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February 2, 2007

The Honorable Harry Reid
United States Senate
Washington, DC

Re: Request to Support NASA Budget Augmentation for Continuation of a Landsat Thermal Sensor

Dear Senator Reid:

The Nevada Division of Water Resources is requesting your support for an augmentation to NASA's budget to include a thermal sensor for the Landsat Data Continuity Mission's (LDCM) planned July 2011 launch. A thermal sensor on board Landsat provides the ability for mapping several environmental variables including water use and water availability at a spatial scale useful for decision making. With the State of Nevada's new municipal and industrial water supplies largely being obtained through the conversion of agricultural water rights, a Landsat thermal sensor is critical for mapping how much water is consumed by irrigated agriculture and by urban-suburban development. In addition to irrigated agriculture applications, a Landsat thermal sensor provides the ability to estimate the amount of groundwater discharge occurring from native vegetation, thus providing a basis for updating basin water budgets and perennial yield estimates throughout Nevada. Both of these applications are of particular importance, however, when combined they are extremely useful for evaluating the amount of water available for transfer out of a basin and the potential environmental consequences of such transfers.

Given demands on the existing NASA budget, it is apparent that NASA is not in a position to fund a thermal sensor by diverting dollars from existing programs. NASA has reinstated an option for the thermal band in the LDCM specifications and the Western States Water Council[1] and Western Governors' Association[2] have expressed written support for a Landsat thermal sensor. Representatives from resource

[1] 2006. D.A. Smith. Letter from the Western Water Council to J.H. Marbuger, Director of the President's Office of Science and Technology Policy.
http://www.idwr.idaho.gov/gisdata/ET/thermal_band_issues/wswc_landsat_position.pdf
[2] 2006. Rounds, M.M. and Freudenthat, D. Letter from the Western Governors' Association to J.H. Marburger, Director of the President's Office of Science and Technology Policy.
http://www.idwr.idaho.gov/gisdata/ET/thermal_band_issues/wga-landsat-letter-2.pdf

agencies in the states of California, Colorado, Idaho, Kansas, Nebraska, New Mexico, Montana, Oklahoma, Utah, and Wyoming as well as many U.S. and foreign scientists from government agencies and universities have also expressed written support.[3]

The Landsat thermal sensor can provide critical information on Nevada's water resources because it provides the only efficient and accurate way to map how much and where water is being consumed. The use of this technology could enable Nevada to determine water use much less expensively and more efficiently than the standard methods of employing multiple staff to conduct crop inventories and apply consumptive use estimates to those acres. This methodology is very labor intensive, and to obtain a reliable estimate of water use requires measuring devices on all surface-water diversions and pumping wells, and requires weather stations in irrigated settings that currently do not exist.

The Landsat thermal sensor also provides an efficient and inexpensive way for mapping the spatial distribution of groundwater discharge occurring from native vegetation. Current standard methods for estimating groundwater discharge from native vegetation are very costly and time consuming, requiring expensive micrometeorological weather stations, which only yield point measurements of groundwater discharge that have to be spatially distributed using numerous questionable empirical relationships. The use of Landsat thermal data provides a more physically based approach and has been proven to provide both financial and scientific advantages over current methods.

In order to continue the ability to map water use and help preserve Nevada's water resources and agriculture industry, I urge you to support an augmentation to the NASA budget to assure that the next generation of Landsat will have the important thermal capability for the planned July 2011 LDCM launch.

I am happy to answer any questions your staff might have, and to provide any additional material. I can be reached at ttaylor@water.nv.gov, or at 775-684-2861. A further description of the specific need for the thermal band aboard the next Landsat mission and numerous letters of support from state and government agencies are located at www.idwr.idaho.gov/gisdata/landsat-thermal-band.htm.

Thank you for considering this important matter.

Sincerely,

Tracy Taylor, P.E.
Nevada State Engineer

cc: Amy Kaminski, NASA Program Examiner for Office of Management and Budget
Gene Whitney, Office of Science and Technology Policy

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[3] 2006. Letter from NASA, USDA and university scientists to the Panel of the Decadal Survey of the National Research Council.
http://www.idwr.idaho.gov/gisdata/ET/thermal_band_issues/nrcds_tir_letter_final.pdf