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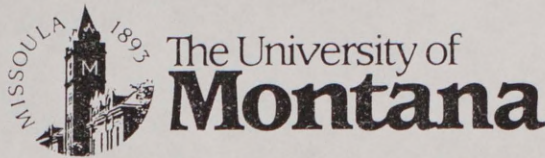
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NEWS RELEASE

June 5, 2003

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GLOBAL GARDEN GROWS GREENER

MISSOULA—

A NASA and Department of Energy study concludes the Earth has been greening over the past 20 years. As climate changed, plants found it easier to grow.

The globally comprehensive, multi-discipline study appears in the June 6 edition of Science magazine. The article states climate changes have provided extra doses of water, heat and sunlight in areas where one or more of those ingredients may have been lacking. Plants flourished in places where climatic conditions previously limited growth.

“Our study proposes climatic changes as the leading cause for the increases in plant growth over the last two decades, with lesser contribution from carbon dioxide fertilization and forest re-growth,” said Ramakrishna Nemani, the study’s lead author from The University of Montana-Missoula.

From 1980 to 2000 changes to the global environment have included two of the warmest decades in the instrumental record; three intense El Niño events during 1982-83, 1987-88 and 1997-98; changes in tropical cloudiness and monsoon dynamics; and a 9.3 percent increase in atmospheric carbon dioxide (CO₂), which in turn affects man-made influences on climate. All these changes impact plant growth.

Earlier studies by Ranga Myneni of Boston University and Compton Tucker of NASA’s

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Goddard Space Flight Center in Greenbelt, Md. -- also co-authors of the study -- reported increased growing seasons and woody biomass in northern high-latitude forests.

Another co-author, Charles Keeling of Scripps Institution of Oceanography in La Jolla, Calif., cautions no one knows whether these positive impacts are because of short-term climate cycles or longer-term global climate changes. Also, a 36 percent increase in global population, from 4.45 billion in 1980 to 6.08 billion in 2000, overshadows the increases in plant growth.

Nemani and his colleagues constructed a global map of the Net Primary Production (NPP) of plants from climate and satellite data of vegetation greenness and solar radiation absorption. NPP is the difference between the CO₂ absorbed by plants during photosynthesis, and CO₂ lost by plants during respiration. NPP is the foundation for food, fiber and fuel derived from plants, without which life on Earth could not exist. Humans appropriate approximately 50 percent of global NPP.

NPP increased globally on average by six percent from 1982 to 1999. Ecosystems in tropical zones and in the high latitudes of the Northern Hemisphere accounted for 80 percent of the increase. NPP increased significantly over 25 percent of the global vegetated area but decreased over seven percent of the area, illustrating how plants respond differently depending on regional climatic conditions.

Climatic changes over about the past 20 years tended to be in the direction of easing climatic limits to plant growth. In general, in areas where temperatures restricted plant growth, it became warmer; where sunlight was needed, clouds dissipated; and where it was too dry, it rained more. In the Amazon, plant growth was limited by sun blocking cloud cover, but the skies have become less cloudy. In India, where a billion people need rain, the monsoon was

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more dependable in the 1990s than in the 1980s.

The climate data for NPP calculations came from the National Oceanic and Atmospheric Administration (NOAA) National Center for Environmental Prediction. Researchers used two independently derived 18-plus-year satellite datasets from the Advanced Very High Resolution Radiometers on the NOAA satellite. The team processed and improved the data at Goddard Space Flight Center and Boston University.

“Systematic observation of global vegetation is being continued by NASA’s Earth observing satellites,” adds Steve Running, another co-author from UM. “Earth observing satellites are paving the way to find out if these biospheric responses are going to hold for the future.”

NASA’s Earth Science Enterprise is committed to studying the primary causes of the Earth system variability, including both natural and human-induced causes. The enterprise partners with UM’s Numerical Terradynamic Simulation Group, which Running directs and in which Nemani is an associate director.

For online information about the research, visit

<http://www.gsfc.nasa.gov/topstory/2003/0530earthgreen.html>.

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Note to journalists: NASA will provide a video regarding this research for those who call Sarah DeWitt at (301) 286-0535. The video also will be shown June 5 at 1 p.m., 4 p.m. and 7 p.m. on NASA-TV, which can be found on AMC-2 (formerly GE-2), transponder 9C at 85 degrees West longitude, with vertical polarization. The frequency is 3880.0 megahertz with audio on 6.8 megahertz. Additional graphics and animations are available by calling Wade Sisler at (301) 286-6256 or e-mailing him at wade.e.sisler@nasa.gov.

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