



Evaluación de Islas de Calor Urbano con Satélites

Geoestacionarios

Kevin Gallo: NOAA/NESDIS/STAR

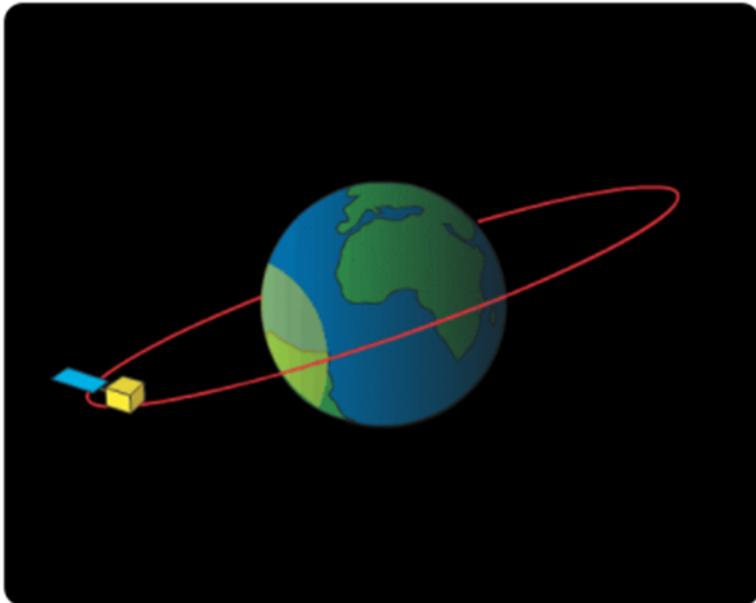
24 de noviembre de 2020



Aviso: Los resultados y conclusiones científicos, así como cualquier punto de vista u opinión expresado en esta presentación, son únicamente del autor y no necesariamente reflejan los de la NOAA o del Departamento de Comercio.

Órbita Geoestacionaria vs. y Órbita Polar

Vistas continuas de la superficie de la Tierra en el área de cobertura (24 horas al día).

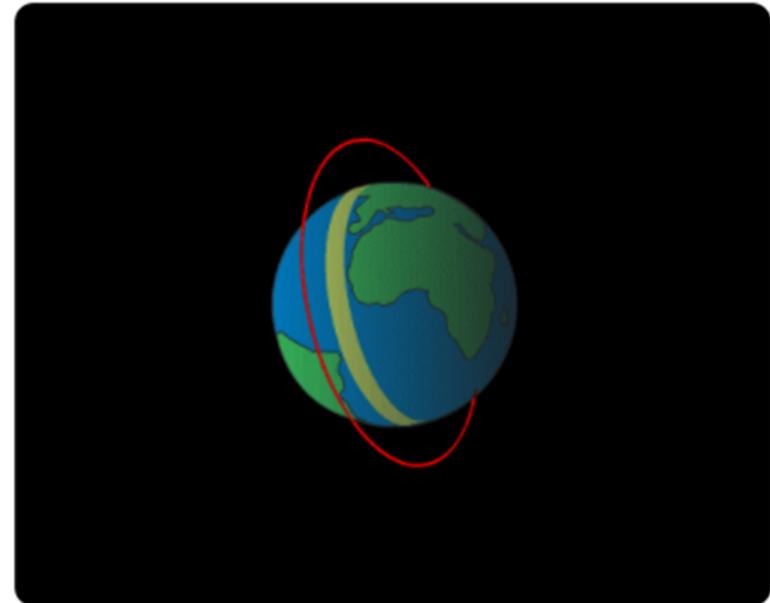


The East-West orbit of GOES satellites depicted in the yellow circle.

Resolución Espacial: ≥ 1 km

Resolución Temporal: ≤ 1 hora

Vistas diurnas y nocturnas de la mayoría de las ubicaciones en la superficie de la Tierra (ej., 2am y 2pm hora local).



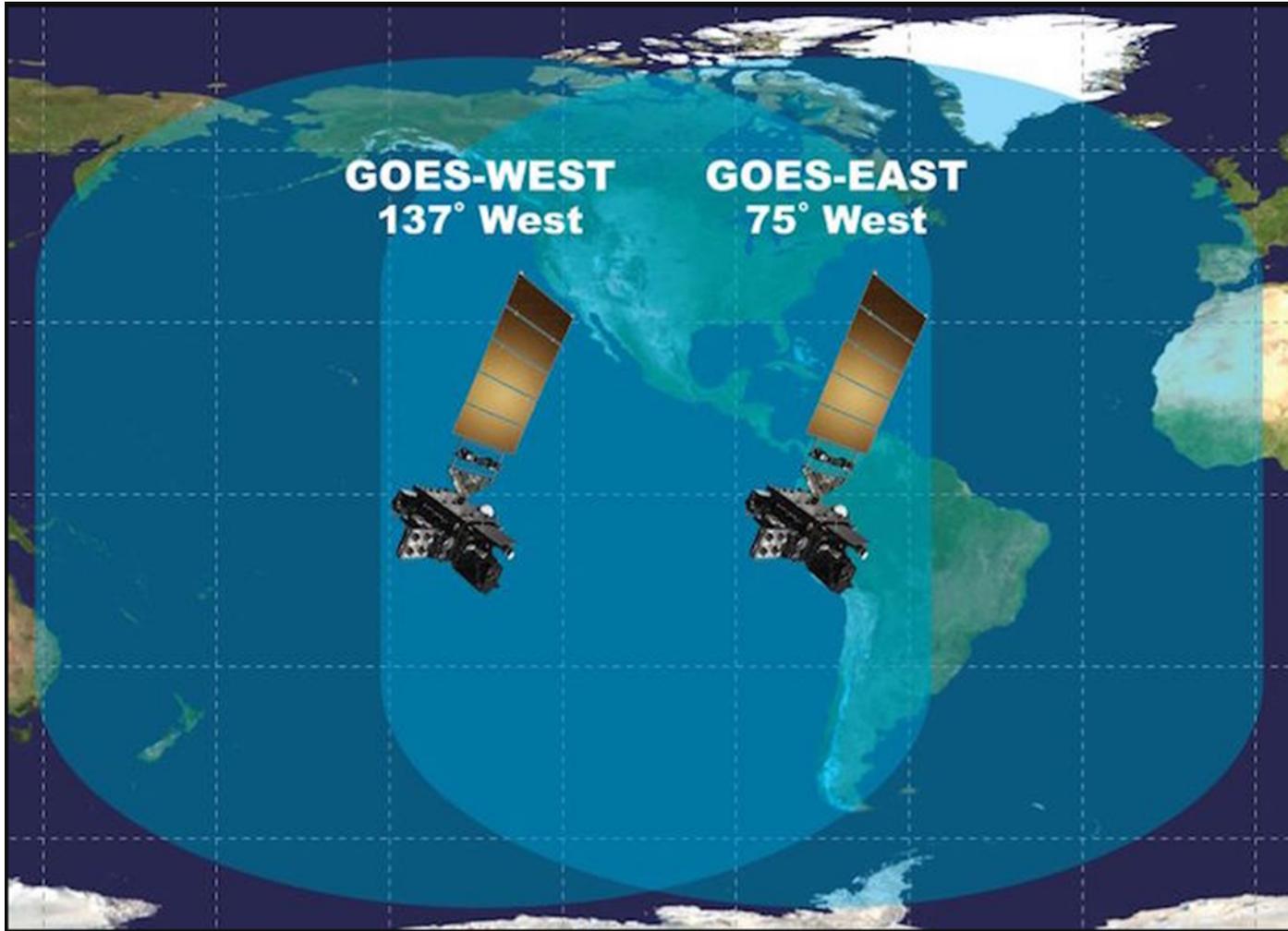
The North-South orbit of Polar orbiting satellites depicted in the yellow line.

