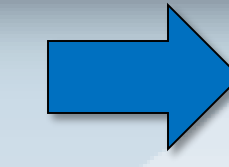
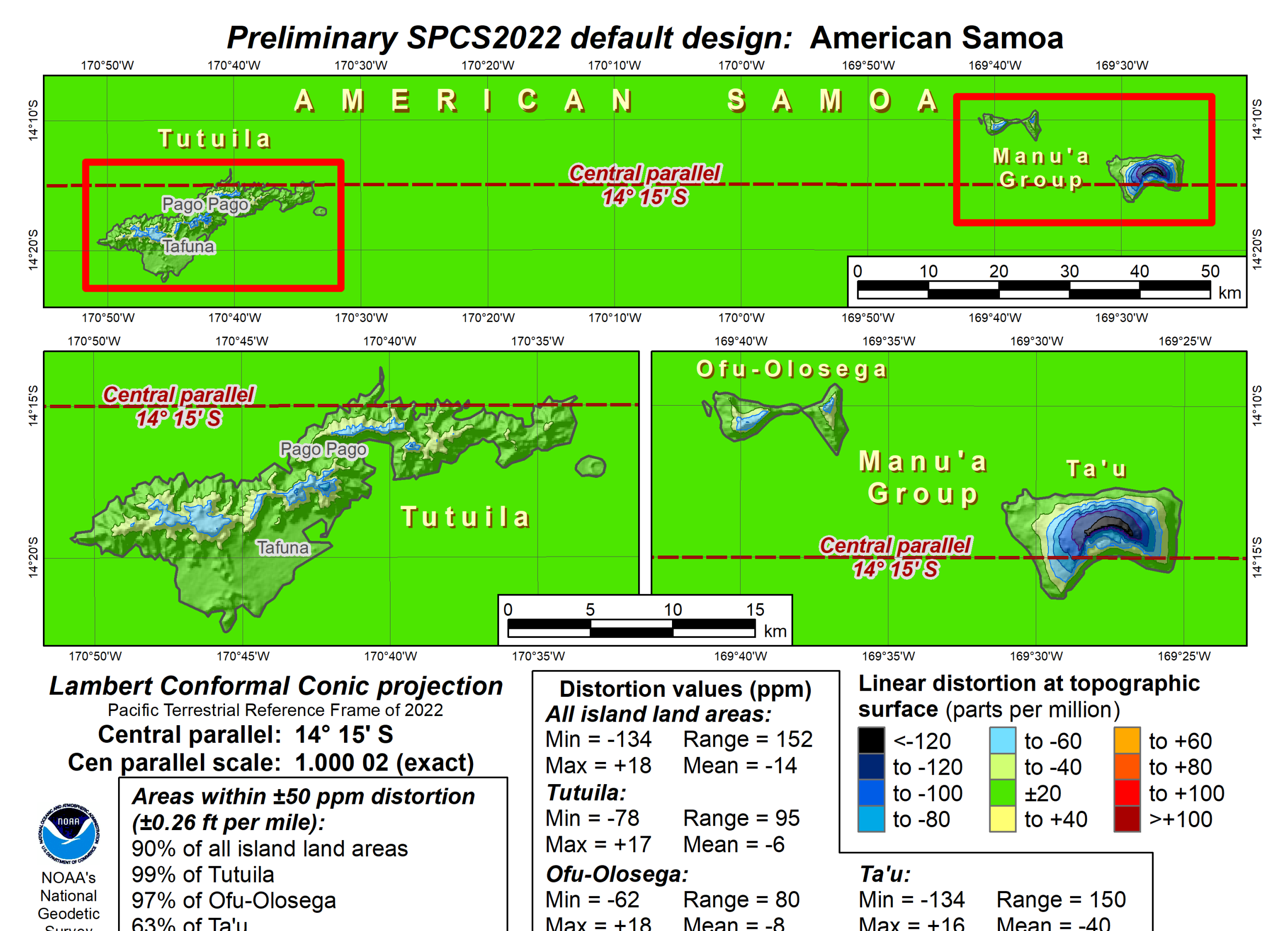
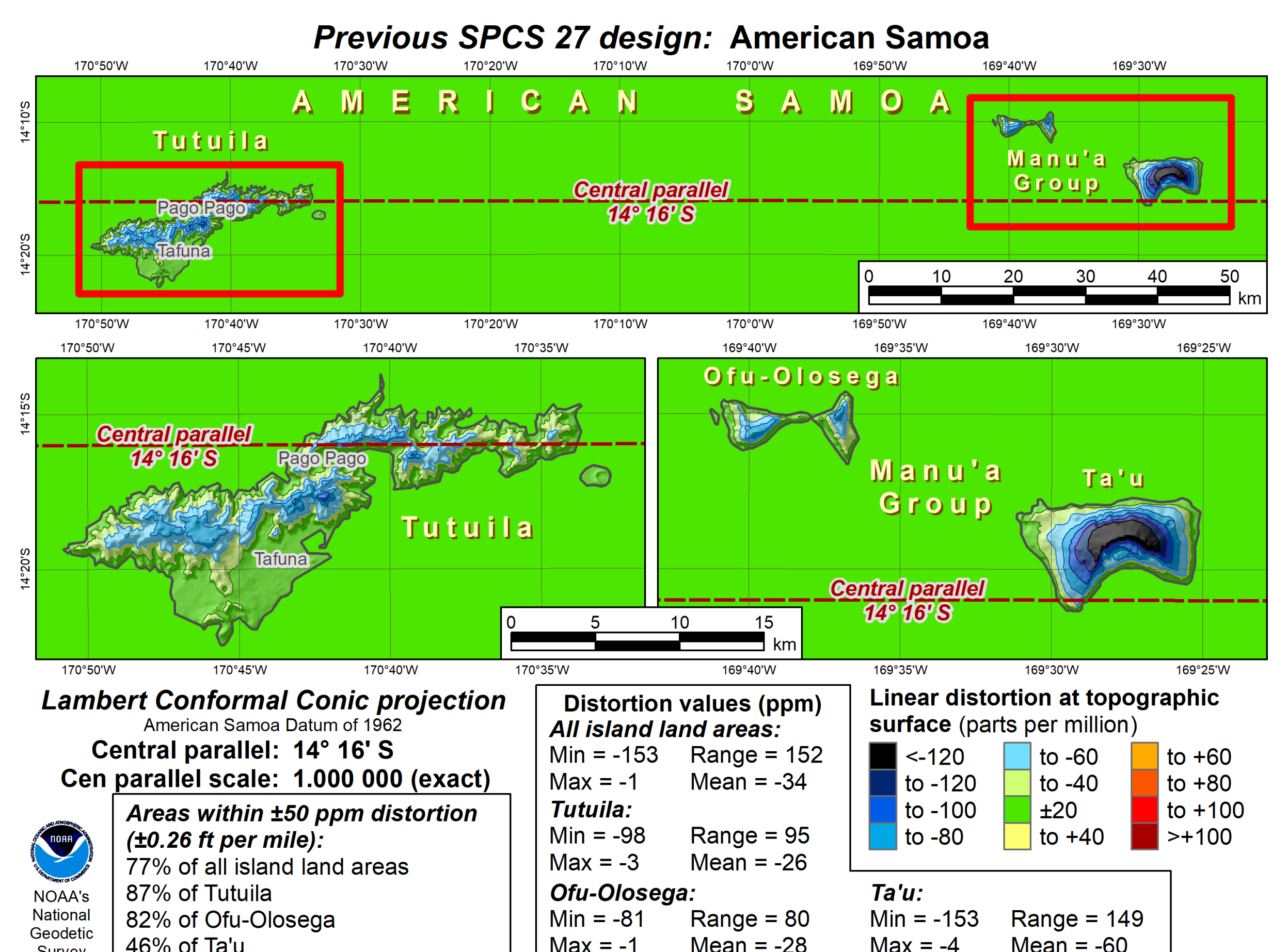
