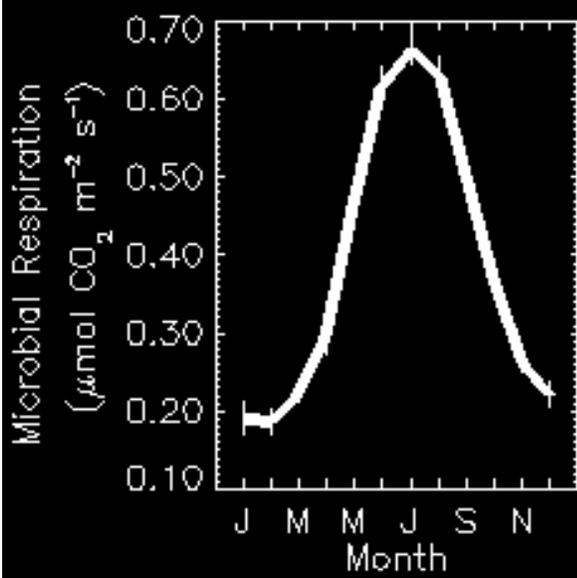
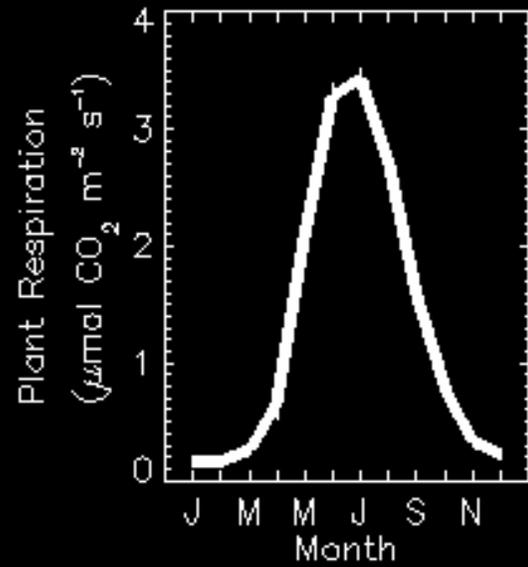
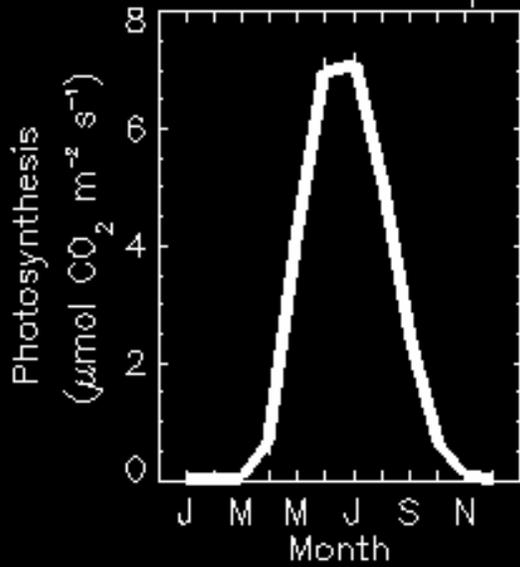
Eastern United States



