TSWG Technology Map - Integrations - Projections and web services

Discussion of SRS codes for web services

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  - Organizations Defining Projection Codes
  - Web-available metadata catalogs for SRS codes
  - Background
  - Questions
  - Non-standard projection specifications
  - Original Email Thread

Definition: Spatial Reference System (SRS) codes are used to communicate the desired coordinate system and projection between a web client and a web mapping service. Part of the purpose of this page is to educate/share with others on this topic and to assess whether there is enough consensus to recommend "Best Practices" to the rest of the community.

Organizations Defining Projection Codes

- The International Oil & Gas Producers (OGP) Geomatics Committee (formerly Surveying & Positioning Committee) of the European Surveying & Positioning Group (EPSG)
- ESRI - makers of ArcGIS
- International Astronomical Union (IAU)
- SR-ORG - user-defined codes
- future: Oracle and ICU

Web-available metadata catalogs for SRS codes

- SpatialReference.org (operated by various Neogeographers)
- EPSG-registry.org (operated by OGP)
- Lookup based on Well-Known Type (WKT) text or *.prj file

Background

Web mapping and mashups have always been driven by the need for application. In the 1990s and early 2000s, ESRI and the OGC (with help from the USGS) put a great deal of effort into creating elaborate standards for "Internet Mapping Services" and "Web Mapping Services". The biggest positive factor to these standards were their status as de juris standards.

When Google launched Google Maps (and perhaps even before), an ecosystem of web mapping arose based on application around as set of de facto standards. Google hadn't even anticipated the uses of its mapping platform. The first "mashups" using Google Maps involved reverse-engineering the API.

One of the standards that came out of Google Maps was the use of the "Web Mercator" or "Web Mercator (auxiliary sphere)" reference system. Of historic note, Google originally used a non-Mercator projection but switched to a more azimuthal projection because they wanted large scale road maps at high latitudes to properly represent intersections (follow this link to see the discussion).

Noel Zinn from Hydrometronics gave a technical critique of the Web Mercator projection at GIS in the Rockies 2010.

Questions

- is the issue that a WCS server can return results in an SRS that some clients can't handle or need to do special/extra things to deal with it? For instance, geotools has an EPSG extension that enables it to handle, among many other SRSs, 102039.

Non-standard projection specifications

(this section is still forming up. The title may not be accurate as the content evolves. If so, feel free to change).

SRS:900913
The history of SRS:900913 is somewhat contentious.

Chris Schmidt (creator of OpenLayers) http://crschmidt.net/blog/archives/243/google-projection-900913/

SRS:102113
SRS:3857
-900913: what is it? EPSG vs. OGC, standard/non-standard? -ESRI support: should it/shouldn't it?
- other projections like this? 102113
- replace both with 3857?
- getCapabilities snafu (just remove it from the catalog?)
Thanks for the update, I fully agree. I didn't know there were still any problems, although, the imagery services are currently being served out of EROS, not here in Denver, so I may be out of the loop. Please let me know if you are still seeing any problems with any service coming out of "services. nationalmap.gov..." or "basemap.nationalmap.gov...".  And, you might pass along the email address "tnm_help@usgs.gov"

As far as this issue, it does seem a little weird that the GetCapabilities lists both projections, but one works and one doesn’t. Wyatt, I do have one idea you could try: add a BoundingBox line for 900913 for each layer. You might have to use ArcMap to figure out what the bounding box extents should actually be. See below, where all the CRS’ are listed, but the layer only has bounding boxes for 84 and 4326 (included in each service by default), and 102113 (probably the projection your mxd is in). Maybe this is why 102113 works but 900913 doesn’t? I did test this when I switched to all manual capabilities files for my services, and it didn’t seem to make any difference whether it was included or not, so I didn’t do it, but maybe I missed something. Let me know if it does make it work. If not, then maybe ESRI needs to look into it.

Mike Schramek’s (contractor at NGTOC) reply (with a possible work-around for ArcServer):

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Wyatt Anderson’s (contractor at EROS) Reply:

Eric,

Our servers are using ESRI ArcGIS Server. ESRI has chosen NOT to implement a custom SRS/CRS code of 900913. So yes, we should take the 900913 projection out of the capabilities file, as it does not work with WMS requests. The 900913 projection was added to the capabilities file to satisfy a National Map requirement for Google access (JIRA 943, 960)

Note: We have successfully used our services in non-ESRI viewers (like OpenLayers) by changing the default projection from 900913 to another projection that ESRI ArcGIS Server supports. We will be happy to assist anyone trying to use our services within Google Earth, Bing, OpenLayers, etc, who are having projection issues.

Matt Tricomi’s comments on Wyatt’s replay:

Wyatt is right.

2 weeks ago, Wiese, Dollison, and I met with open geo (actually, the author of 900913) and he suggested by no means is the issue have anything to do with ESRI. Actually, he said 900913 was rejected by OGC, and that there appears to be some “disagreement” in the open source community around that EPSG.

There are plenty of other ESRI delivery issues, but this “favoring” point has nothing to do with ESRI - they are implementing the spec correctly as Wyatt noted. And, Kevin Hope has made absurdly clear to the blueprint team that standards will be key to addressing the next set of TNM solutions. He has also followed up with open geo groups recently and we have had active weekly threads with open groups as research related to the blueprint.

Your issue has been OK’d by Kevin Hope and Rob Dollison to add as part of the delivery blueprint, and CEGIS has been identified as SMEs per our discussions with our respective bosses last month - stay tuned, interviews are coming!