Oregon Transect Ecosystem Research (OTTER) Project

Richard H. Waring; David L. Peterson

Ecological Applications, Vol. 4, No. 2 (May, 1994), 210.

Stable URL:
http://links.jstor.org/sici?sici=1051-0761%28199405%294%3A2%3C210%3AOTER%28P%3E2.0.CO%3B2-D

Ecological Applications is currently published by The Ecological Society of America.

OTTER Project

Oregon Transect Ecosystem Research (OTTER) Project

One challenge in ecosystem research is to find principles that scale across landscapes. Repeated views of Earth from space entrance us with the potential that remotely sensed data may help interpret changes in the ways that ecosystems operate. In a National Aeronautics and Space Administration (NASA)-sponsored project a group of ecologists, remote-sensing specialists, and system modelers were given an opportunity to evaluate the extent that model predictions and inferences from remotely sensed data match ground-based measurements. In western Oregon, where the project was conducted, a wide range in coniferous forest vegetation is arrayed across a 200-km transect at 44° N latitude. At selected sites along this transect the team of researchers made standardized measurements required to initialize and to run a carbon-, water-, and nitrogen-cycling ecosystem model. In addition, remotely sensed measurements were taken seasonally from various platforms, starting from a tripod and extending to satellites.

It is our privilege to report the first series of papers from the OTTER project in this issue (additional papers from the OTTER project are to appear in *Remote Sensing of Environment* in 1994). First, Peterson and Waring present an overview of the project's objectives and organization. This is followed by a detailed analysis of ground-based measurements of environment and vegetational characteristics across the transect (Runyon et al.). Against these ground-based measurements computer simulation models of ecosystem processes (Running) and climatic variation (Glassy and Running) are compared. Other papers assess the ability of optical sensors with different spectral and spatial resolution to discern variation in leaf area indices (Spanner et al.), light interception by different species (Law and Waring), and biochemical properties of the canopy (Matson et al.). Crown size, stocking density, and biomass are also evaluated with satellite-derived measures (Wu and Strahler). A way of estimating foliar biomass at maximum canopy leaf area from satellite imagery is presented in the paper by Pierce and Running. Finally, Goward et al. evaluate the ability of present satellites to estimate seasonal changes in solar radiation, the fraction of light intercepted by vegetation, and environmental conditions that constrain photosynthesis, transpiration, decomposition, and other related ecosystem processes.

RICHARD H. WARING, *Oregon State University*
and
DAVID L. PETERSON, *NASA Ames Research Center*

Key words: ecosystem modeling; ground-based measurements; Oregon transect; OTTER project; remotely sensed data; satellite imagery.