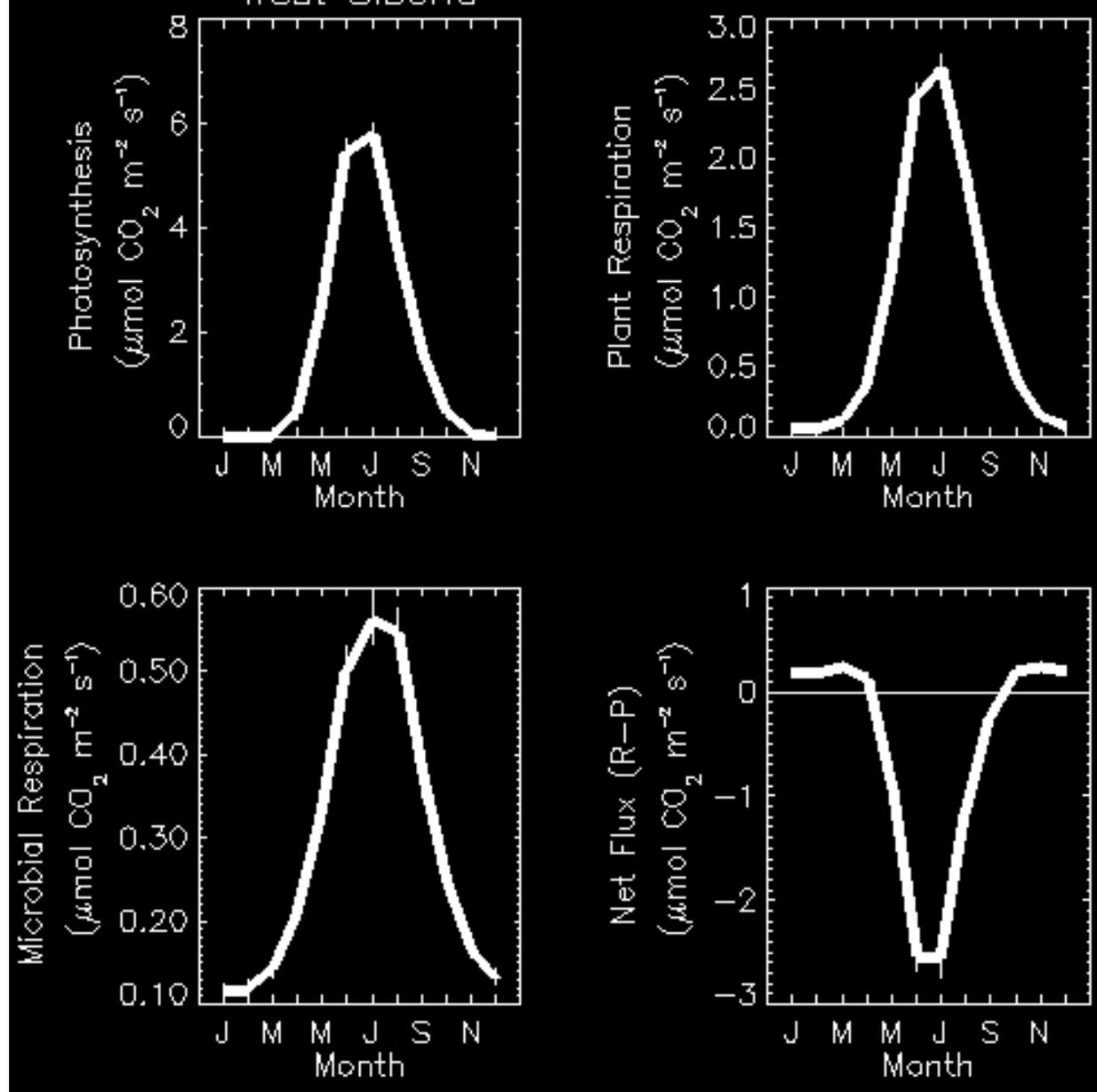
Central Europe



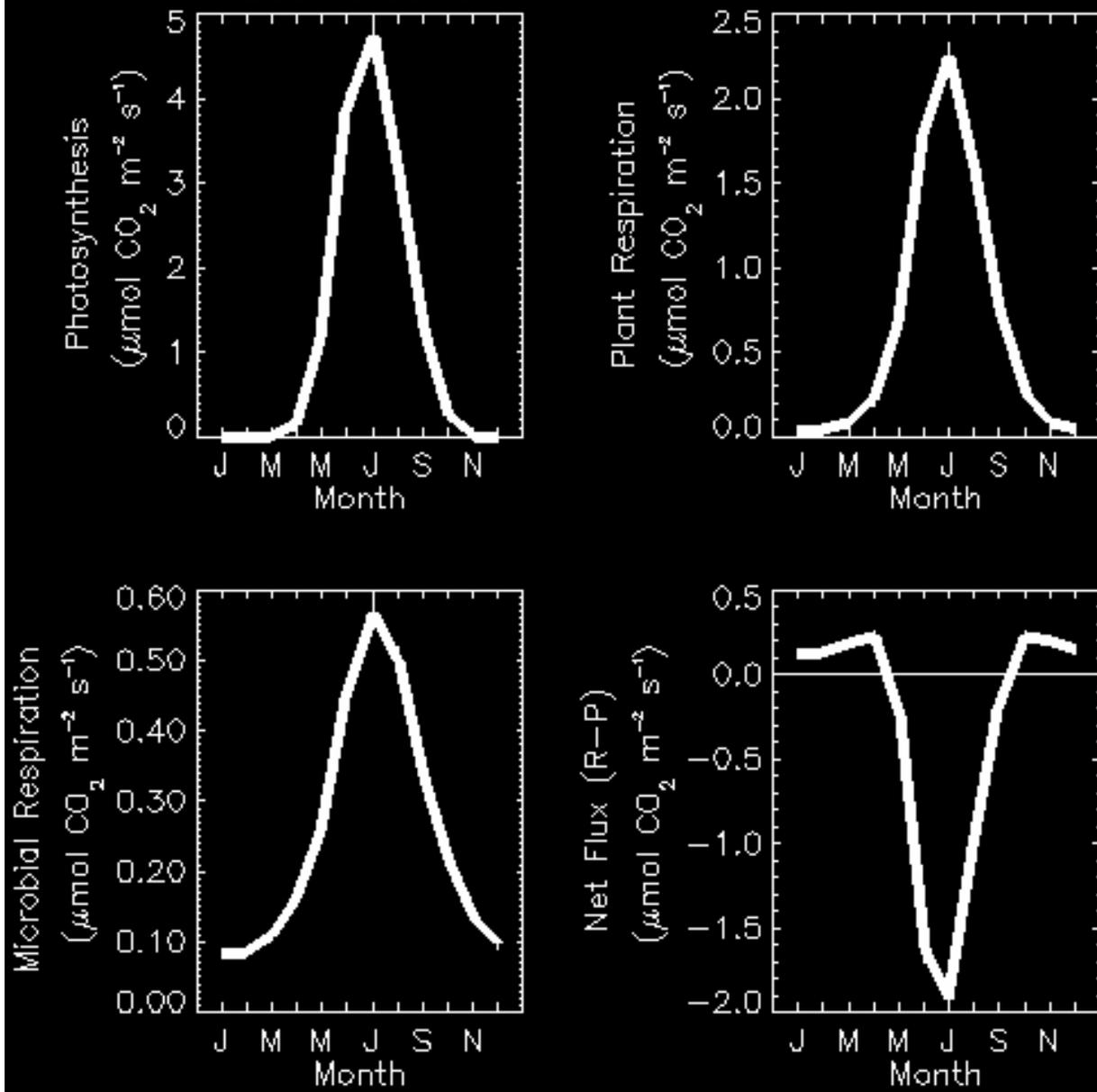
Northern Europe



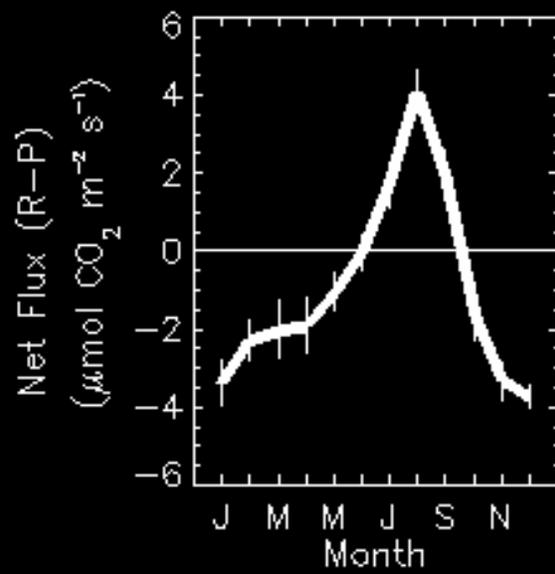
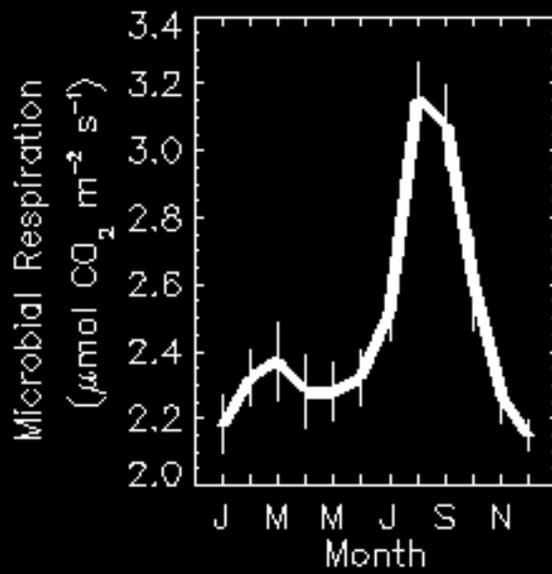
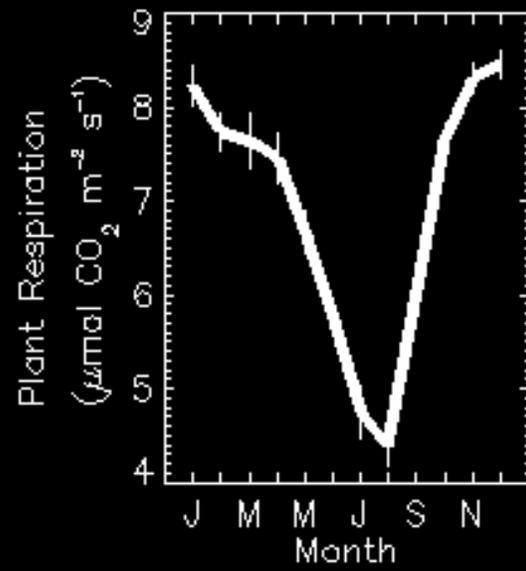
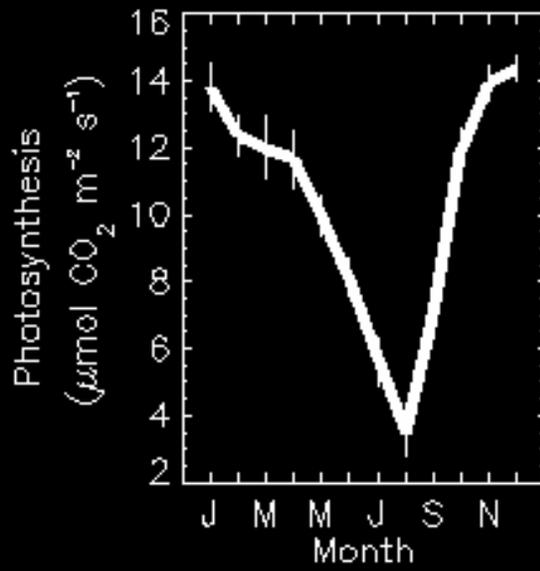
West Siberia