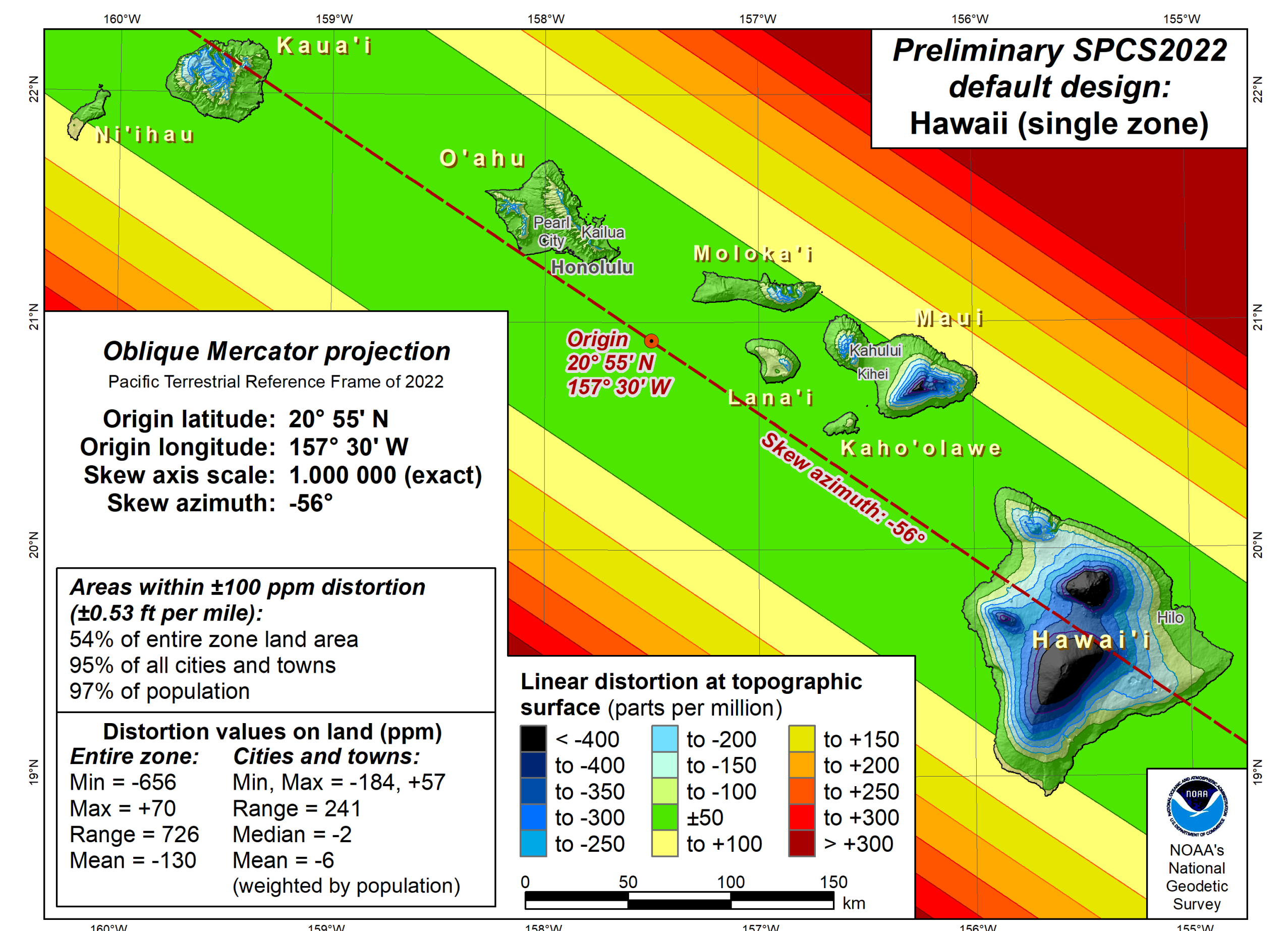
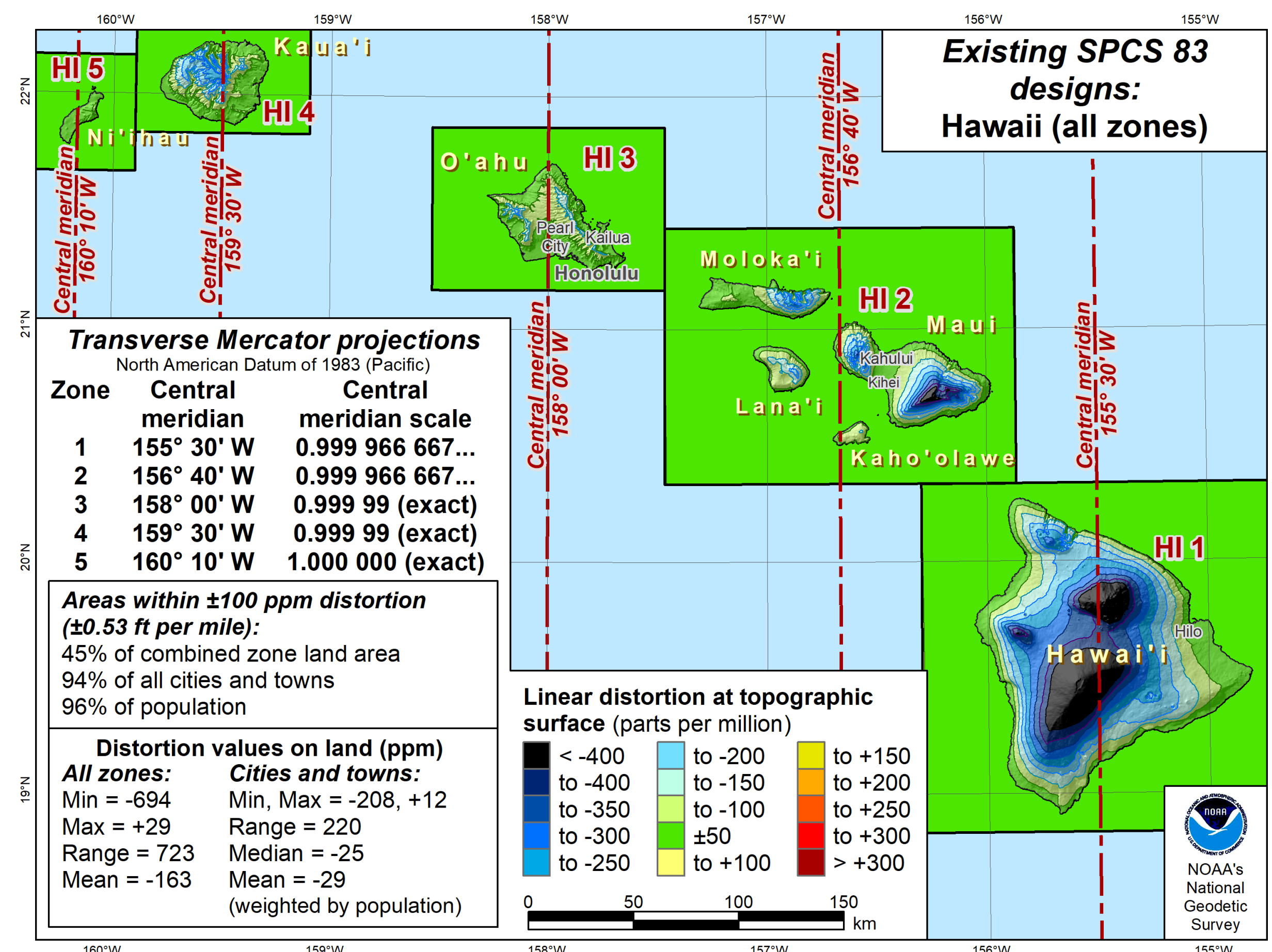
