131

to photosynthesis during physiological emergence from seasonal dormancy. We investigated the photosynthetic response of glacier lily during a 7-day emergence period in June, 1990 in the mountains of SE Wyoming, USA. Photosynthetic gas exchange (A), stomatal conductance and flurometric quantum efficency (Fv/Fm) were measured for emerging plants. Corresponding soil and snow temperatures, snowpack sunlight and CO_2 concentrations at plant depths were also measured. During emergence, a progressive increase in A appeared to be biphasic. An initial increase in A (-5.0 - 10.0 μmol $m^{-2}s^{-1}$) corresponded to rises in Fv/Fm, or non-stomatal influences. The second phase appeared to be a cessation of non-stomatal limitations where A increased from 10.0 to 23.0 μmol $m^{-2}s^{-1}$. Thus, non-stomatal limitations preceeded about equal stomatal limitations to photosynthesis.

HANEY, ERIC, NORMAN CHRISTENSEN, ERIC KASISCHKE, AND CRAIG DOBSON. Duke University, Durham, NC, 27706, USA, Environmental Research Institute of Michigan, Ann Arbor, MI, 48107, and the University of Michigan, Ann Arbor, MI 48109. The impact of variations in tree architecture and density on synthetic aperture radar signatures of loblolly pine forests in the Duke University Research Forest.

Architectural changes associated with variations in tree height and stand density, including branching geometry, branch and needle biomass, crown ratio, and bole mass, were measured for 5-40 yr loblolly pine stands. Simulations using the Michigan Microwave Canopy Scattering model (MIMICS) at X-, C-, and L-bands and all polarizations indicated that the relative importance of each architectural feature varies considerably among bands and polarizations. For example, needle and branch features accounted for the majority of variation in backscatter at X- and C-band, whereas bole biomass predominated at L-band. These results were confirmed with airborne multipolarization synthetic aperture radar data collected over Duke Forest Stands.

HANSEN, ANDREW J. and DEAN L. URBAN. Oregon State University, Hatfield Marine Science Center, Newport, OR, 97365 USA and Department of Environmental Sciences, University of Virginia, Charlottesville, VA, 22903, USA. Avian habitat dynamics under three common landscape trajectories.

We modeled bird habitat response to: fragmentation of forest by nonforest; conversion of natural forest to managed plantation; and forest succession following abandonment of agricultural land. These landscape dynamics were generated with a simple geometric model and habitat suitability was classified for a Pacific Northwest avifauna. The forest fragmentation run produced acute changes in forest area and edge density and bird habitat richness fell to 38% of that in a natural landscape. Under forest conversion, bird habitat richness fell to 56% of that in a natural landscape; forest regrowth and the transient nature of edges allowed some closed-canopy species to persist. 220 years of forest development following land abandonment produced habitat for 76% of the natural bird community. These findings suggest that innovative conservation strategies are needed to maintain native species diversity in anthropogenic landscapes.

HARMON, MARK E. and SANDRA BROWN and STITH T. GOWER. Department of Forest Science, Oregon State University, Corvallis, OR, 97331-5705, USA and Department of Forestry, University of Illinois, Urbana, IL, 61801, USA and Department of Forestry, University of Wisconsin, Madison, WI, 53706, USA. From gaps to the globe: ecosystem consequences of tree death.

Tree death influences many ecosystem process at scales ranging from tree gaps to the global carbon cycle. Within stands, tree death determines the location of resources for both plants and animals, and influences soil forming processes. At the landscape scale, tree death controls the propagation of disturbances such as fire and insect out-breaks. Tree death is an important, but unstudied facet of the global carbon cycle. We estimate that 4-8 Pg C yr^{-1} is added to detrital pools by dying trees, excluding timber harvest. While smaller than the 28 Pg C yr^{-1} added by fine litterfall, woody substrates decay more slowly and accumulate in later stages of succession.

ca

/, Ithaca, NY 14853
ı, Athens, GA 30602
University, Corvallis,

Laramie, WY 82071
E, Aiken, SC 29801
ssee, Knoxville, TN

Palo Alto, CA 94303
/ironmental Studies,

fying the science of
n among ecologists,
on of environmental
between organisms
ogical responses of
iization of biological

or its applications,
environment.

ess Manager

ership subscription

SOCIETY OF AMERICA,
zations, programs,
ECOLOGY publishes
ı basic and applied
rticles. ECOLOGICAL
that have specific

ournals as follows:

Regular	Student
$65.00	$50.00

Free to members

ess Manager).

o whom all corre-
ership applications

Supplement to

Volume 72. No. 2 **June 1991**

Table of Contents

ACKER