

# Future global carbon cycle and climate projection : Integrated analysis of satellite-based data, terrestrial ecosystem model, and simplified earth system model

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## BACKGROUND :

Global warming, resulting from anthropogenic greenhouse gas emission (e.g. carbon dioxide) is one of the most significant issues of the Earth's environmental problems. Although future projection models need more knowledge on current carbon budget for model calibration especially in terrestrial biosphere, few data can be available due to sparse monitoring network. Although satellite-based data have a possibility to give constraints on models, it was difficult due to the poor quality of satellite data.

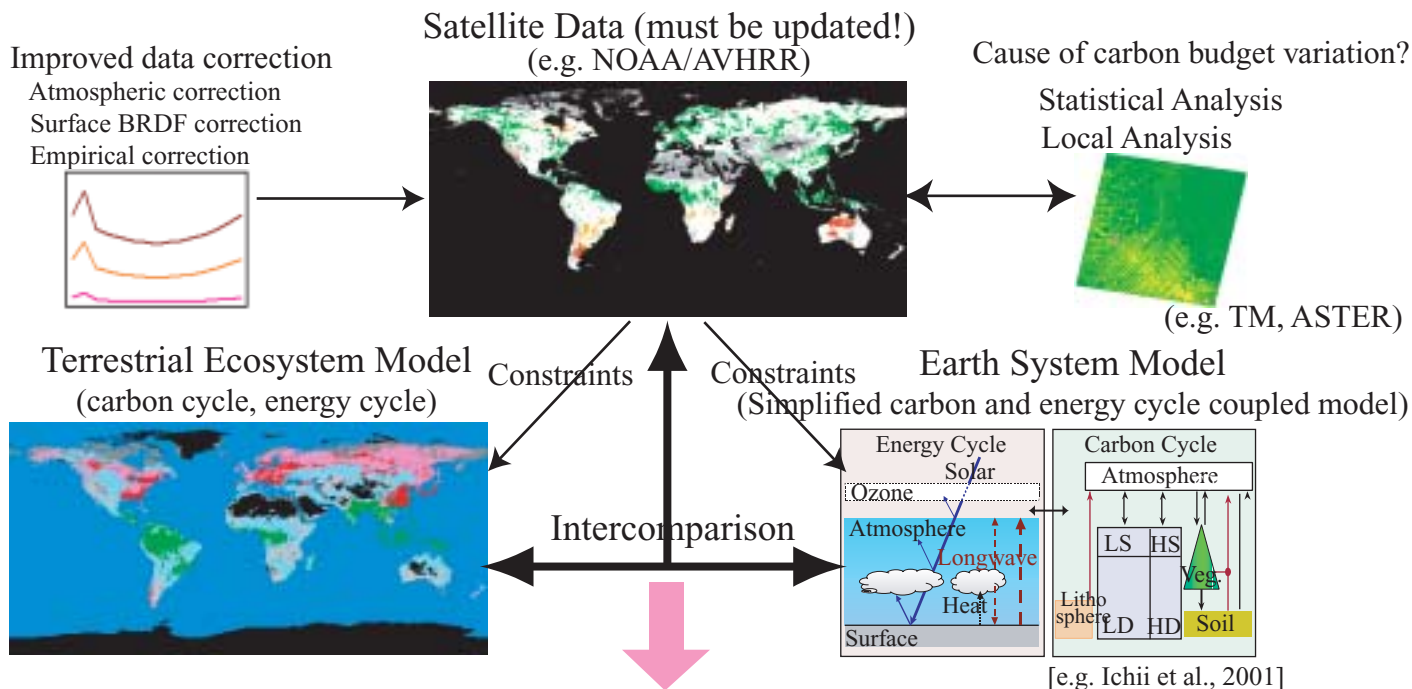
## PURPOSE OF THE STUDY :

Reducing uncertainties in future projection of global carbon cycle and climate.

- Through :
- 1) Satellite based monitoring of decadal changes in terrestrial carbon cycle
  - 2) Intercomparison of satellite-based analysis, terrestrial ecosystem model and earth system model.

## STUDY PLAN :

- 1) Satellite based monitoring of decadal changes in terrestrial carbon cycle.
  - Improve correction methods of time-series AVHRR data (e.g. Atmospheric, surface BRDF correction)
  - Estimation of the detectable limitation on time series AVHRR data.
  - Clarify geographical distribution of terrestrial carbon cycle trend (especially in the low latitude region).
  - Clarify mechanisms of satellite-derived carbon cycle variation based on climate data and high spatial resolution satellite data (e.g. Landsat TM, Terra ASTER)
- 2) Intercomparison of satellite-based analysis, terrestrial ecosystem model and earth system model.
  - More model constraints based on decadal satellite-based analysis.
- 3) Future projection of terrestrial carbon cycle and global carbon cycle and climate.
  - Terrestrial Ecosystem based analysis, Earth system model based analysis.



Geographical distribution of terrestrial carbon budget (past 20 years).  
Future projection of terrestrial carbon budget under prescribed climate scenario.  
Future projection of global carbon cycle and climate under anthropogenic gas emission scenario.