Resolución Espacial: ≤ 1 km

Resolución Temporal: \geq día/noche
(Landsat 16 días)



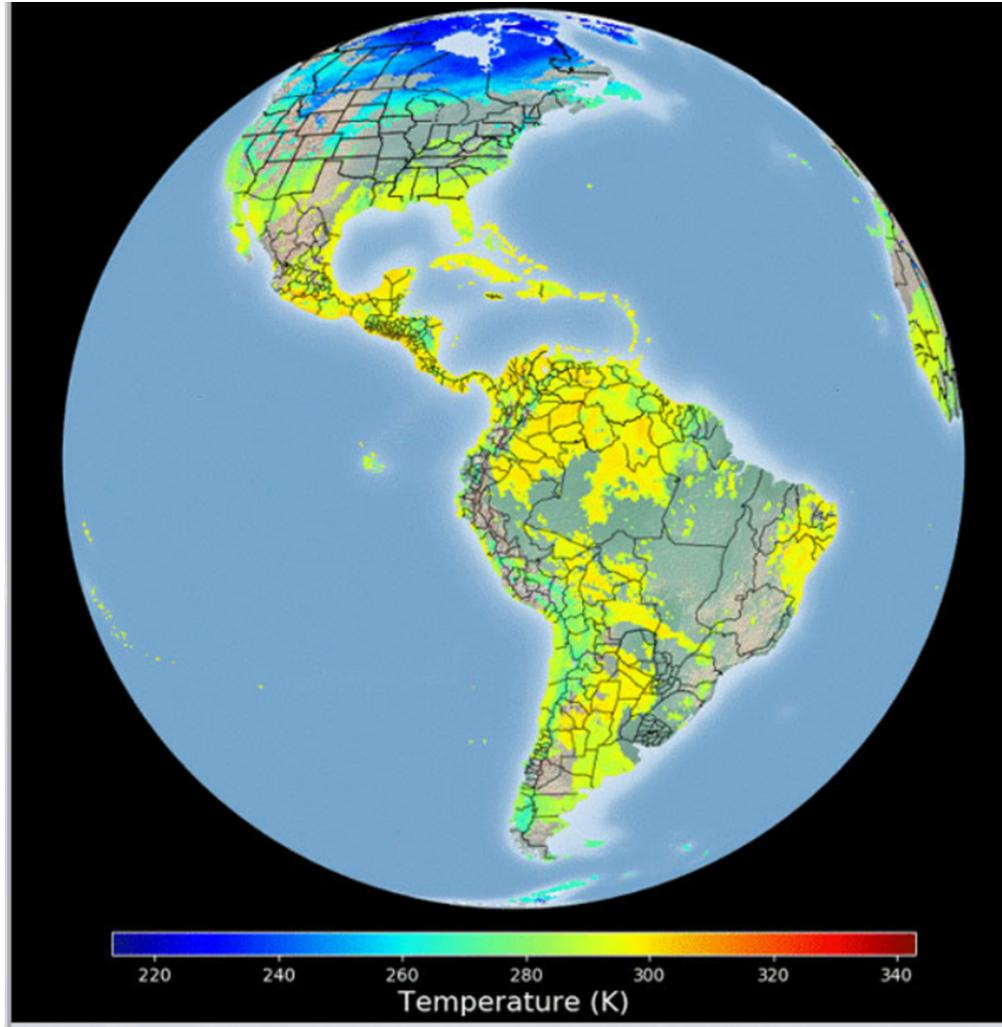
Geostationary Operational Environmental Satellite (GOES)



Dos satélites GOES operativas brindan cobertura de Norte y Sur América.



Ejemplo de Producto de la Temperatura de la Superficie de la Tierra (Land Surface Temperature o LST)



Para EE.UU. Continental:

- Resolución espacial -2 km
- Resolución temporal 1 hora



Necesidad de una Alta Frecuencia de Observaciones (Resolución Temporal)

Una mayor resolución temporal permite una mayor frecuencia de observación y medición de:

- 1) temperaturas altas y bajas y
- 2) el rango de temperatura diurna y la duración asociada de las temperaturas.

The 1995 Chicago Heat Wave: How Likely Is a Recurrence?



Thomas R. Karl and Richard W. Knight
National Climatic Data Center, Asheville, North Carolina

ABSTRACT

The deadly heat wave of July 1995 that affected much of the U.S. midwest, most notably Chicago, Illinois, has been put into historical perspective. The heat wave has been found to be remarkably unusual, but only partially because of the extreme high apparent temperatures (an index of the combined effect of temperature and humidity on humans), where the authors calculate a return period of the peak apparent temperature of ≤ 23 yr. Of greater significance were the very high temperatures that persisted day and night over an extended 48-h period. Analysis presented here indicates that for Chicago such an extended period of continuously high day and night apparent temperature is unprecedented in modern times. The authors find that the minimum temperature for the heat wave (21.5°C (70.8°F)) is not

lated to be an ex-
parameter (temp-
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Such unusua-
was merely an e-
of trends (1948-
year from 26 m-
wide range of qu-
perature with its
that because of

affects of urbanization, and little trend of summer mean temperatures, it is unlikely that the macroscale climate of heat waves in the Midwest or in Chicago is changing in any significant manner.

Trends notwithstanding, the authors demonstrate the difficulty associated with projecting changes in the frequency and severity of similar types of events, even if the mean apparent temperature could be accurately predicted for the next century, for example, global warming projections. This is demonstrated using Chicago temperatures. The authors show that accurate projections of the frequency, severity, and duration of heat waves in the Midwest require accurate projections not only of the mean, the interannual variance, the intraseasonal variance, and day-to-day persistence, but also the interrelationships among these quantities within different synoptic-climatic regimes.

“De mayor significancia fueron las temperaturas muy altas que persistieron de día y de noche”

1. Introduction

lyzed the impacts and responses to the 1995 heat wave, and Kunkel et al. (1996) have reviewed the

Karl TR, Knight RW. The 1995 Chicago heat wave: How likely is a recurrence. B Am Meteorol Soc. 1997;78(6):1107-1119.

