



The GOES-R Education Proving Ground

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The **GOES-R Education Proving Ground** features the design and development of lesson plans and activities for G6-12 teachers and students in collaboration with NOAA scientists at the Advanced Satellite Products Branch (ASPB) at CIMSS.

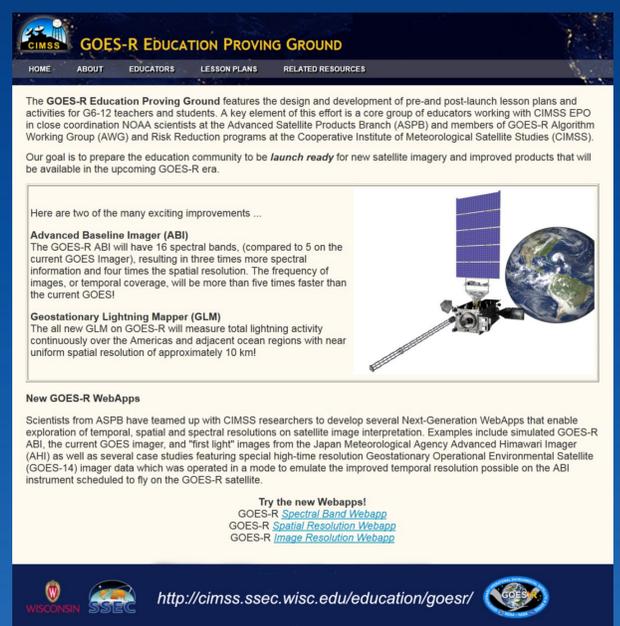
Project Outcomes

- Awareness of NOAA's contributions to satellite remote sensing applications
- Increased utilization of satellite data in science classrooms
- Improvements in science literacy
- Effective transfer of GOES-R satellite products to the educational community



COUNTDOWN TO LAUNCH!

- Expanding teachers from 6 to 26
- Planning 4 educational webinars (February, March, April & September)
- Teacher Workshop at the launch (10/14 & 10/15)
- Additional workshops in 2017 & 2018 co-located with ESIP summer meetings

GOES-R EDUCATION PROVING GROUND

HOME ABOUT EDUCATORS LESSON PLANS RELATED RESOURCES

The GOES-R Education Proving Ground features the design and development of pre- and post-launch lesson plans and activities for G6-12 teachers and students. A key element of this effort is a core group of educators working with CIMSS EPO in close coordination NOAA scientists at the Advanced Satellite Products Branch (ASPB) and members of GOES-R Algorithm Working Group (AWG) and Risk Reduction programs at the Cooperative Institute of Meteorological Satellite Studies (CIMSS).

Our goal is to prepare the education community to be **launch ready** for new satellite imagery and improved products that will be available in the upcoming GOES-R era.

Here are two of the many exciting improvements ...

Advanced Baseline Imager (ABI)
The GOES-R ABI will have 16 spectral bands, (compared to 5 on the current GOES Imager), resulting in three times more spectral information and four times the spatial resolution. The frequency of images, or temporal coverage, will be more than five times faster than the current GOES!

Geostationary Lightning Mapper (GLM)
The all new GLM on GOES-R will measure total lightning activity continuously over the Americas and adjacent ocean regions with near uniform spatial resolution of approximately 10 km!

New GOES-R WebApps
Scientists from ASPB have teamed up with CIMSS researchers to develop several Next-Generation WebApps that enable exploration of temporal, spatial and spectral resolutions on satellite image interpretation. Examples include simulated GOES-R ABI, the current GOES imager, and "first light" images from the Japan Meteorological Agency Advanced Himawari Imager (AHI) as well as several case studies featuring special high-time resolution Geostationary Operational Environmental Satellite (GOES-14) imager data which was operated in a mode to emulate the improved temporal resolution possible on the ABI instrument scheduled to fly on the GOES-R satellite.

