

INTELIGENCIA ARTIFICIAL (DEEP LEARNING) PARA LA OBSERVACIÓN DEL TERRITORIO

Servicio de Cartografía y
Sistemas de Información
Geográfica



GOBIERNO
de
CANTABRIA

Abril 2023

II Seminario de nuevas tecnologías aplicadas al conocimiento de los ecosistemas
CENEAM (Valsaín, Segovia. 19-21 de abril de 2023)

Project Map Insert Analysis View Edit Imagery Share

Cut Copy Paste Copy Path Clipboard

Explore Navigate Bookmarks Go To XY

Add Graphics Layer Layer

Select Select By Attributes Select By Location Clear Zoom To Selection

Measure Locate Infographics Coordinate Conversion Inquiry

Pause Lock View Unplaced More Labeling

Convert Download Map Offline

Contents Vegetación 2020



Catalog Symbolology Modify Features Attributes Geoprocessing History Create Features Export Chart Properties Label Class



Project Map Insert Analysis View Edit Imagery Share Feature Layer Labeling Data

Clipboard: Cut, Copy, Copy Path, Paste

Navigate: Explore, Bookmarks, Go To XY

Layer: Basemap, Add Data

Selection: Select, Select By Attributes, Select By Location, Clear, Zoom To

Inquiry: Measure, Locate, Infographics, Coordinate Conversion

Labeling: View Unplaced, Convert, More

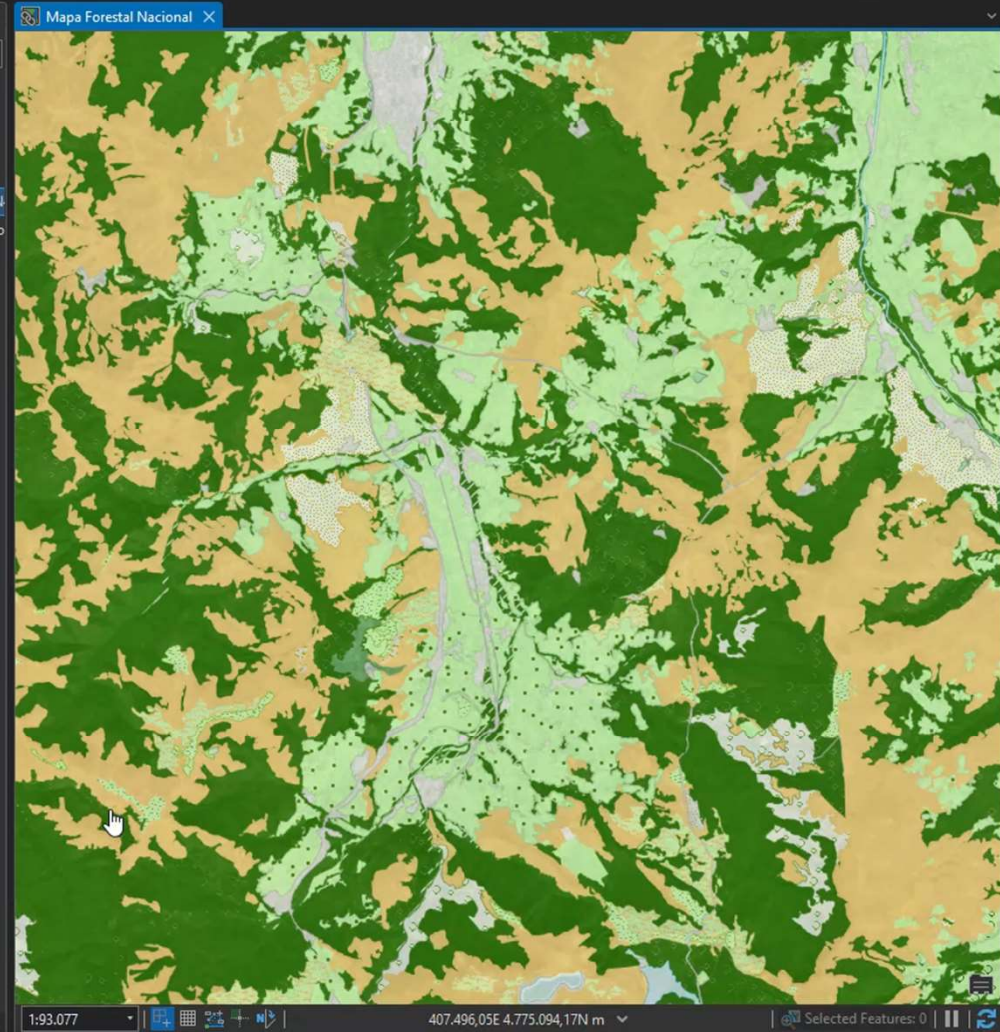
Offline: Download Map, Sync, Remove

Contents

Search

Drawing Order

- Mapa Forestal Nacional
 - Mapa Forestal Nacional IFN
 - Arbolado_2020_Combinado
 - Ortofoto_2020



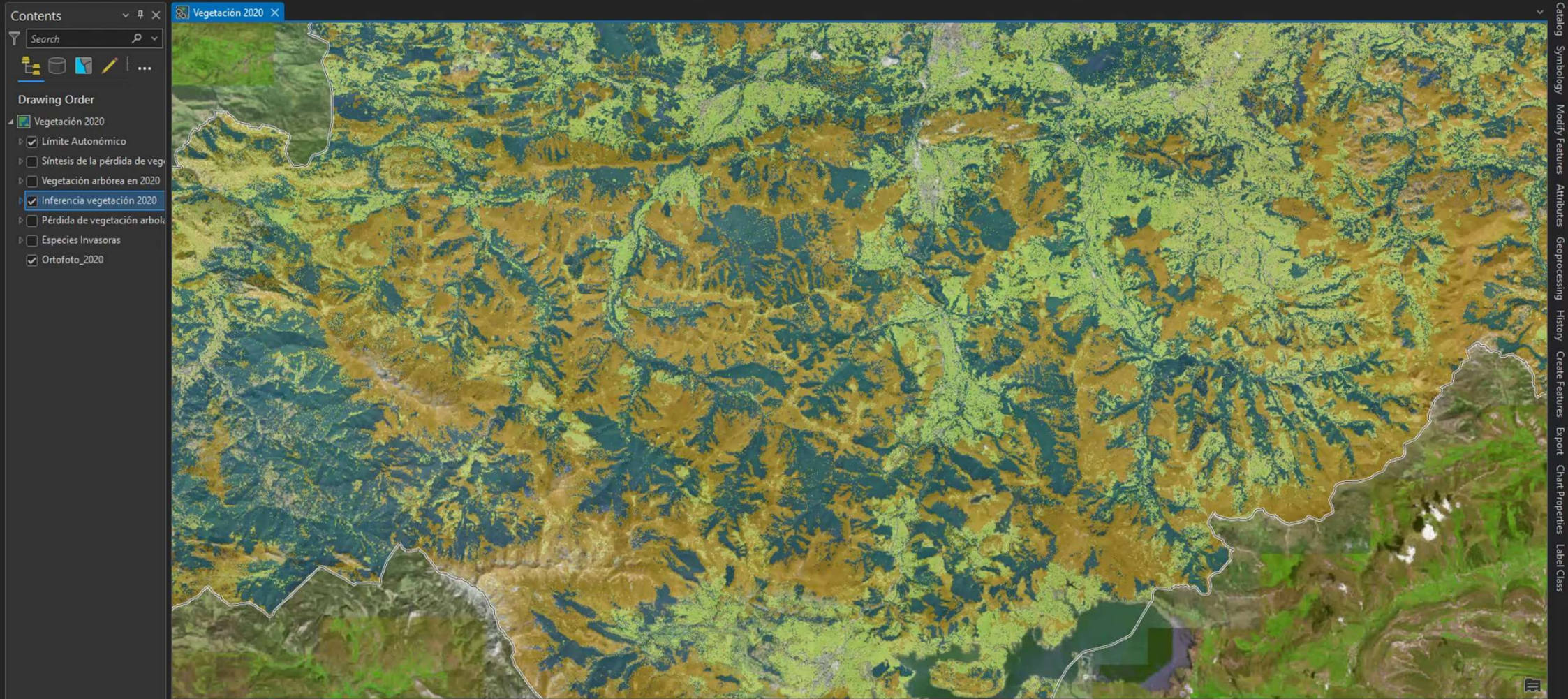
1:93.077 407.496,05E 4.775.094,17N m Selected Features: 0



1:93.077 394.961,12E 4.779.822,48N m Selected Features: 0

Project Map Insert Analysis View Edit Imagery Share **Raster Layer** Data

In Beyond <None> Transparency 65,0 % Swipe
Out Beyond <None> Layer Blend Normal Flicker 500,0 ms Symbology Stretch Type
Clear Limits Feature Blend Normal Lock stats Resampling Type Band Combination Masking
Visibility Range Effects Compare Rendering Enhancement Rotation