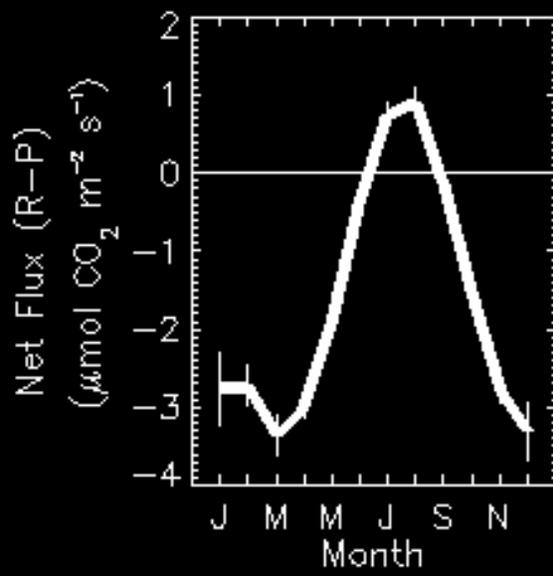
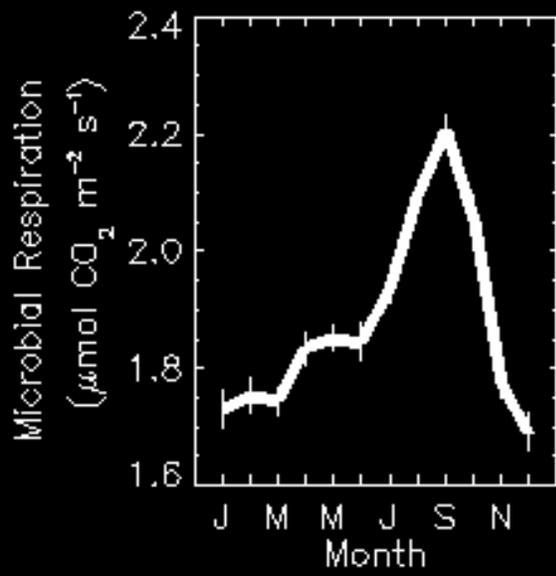
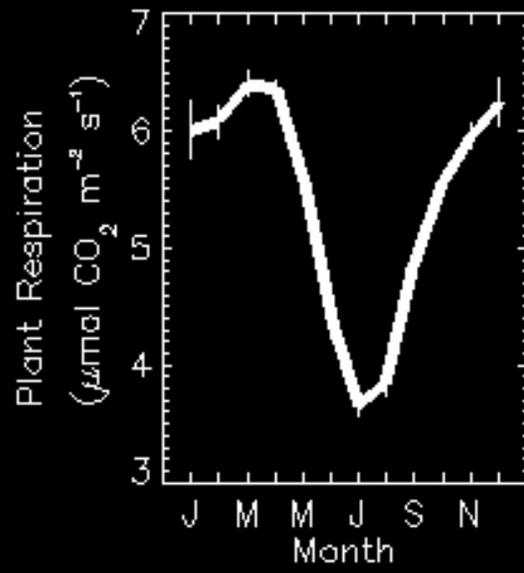
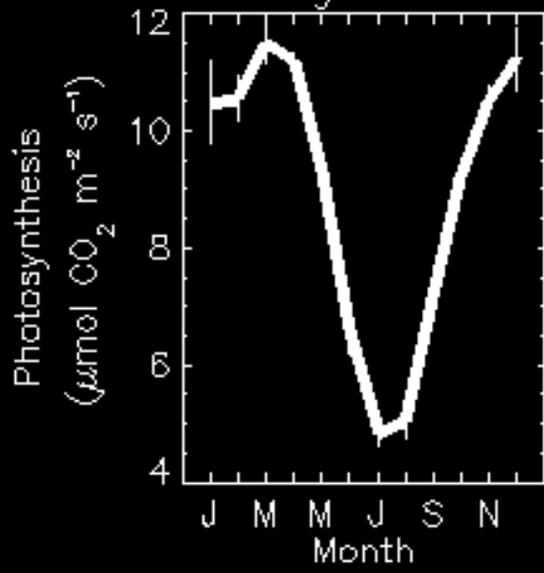
East Siberia



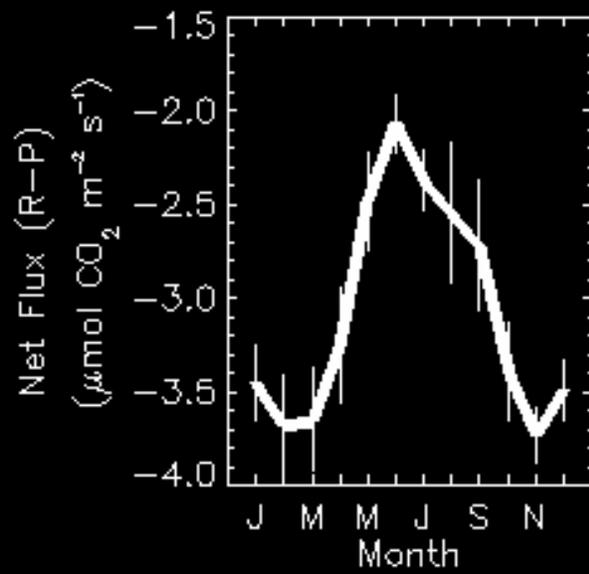
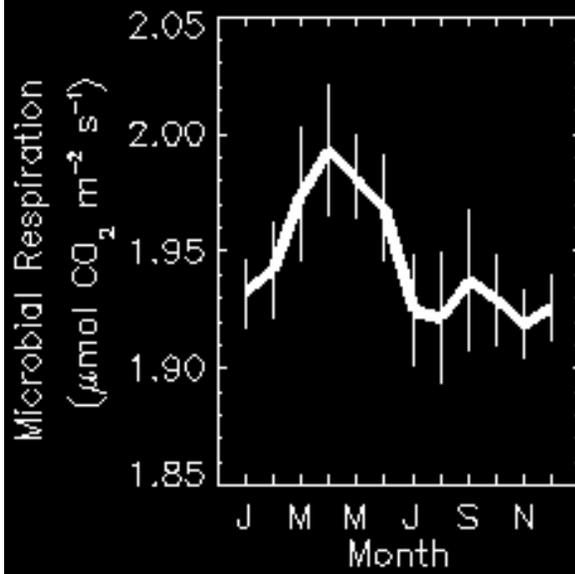
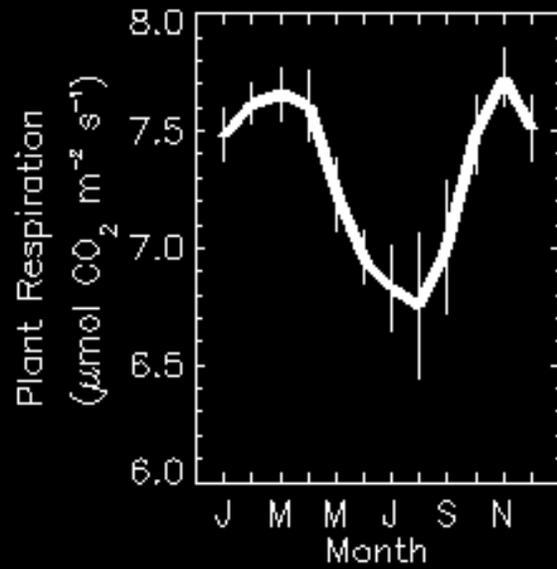
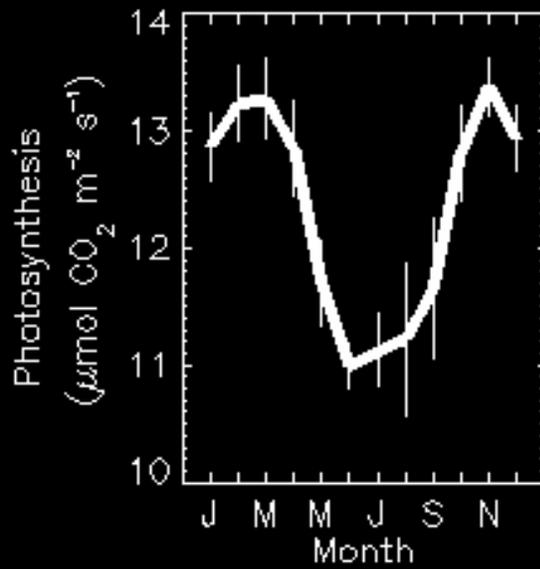
Amazon Basin



