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Contact: Dr. Jim P.M. Chamie  
IALC Managing Director  
520-621-3024  
ialc@ag.arizona.edu

Jodi Bodner  
JNF Director of Communications  
212-879-8305 ext. 221  
jbodner@jnf.org

### **Desert Research Institute Professor Awarded \$100,000 Grant from International Arid Lands Consortium**

**July 18, 2006 – Reno, NV** – Ask the average person about his concern for environmental changes in the desert and he will likely seem unalarmed. But ask Professor John A. Arnone III of the Desert Research Institute in Reno, Nevada, and he will tell you that the effects of these changes have important global implications, as approximately 40% of the Earth's land surface is desert.

Arnone and his colleagues have been awarded a \$100,000 grant from the International Arid Lands Consortium (IALC) to test the hypothesis that increased rainfall and nitrogen levels in desert regions – brought on by human activities and global warming – will shift the balance of these arid ecosystems, causing them to become "sinks" of carbon dioxide while experiencing a depletion in their already limited water supply. The two-year study will take place in the Mojave Desert in the southwestern US and in Israel's Negev Desert.

Desert ecosystems are, of course, characterized by a scarcity of water, but they are also scarce in nitrogen, an element essential to plant growth. These environmental limitations constrain plant growth. With the expansion of urban areas in desert regions, nitrogen levels are expected to increase as pollution containing nitrogen compounds is released into the atmosphere and deposited into soil by rainfall. In addition, global warming, caused by rising levels of carbon dioxide in the atmosphere, may increase rainfall in some of the world's large dryland regions.

Numerous studies have already shown that in many ecosystems, increased water and nitrogen supplies lead to a substantial increase in plant growth: leaves get bigger and greener, branches grow longer, lifespan increases. However, this trend has not yet been studied extensively in the desert.

Arnone and his colleagues expect that, when introduced to higher levels of water and nitrogen, desert flora in the Mojave and the Negev will grow larger, leading to a shift in the water and carbon balance of these ecosystems. The plants will use more carbon dioxide for photosynthesis – removing more from the atmosphere than they emit – making the regions "carbon sinks." This will come at a cost of greater water loss to the atmosphere, as larger plants lose more water through transpiration from their leaves.

Research will be conducted at the Mojave Global Change Facility (MGCF), a long-term ecological research facility established in 2000 near Las Vegas, and at a second site near Sde Boker in the Negev. For two years, water loss and carbon exchange will be measured in two enclosed domes that house a representative sample of each desert's vegetation.

Nearly \$400,000 in funding was approved by the IALC Research and Demonstration Advisory Committee, which reviewed 26 proposals submitted from Arizona, Illinois, Israel, Jordan, Nevada, New Mexico, South Dakota and Texas. The vast majority of proposals were collaborations between two or more principal investigators. Funding of all IALC projects is contingent upon receipt of federal funding.

“The research that we were able to fund today offers the prospect of results that will have an important impact on arid land management and the world we live in,” said Dr. Colin Kaltenbach, President of the IALC Board of Directors. “However, we would not have been able to support such work without the generous assistance of the USDA CSREES.”