Project Map Insert Analysis View Edit Imagery Share

Cut Copy Paste Copy Path Clipboard

Explore Bookmarks Go To XY

Basemap Add Data Layer

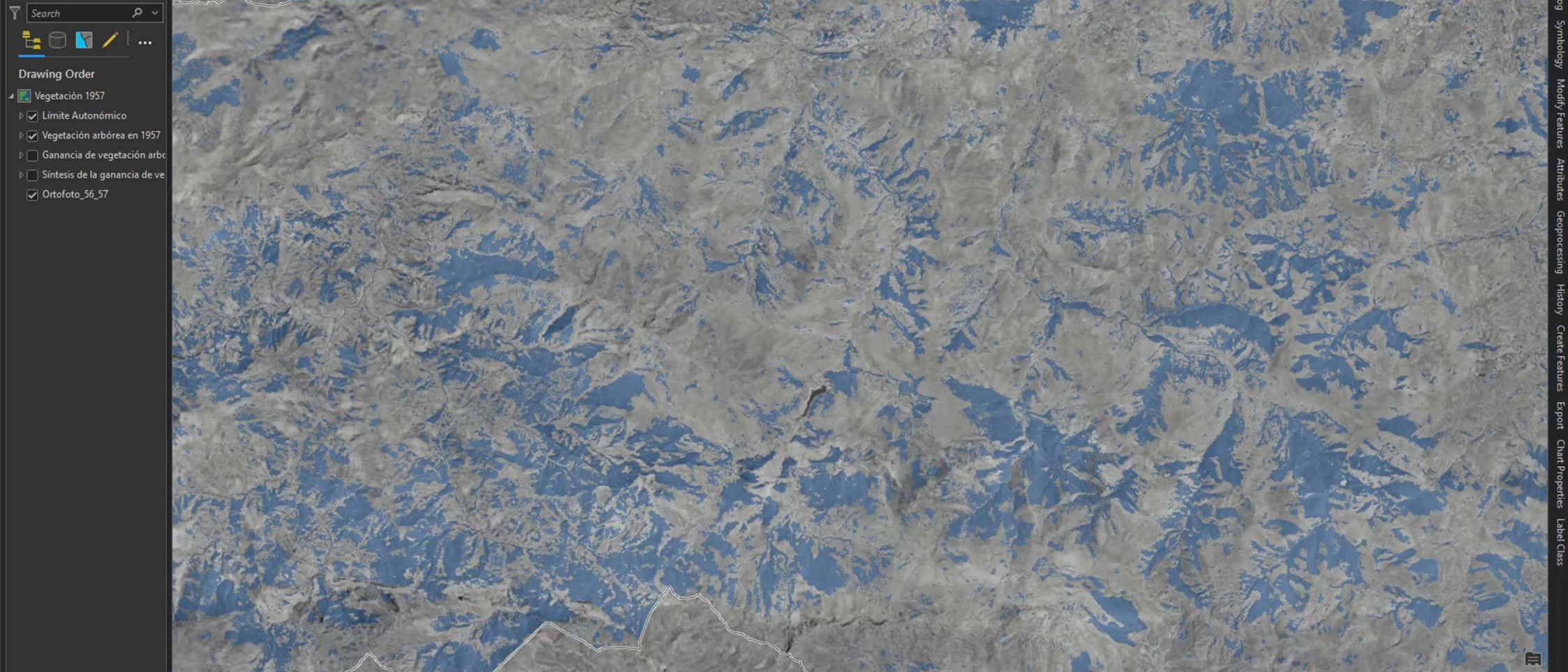
Select Select By Attributes Select By Location Clear Selection

Measure Locate Infographics Coordinate Conversion Inquiry

Pause Lock View Unplaced More Labeling

Convert Download Map Remove Offline

Contents Vegetación 2020 Vegetación 1957



Project Map Insert Analysis View Edit Imagery Share

Clipboard: Cut, Copy, Copy Path

Navigate: Explore, Bookmarks, Go To XY

Layer: Add Graphics Layer, Add Data

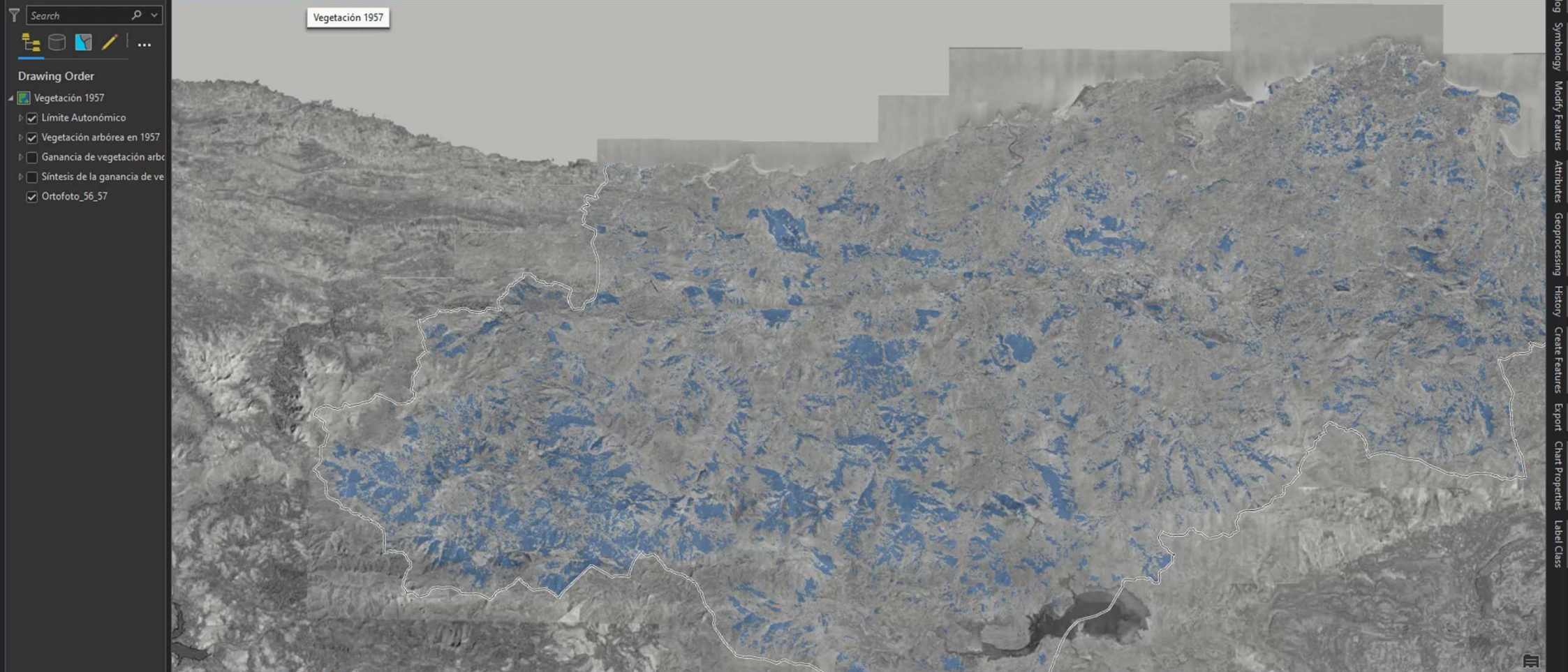
Selection: Select, Select By Attributes, Select By Location, Clear, Zoom To