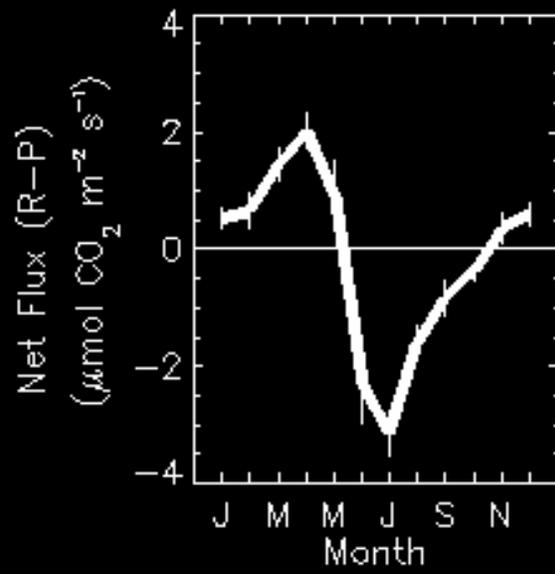
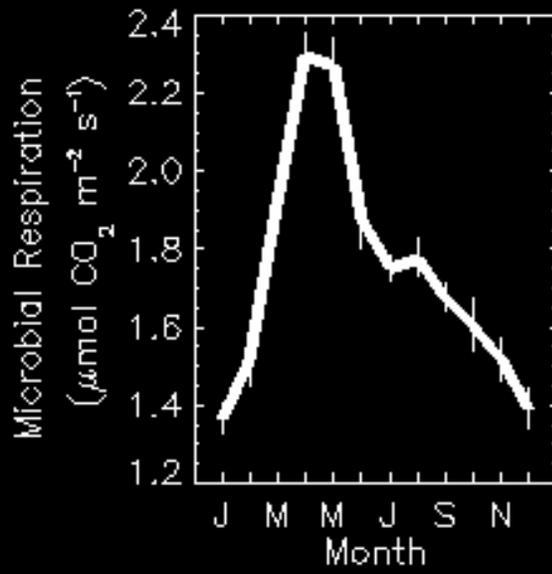
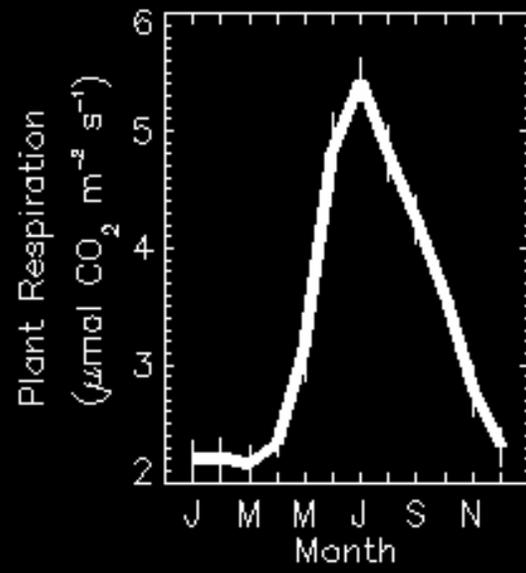
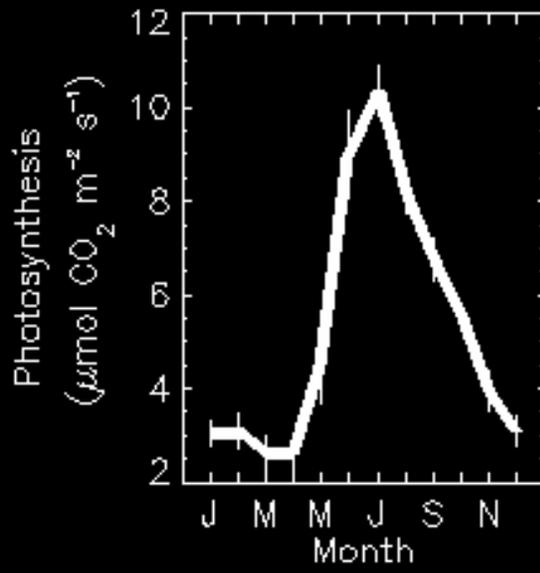
Congo Basin



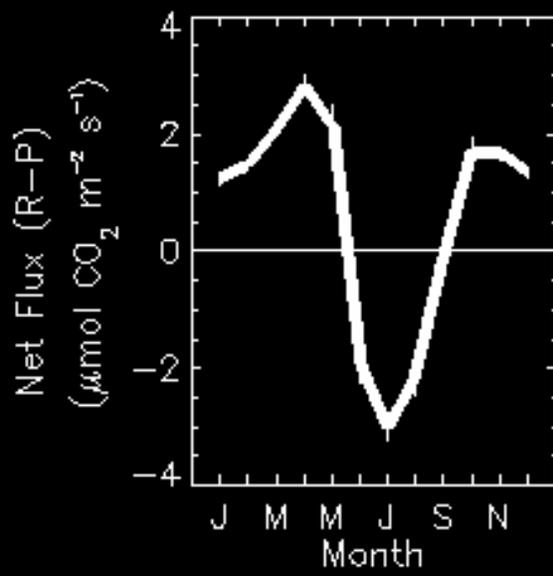
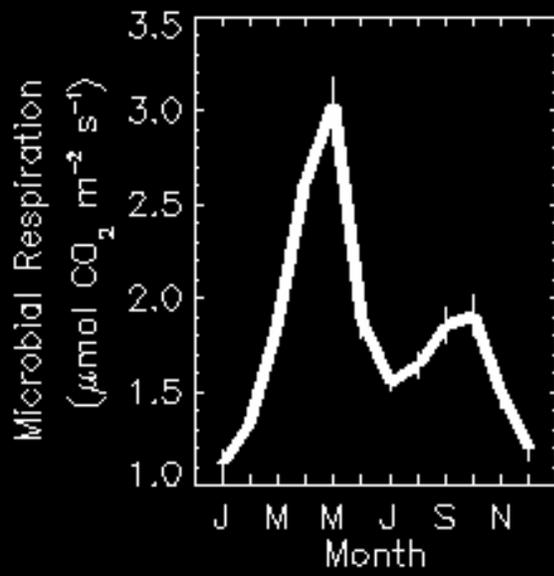
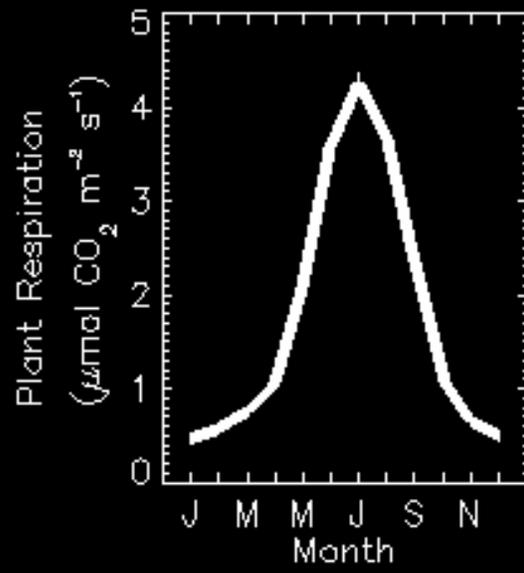
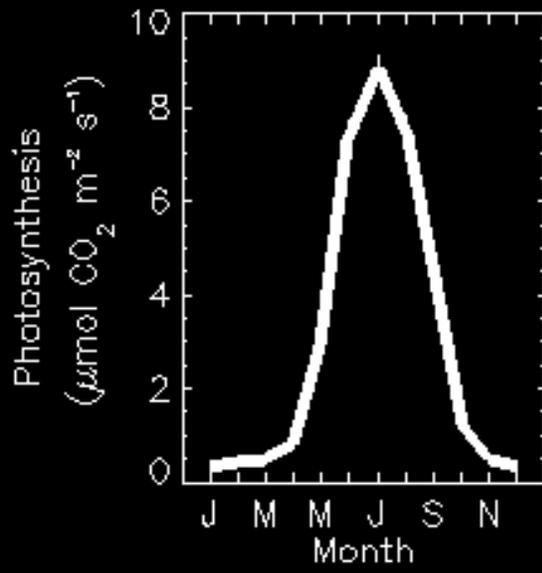
Indonesia



