Lining Up Your Data in ArcGIS

Bojan Šavrič & Melita Kennedy

2021 ESRI
DEVELOPER SUMMIT

Melita Kennedy
Principal Product Engineer
Projection Engine Team

Bojan Šavrič
Software Development Engineer
Projection Engine Team

My data is everywhere else except…

Palm Springs Downtown Map Demo

My data has unknown coordinate system

Palm Springs Downtown Map Demo

Filter and search for the predefined coordinate systems

Palm Springs Downtown Map Demo

What if my data is defined with incorrect coordinate system…

Palm Springs Downtown Map Demo

Missing transformation and how to select the right one

Palm Springs Downtown Map Demo

Selecting the right projected coordinate system for my map

Palm Springs Downtown Map Demo

Creating a custom projected coordinate system for my map

Palm Springs Downtown Map Demo

I don’t know which projection and what parameter values I should use

Palm Springs Downtown Map Demo

How to use Project tool?

Palm Springs Downtown Map Demo

My data also has heights…

NY Financial District Scene Demo

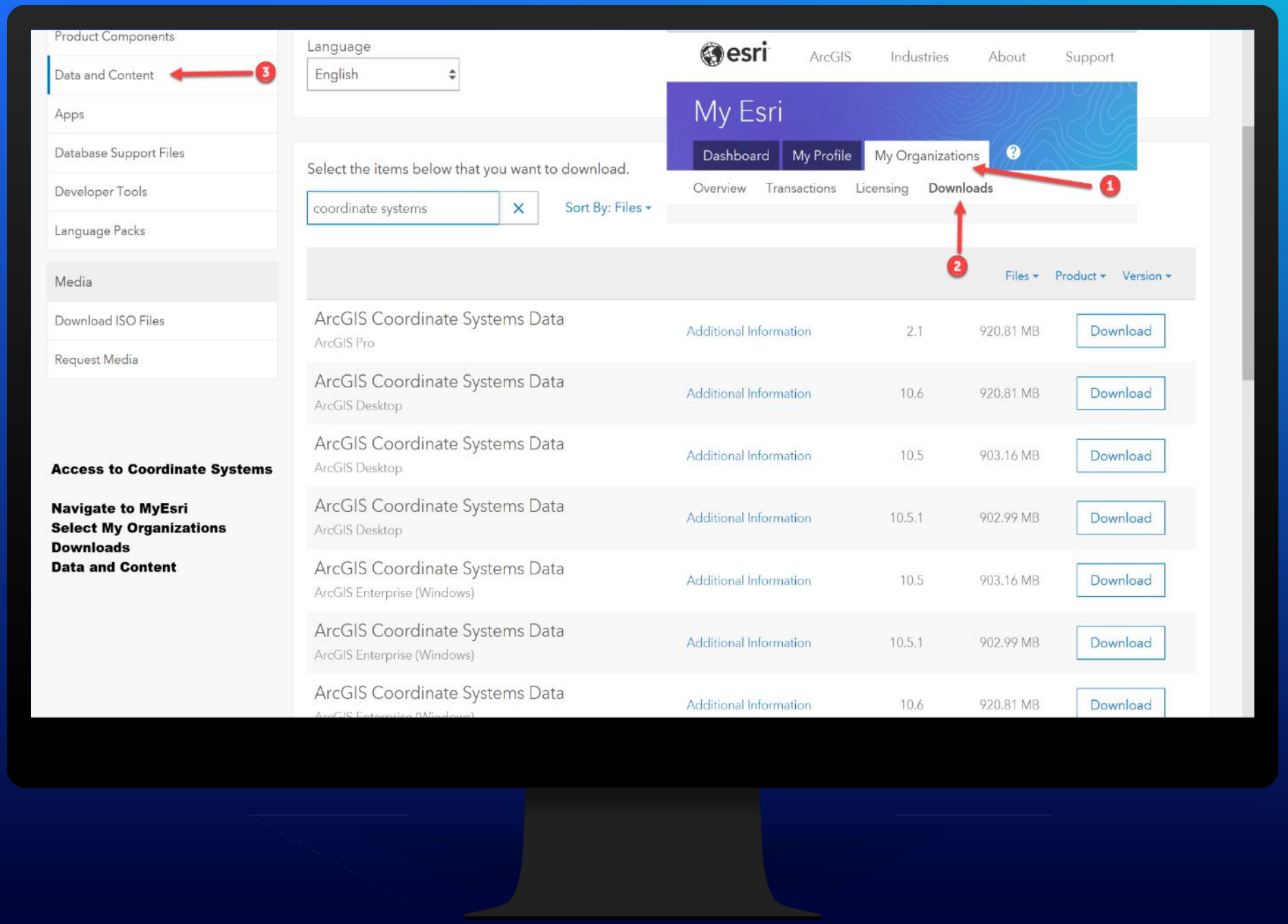
Selecting a vertical coordinate system for the scene