Inquiry: Measure, Locate, Infographics, Coordinate Conversion

Labeling: Pause, Lock, View Unplaced, More, Convert

Offline: Download Map, Sync, Remove

Contents Vegetación 2020 Vegetación 1957



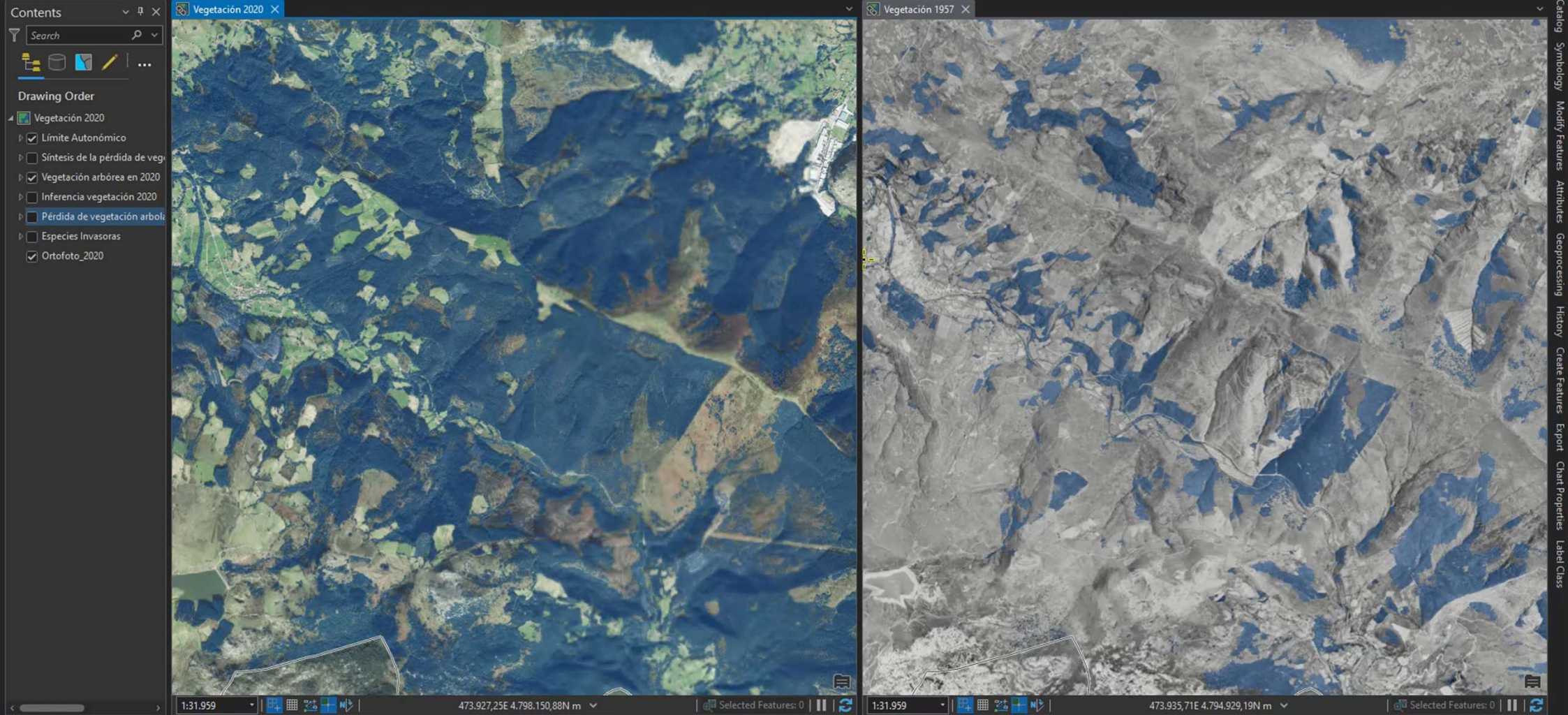
Catalog Symbology Modify Features Attributes Geoprocessing History Create Features Export Chart Properties Label Class

Vegetacion_1957_2020_Comparativa Command Search (Alt+Q) Not signed in

Project Map Insert Analysis View Edit Imagery Share

Clipboard Navigate Layer Selection Inquiry Labeling Offline

Explore Bookmarks Go To XY Basemap Add Data Add Graphics Layer Select Select By Attributes Select By Location Clear Measure Locate Infographics Coordinate Conversion Pause Lock View Unplaced Convert Download Map Sync Remove More



An aerial photograph of a city, likely Cantabria, is shown with a semi-transparent green grid overlay. A semi-transparent green rounded rectangle is positioned in the center of the image, containing white text. The text is centered and reads: "IF YOU WANT TO KNOW MORE ABOUT THIS STORY...". Below this, in a larger rounded rectangle, is the text: "Search for 'tree cover Cantabria' at arcgis.com or go to: https://storymaps.arcgis.com/stories/1db87a67f3614cc4b58f7e00f44af03e".

IF YOU WANT TO KNOW MORE ABOUT THIS STORY...

Search for "*tree cover Cantabria*" at arcgis.com or go to:
<https://storymaps.arcgis.com/stories/1db87a67f3614cc4b58f7e00f44af03e>

Assessing the evolution of tree cover in Cantabria,1957-2020

A quantitative approach based on Artificial Intelligence

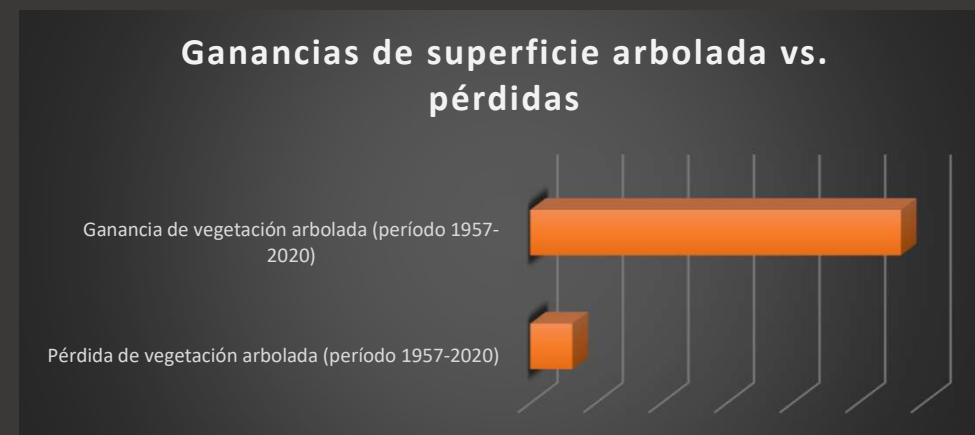
Dept. of Mapping and GIS, Government of Cantabria, Spain

February 17, 2023

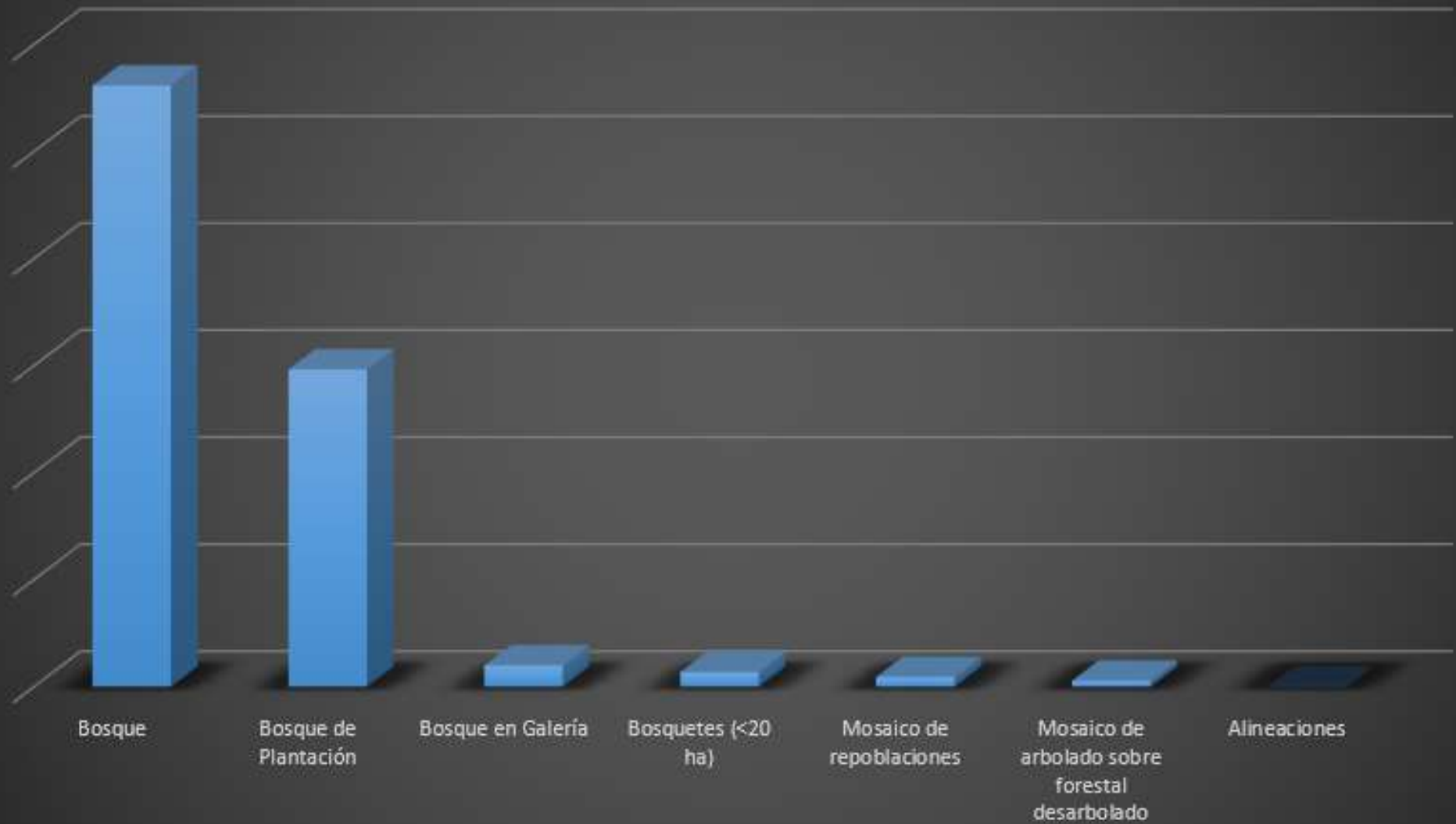
Año	m ²	ha	Múltiplo
Total de vegetación arbolada en 1957	842.027.653	84.203	
Total de vegetación arbolada en 2020**	1844291074	184.429	x 2,19030
	1.002.263.421		