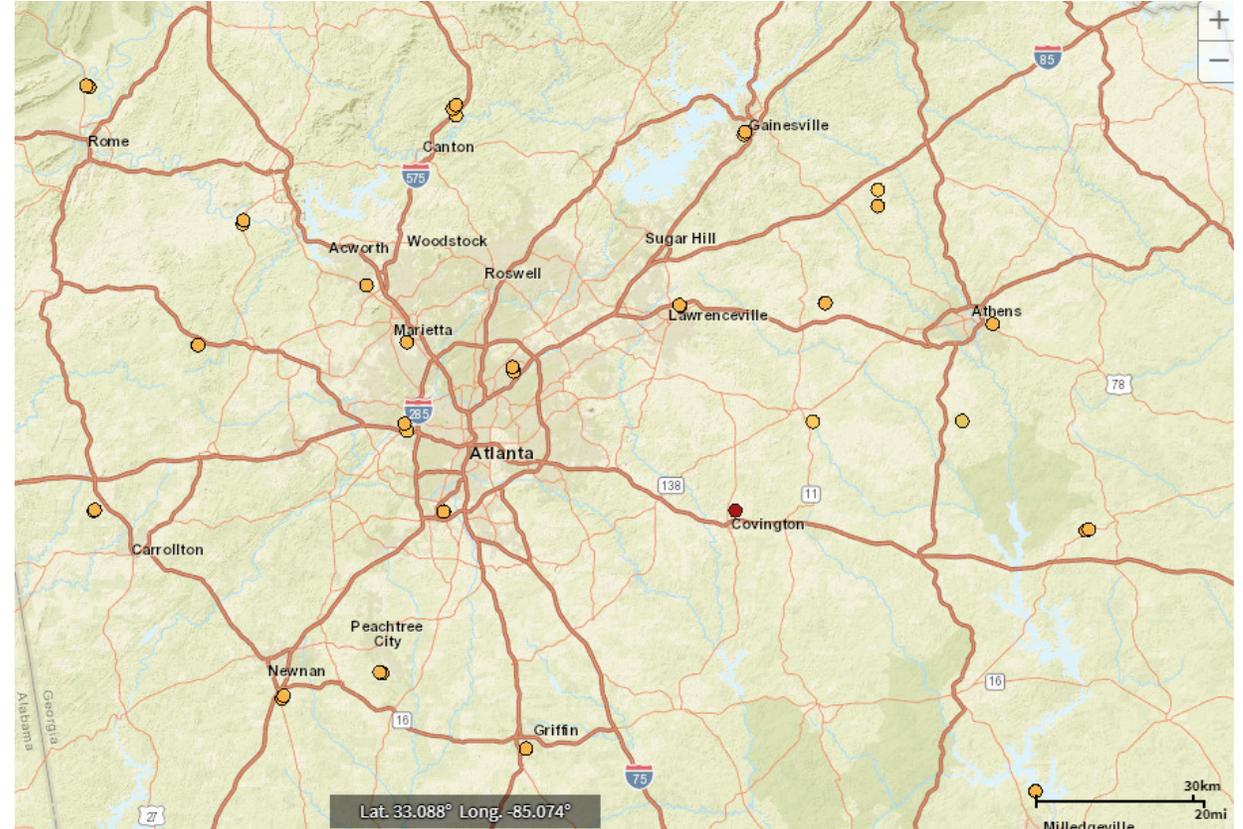


Necesidad de una Alta Frecuencia de Observaciones (Resolución Temporal)

Las observaciones de temperaturas diurnas en ubicaciones estándar de una red climatológica son relativamente pocas, aun en regiones metropolitanas mayores.

LEGEND	
Hourly Global	
Climate Reference Network	 CRN  AL HCN-M  US HCN-M
Local Climatological Data	

Estaciones de Temperatura Diurna: Región de Atlanta

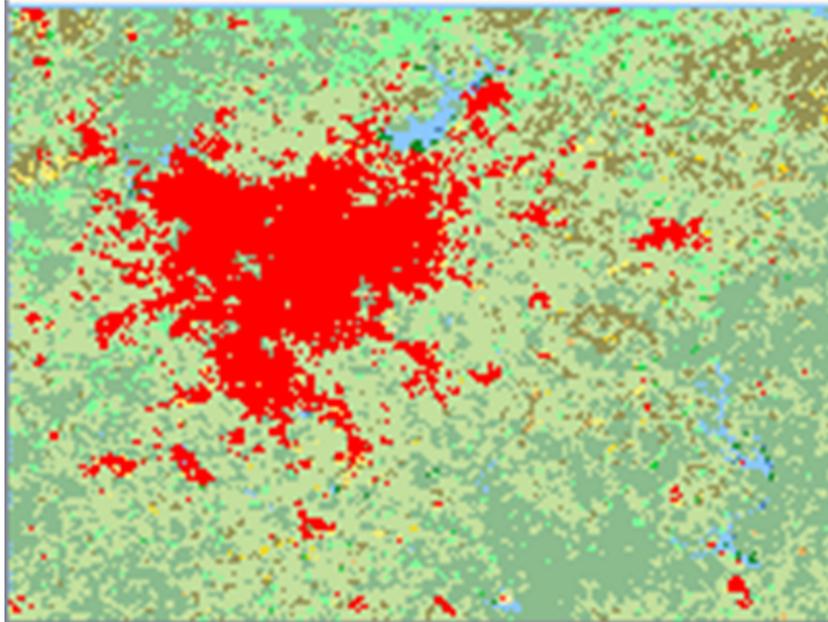


<https://gis.ncdc.noaa.gov/maps/ncei/cdo/hourly?layers=001>



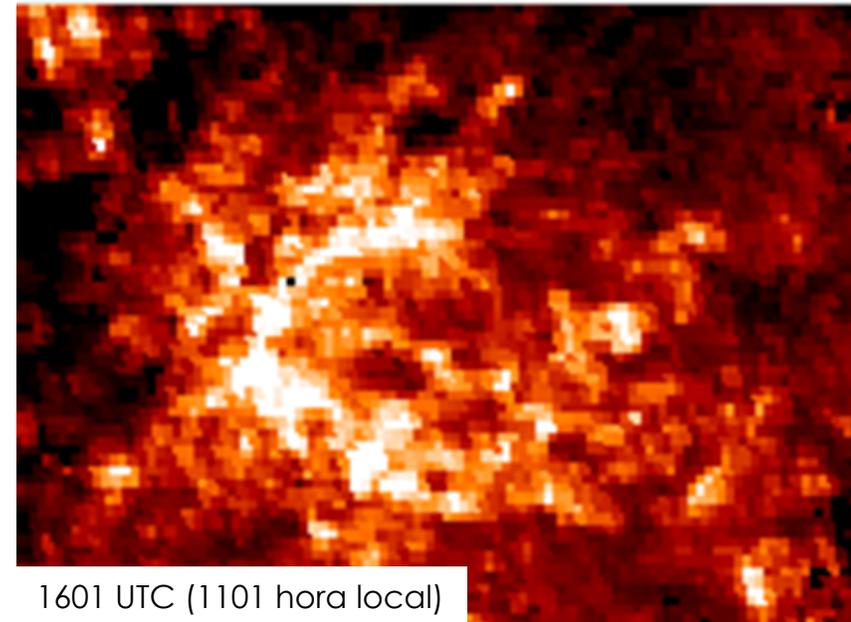
Región Atlanta- Observaciones de la Cobertura Terrestre y Temperatura de la Superficie de la Tierra

Producto de Tipo de Superficie Terrestre de "Visible Infrared Imaging Radiometer Suite" (VIIRS)



- Urban & built up 
- Woody Savana 
- Mixed Forest 
- Water 

Temperatura de la Superficie de la Tierra según el GOES-16 Advanced Baseline Imager: 16 ago 2019