Try the new Webapps!
GOES-R [Spectral Band Webapp](#)
GOES-R [Spatial Resolution Webapp](#)
GOES-R [Image Resolution Webapp](#)

<http://cimss.ssec.wisc.edu/education/goesr/>

Three New HTML5 WebApps! Compatible with all browsers & devices

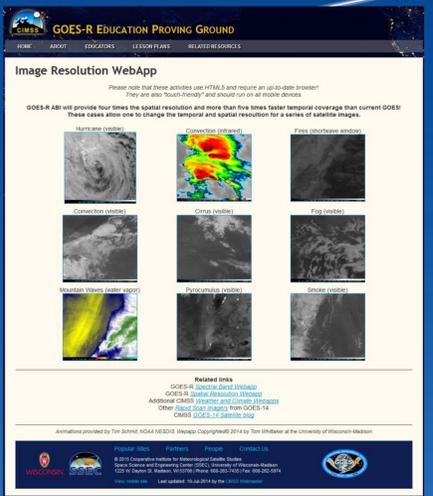


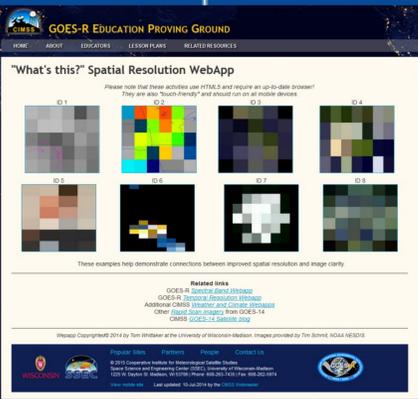
Image Resolution WebApp

Please note that these activities use HTML5 and require an up-to-date browser! They are also "touch-friendly" and should run on all mobile devices.

GOES-R ABI will provide four times the spatial resolution and more than five times faster temporal coverage than current GOES! These cases alone will change the temporal and spatial resolution for a series of satellite images.

Examples include: Marine (satellite), Convective (satellite), Fire (satellite/airborne), Convective (airborne), Cloud (satellite), Fog (satellite), Mountain (satellite/airborne), Psychological (satellite), Smoke (satellite).

Related Links:
GOES-R [Spectral Band Webapp](#)
GOES-R [Spatial Resolution Webapp](#)
Additional CIMSS WebApps and Content: [GOES-R Spatial Resolution Webapp](#)
Other Case Study Imagery from GOES-14: [GOES-14 Case Study Imagery](#)



"What's this?" Spatial Resolution WebApp

Please note that these activities use HTML5 and require an up-to-date browser! They are also "touch-friendly" and should run on all mobile devices.

Examples help demonstrate connections between improved spatial resolution and image clarity.

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Spectral Band WebApp

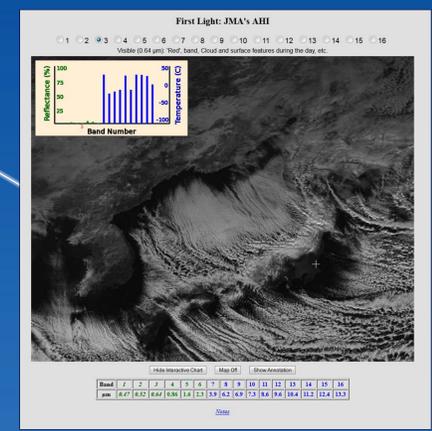
Please note that these activities use HTML5 and require an up-to-date browser! They are also "touch-friendly" and should run on all mobile devices.

Explore information available from different spectral bands measured by satellites.

Examples include: GOES Imager, GOES-R ABI (simulated), JMA/AHI (Oct. 2014), JMA/AHI (Jan. 2015).

This webapp allows you to explore, via an interactive graph, information available from different spectral bands.

Related Links:
Information about the [GOES-R Imager](#)
GOES-R [Spectral Resolution Webapp](#)
GOES-R [Spatial Resolution Webapp](#)
Additional CIMSS WebApps and Content: [GOES-R Spatial Resolution Webapp](#)
[Real-time geo satellite imagery](#) from around the world



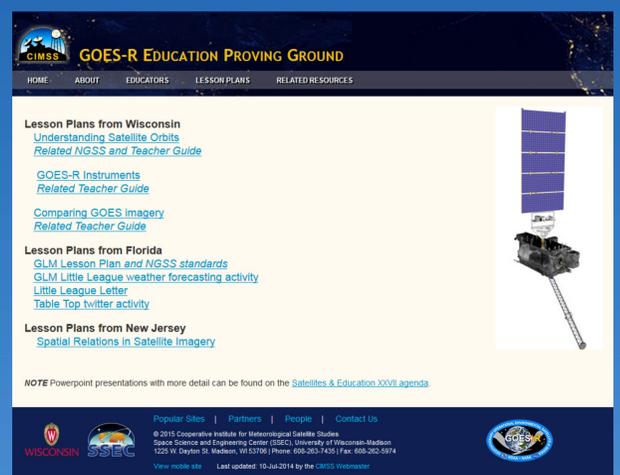
First Light: JMA's AHI

Visible (0.64 μm): Total, band, cloud and surface features during the day, etc.