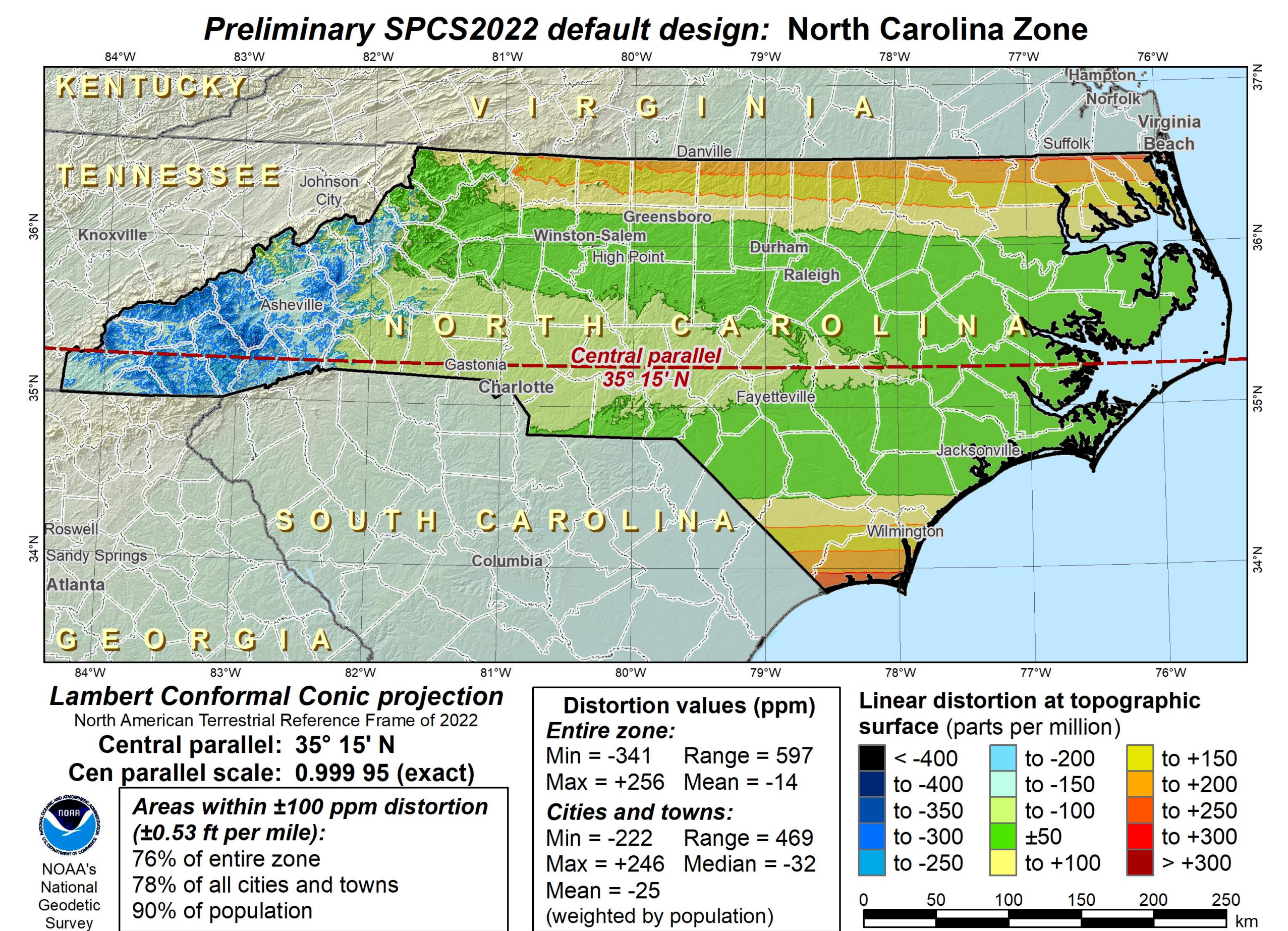
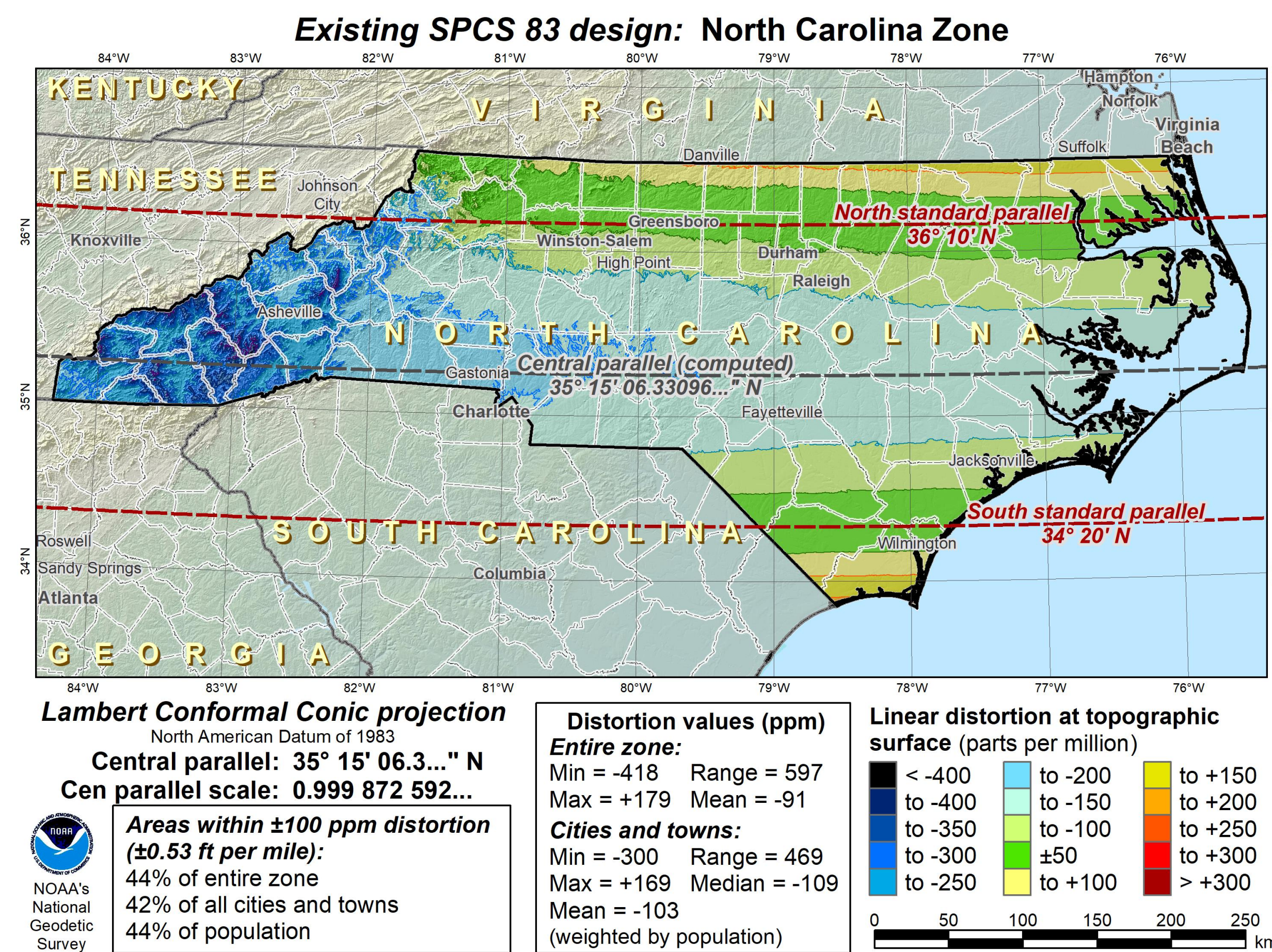
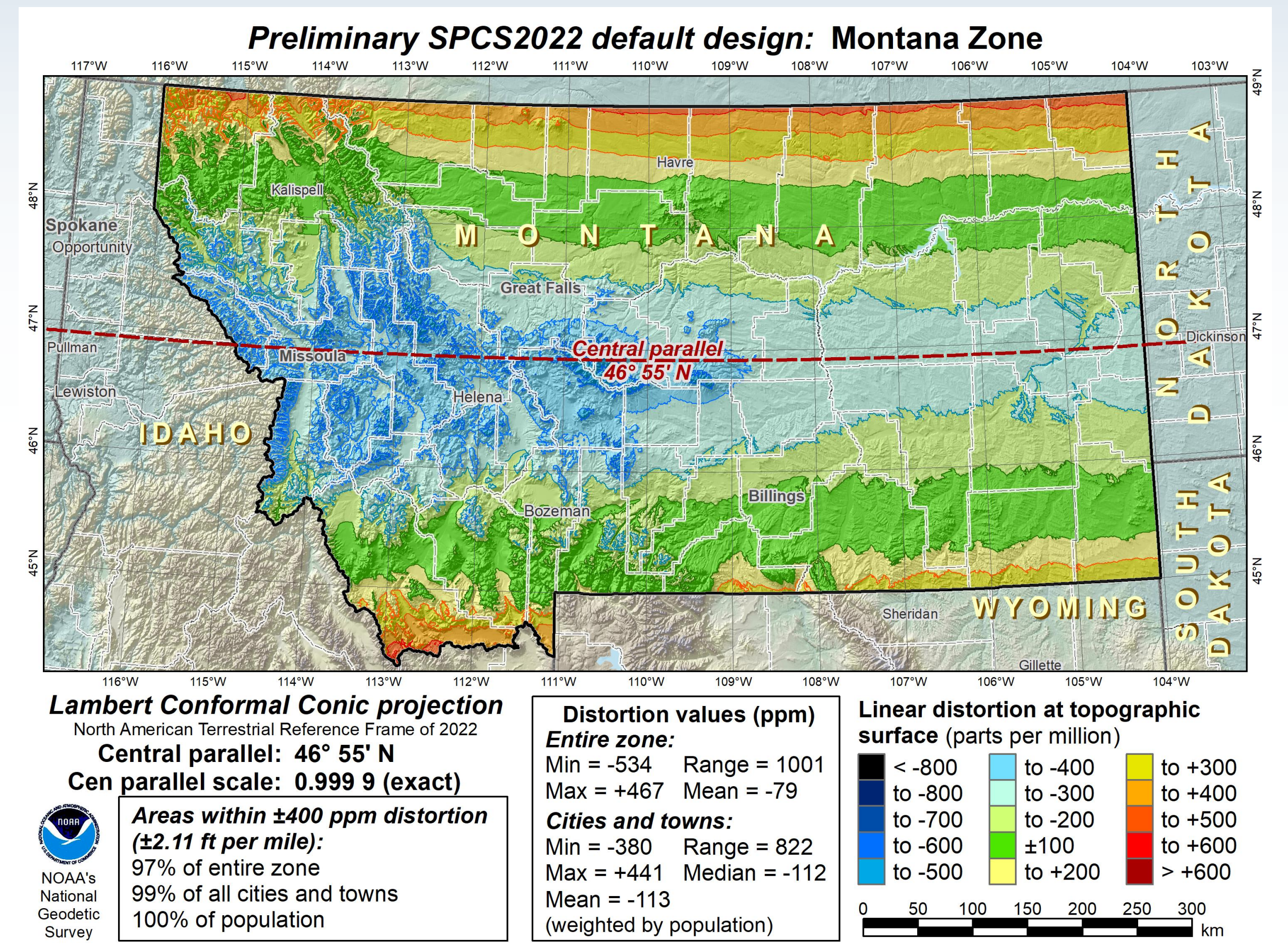