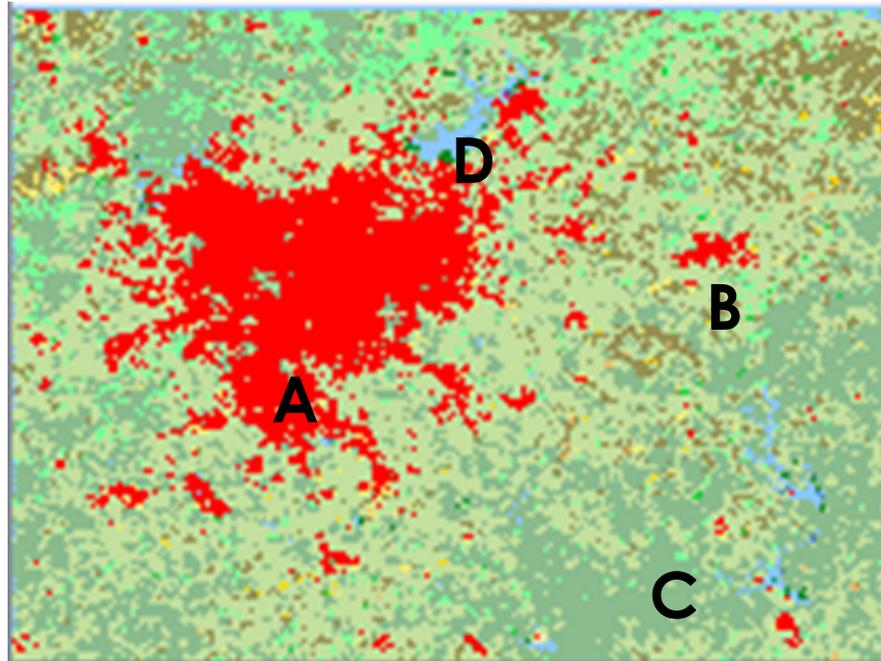


Low High
Land Surface Temperature



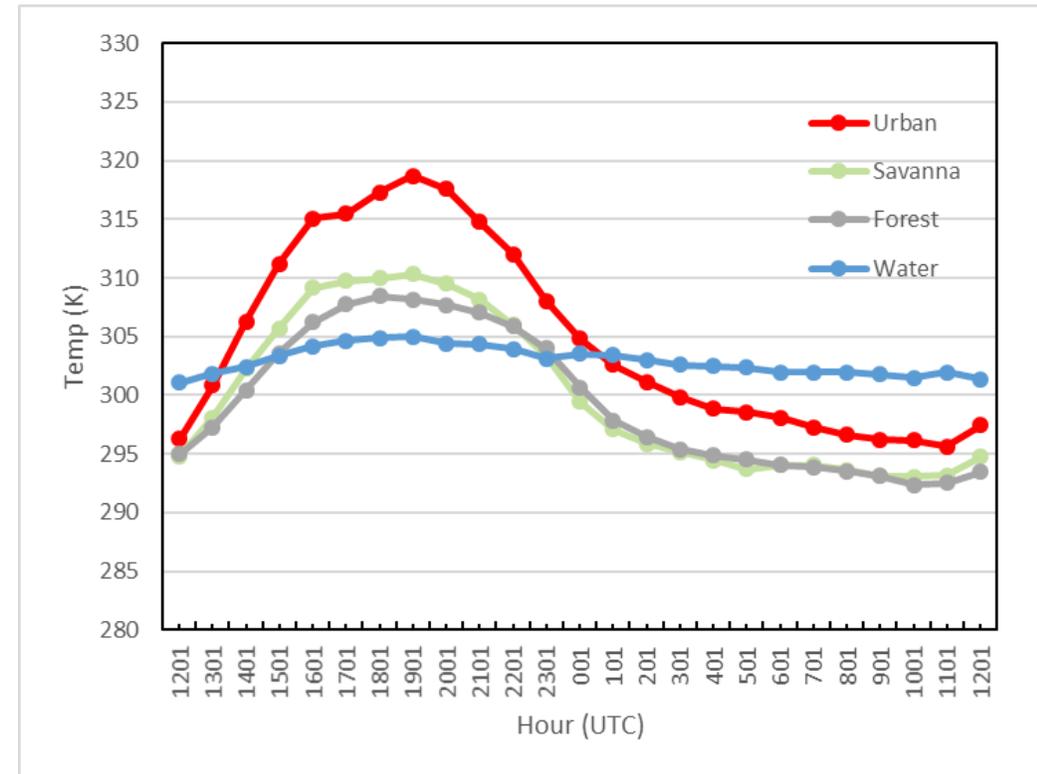
Observaciones de la Cobertura Terrestre de la Temperatura de la Superficie Diurna

Land Surface Type



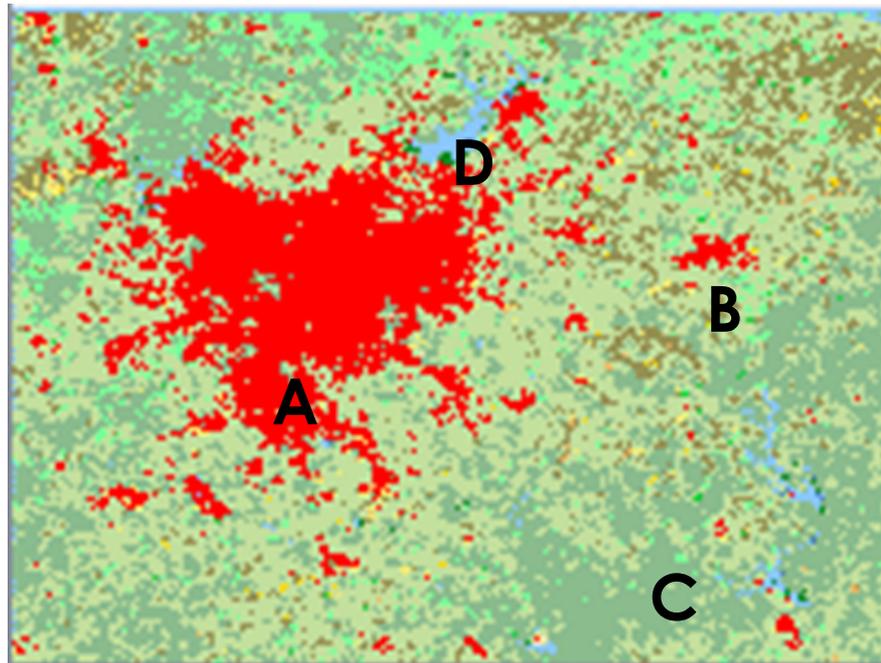
- A** Urban & built up
- B** Woody Savanna
- C** Mixed Forest
- D** Water

Land Surface Temperature:
16-17 August 2019

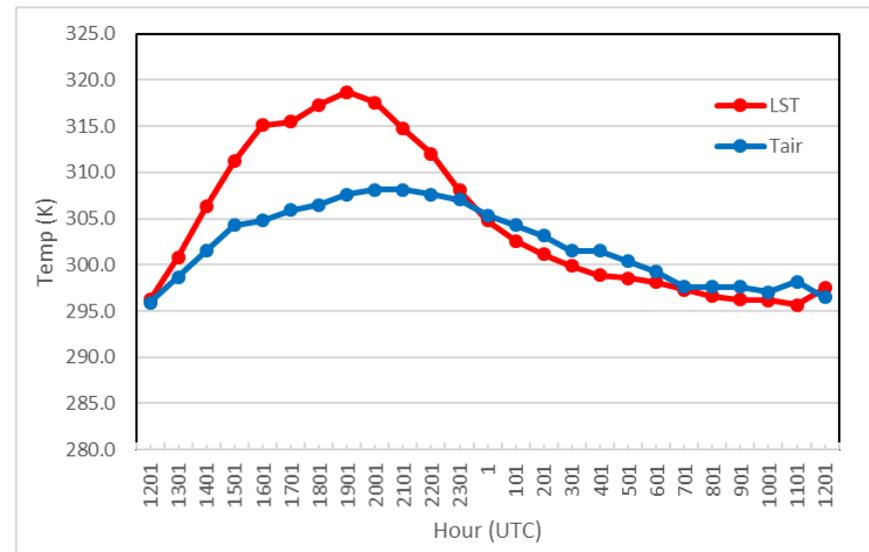


Observaciones de la Cobertura Terrestre de la Temperatura Diurna del Aire y la Superficie de la Tierra

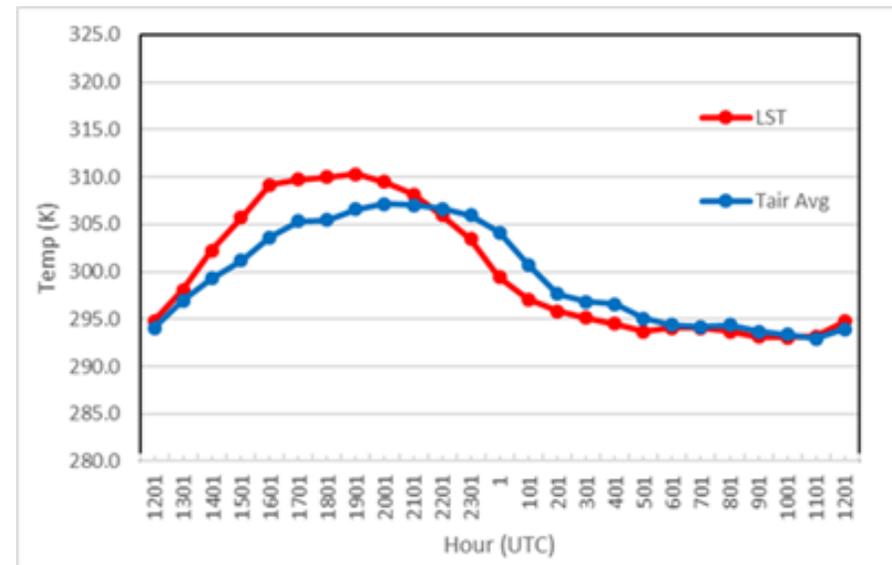
Producto de Tipo de Superficie Terrestre