Band Number: 1-16

Reflectance (%) and Temperature (C) graphs.

Image description: AHI satellite image showing cloud cover and surface features.



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HOME ABOUT EDUCATORS LESSON PLANS RELATED RESOURCES

Lesson Plans from Wisconsin
[Understanding Satellite Orbits](#)
[Related NGSS and Teacher Guide](#)

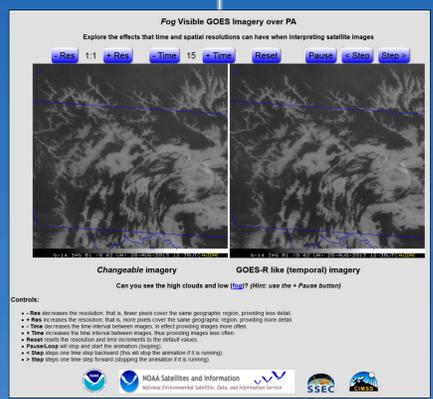
GOES-R Instruments
[Related Teacher Guide](#)

Comparing GOES Imagery
[Related Teacher Guide](#)

Lesson Plans from Florida
[GLM Lesson Plan and NGSS standards](#)
[GLM Little League weather forecasting activity](#)
[Little League Letter](#)
[Table Top Twitter activity](#)

Lesson Plans from New Jersey
[Spatial Relations in Satellite Imagery](#)

NOTE Powerpoint presentations with more detail can be found on the [Satellites & Education XXVI agenda](#)



Fog Visible GOES Imagery over PA

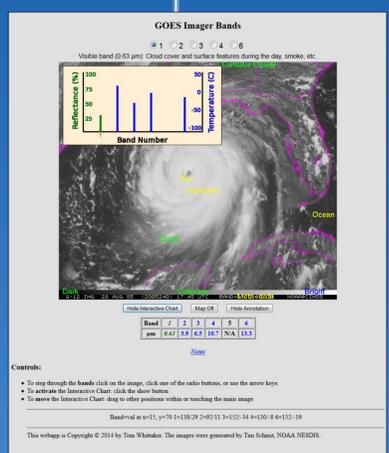
Explore the effects that time and spatial resolutions can have when interpreting satellite images.

Controls: Res, 1:1, Res, Time, 15, Time, Reset, Pause, Stop, Step>

Changeable imagery | GOES-R like (temporal) imagery

Can you see the high clouds and low (fog)? (Hint: use the + Pause button)

Controls:
• Res decreases the resolution, that is, fewer pixels cover the same geographic region, providing less detail.
• Res increases the resolution, that is, more pixels cover the same geographic region, providing more detail.
• Time decreases the time interval between images, in other words, images come often.
• Time increases the time interval between images, in other words, images come less often.
• Reset resets the resolution and time intervals to the default values.
• Pause/Stop/Step> stop and start the animation (temporal).
• Step steps one time step backward (this will stop the animation if it is running).
• Step steps one time step forward (temporal).
• Step steps one time step forward (spatial).
• Step steps one time step backward (spatial).

GOES Imager Bands

Visible band (0.63 μm): Cloud cover and surface features during the day, smoke, etc.

Band Number: 1-8

Reflectance (%) and Temperature (C) graphs.

Image description: GOES imager image showing cloud cover and surface features.

<http://cimss.ssec.wisc.edu/education/goesr/>

AMS Earth System Science, Technology, Engineering, and Mathematics (STEM) Education Policy Statement (2014)

- recognizes the importance of STEM Education in developing, maintaining, and growing an education "pipeline" for the purpose of creating a world-class 21st century workforce in the USA
- stresses the benefits of integrating Earth system science as a major component of STEM
- offers leadership to organizations and institutions tasked with creating guidelines and supporting documents
- highly recommends and encourages the use of datasets, computer models and visualizations, remote-sensing technologies, and field experiences.

