TexasView Remote Sensing Activities 2014 - 2015

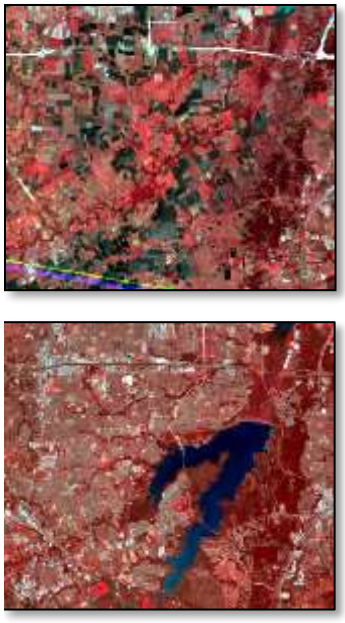
Watching over Texas From Space (WOTFS) – "How is Texas Changing"

Watching over Texas from Space **(WOTFS)** consists of a set of tutorials patterned after the Canadian Center for Remote Sensing's "Watching over Our Planet from Space". Development of hard-copy activities and materials is a priority because most high schools do not have access to digital image processing capabilities, making satellite imagery difficult to access within the classroom. *WOTFS* is intended to be a low-threshold mechanism to expose students to geospatial technology without requiring computers and software. Classroom activities are provided in poster and page-size (handout) formats; answer sheets and correlations to **Texas Essential Knowledge and Skills (TEKS) standards** are also provided for teachers.

"How is Texas Changing" engages students and teachers in identification of landscape change using examples from across the state of Texas. Examples include change related to wildfires, flooding, hurricanes, water resource management, urban development, and other resource development.

Dallas, Texas. *Landsat imagery shows an agricultural area southeast of Dallas slated to serve as a site for a new reservoir used for drinking water, flood control, and recreation. Known as Joe Pool Lake, it began filling in 1986 and completed in 1989. Farmland was flooded, and the adjacent farmland was rapidly replaced with residential, commercial, and industrial development. The area directly adjacent to the lake remains relatively undeveloped and is home to Cedar Hill State Park.*

ABOVE: Landsat 1, March 12, 1974
BELOW: Landsat 8, March 11, 2014



WOTFS – "Which is Which"

"Which is Which" asks students to match descriptions of landscape and anthropogenic features, natural disaster impacts, and geomorphic processes with satellite images from multiple systems including Landsat, ASTER, MODIS, and EO-1 as well as astronaut photography. Classroom materials are provided in the same formats mentioned above.

Landsat 5 image acquired October 29, 2011. Lake Buchanan, an artificial reservoir located in central Texas, was more than 5 meters below the historic average for the month, due to a long-term drought affecting all of Texas.

Benefits to Texas

Satellite images are useful in teaching multiple subjects in multiple grade levels; direct correlation with **TEKS** has been accomplished for two courses taught at the high school level. Teachers benefit from materials developed by TexasView because the materials are accessible without the need to download and process satellite imagery. In particular, materials:

- Cover diverse science topics that students are specifically required to understand.
- Engage students with Texas-centric imagery and geospatial applications.
- Are provided in multiple formats for use in individual or group, hands-on activities and assignments.
- Can be captured and transformed into other formats that individual teachers require.
- Are directly linked to original sources including USGS and NASA websites that provide in-depth explanation of images (Earthshots and Earth Observatory).

TexasView is a member of the AmericaView Consortium, a nationally coordinated network of academic, agency, non-profit, and industry partners and cooperators that share the vision of promoting and supporting the use of remote sensing data and technology within each state.

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Supporting State Educational Standards

High School TEKS standards for **Earth and Space Science (ESS)** explicitly require that students be able to *"describe and interpret Earth surface features using a variety of methods including satellite imagery,"* and to *"use a wide variety of additional course apparatuses, equipment, techniques, and procedures as appropriate such as satellite imagery and other remote sensing data.* **WOTFS** activities "Which is Which" and "How is Texas Changing" focus on these standards, as well as other standards related to *change over a range of time scales; interactions among Earth's subsystems; the roles of erosion and deposition in reshaping Earth's surface; changes caused by natural disasters; effects of resource usage and of population growth; the dynamics of surface water movement.*

High School-level Texas Essential Knowledge and Skills (TEKS) standards for **Environmental Systems (ES)** are also addressed by **WOTFS** activities. These standards cover *water resource use and management; resource depletion; impact of urban development, natural disasters, and urbanization; habitat loss and restoration.*

WOTFS activities were introduced to middle and high school teachers from several North Texas independent school districts during a full-day workshop held for 24 teachers in June 2015, in Wichita Falls, Texas. Feedback from the teachers will be incorporated in future workshops.

The rapid spread of urbanization that followed the building of Dallas/Fort Worth airport addresses TEKS standards concerning the impact of human population growth for both High School ***Earth and Space Science*** *and* ***Environmental Systems*** *courses.* **Dallas, Texas, August 31st, 1984.** Landsat 5 TM image.

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