



Climate change impacts on the carbon cycle of Canada's ecosystems



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Canadian forests have experienced and are predicted to experience more rapid climate change than the global average.

How has climate change impacted and will impact the carbon cycle of Canadian forests?

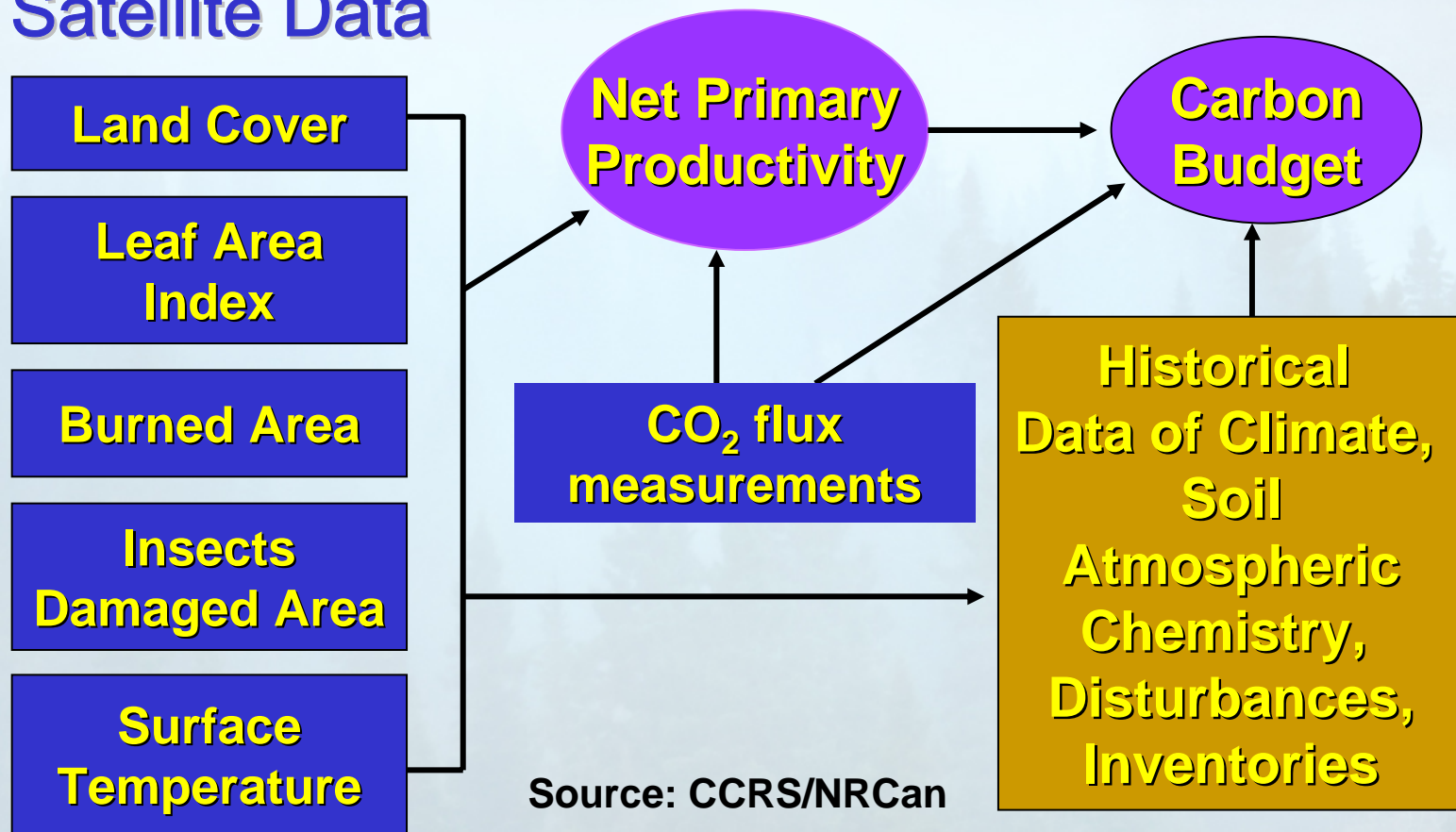
To address this question, many detailed data of Canadian forest ecosystems are needed, including climate and atmospheric chemistry, vegetation, soil, disturbances, and human activities.

Satellite remote sensing techniques can provide repeated and consistent coverage over large areas at a relative low cost. When combined with other tempo-spatial data and modelling expertise, remote sensing can be a powerful tool for addressing the carbon cycle question.