NY Financial District Scene Demo

Transforming vertical data

NY Financial District Scene Demo

ArcGIS Coordinate Systems Data



Access to Coordinate Systems

Navigate to MyEsri
Select My Organizations
Downloads
Data and Content

ArcGIS Coordinate Systems Data

- 2 GB additional data install

- GEOCON / NADCON 5 (US)
- NTv2 (AU, BE, CA, IS, NL, ES, CH, UK)
- NADCON (SK)

Geographic Transformations

- VERTCON (US)
- Geoids (AU, JP, NZ, SI, CH, US)
- EGM2018 (world)

Vertical Transformations

Resources

- ArcGIS Pro and ArcGIS Desktop Online Documentation
  https://esriurl.com/ArcGISPro-coordinate-systems-and-projections
  https://esriurl.com/ArcGIS-desktop-coordinate-systems-and-projections

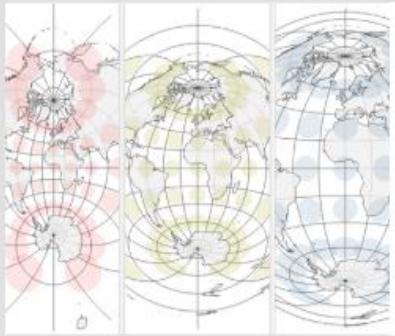
- Don't forget the Knowledge Base / Technical Articles!
  http://esriurl.com/11518

- Map Projections Learning Path
  https://learn.arcgis.com/en/paths/map-projections

- Make a Web Map without Web Mercator Lesson
  https://learn.arcgis.com/en/projects/make-a-web-map-without-web-mercator

Map projections

Explore different ways to project the round earth onto a flat map.



Choose the right projection

Learn some tips for choosing an appropriate projected coordinate system for your map.

1 hr
Lesson

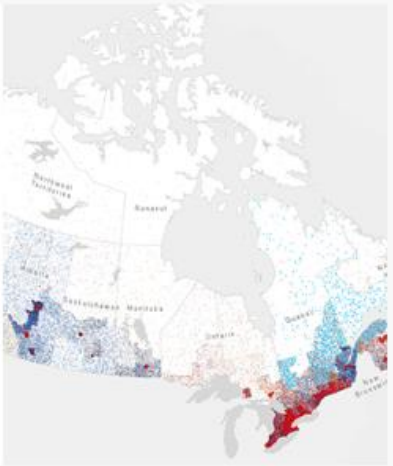
1

Mercator, it's not hip to be square

The purpose and problems of the Mercator projection and some methods for replacing it in web maps.

30 min
Article
English Only

2



Earth peel

Illustrate map projections by peeling a digital orange in ArcGIS Pro.

10 min
Article
English Only

3

https://learn.arcgis.com/en/paths/map-projections

Make a web map without Web Mercator

Make web maps with projections other than Web Mercator. Build and publish vector tiles from ArcGIS Pro to make a basemap in a chosen projected coordinate system.