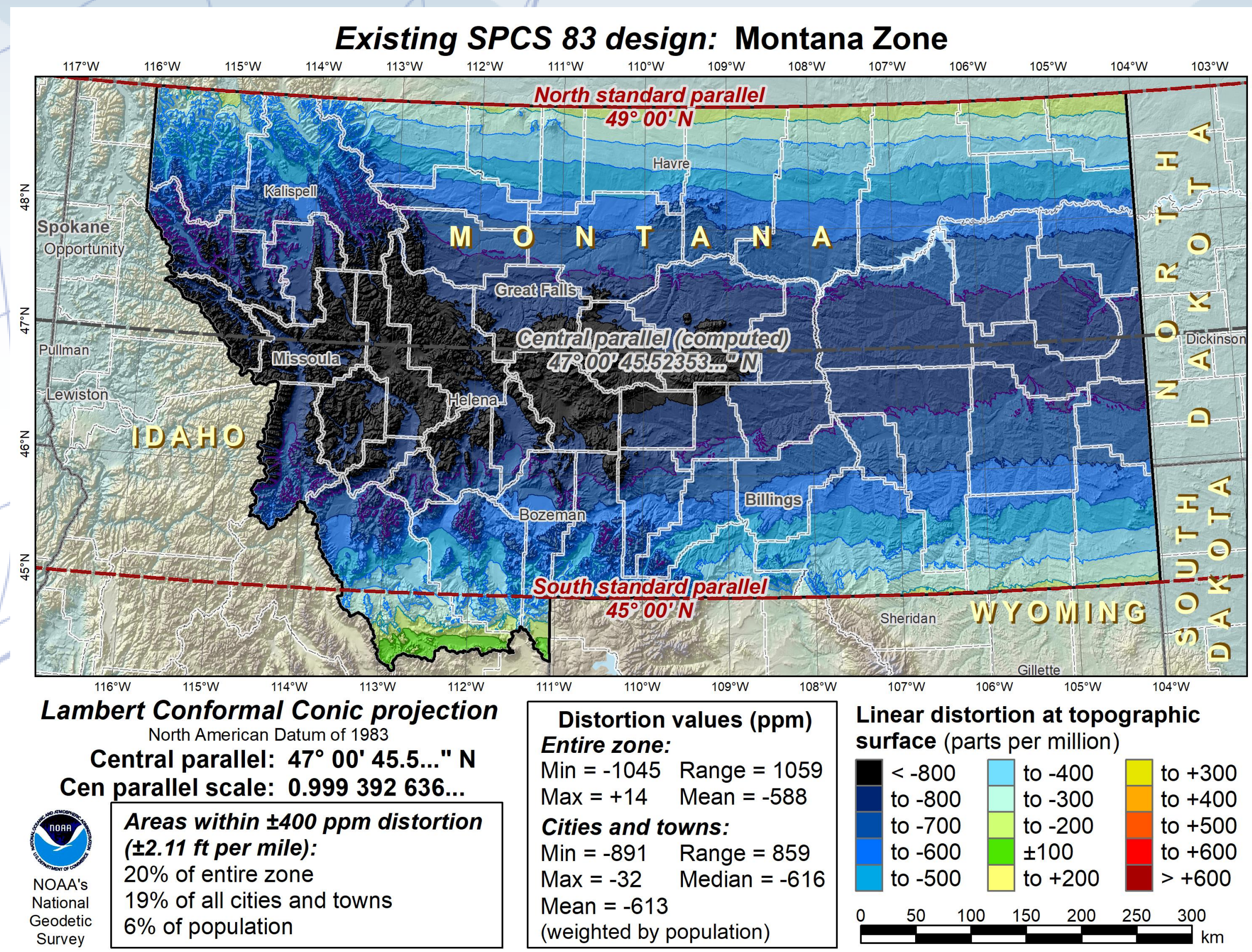
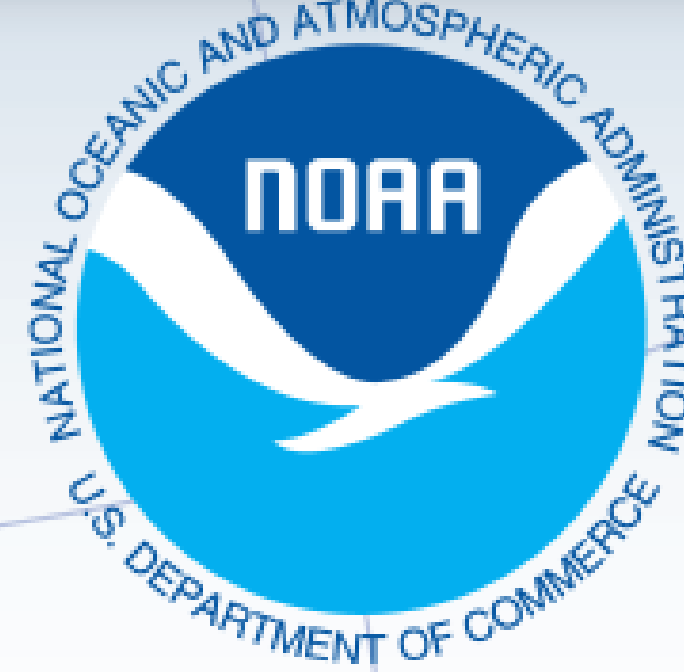


