

SPCS2022 Multiple Zone Layer

For the benefit of those who may wish to know (five years from now) what the WSR2022 Task Force submitted, the following may be helpful.

First one must understand that the Procedures Document does not say exactly the same thing as the submittal instructions with the SPCS2022 Zone Design Submittal Form. It appears that the Procedures Document was written more for how NGS will process, document, file, and ultimately distribute the new reference frame information. The submittal instructions are for those states designing projections.

According to at least one interpretation of the submittal instructions, there will be three files attached to a submittal cover letter. The files will be:

- Design submittal form file.
- Zone parameters file.
- Zone extents file.

The zone parameters file includes:

1. Zone number, sequential starting with the numeral "1".
2. Zone name, for Wisconsin this will be a county name or a set of counties names.
3. Zone abbreviation, four letters representing the zone, usually the first four letters of the county covered by the zone. When a zone covers more than one county, the county that is listed first alphabetically will be used for the zone abbreviation.
4. Latitude of coordinate origin, north latitude in decimal degrees to 12 decimals.
5. Longitude of coordinate origin, east longitude in decimal degrees to 12 decimals.
6. False northing in meters (0 for TM, multiple of 1,000 m for LCC).
7. False easting in meters (multiple of 1,000 m).
8. Scale factor to 10 decimal places.
9. Projection type, either transverse Mercator (TM) or Lambert conformal conic (LCC).
10. At least one test point in each zone; additional test points are optional. Each test point will include:
 - Input latitude, north in decimal degrees to 9 decimal places.
 - Input longitude, east in decimal degrees to 9 decimal places.
 - Input ellipsoid height in meters to 3 decimal places.
 - Output northing in meters to 4 decimal places.
 - Output easting in meters to 4 decimal places.
 - Output linear distortion in ppm to 3 decimal places.
 - Convergence angle (optional).

The zone extents file includes:

1. Zone number, as defined in the zone parameters file.
2. A polygon shapefile for each zone. Wisconsin used a US Census shapefile for each county, as provided by NGS. For a zone that covered more than one county, the adjacent counties were reformatted in a single shapefile for that zone. Each zone shapefile was identified with the zone number.

Optional data (listed below) were included in the zone extents file to have a complete package.

3. Zone abbreviation.
4. Zone name.
5. Projection type.
6. Latitude of coordinate origin, north latitude in decimal degrees to 12 decimals.
7. Longitude of coordinate origin, east longitude in decimal degrees to 12 decimals.
8. Scale factor to 10 decimal places.
9. False northing in meters.
10. False easting in meters.
11. Reference Frame.

All of the files were zipped to be submitted as the zone extents file with the submittal form.