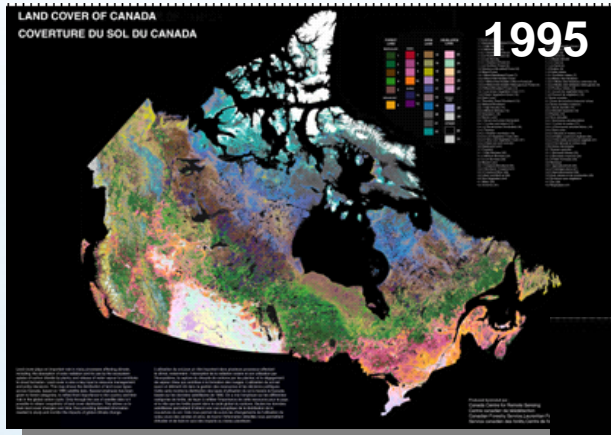


Climate change impacts on the carbon cycle of Canada's ecosystems using satellite observations

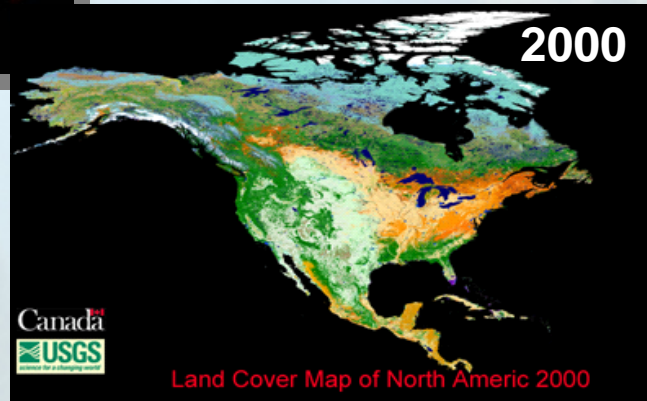
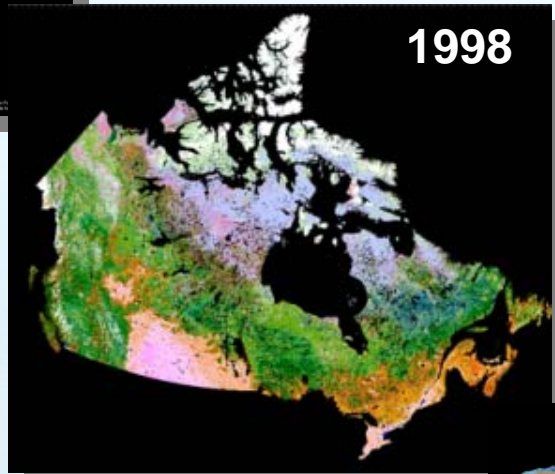
Satellite Data



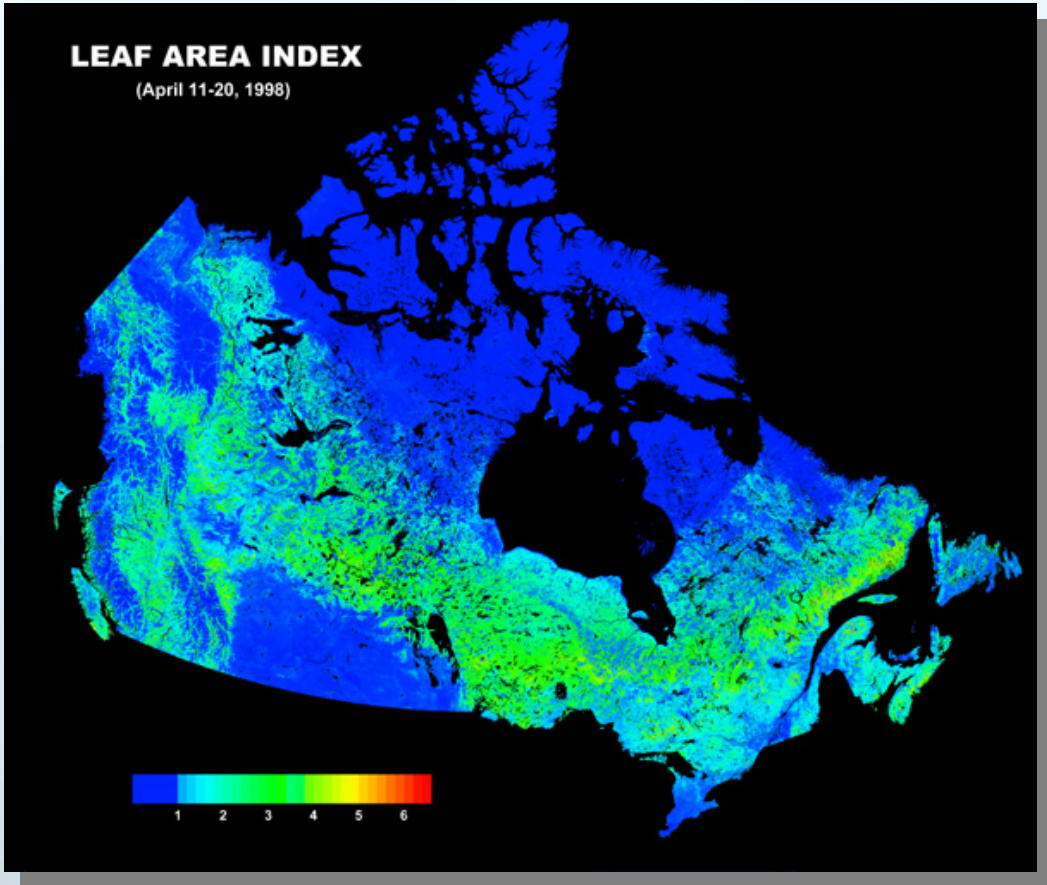
Climate change impacts on the carbon cycle