Existing SPCS 83 (or 27) Design



Preliminary SPCS2022 Default Design

The State Plane Coordinate System (SPCS) of the United States will soon change
State Plane Coordinates

Future State Plane Coordinate System for the United States

Michael L. Dennis, Dana J. Caccamise II, and William A. Stone

The United States State Plane Coordinate System (SPCS) will soon change!

A new version (SPCS2022) will replace the existing North American Datum of 1983 (NAD83) version (SPCS 83) as part of the transition to the Terrestrial Reference Frames of 2022 of the ongoing modernization of the U.S. National Spatial Reference System. Because this change will significantly impact U.S. mapping, surveying, engineering, and myriad georeferenced activities, NOAA's National Geodetic Survey (NGS) is seeking user-community input on the development of SPCS2022 (see below for deadlines). In support of this process, NGS is creating preliminary designs (subject to change, based in part on state input) of SPCS2022 zones (including statewide zones) to help state stakeholders make informed decisions on what design best meets each state's needs. These SPCS2022 designs are illustrated on the side panels with maps showing linear distortion (map scale error) at the topographic surface, along with maps of existing SPCS 83 (or 27) distortion. The map comparisons provide a means to visually assess the performance of proposed SPCS2022 zones and to compare them to SPCS 83. The intent is that SPCS2022 will be a technically sound and practical component of the nation's spatial data infrastructure of tomorrow, fully satisfying the broad needs and applications of the geospatial community for years to come.

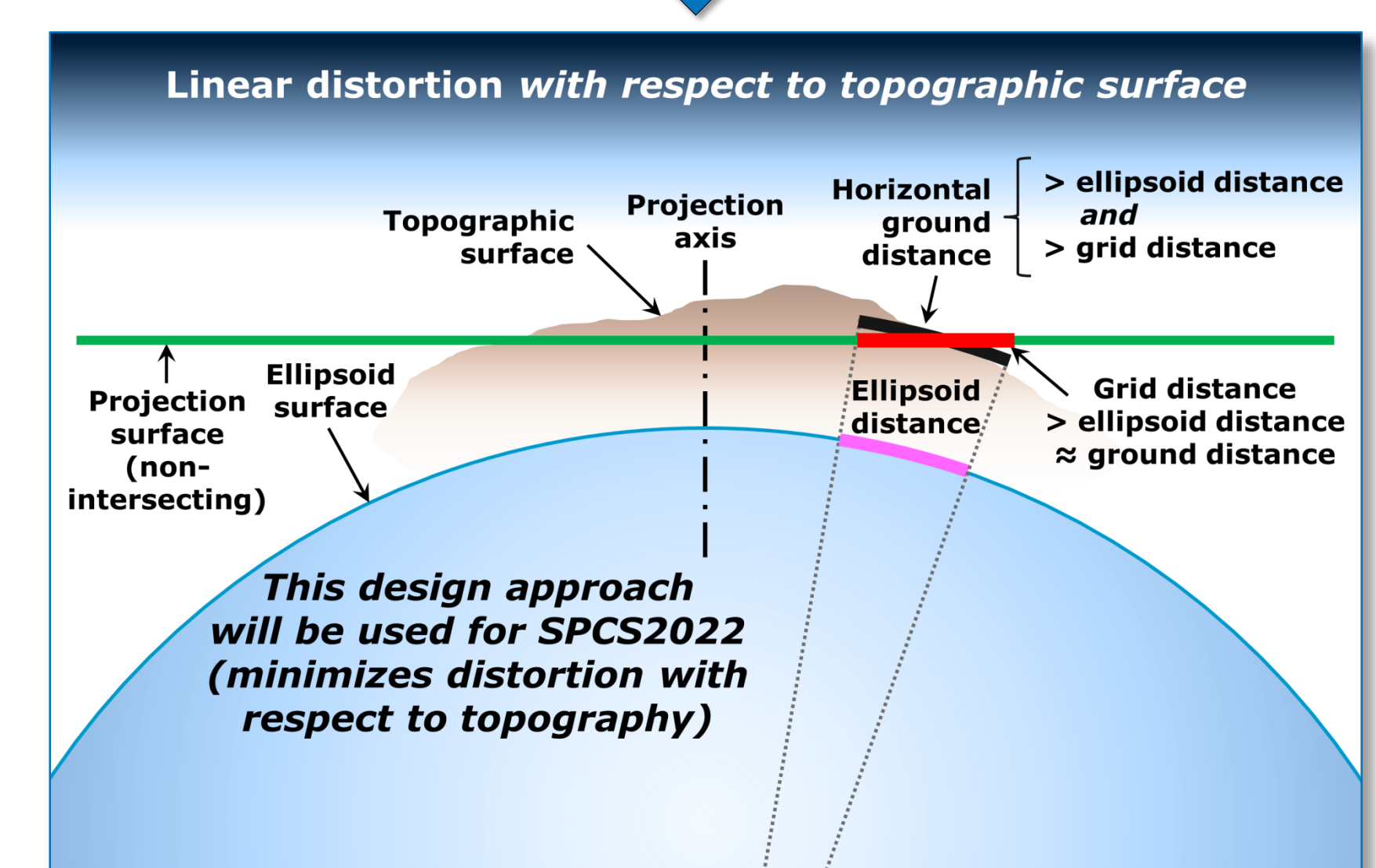
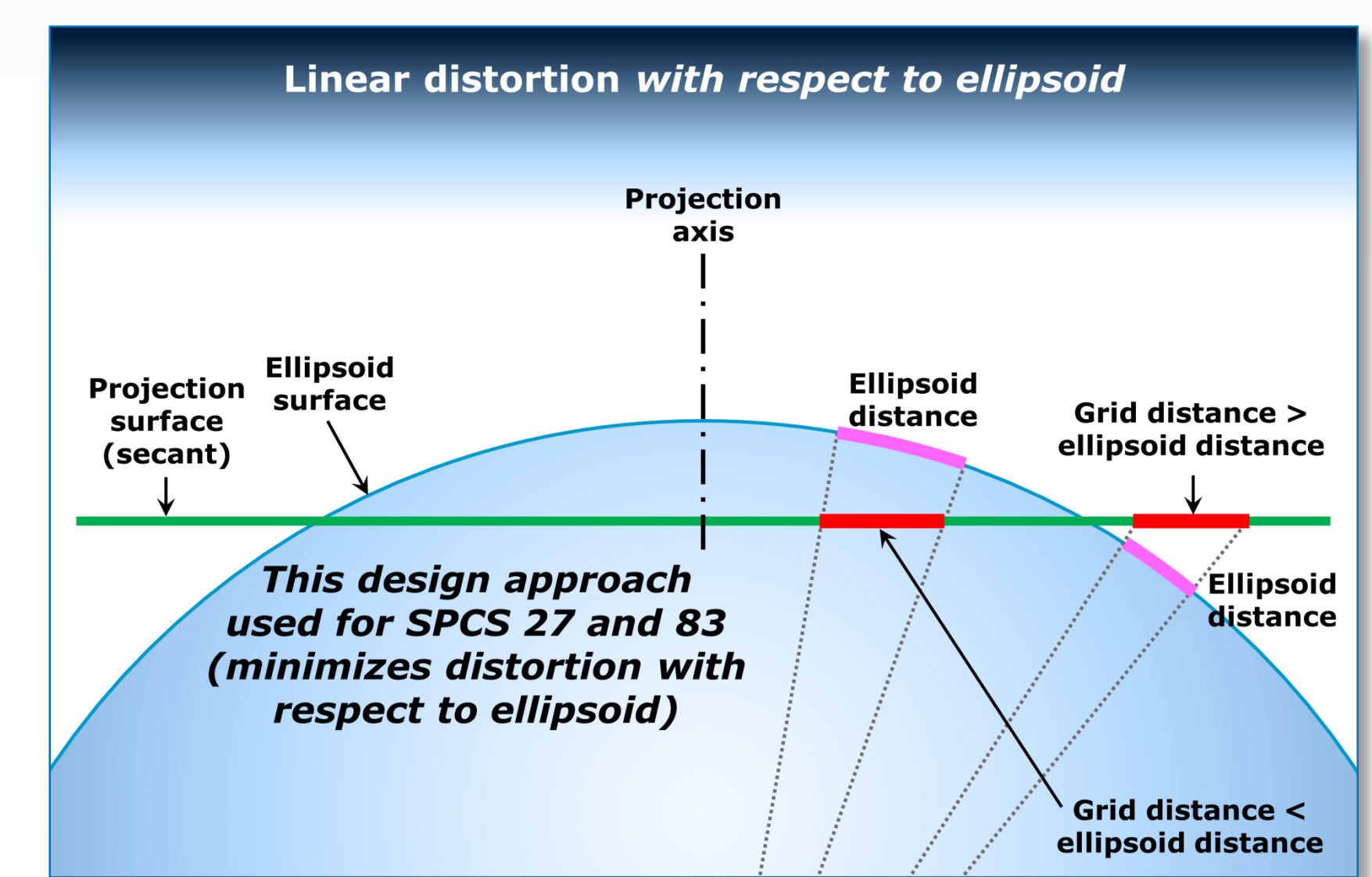
All interested parties are invited to partner with NGS in this collaborative effort to formulate and optimize the State Plane Coordinate System of 2022!

