CASA (Carnegie-Ames-Stanford Approach) Model

Description	Calculation of monthly terrestrial NPP is based on the concept of light-use efficiency, modified by temperature and moisture stress scalars. Soil carbon cycling and Rh flux components of the model are based on a compartmental pool structure, with first-order equations to simulate loss of CO2 from decomposing plant residue and surface soil organic matter (SOM) pools. Model outputs include the response of net CO2 exchange and other major trace gases in terrestrial ecosystems to interannual climate variability (1983 to 1988) in a transient simulation mode.
Appropriate Use	Climate change analysis of ecosystem productivity.
Scope	Global to regional.
Key Output	Global gridded estimates of primary production, above and below ground biomass, leaf area index (LAI), and trace gas fluxes.
Key Input	Air surface temperature and precipitation are used together with long-term (30-year) mean values, and surface solar irradiance measurements.
Ease of Use	Expertise of ecosystem and biogeochemistry science.
Training Required	Yes.
Training Available	No formal training offered.
Computer Requirements	High end workstation.
Documentation	http://geo.arc.nasa.gov/sge/casa/index4.html.
Applications	Estimate of current ecosystem productivity.
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Cost	Not specified.
References	Potter C.S. and S.A. Klooster. 1997. Global model estimates of carbon and nitrogen storage in litter and soil pools: Response to change in vegetation quality and biomass allocation. *Tellus* 49B(1):1-17. Potter, C.S., E.A. Davidson, and L. Verchot. 1996. Estimation of global biogeochemical controls and seasonality in soil methane consumption. *Chemosphere* 32(11):2219- 2246. Potter, C.S., S.A. Klooster, and V. Brooks. 1999. Interannual variability in terrestrial net primary production: Exploration of trends and controls on regional to global scales. *Ecosystems* 2(1):36-48. Potter, C.S., P.A. Matson, P.M. Vitousek, and E.A. Davidson. 1996. Process modeling of controls on nitrogen trace gas emissions from soils world-wide. *J. Geophys. Res.* 101:1361- 1377.