Land Cover

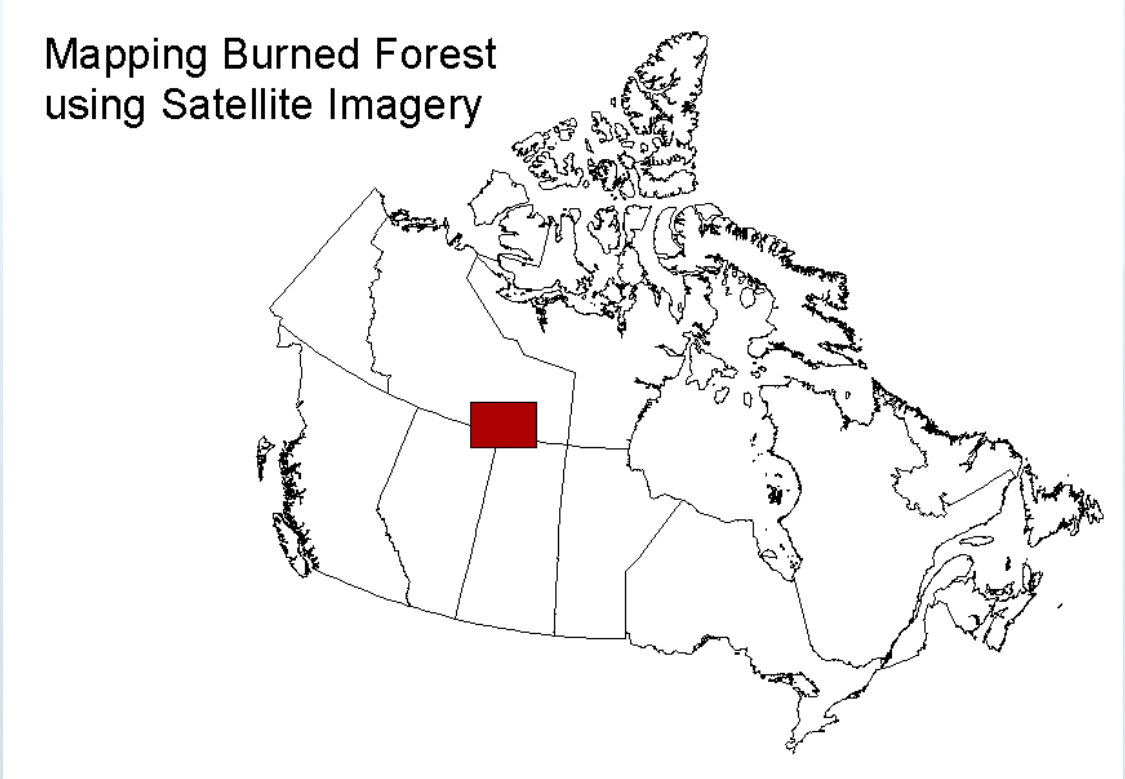


Leaf Area Index



from SPOT VGT 1998

Burned Area

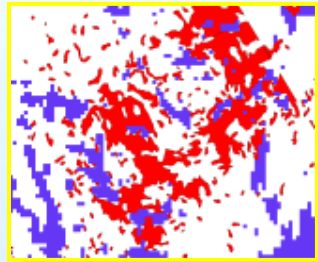
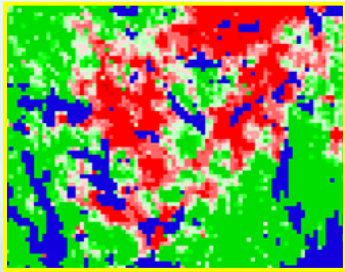