SPCS2022 projection types (above):

- all conformal projections
- based on Geodetic Reference System of 1980 (GRS80) ellipsoid
- SPCS2022 LCC projection will use the 1-parallel form (whether secant, tangent, or non-intersecting)
- same projections used for SPCS 27 and 83

Schematics contrasting the zone design approach and characterization of linear distortion (map scale error) for:

- SPCS 27 and 83 (top): minimizes distortion with respect to the ellipsoid
 - SPCS2022 (bottom): minimizes distortion with respect to the topography
- Positioning the developable surface (the plane) along the topography (vs. the ellipsoid) reduces distortion in many regions, particularly at higher elevation.



State Plane Coordinate Systems of 1927 (134 zones) and 1983 (125 zones)

This map summarizes the zones of both SPCS 27 and 83 and indicates where 27-83 zone parameter/extent changes exist. SPCS2022 will comprise similar zone extents for some states and will be completely redefined for others, based on stakeholder input. The red footprints indicate states/zones featured in the SPCS 83 (or 27) vs. SPCS2022 zone and statewide distortion maps on the left and right poster panels. Find this map – and much more detailed SPCS information – in the comprehensive 2018 report: **“The State Plane Coordinate System: History, Policy, and Future Directions”** (see below).

Guam
1 zone
(SPCS 27 referenced to Guam 1963 Datum)

American Samoa
1 zone, **only** for SPCS 27
(SPCS 27 referenced to American Samoa 1962 Datum)

Hawaii
5 zones
(SPCS 27 referenced to Old Hawaiian Datum)

Alaska
10 zones
(SPCS 27 AK Zone 9 referenced to datums established in 1952 on four islands in the Bering Sea)

Conterminous United States
110 zones for original SPCS 27
112 zones for final SPCS 27
108 zones for final SPCS 83
(Note: 3 TM zones defined in Michigan in 1934 replaced by 3 LCC zones in 1964)

Puerto Rico & U.S. Virgin Islands
2 zones for SPCS 27
1 zone for SPCS 83
(SPCS 27 referenced to Puerto Rico 1940 Datum)

State Plane Coordinate Systems of 1927 and 1983

All zones throughout the NSRS for both systems

Total of 134 zones for SPCS 27

Total of 125 zones for SPCS 83

23 SPCS 83 zones with geodetic parameters that changed from SPCS 27

7 SPCS 83 zones where SPCS 27 extents changed, previous zone absorbed, or new zone added

Explore the **left poster panel** to compare linear distortion maps for 4 states / territories based on: existing SPCS 83 (or 27) design and preliminary SPCS2022 default design. Compare zone statistics and note the typical improvement (decreased distortion) in default zone performance due primarily to positioning the developable surface (the plane) at the topographic surface and weighting by population.

Explore the **right poster panel** to compare linear distortion maps for 4 states based on: existing SPCS 83 design, preliminary SPCS2022 default design, and preliminary SPCS2022 statewide design. Compare zone statistics and note the typical improvement (decreased distortion) in default zone performance. Statewide zones are designed to support geospatial activities that benefit from a single, consistent state coordinate system, such as a statewide GIS.

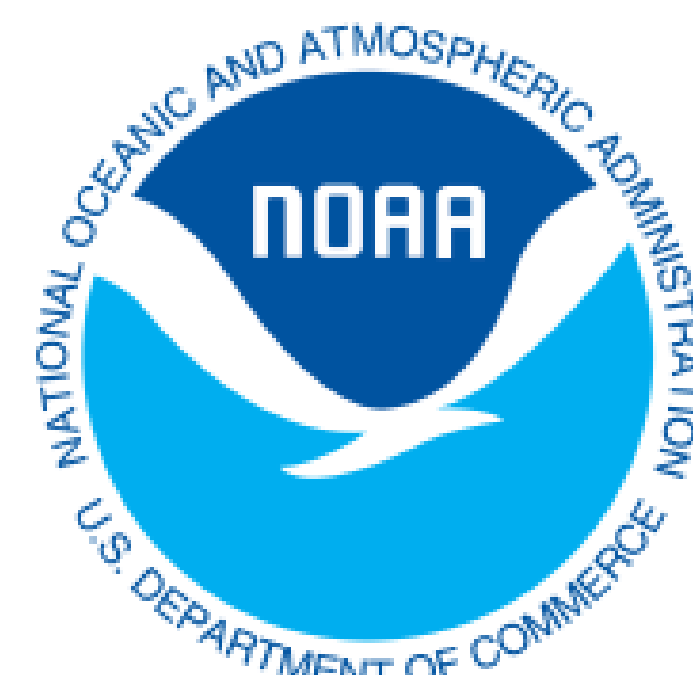
Learn More

NGS website: <https://geodesy.noaa.gov>

SPCS website: <https://geodesy.noaa.gov/SPCS/>

SPCS2022 Proposed Policy/Procedures:

<https://geodesy.noaa.gov/SPCS/draft-policy.shtml>

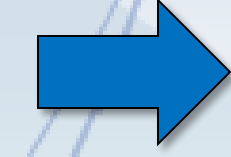
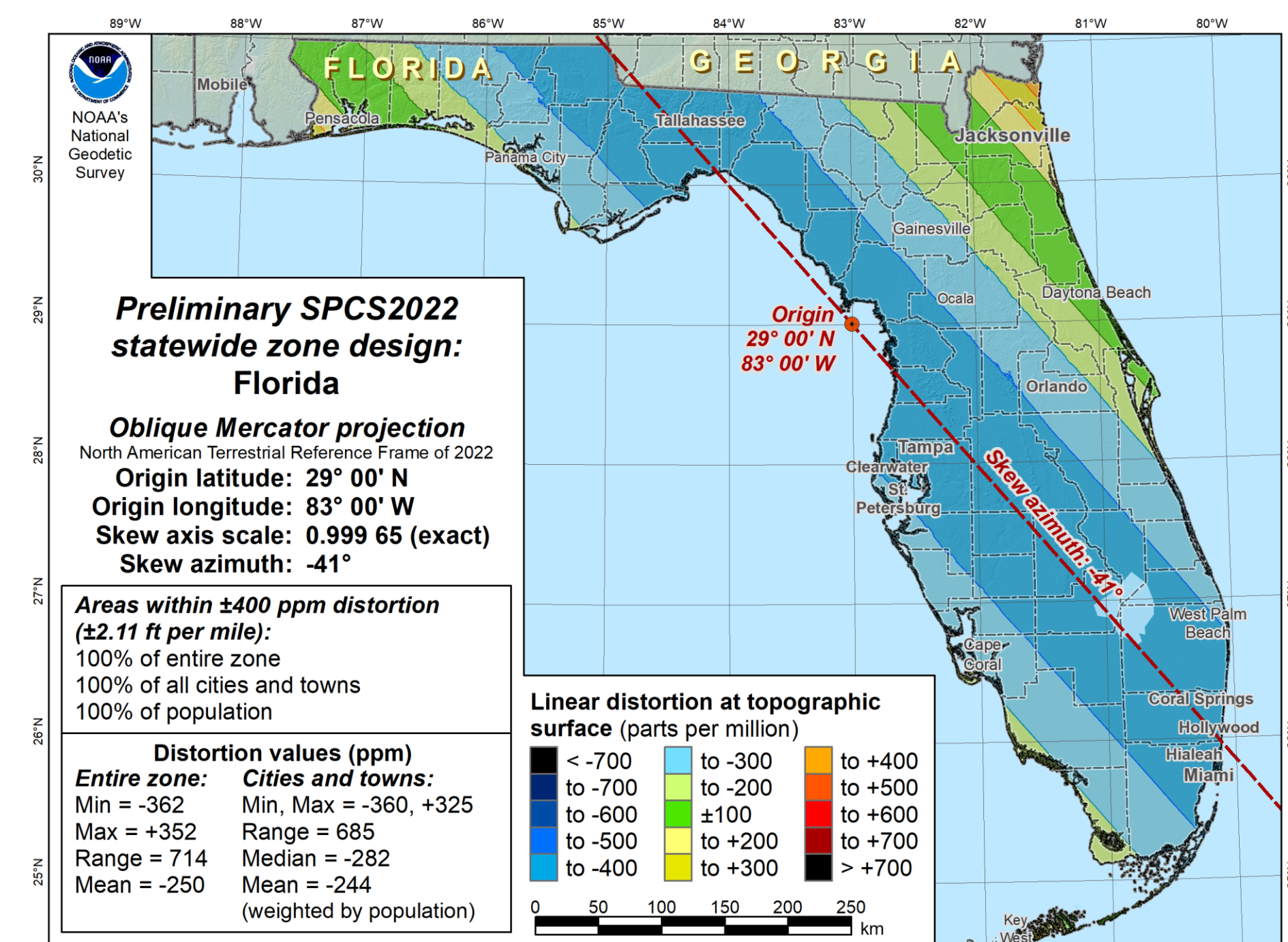