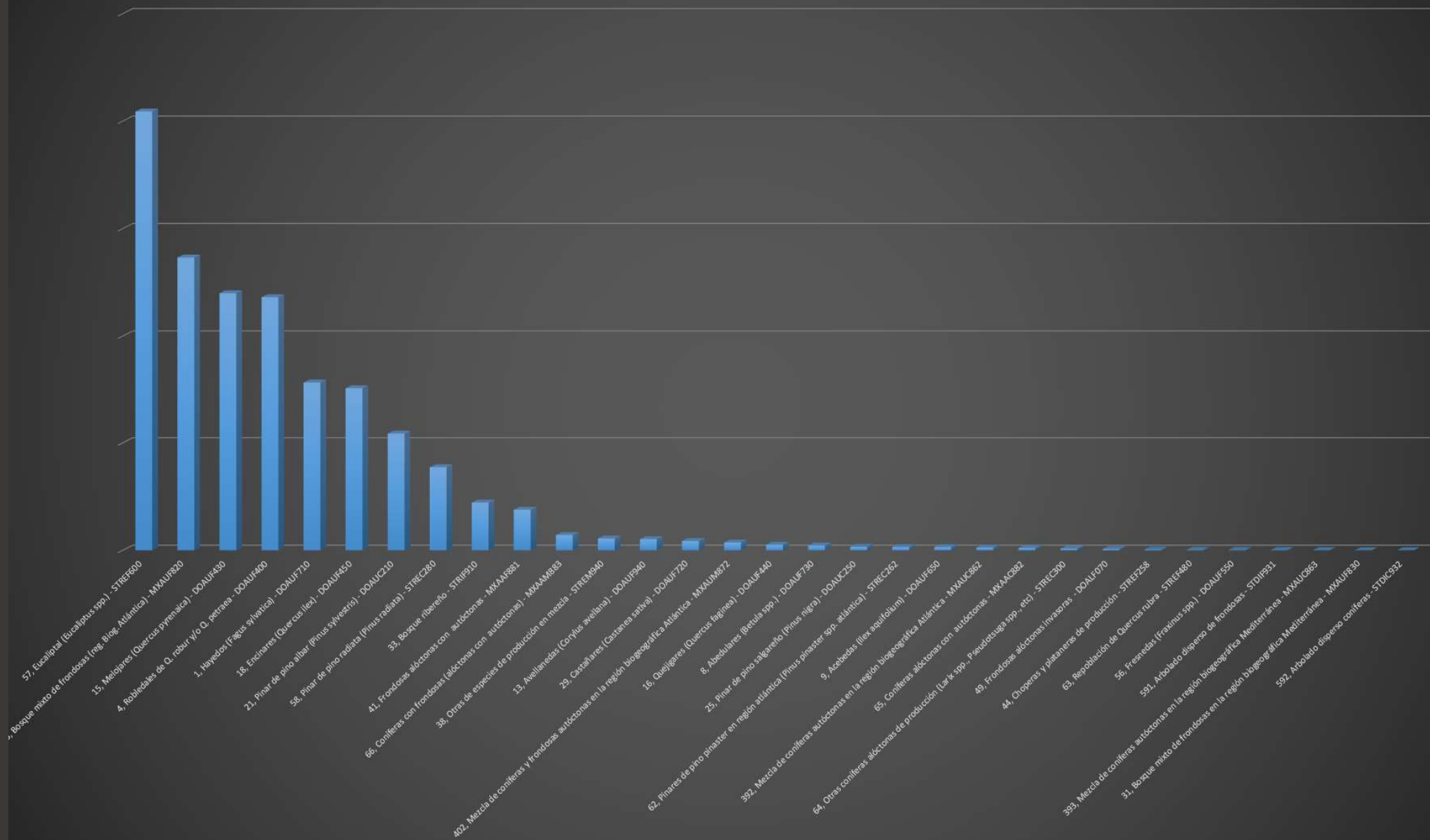
Año	m ²	ha	Múltiplo
Pérdida de vegetación arbolada (período 1957-2020)	129.070.309	12.907	
Ganancia de vegetación arbolada (período 1957-2020)	1.131.333.397	113.133	x 8,77



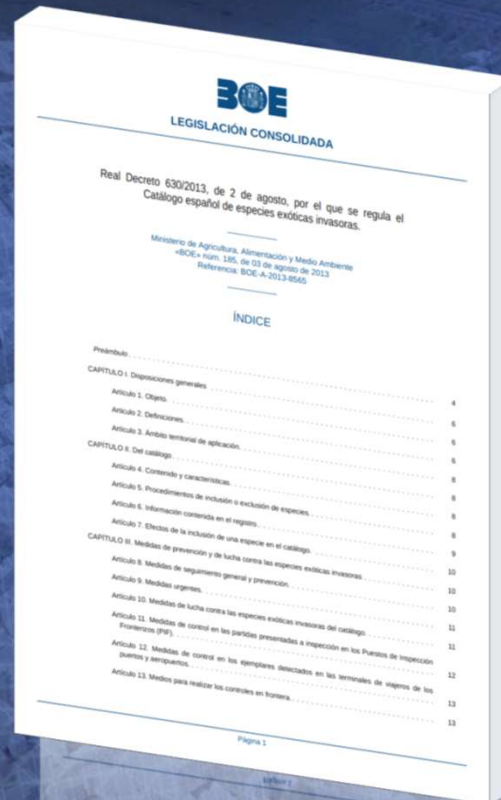
Incrementos por Tipo Estructural



Incrementos por formaciones arbóreas



ESPECIES INVASORAS: PLUMERO (*Cortaderia ssp.*)



Cortaderia ssp. está incluida en el Real Decreto 630/2013, de 2 de agosto, por el que se regula el Catálogo español de especies exóticas invasoras.

También está considerada como una de las 100 especies más dañinas según el DAISIE (*Inventory of Alien Invasive Species in Europe*).

El departamento de Agricultura de los Estados Unidos lo considera como una "invasora de alto riesgo" (*Weed Risk Assessment for Cortaderia selloana*, 2014).

Las primeras evidencias en Cantabria datan de 1953 (Guinea E., 1953: "*Geografía Botánica de Santander*", *Publicaciones de la Excma. Diputación Provincial de Santander*) probablemente asociada con el comercio con sudamérica asociado al Puerto de Santander.

Desde entonces no ha parado de expandirse, así que decidimos intentar hacer algo para ayudar a seguir y a combatir el problema.

Project Map Insert Analysis View Edit Imagery Share Feature Layer Labeling Data

In Beyond <None> Transparency 0,0 % Swipe
Out Beyond <None> Layer Blend Normal Flicker 500,0 ms
Clear Limits Feature Blend Normal

Visibility Range Effects Compare Drawing Extrusion Faces

Symbology Masking Display Filters Aggregation Type Unit
Import

Field No fields
Face Culling Lighting

Contents Vegetación 2020



IF YOU WANT TO KNOW MORE ABOUT THIS STORY...

