
Conservation Applications of Astronaut Photographs of Earth: Tidal-Flat Loss (Japan), Elephant Effects on Vegetation (Botswana), and Seagrass and Mangrove Monitoring (Australia)

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Abstract: *National Aeronautics and Space Administration (NASA) photographs taken by astronauts from low Earth orbit can provide information relevant to conservation biology. This data source is now more accessible because of improvements in digitizing technology, Internet file transfer, and availability of image processing software. We present three examples of conservation-related projects that benefited from the use of astronaut photographs. First, NASA scientists requested that astronauts photograph the area of the controversial Isabaya Bay reclamation project in Japan. Japanese researchers used photographs from before and after the reclamation as a tool for communication with the public about the effects of tidal-flat loss. The newly acquired images and the availability of high-resolution digital images from NASA archives provided timely public information on the observed changes. Second, we digitally classified and analyzed a Space Shuttle photograph of Chobe National Park in Botswana to identify the locations of woodlands affected by elephants. Field validation later confirmed that areas identified on the image showed evidence of elephant damage. Third, we used a summary map from intensive field surveys of seagrasses in Shoalwater Bay, Australia, as reference data for a supervised classification of a digitized photograph taken from orbit. The classification distinguished seagrasses, sediments, and mangroves with accuracy approximating that in studies using other satellite remote-sensing data. Astronaut photographs are in the public domain, and the database of nearly 400,000 photographs from the late 1960s to the present is available at a single searchable location on the Internet (<http://eol.jsc.nasa.gov/sseop>). These photographs can be used by conservation biologists as a source of general information about the landscape and for quantitative mapping.*

Usos en la Conservación de Fotografías Tomadas por Astronautas: Pérdida de Zonas de Mareas (Japón), Efectos de Elefantes en la Vegetación (Botswana), y Monitoreo de Pastos Marinos y Manglares (Australia)

Resumen: *Las fotografías de la Administración Nacional de Aeronáutica y el Espacio (NASA) tomadas por astronautas en vuelos de órbita terrestre a baja altura pueden aportar información relevante para la bi-*

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