- A** Urban & built up
- B** Woody Savanna
- C** Mixed Forest
- D** Water



A



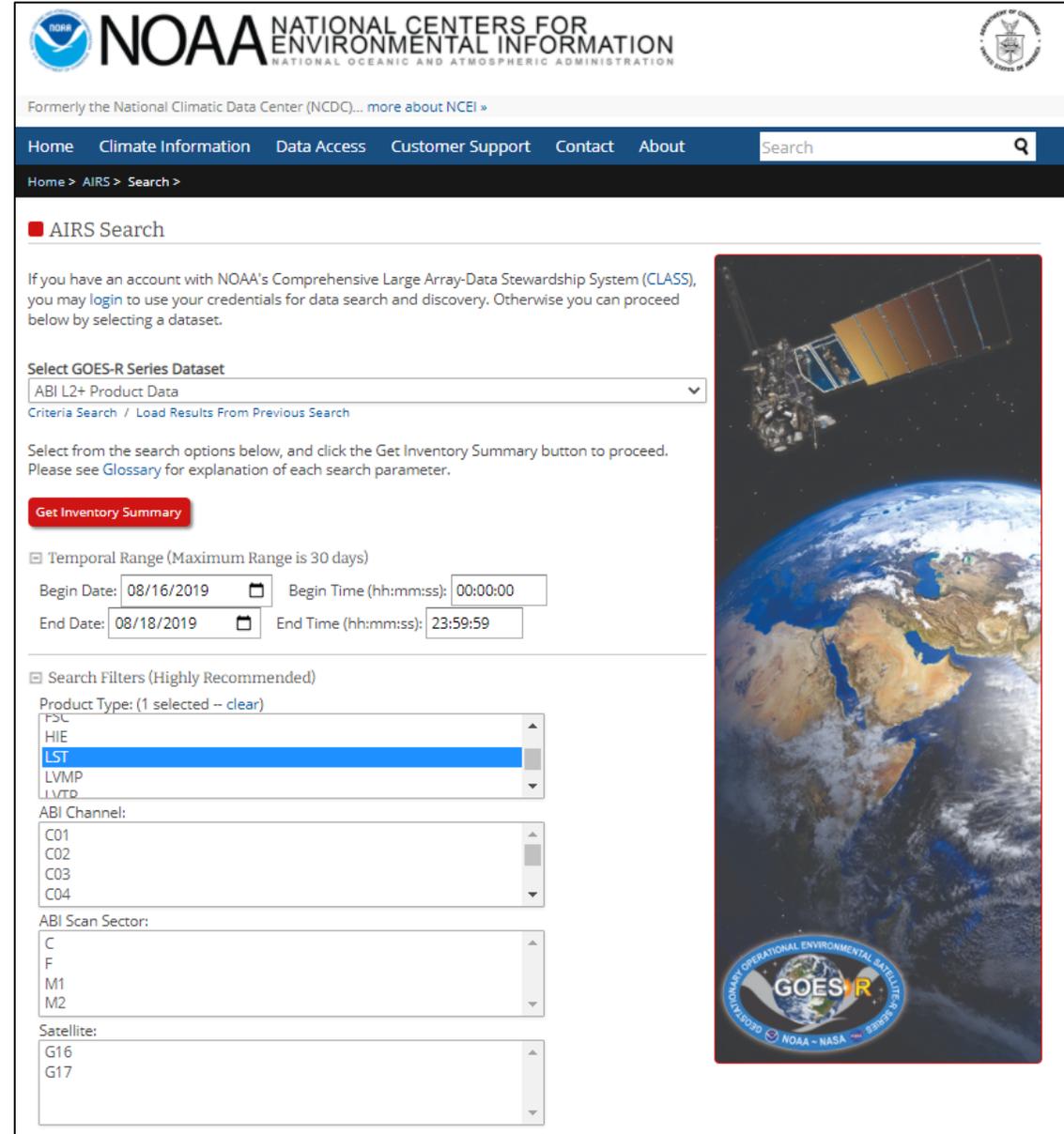
B



Cómo Obtener el Producto GOES Land Surface Temperature (LST)

El Sistema NOAA "Archive Information Request System" (AIRS)

<https://www.ncdc.noaa.gov/airs-web/search>



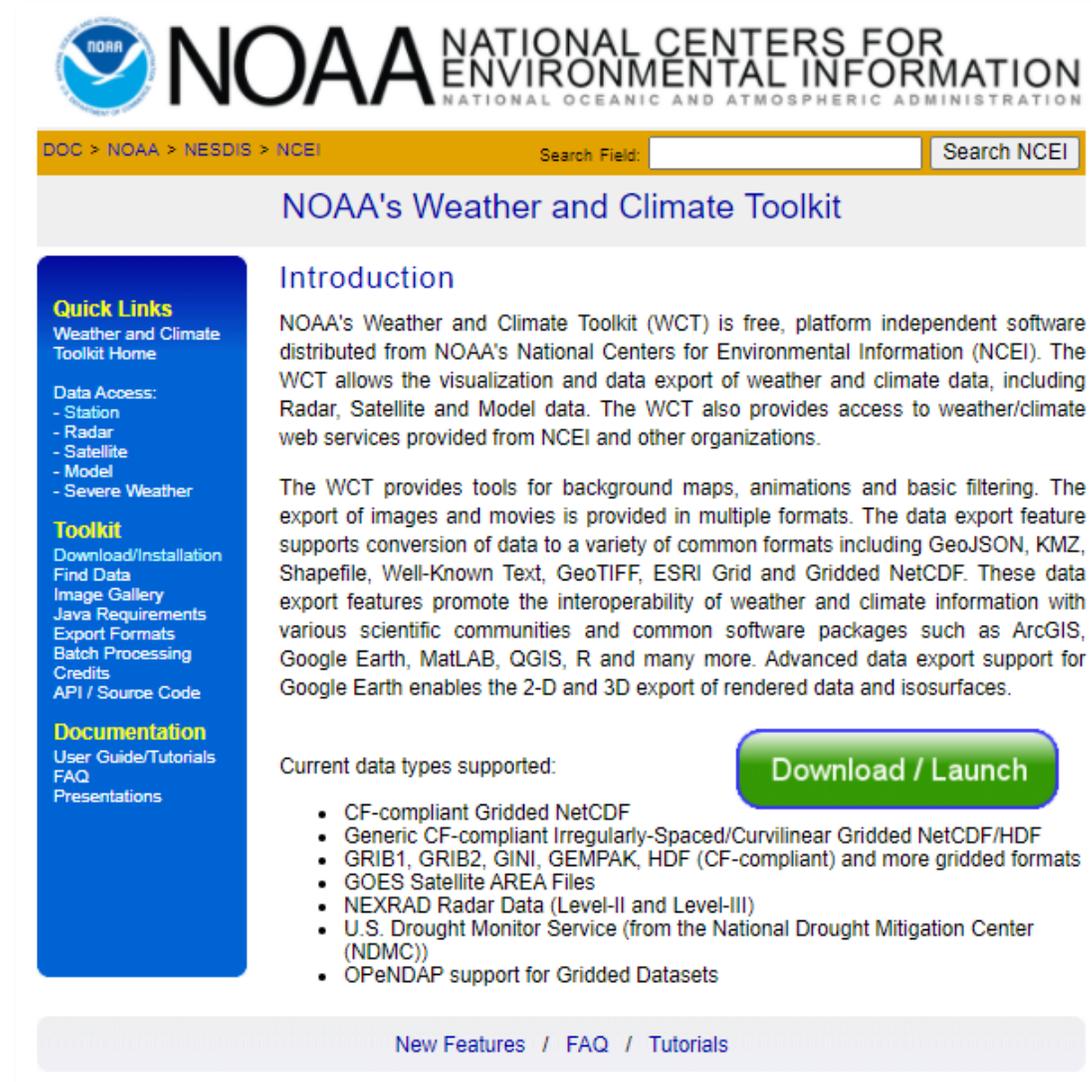
The screenshot displays the NOAA AIRS Search web interface. At the top, the NOAA logo and "NATIONAL CENTERS FOR ENVIRONMENTAL INFORMATION" are visible. Below the navigation bar, the "AIRS Search" section is active. A dropdown menu for "Select GOES-R Series Dataset" is set to "ABI L2+ Product Data". A red "Get Inventory Summary" button is prominent. The "Temporal Range" section shows a date range from 08/16/2019 to 08/18/2019. The "Search Filters" section includes a "Product Type" dropdown with "LST" selected, and other filters for "ABI Channel", "ABI Scan Sector", and "Satellite". A large image of the GOES-R satellite orbiting Earth is on the right side of the page.