Search for “**Tracking *Cortaderia selloana* in Cantabria**” at arcgis.com or go to:
<https://cantabria.maps.arcgis.com/apps/webappviewer/index.html?id=a7305e3e80394d769ff789bc6c4909c4>

Project Map Insert Analysis View Edit Imagery Share

Feature Layer Labeling Data

In Beyond <None> Transparency 0,0 % Swipe
Out Beyond <None> Layer Blend Normal Flicker 500,0 ms Symbology Masking
Clear Limits Feature Blend Normal Import Display Filters Aggregation
Visibility Range Effects Compare Drawing Extrusion Faces

Field No fields
Type Unit
Face Culling Lighting

Contents

Search

Drawing Order

- Construcciones 1957
- Límite Autonómico
- Construcciones 1957
- Áreas Urbanizadas entre 1957 y 1977-1986, en m2
- Ortofoto_56_57



Catalog Symbology Modify Features Attributes Geoprocessing History Create Features Export Chart Properties Label Class

1:1.565 413.157,83E 4.803.657,28N m Selected Features: 0 1:1.5 1:1.5

Project Map Insert Analysis View Edit Imagery Share

Feature Layer Labeling Data

In Beyond <None> Transparency 0,0 % Swipe
Out Beyond <None> Layer Blend Normal Flicker 500,0 ms
Clear Limits Feature Blend Normal

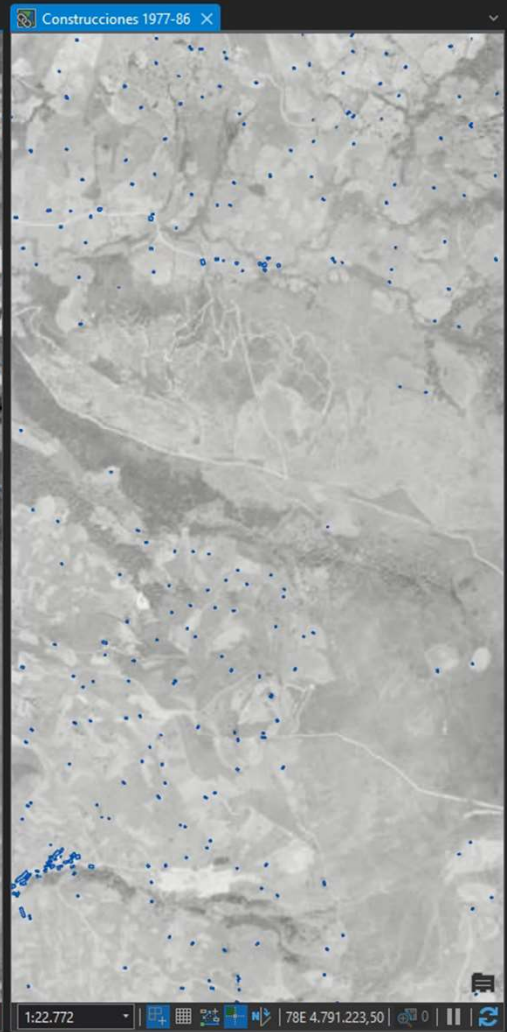
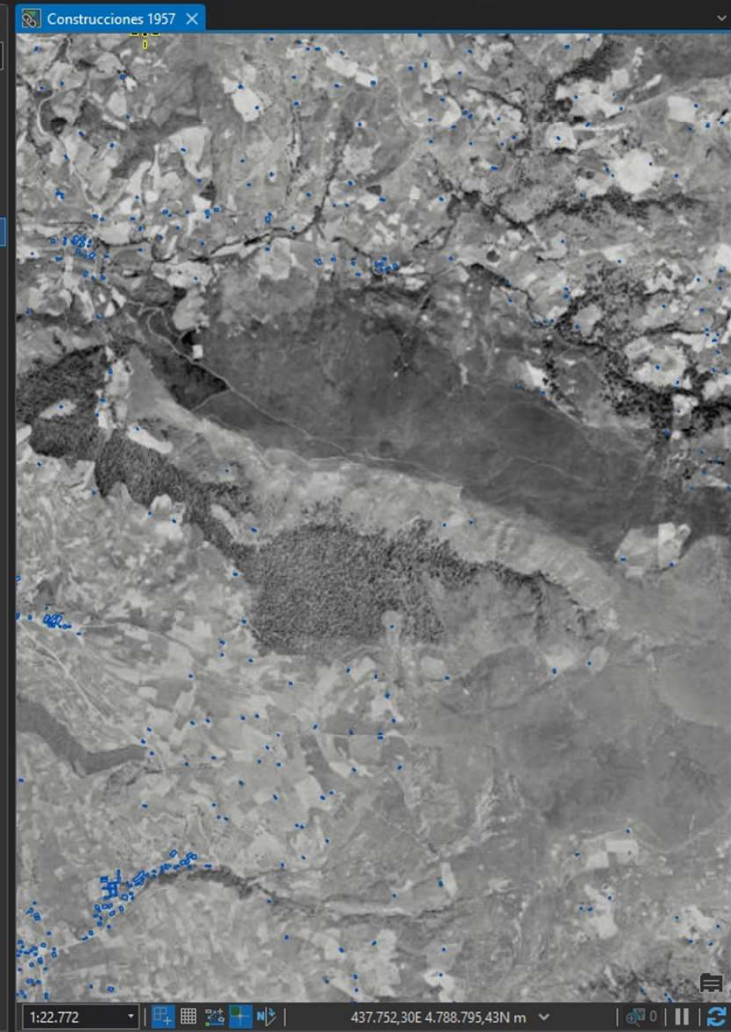
Visibility Range Effects Compare Symbology Masking Display Filters Aggregation
Type Unit No fields Face Culling Lighting

Contents

Search

Drawing Order

- Construcciones 1957
- Límite Autonómico
- Construcciones 1957
- Áreas Urbanizadas entre 1957 y 1977-1986, en m2
- Ortofoto_56_57