Satellite-Based Change Detection for Annual Mapping Burned Forest

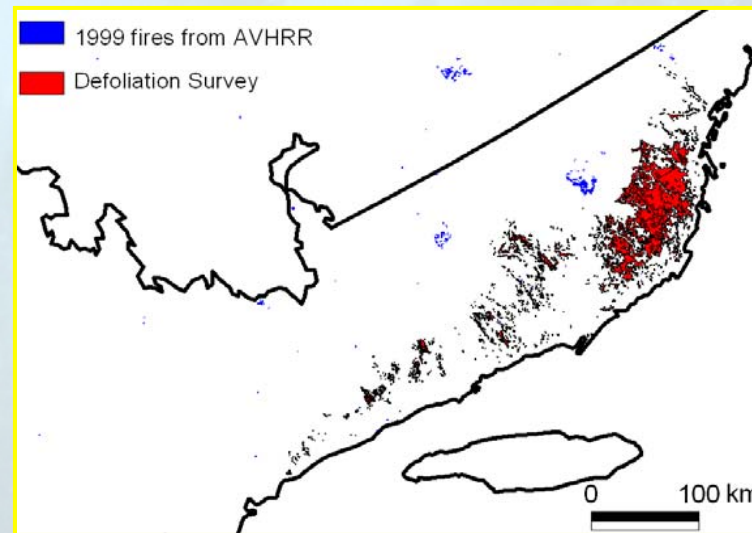
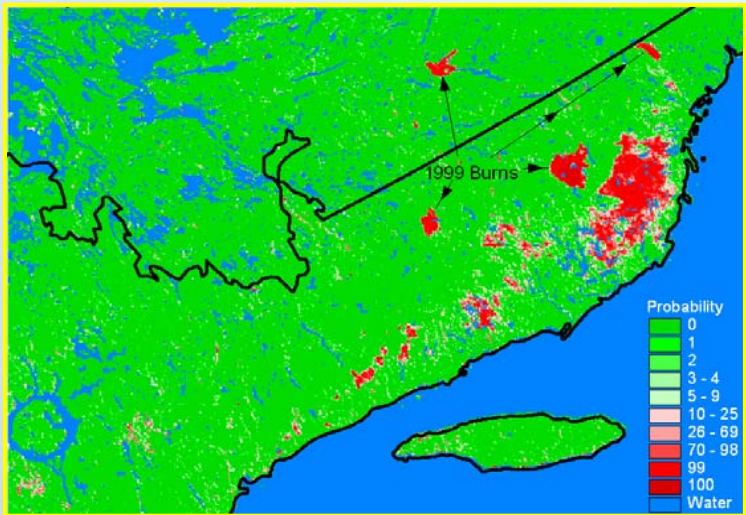
Satellite Mapping of Severe Defoliation Caused by Hemlock Looper Insect