Cómo Obtener el Producto GOES LST

La página del NOAA
“Weather and Climate Toolkit”

<https://www.ncdc.noaa.gov/wct/>



NOAA NATIONAL CENTERS FOR ENVIRONMENTAL INFORMATION
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

DOC > NOAA > NESDIS > NCEI Search Field: Search NCEI

NOAA's Weather and Climate Toolkit

Quick Links
Weather and Climate Toolkit Home

Data Access:
- Station
- Radar
- Satellite
- Model
- Severe Weather

Toolkit
Download/Installation
Find Data
Image Gallery
Java Requirements
Export Formats
Batch Processing
Credits
API / Source Code

Documentation
User Guide/Tutorials
FAQ
Presentations

Introduction

NOAA's Weather and Climate Toolkit (WCT) is free, platform independent software distributed from NOAA's National Centers for Environmental Information (NCEI). The WCT allows the visualization and data export of weather and climate data, including Radar, Satellite and Model data. The WCT also provides access to weather/climate web services provided from NCEI and other organizations.

The WCT provides tools for background maps, animations and basic filtering. The export of images and movies is provided in multiple formats. The data export feature supports conversion of data to a variety of common formats including GeoJSON, KMZ, Shapefile, Well-Known Text, GeoTIFF, ESRI Grid and Gridded NetCDF. These data export features promote the interoperability of weather and climate information with various scientific communities and common software packages such as ArcGIS, Google Earth, MatLAB, QGIS, R and many more. Advanced data export support for Google Earth enables the 2-D and 3D export of rendered data and isosurfaces.

Current data types supported:

[Download / Launch](#)

- CF-compliant Gridded NetCDF
- Generic CF-compliant Irregularly-Spaced/Curvilinear Gridded NetCDF/HDF
- GRIB1, GRIB2, GINI, GEMPAK, HDF (CF-compliant) and more gridded formats
- GOES Satellite AREA Files
- NEXRAD Radar Data (Level-II and Level-III)
- U.S. Drought Monitor Service (from the National Drought Mitigation Center (NDMC))
- OPeNDAP support for Gridded Datasets

[New Features](#) / [FAQ](#) / [Tutorials](#)

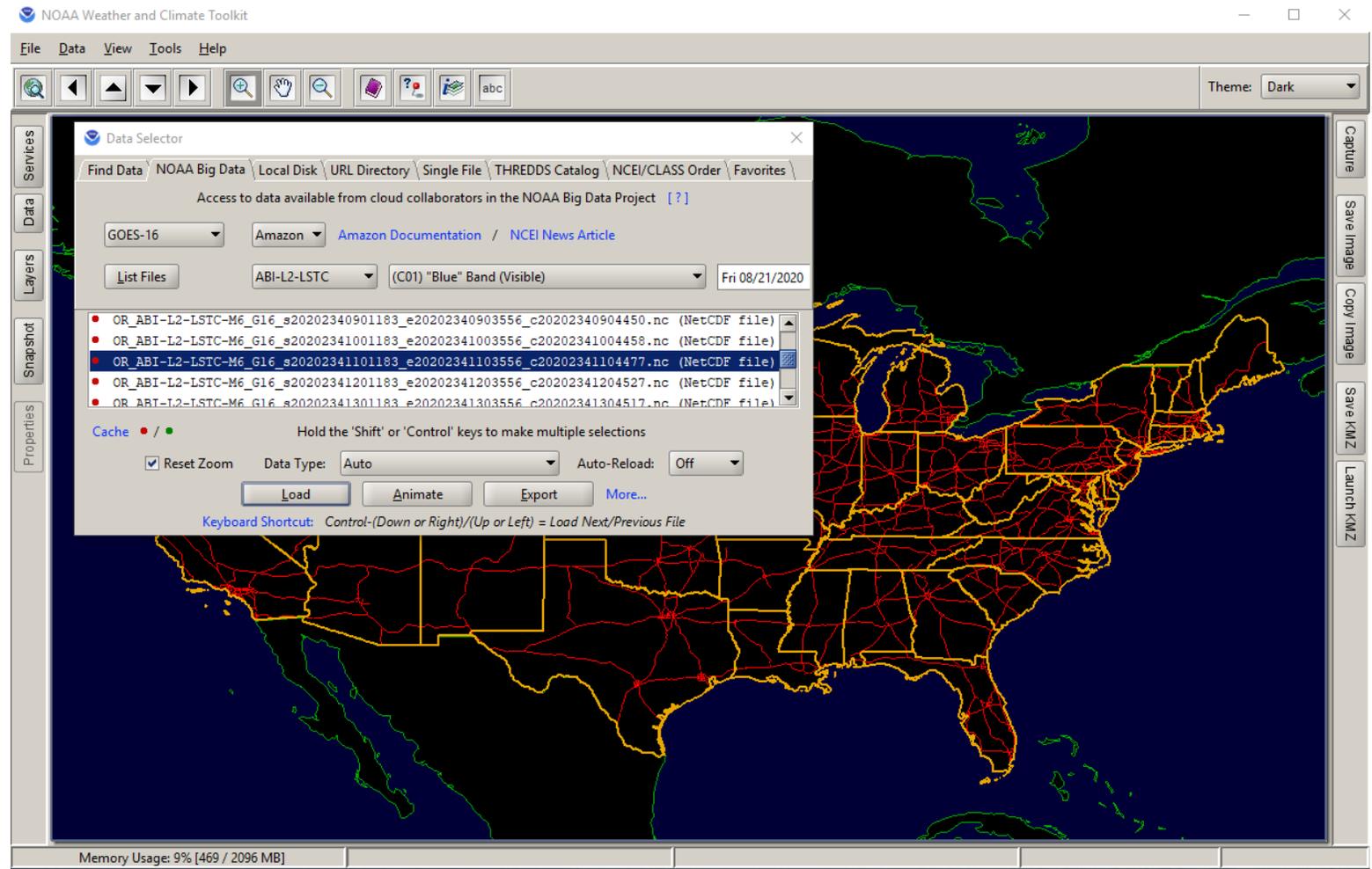


Cómo Obtener el Producto GOES LST

El NOAA “Weather and Climate Toolkit”

Los Datos son:

- Recuperados

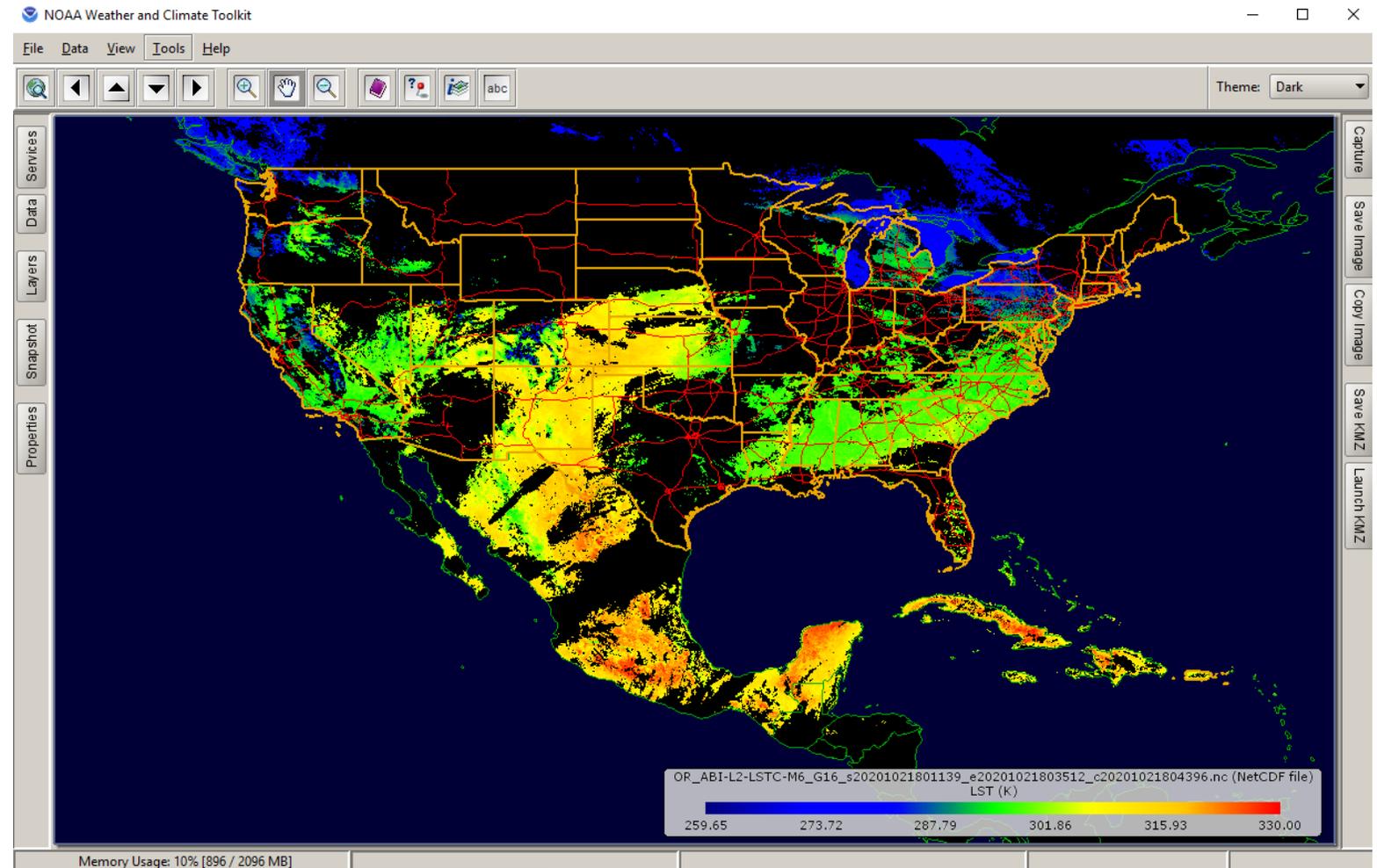


Cómo Obtener el Producto GOES LST

El NOAA “Weather and Climate Toolkit”

Los Datos son:

- Recuperados
- Visualizados

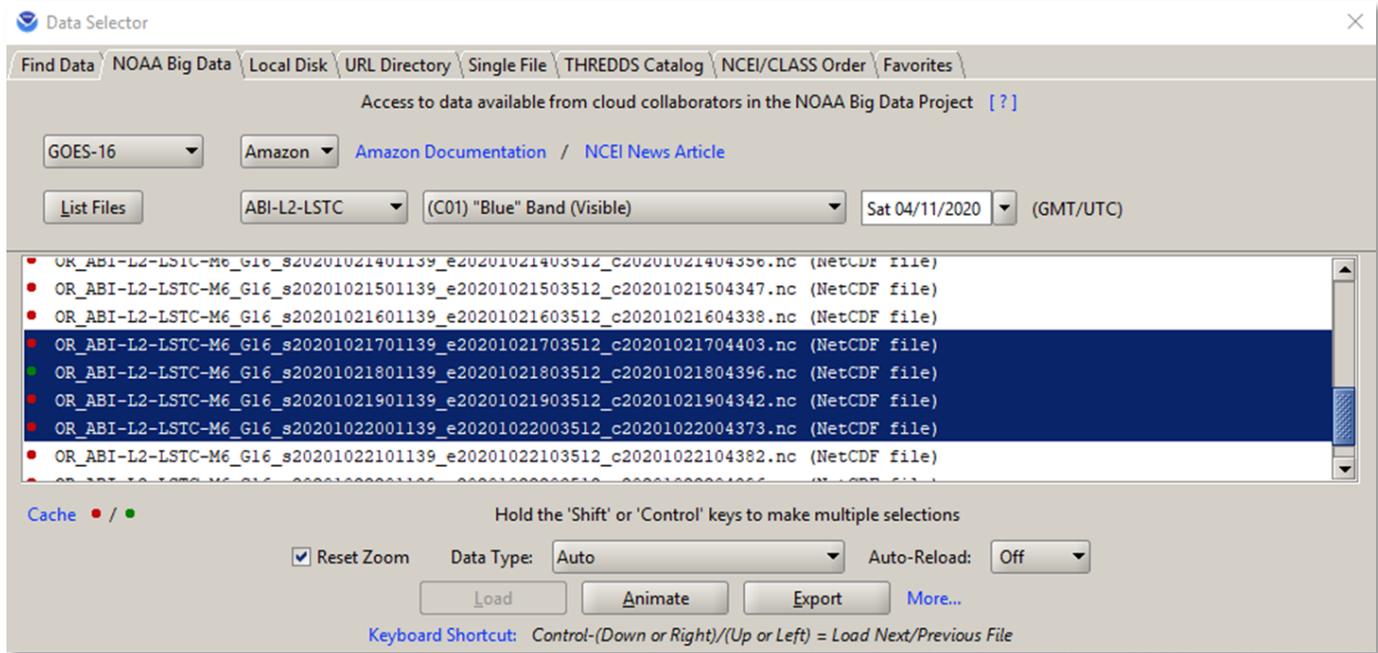


Cómo Obtener el Producto GOES LST

El NOAA “Weather and Climate Toolkit”

Los Datos son:

- Recuperados
- Visualizados
- Procesados de Manera Personalizada

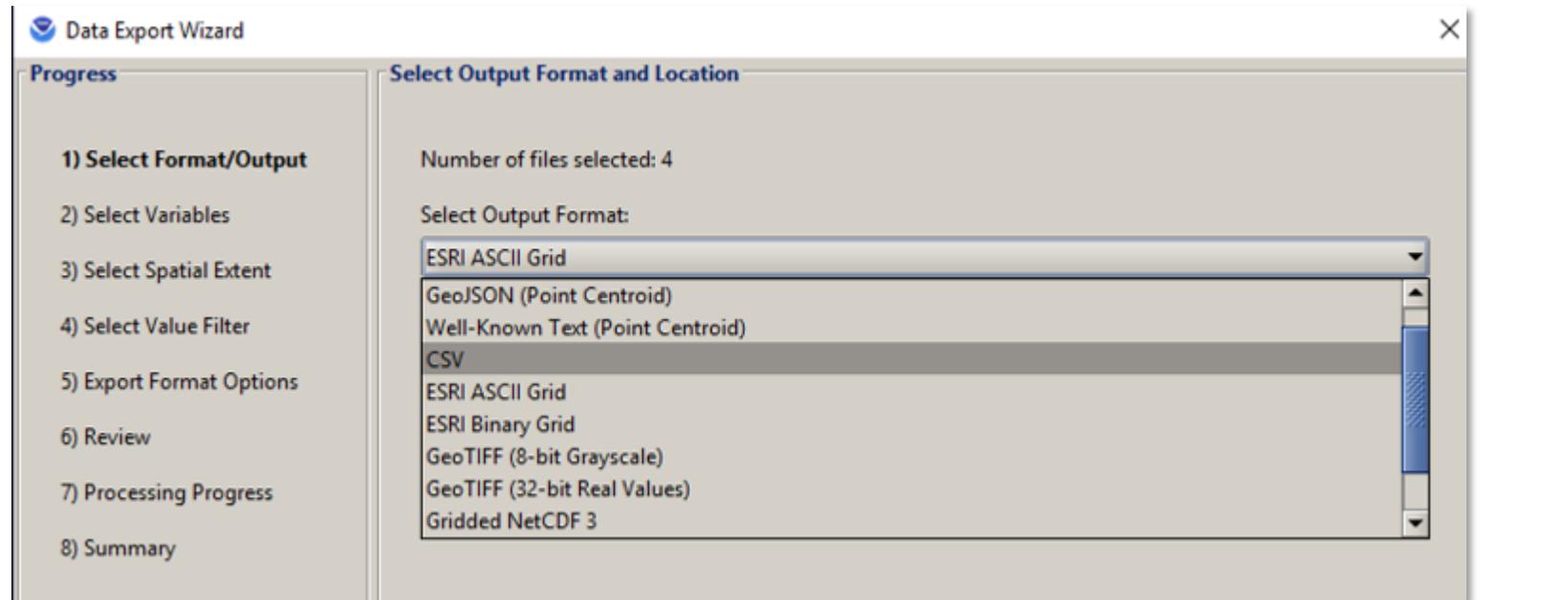


Cómo Obtener el Producto GOES LST

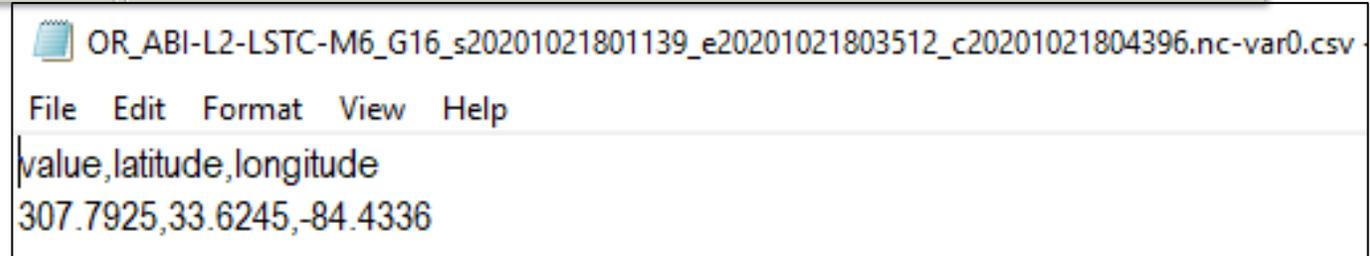
El NOAA “Weather and Climate Toolkit”

Los Datos son:

- Recuperados
- Visualizados
- Procesados de Manera Personalizada
- Exportados en Varios Formatos



**Formato
CSV
(ubicación
singular)**

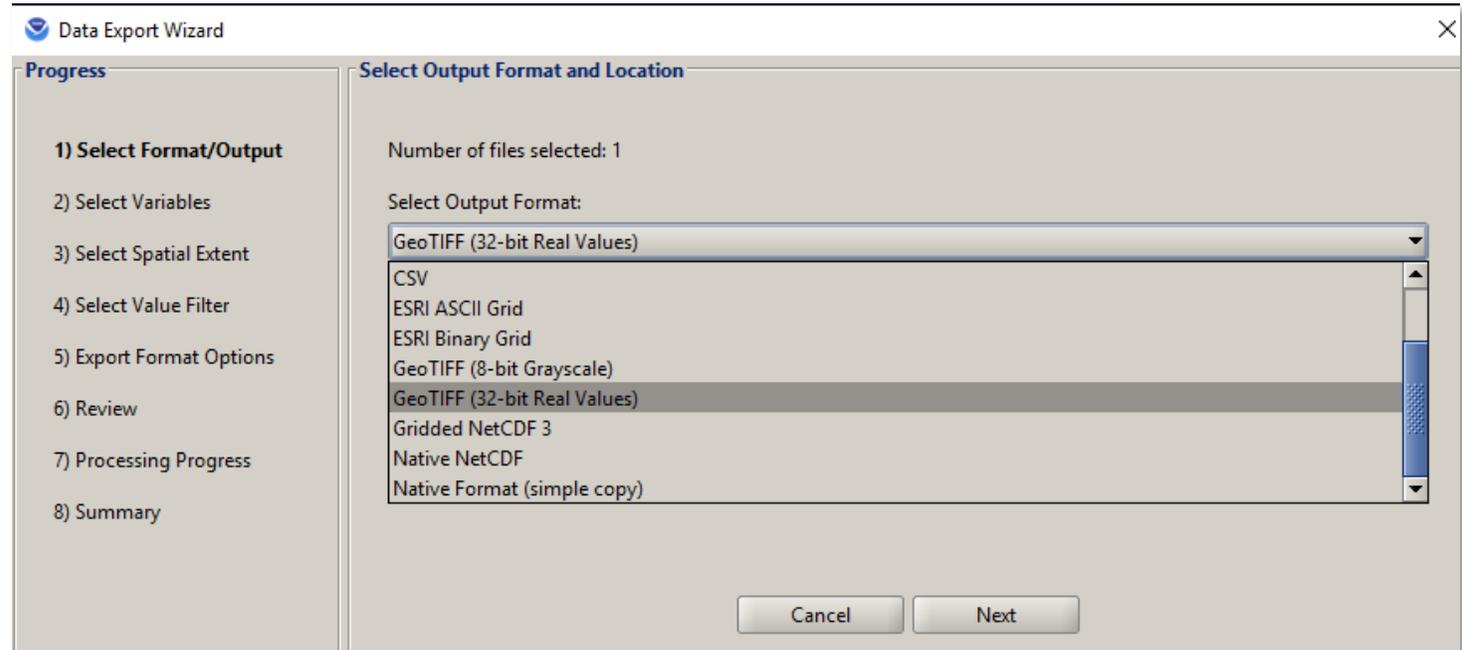


Cómo Obtener el Producto GOES LST

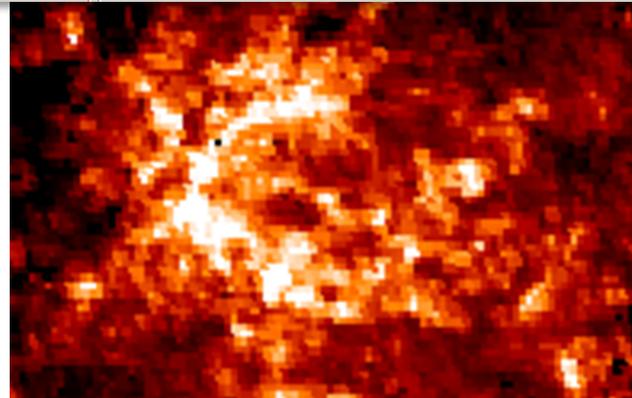
El NOAA “Weather and Climate Toolkit”

Los Datos son:

- Recuperados
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**Formato
GeoTIFF**





¡Gracias!