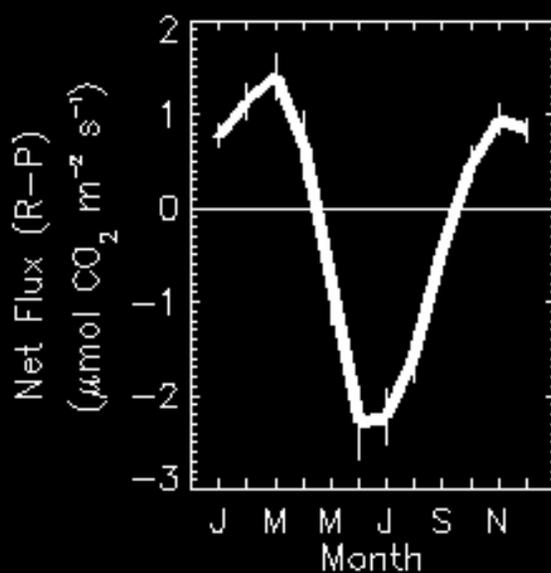
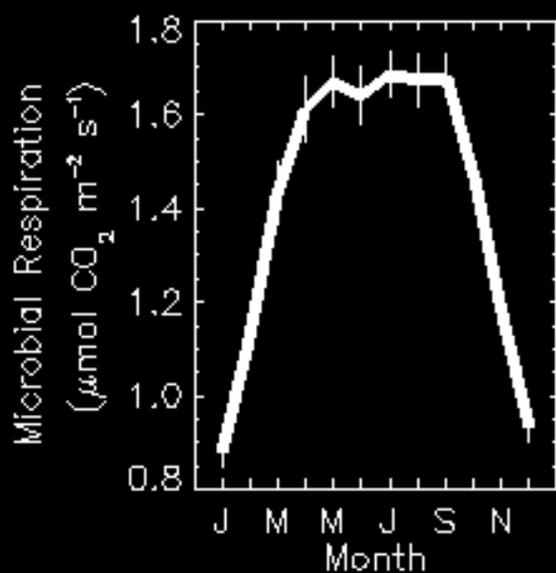
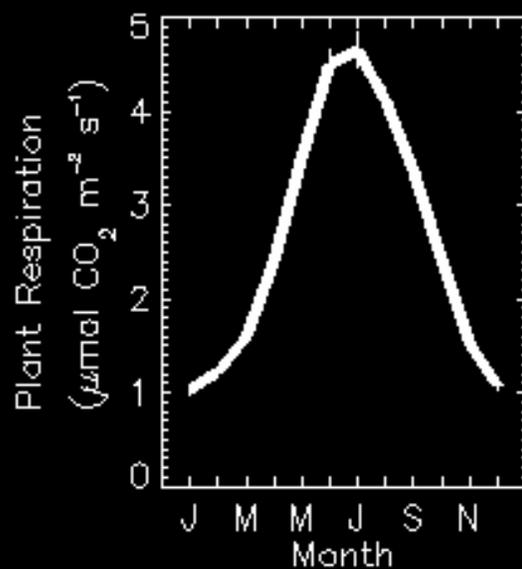
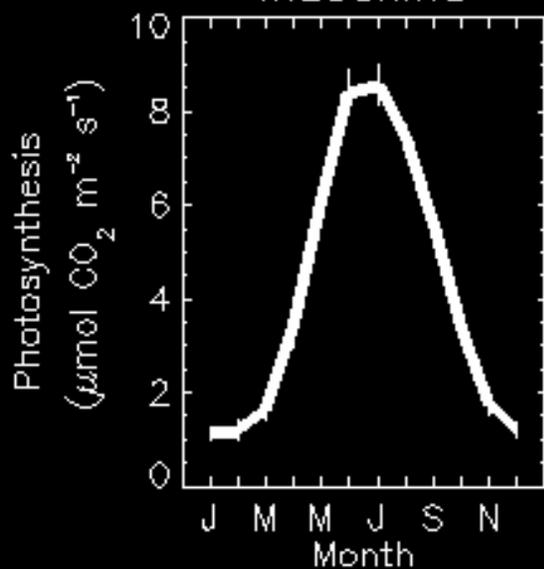
Central America



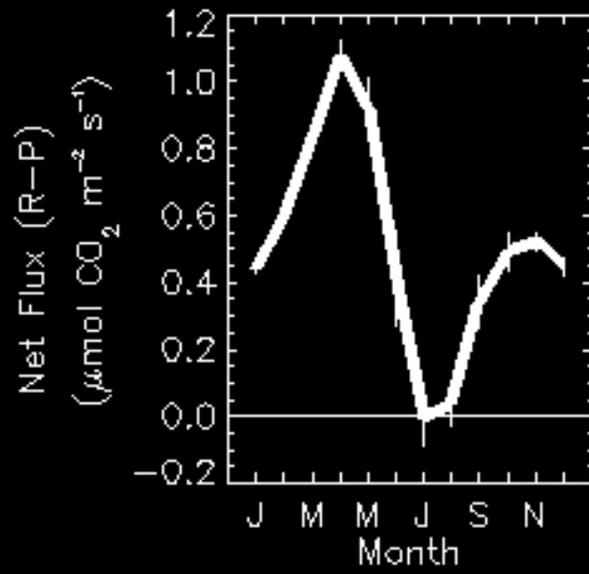
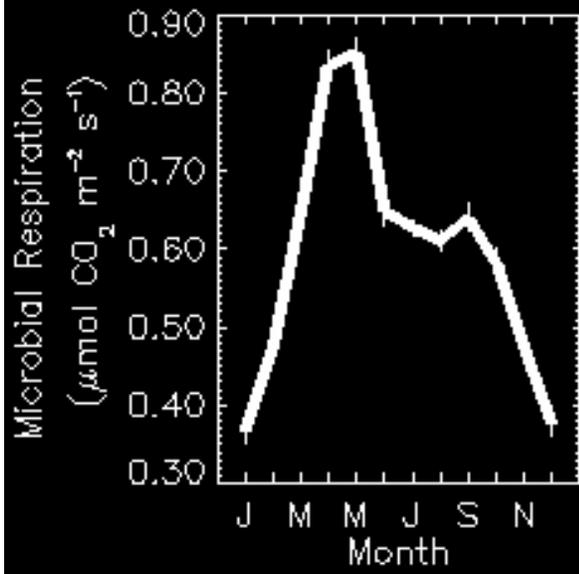
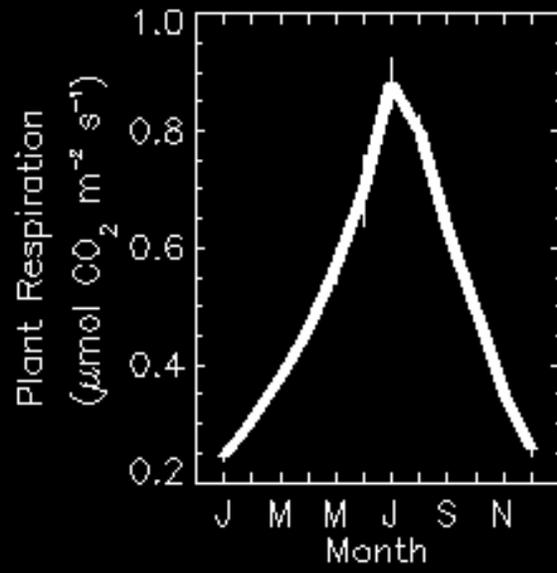
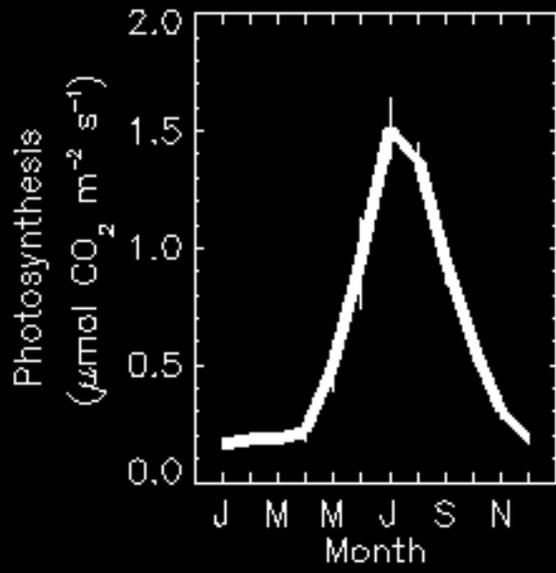
India