**Insects
Damaged Area**

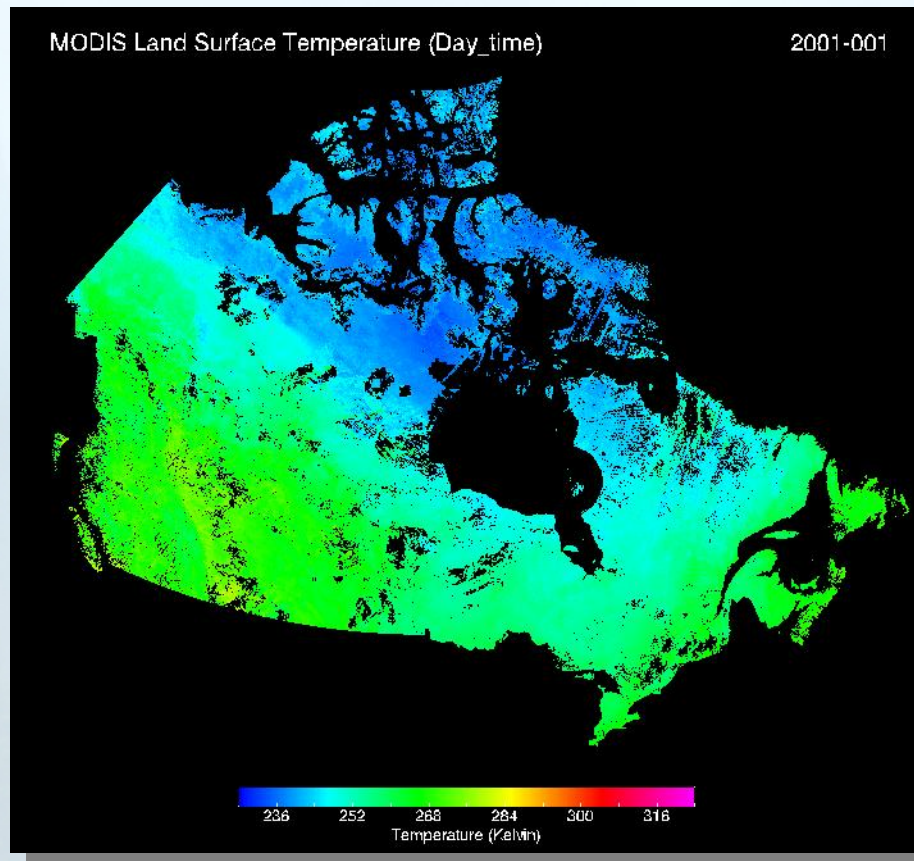
Satellite-based defoliation/ mortality probability model