Duration
50mins

Mapping Education

As a GIS consultant in Bogotá, Colombia, you make web maps for clients, all with different needs. You have two upcoming projects that require you to make web maps with specific projections—not the default of Web Mercator.

In this lesson, you'll learn how to change the projection of a web map by changing the basemap. You'll also learn how to make your own basemap in ArcGIS Pro with a coordinate system of your choice, which you can then use to build projected web maps.

View final result

Requirements

- Publisher or Administrator role in an ArcGIS organization (get a free trial)
- ArcGIS Pro (get a free trial)

Lesson Plan

Make an equal-area web map Choose a projected basemap f	10 minutes
Make a custom basem	25 minutes

https://learn.arcgis.com/en/projects/make-a-web-map-without-web-mercator

README.md

Esri Projection Engine Database Documentation

The Esri Projection Engine (PE) libraries deal with coordinate reference systems and their projections and transformations, as well as providing many support functions such as calculating distances and areas, converting between lat/lon notations, importing/exporting objects from/to well-known text (WKT) strings, converting from/to well-known ID (WKID) values, etc.

To perform WKID conversion, the PE contains a comprehensive database of known coordinate systems, datums, ellipsoids, units, etc. This database is regularly updated and kept in sync with the EPSG database.

This documentation is based on ArcGIS Desktop version 10.8.1 (ArcGIS Pro version 2.6). Entries taken from EPSG are from the 9.8.6 version of the EPSG database.

Contents

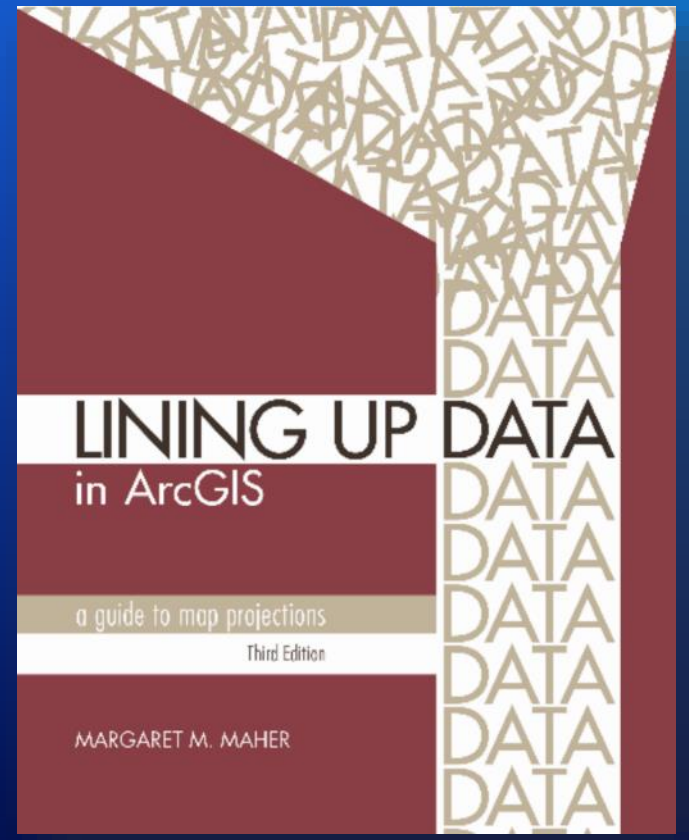
Documentation files are found in the following directories:

Directory	Contents	Filenames

https://github.com/Esri/projection-engine-db-doc

Resources

- Esri Projection Engine Database Documentation
  https://github.com/Esri/projection-engine-db-doc
- EPSG Geodetic Parameter Dataset (epsg.org)
  - *Database of coordinate systems & transformations*
  - *Check Guidance Note 7-2 for formulas*
- GeoNet Community for user-to-user help
  https://community.esri.com
- Lining Up Data in ArcGIS: A Guide to Map Projections by Margaret M. Maher



Please provide your feedback for this session by clicking on the session survey link directly below the video.