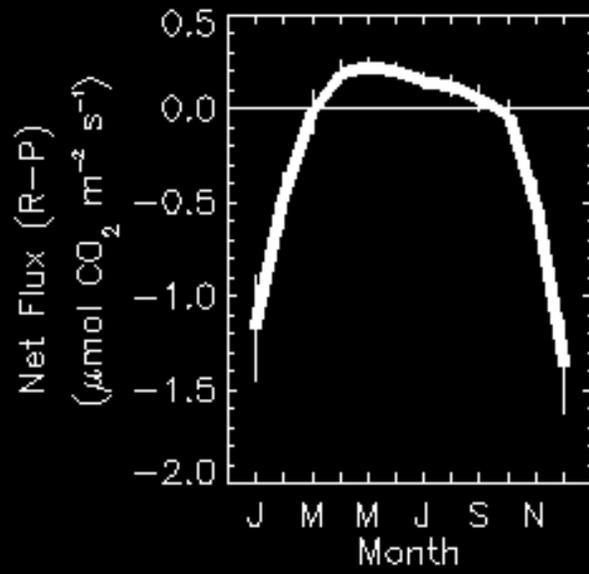
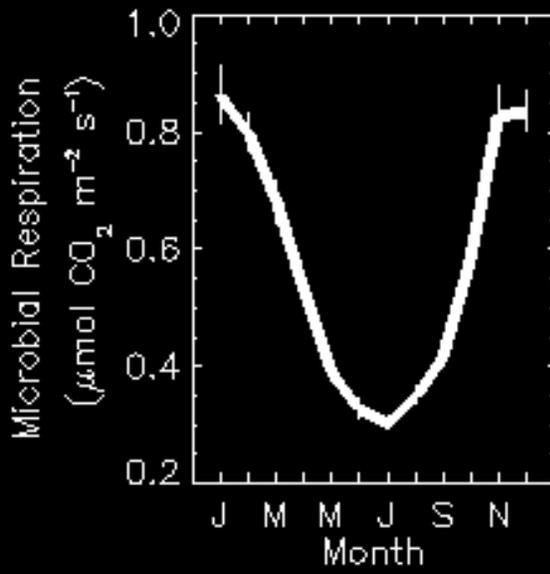
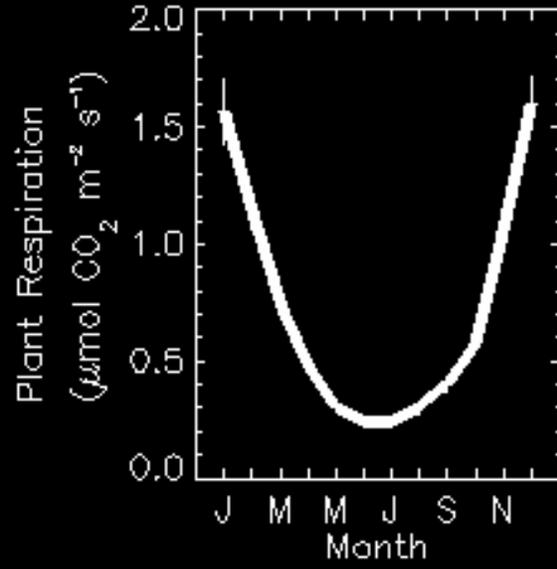
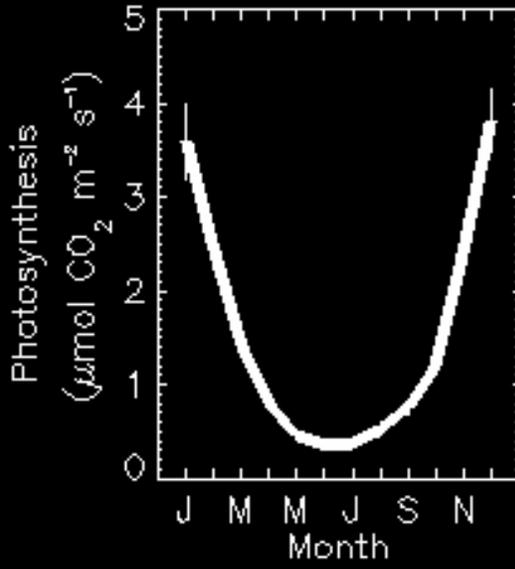
Indochina



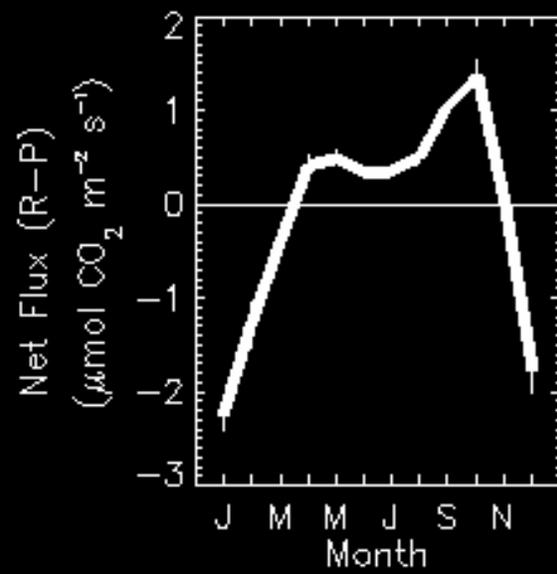
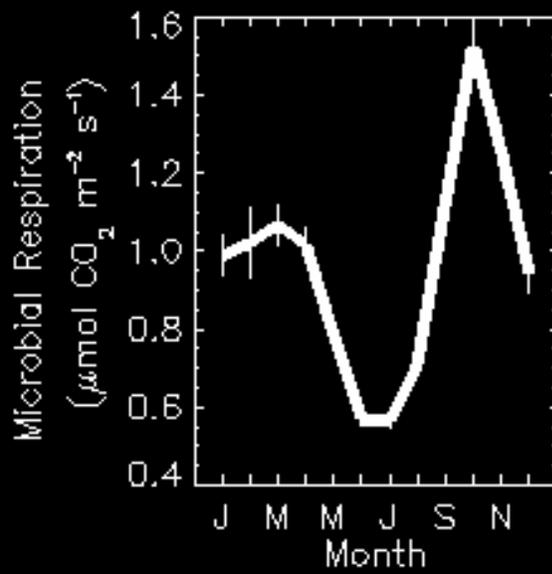
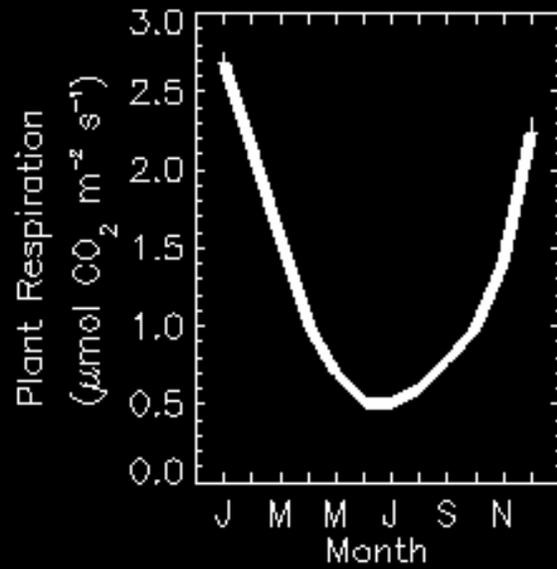
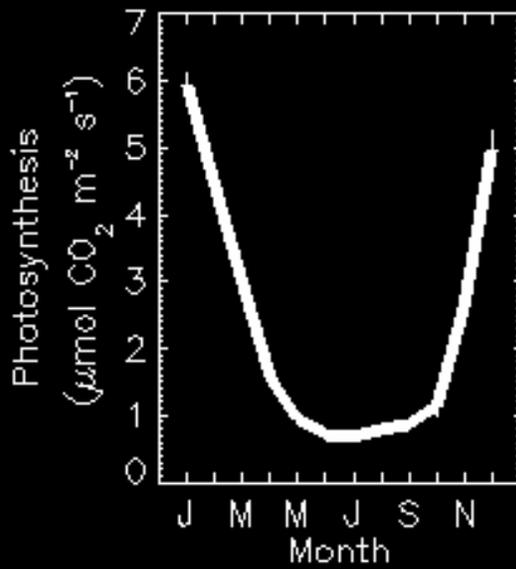
Sahara Desert