Urbanización_1957_2020_Comparativa Command Search (Alt+Q) Not signed in

Project **Map** Insert Analysis View Edit Imagery Share

Cut Copy Paste Copy Path **Explore** Bookmarks Go To XY

Clipboard Navigate Layer Add Graphics Layer

Select Select By Attributes Select By Location Clear Zoom To

Measure Locate Infographics Coordinate Conversion

Pause Lock View Unplaced Convert Download Map Sync Remove

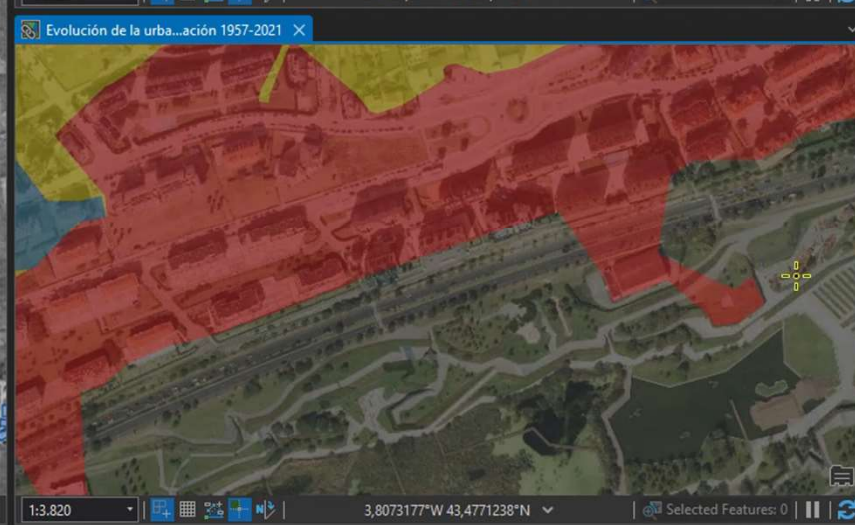
More Labeling Offline

Contents

Search

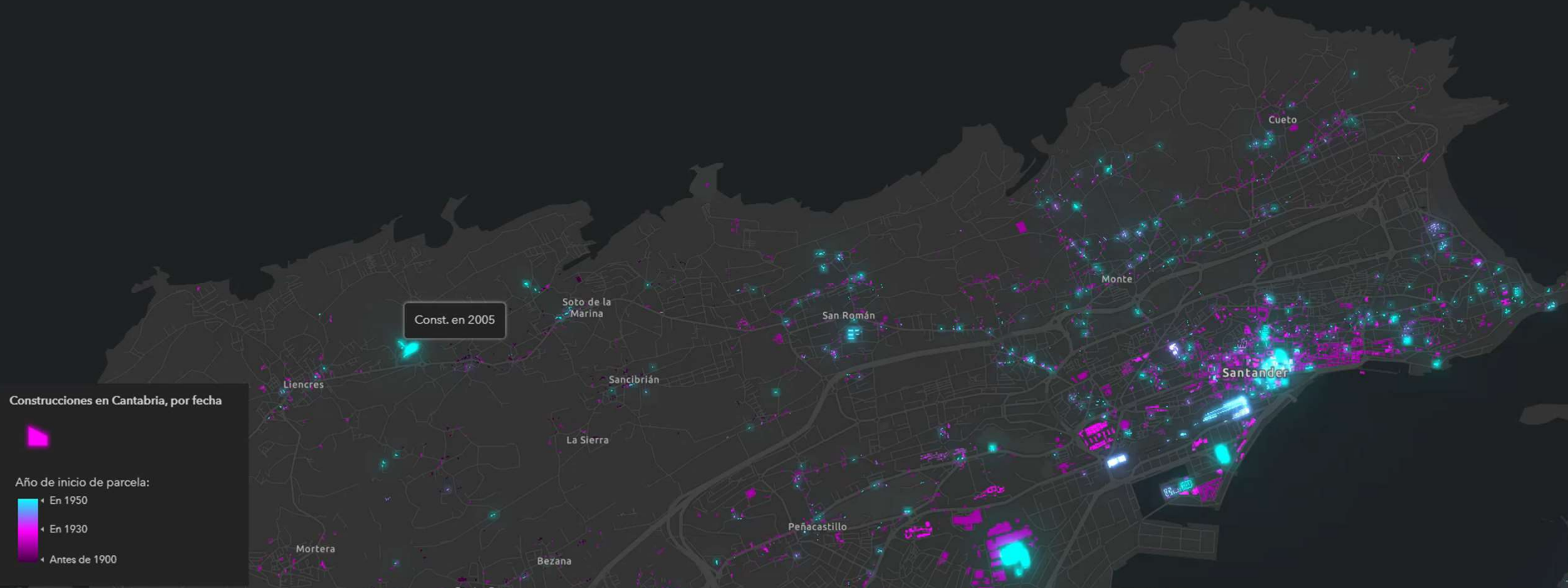
Drawing Order

- Evolución de la urbanización 1957-2021
 - Limite Autonómico
 - Evolución de la urbanización
 - Zonas urbanizadas hasta 1957
 - Zonas urbanizadas hasta el período 1977-1986
 - Zonas urbanizadas en la actualidad
 - Ortofoto 2020 en fondo nocturno
 - Fondo noche
 - Foto 2020



Catalog Symbology Modify Features Attributes Geoprocessing History Create Features Export Chart Properties Label Class

El proceso urbanizador en Cantabria, datos de Catastro



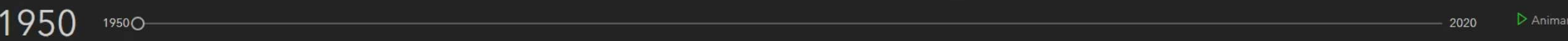
Construcciones en Cantabria, por fecha

Año de inicio de parcela:

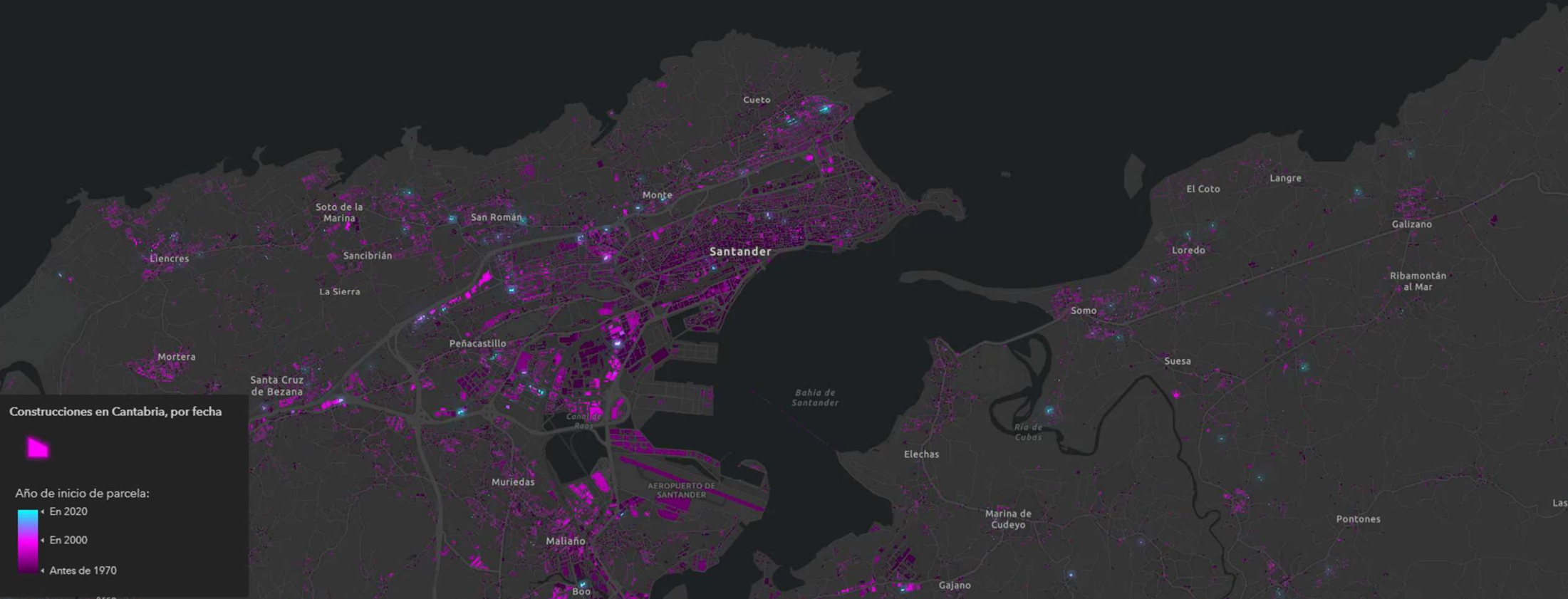
- En 1950
- En 1930
- Antes de 1900

Instituto Geográfico Nacional, Esri, HERE, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS

Powered by Esri



El proceso urbanizador en Cantabria, datos de Catastro



Construcciones en Cantabria, por fecha

Año de inicio de parcela:

- En 2020
- En 2000
- Antes de 1970

Instituto Geográfico Nacional, Esri, HERE, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS

Powered by Esri

2020 1950 02020 Animar

El proceso urbanizador en Cantabria, datos de Catastro



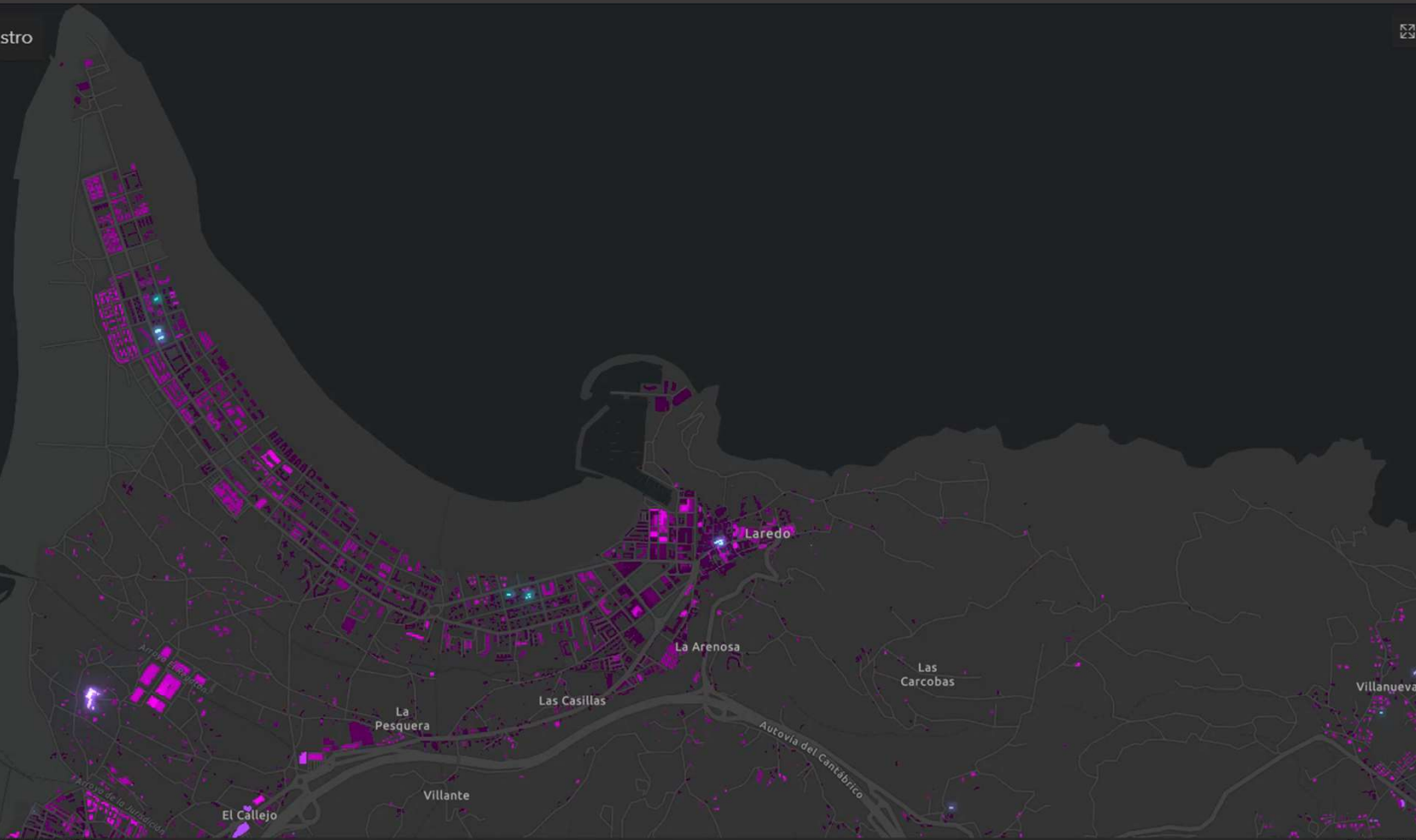
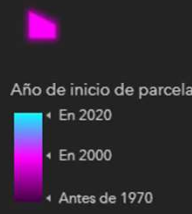
Ría de Treto

Canal de San Jorge

Sollagua

La Vía

Construcciones en Cantabria, por fecha



Instituto Geográfico Nacional, Esri, HERE, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS

Powered by Esri

2020 1950

2020

Animar

An aerial photograph of a city grid, overlaid with a semi-transparent green grid pattern. The city buildings are rendered in a dark blue/purple hue. A prominent road or canal winds through the grid. In the bottom left corner, there is a small, partially visible logo consisting of several overlapping colored circles (blue, green, yellow, red).