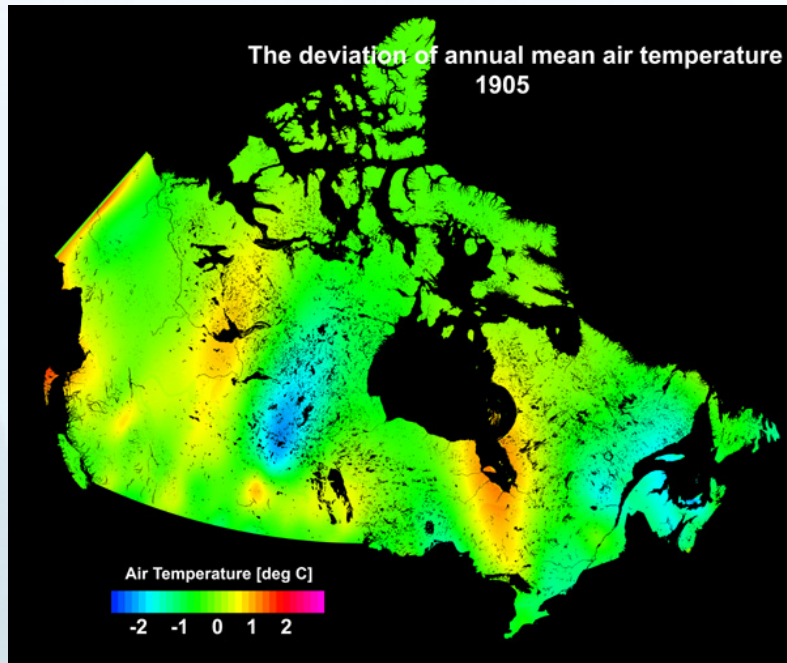
Hemlock
Looper
defoliation
survey



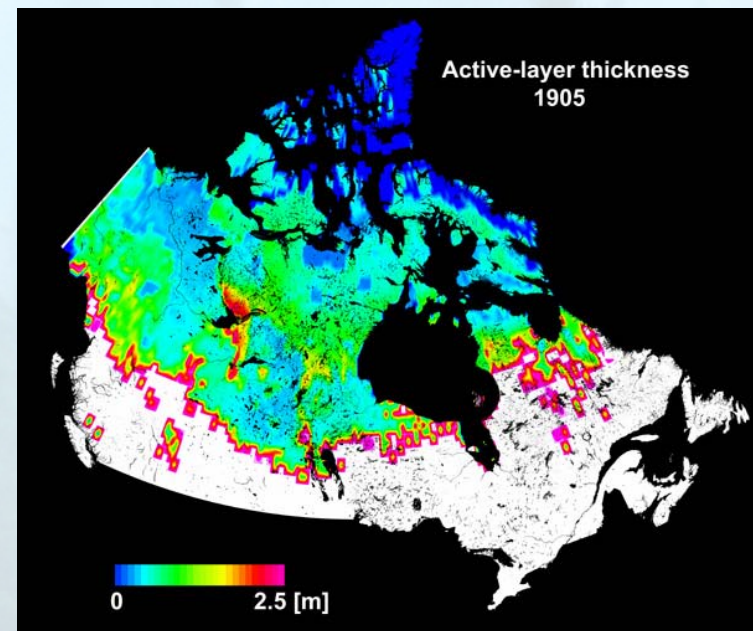
Surface Temperature



Land Surface Temperature from MODIS data



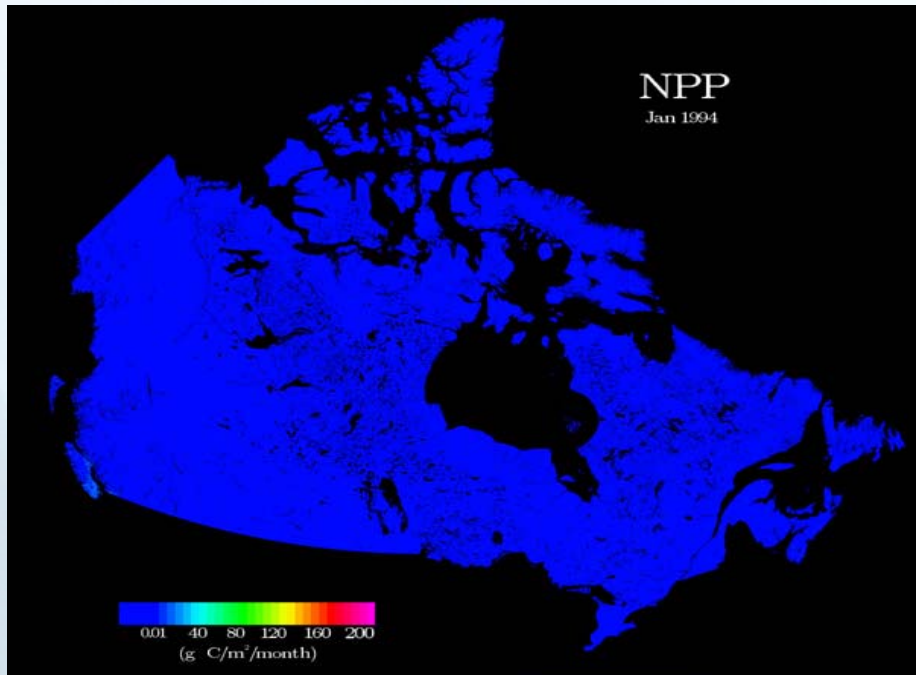
Historical Data of Climate,
Soil Atmospheric
Chemistry, Disturbances,
Inventories



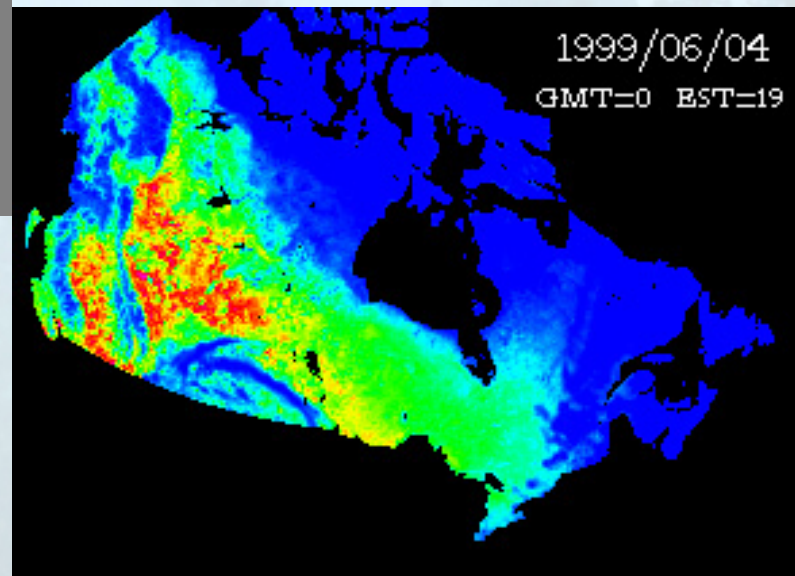
CO₂ flux measurements



Net Primary Productivity



← **Monthly**



Hourly →

Carbon Budget

A preliminary map of carbon budget