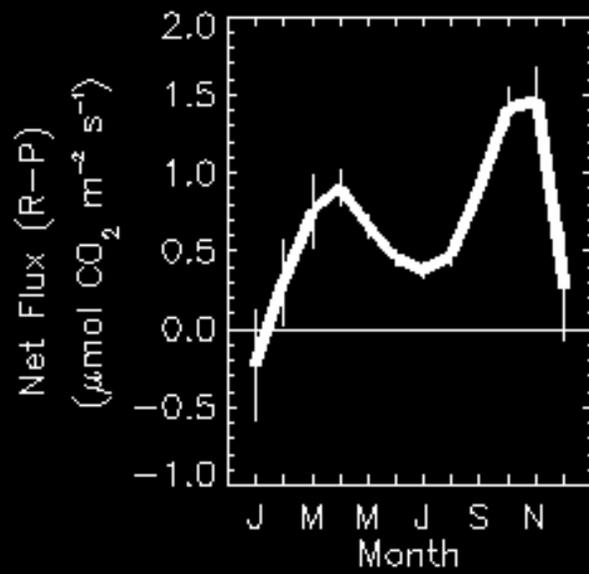
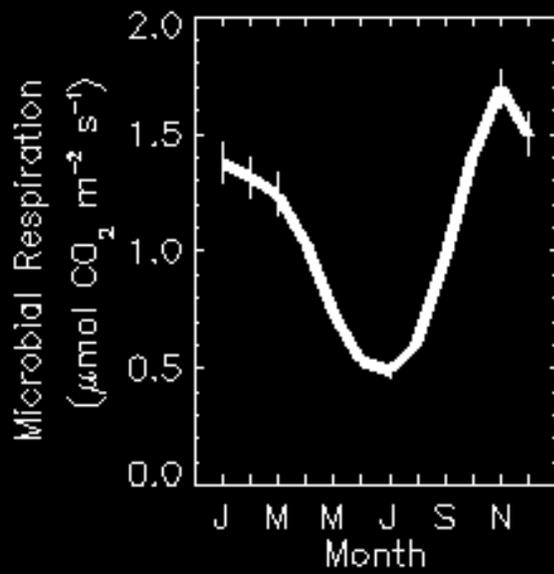
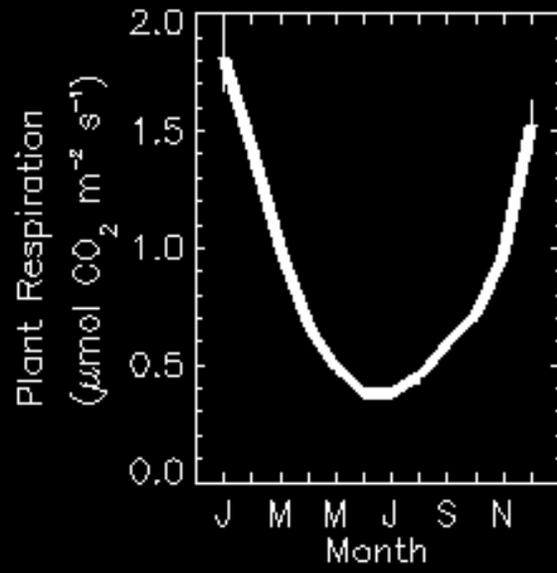
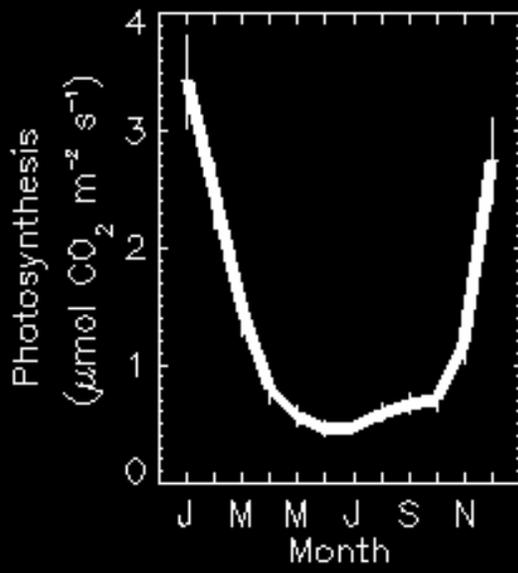
Southern South America