IF YOU WANT TO KNOW MORE ABOUT THIS STORY...

Go to <https://mapas.cantabria.es/visores/urbanizacion.html>

Project Map Insert Analysis View Edit Imagery Share Feature Layer Labeling Data Linear Referencing

Clipboard Navigate Layer Selection Inquiry Labeling Offline

Clipboard: Cut, Copy, Copy Path, Paste, Copy Path

Navigate: Explore, Bookmarks, Go To XY

Layer: Add Graphics Layer, Add Data

Selection: Select, Select By Attributes, Select By Location, Clear, Zoom To

Inquiry: Measure, Locate, Infographics, Coordinate Conversion

Labeling: Pause, Lock, View Unplaced, More, Convert

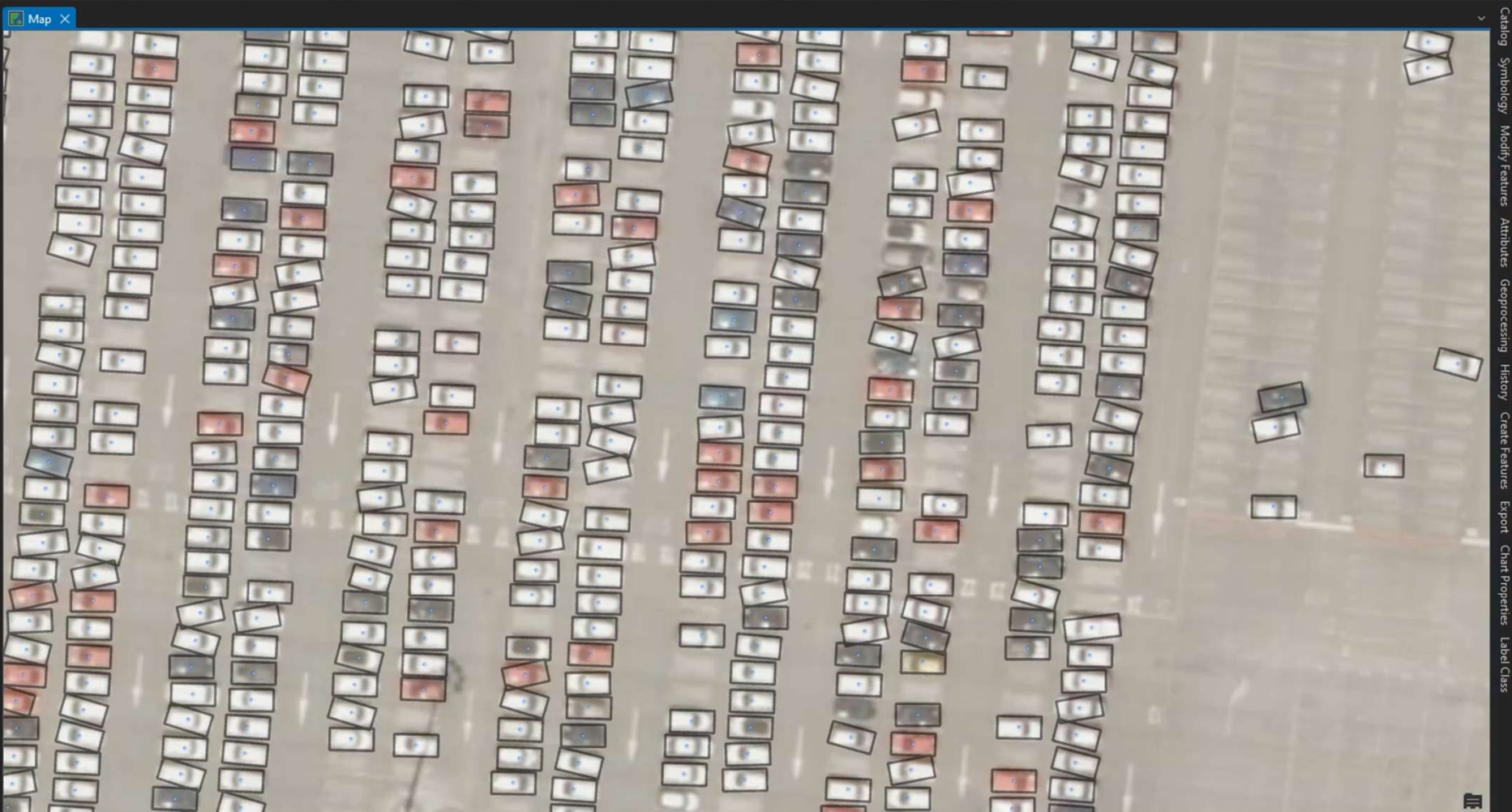
Offline: Sync, Remove, Download Map

Contents

Search

Drawing Order

- Map
- Vehiculos (puntos)
- Limite Autonómico
- Vehiculos (poligonos)
- Ortofoto 2020 en fondo nocturno
 - Fondo noche
 - Ortofoto_2014