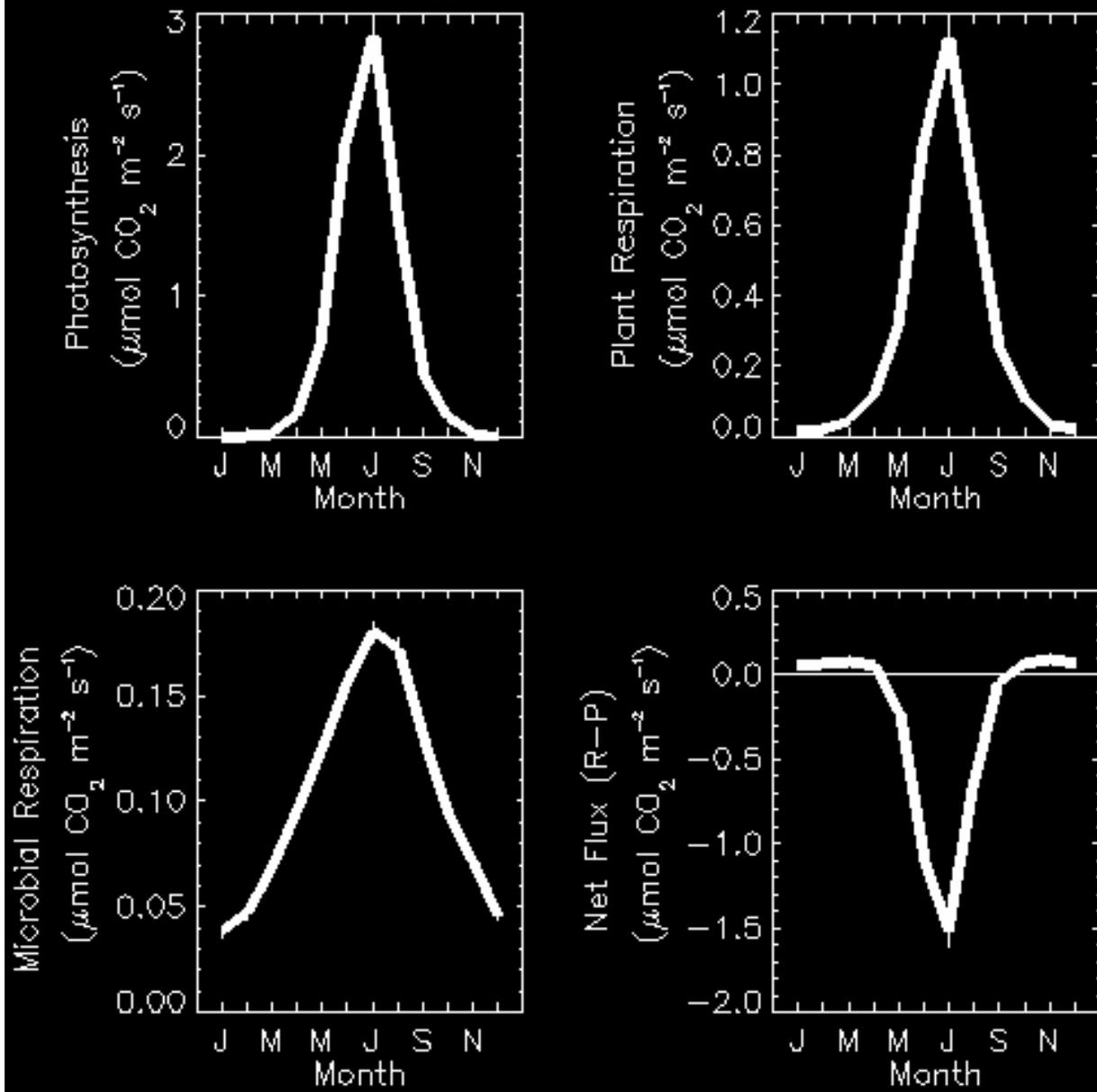
South Africa



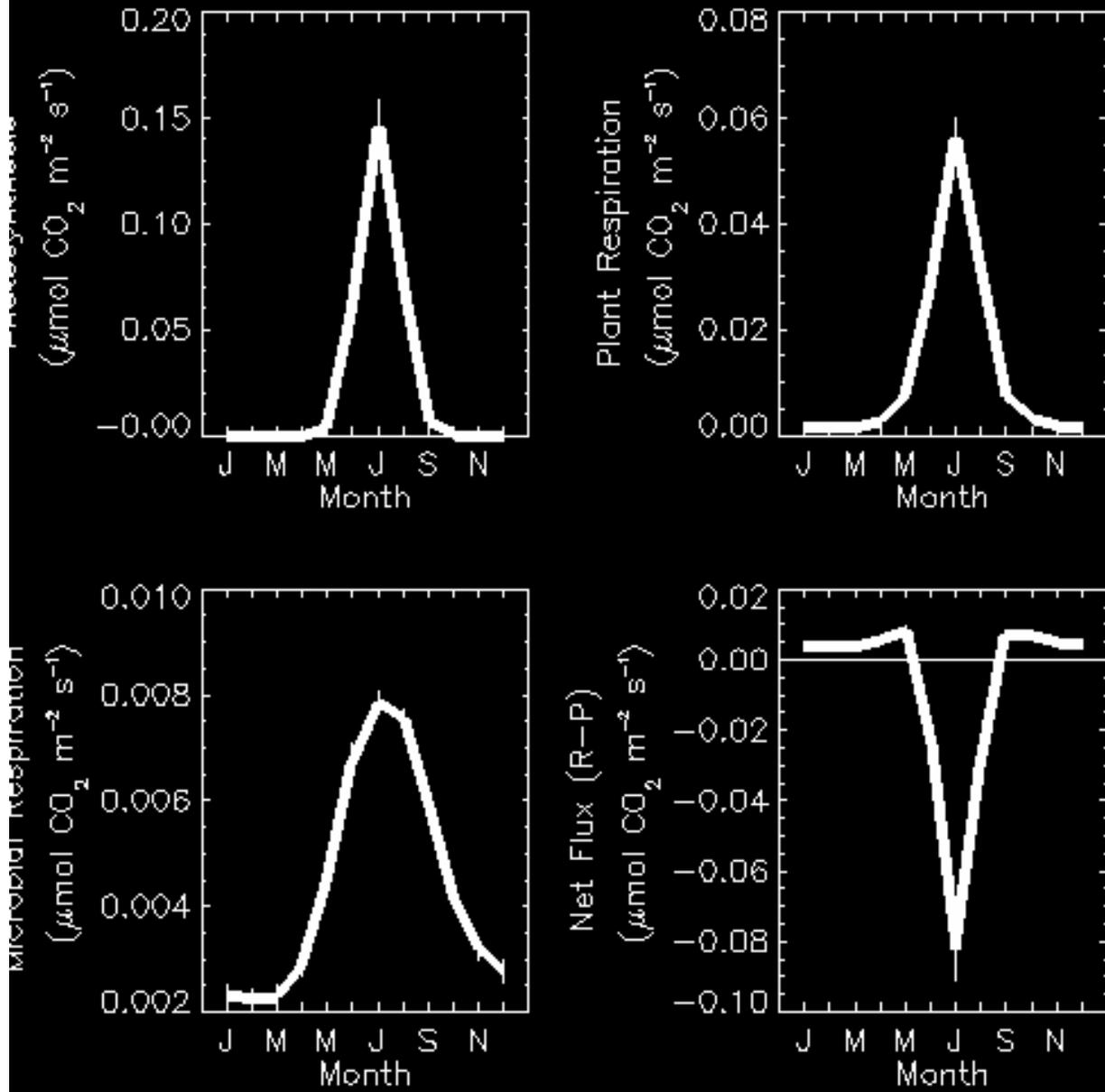
Australia



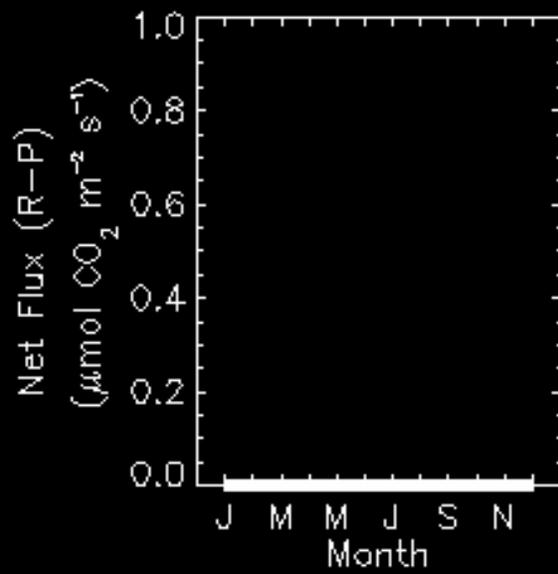
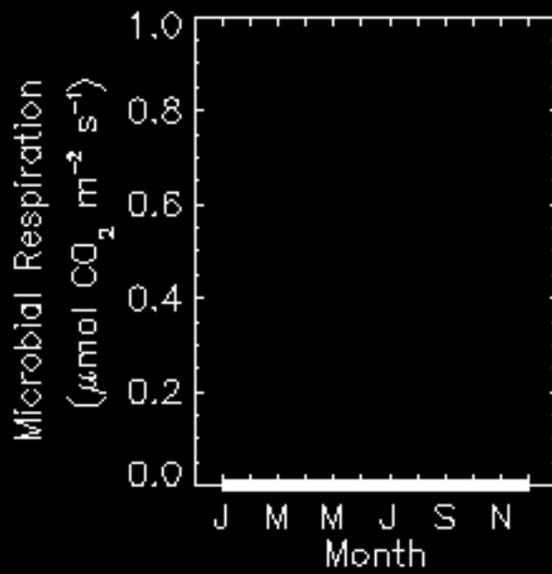
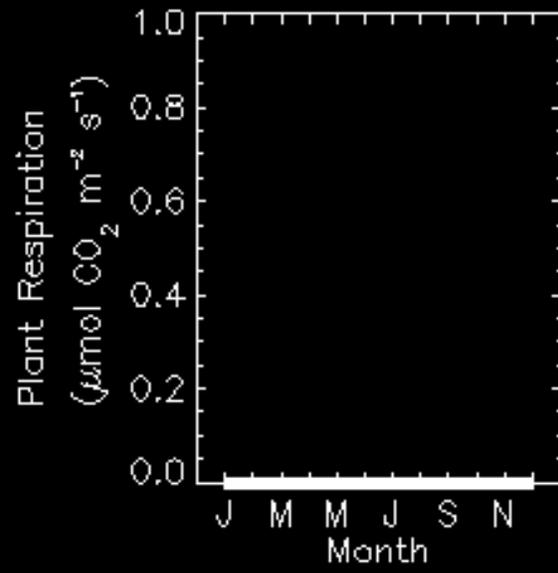
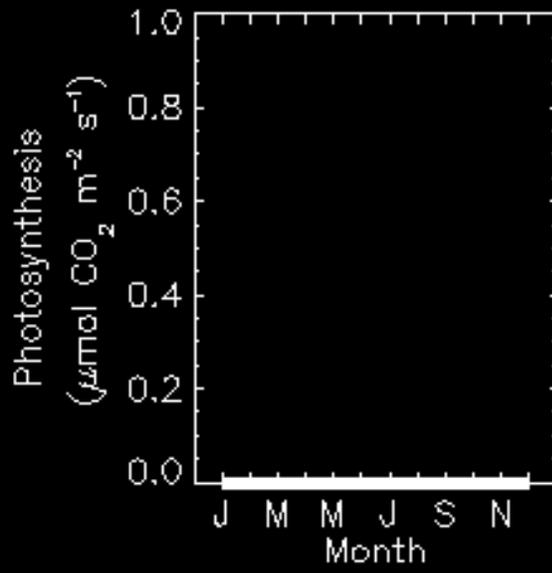
Tibetan Plateau



Greenland



Antarctica



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