Evaluando la afluencia a las playas de Cantabria

Una aproximación basada en inteligencia artificial

Servicio de Cartografía y SIG, Gobierno de Cantabria

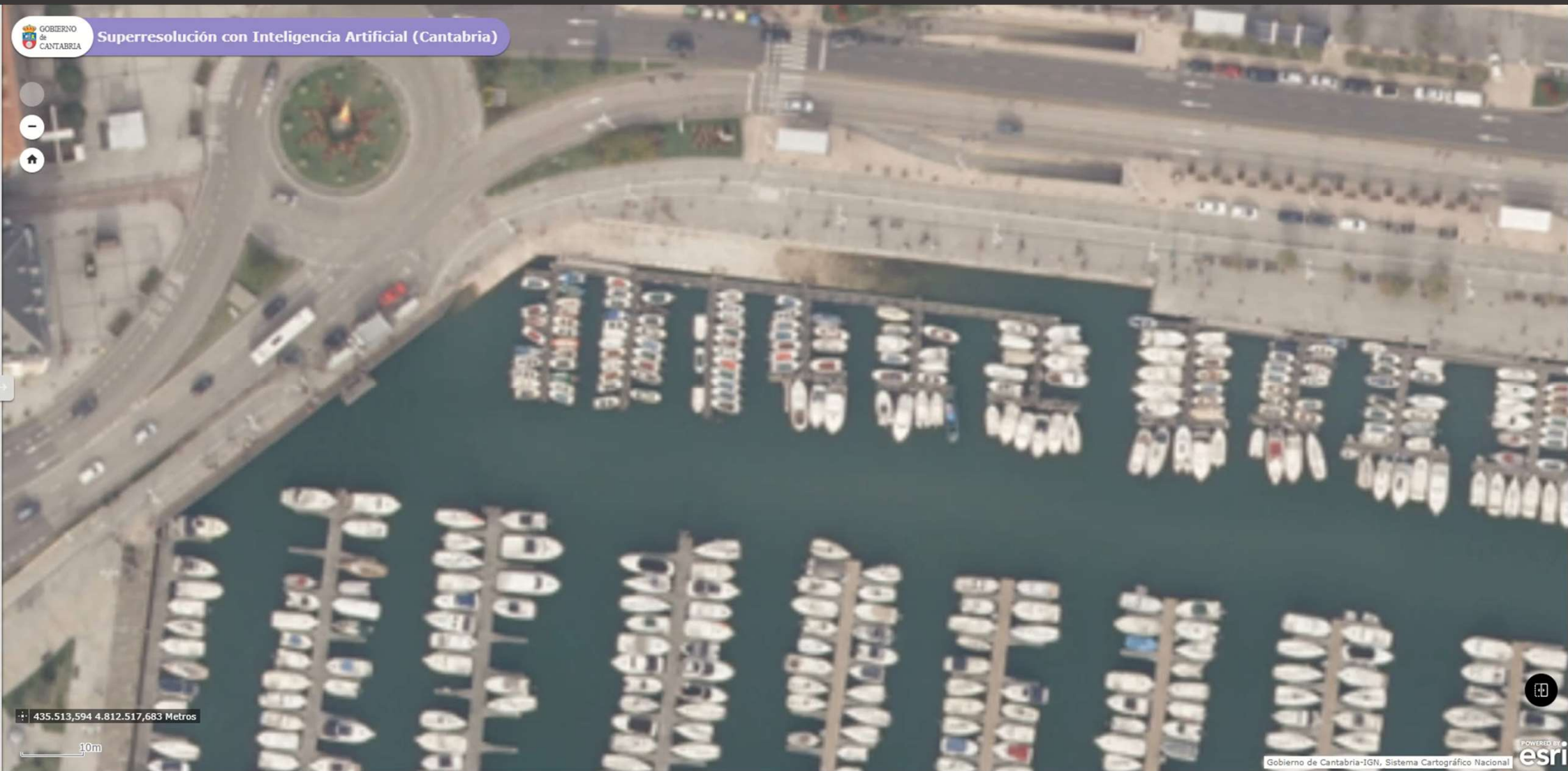
29 de agosto de 2022



An aerial 3D perspective view of a city grid, rendered in shades of blue and purple. A semi-transparent green rectangular box with rounded corners is centered on the image, containing white text. The text is arranged in two lines: the first line is a call to action, and the second line provides a search instruction and a URL.

IF YOU WANT TO KNOW MORE ABOUT THIS STORY...

Search for “**Evaluando la afluencia a las playas de Cantabria**” at arcgis.com or go to: <https://storymaps.arcgis.com/stories/862bf11ce2034208b47ef43f32a7e84a>



435.513,594 4.812.517,683 Metros

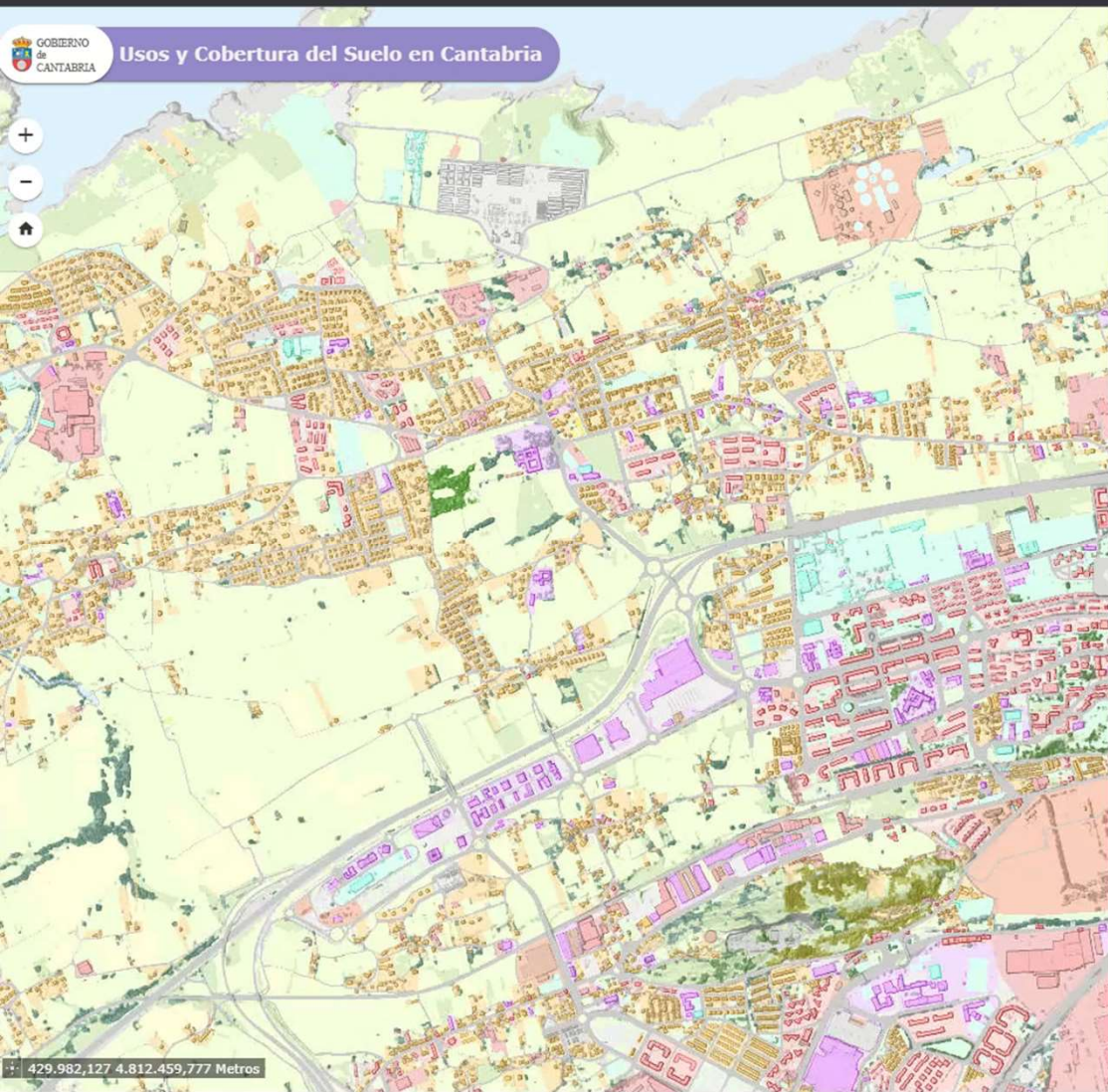


IF YOU WANT TO KNOW MORE ABOUT THIS STORY...

Search for “**Superresolución con Inteligencia Artificial (Cantabria)**” at arcgis.com

or go to:

<https://cantabria.maps.arcgis.com/apps/webappviewer/index.html?id=f14ab31439644f118c3ca7ef8c2258c9>

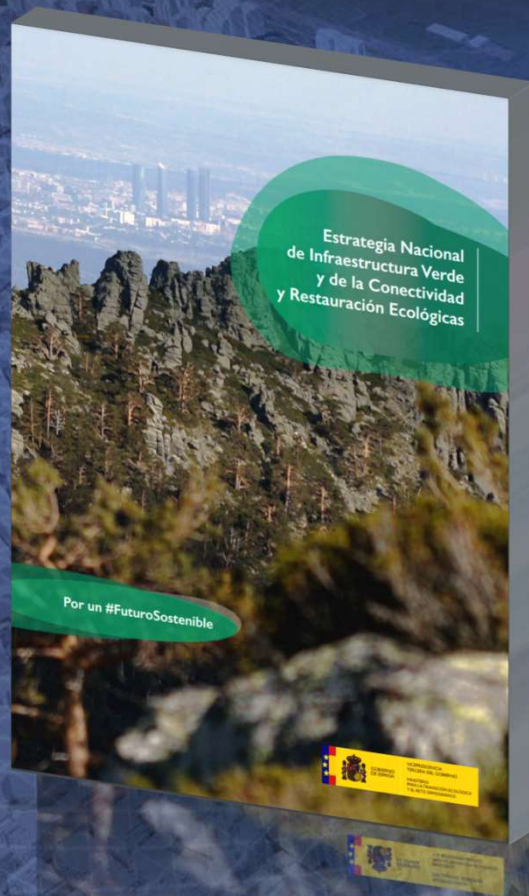


ESTRATEGIA NACIONAL DE INFRAESTRUCTURA VERDE Y DE LA CONECTIVIDAD Y RESTAURACIÓN ECOLÓGICAS

Red ecológicamente coherente y estratégicamente planificada de zonas naturales y seminaturales y de otros elementos ambientales, diseñada y gestionada para la conservación de los ecosistemas y el mantenimiento de los servicios que nos proveen.



Art. 15 de la Ley 42/2007 del Patrimonio Natural y la Biodiversidad, en su modificación por la Ley 33/2015, 'Del Marco estratégico de la Infraestructura Verde y de la conectividad y restauración ecológicas'



GRACIAS POR VUESTRA ATENCIÓN

Servicio de Cartografía y
Sistemas de Información
Geográfica



GOBIERNO
de
CANTABRIA

Abril 2023

Gabriel J. Ortiz Rico

 <https://www.linkedin.com/in/gabriel-ortiz-gis-cantabria>