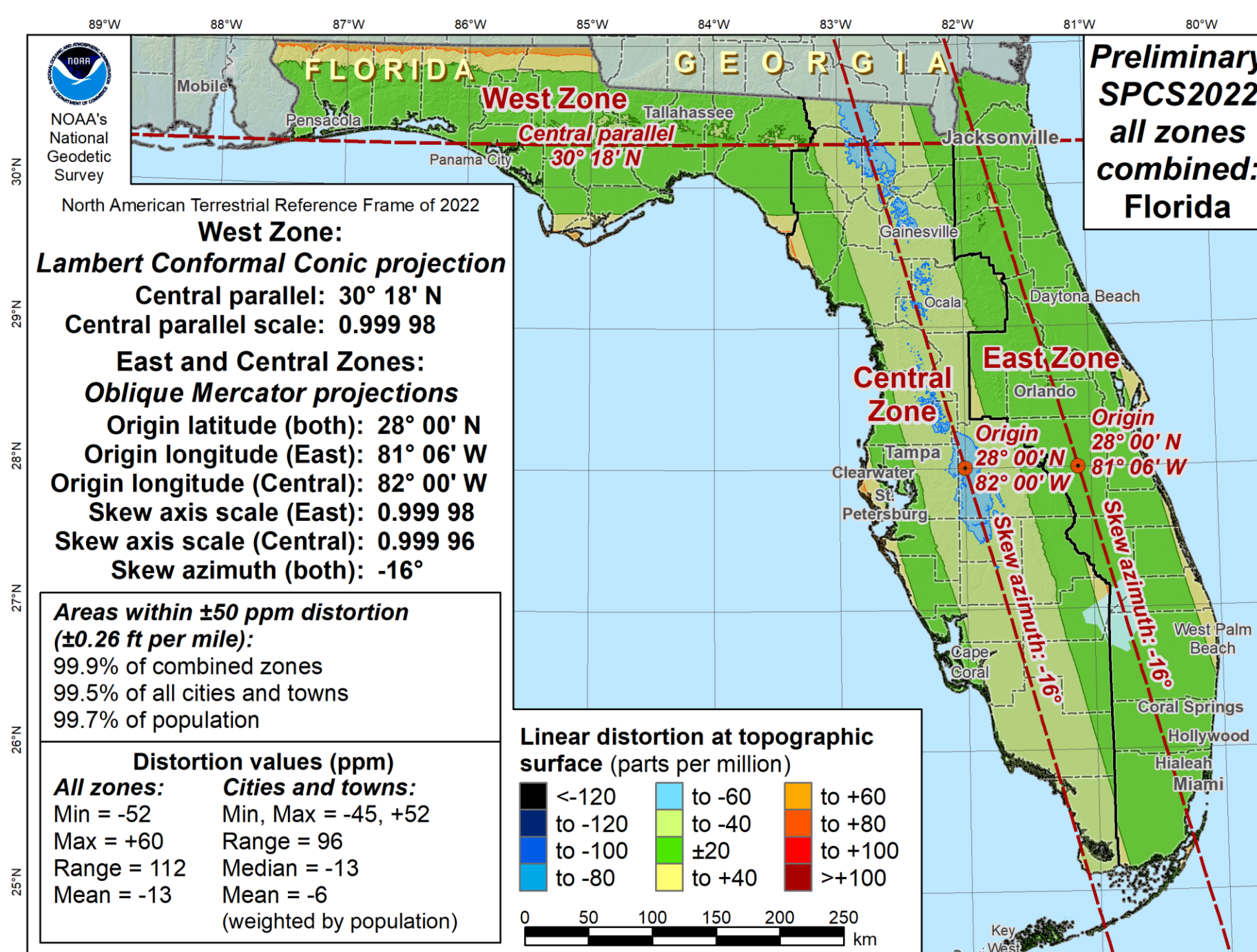
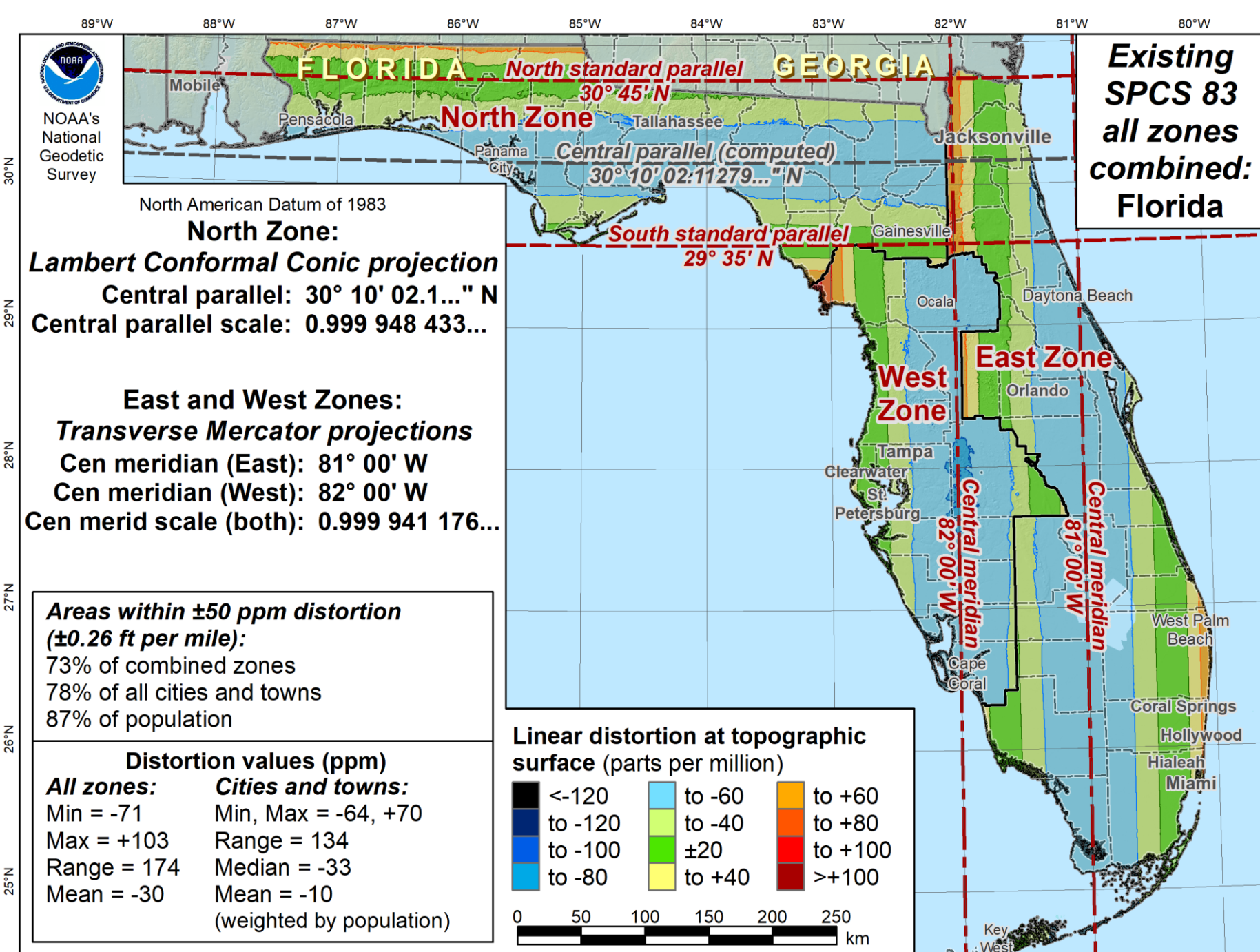
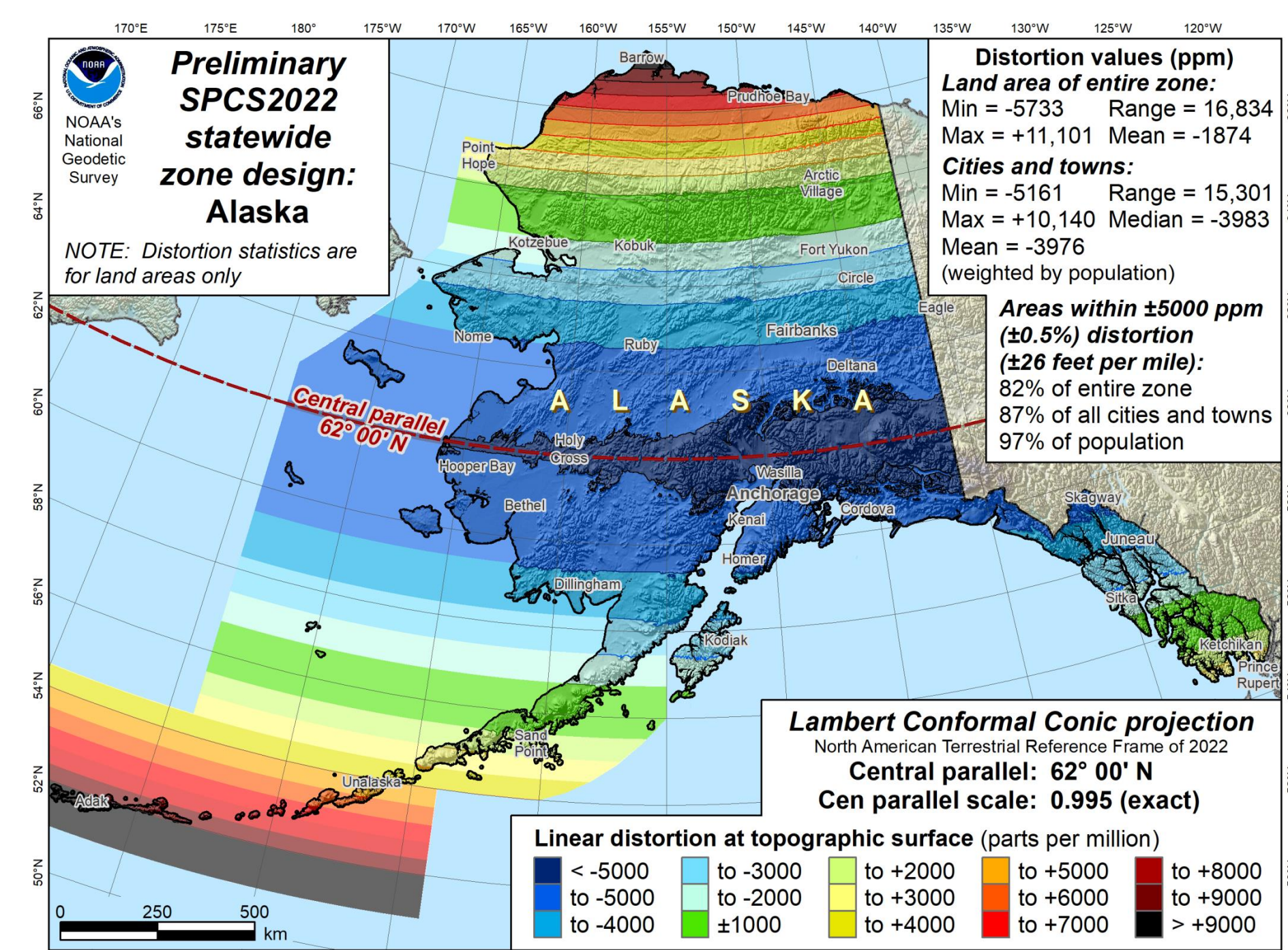
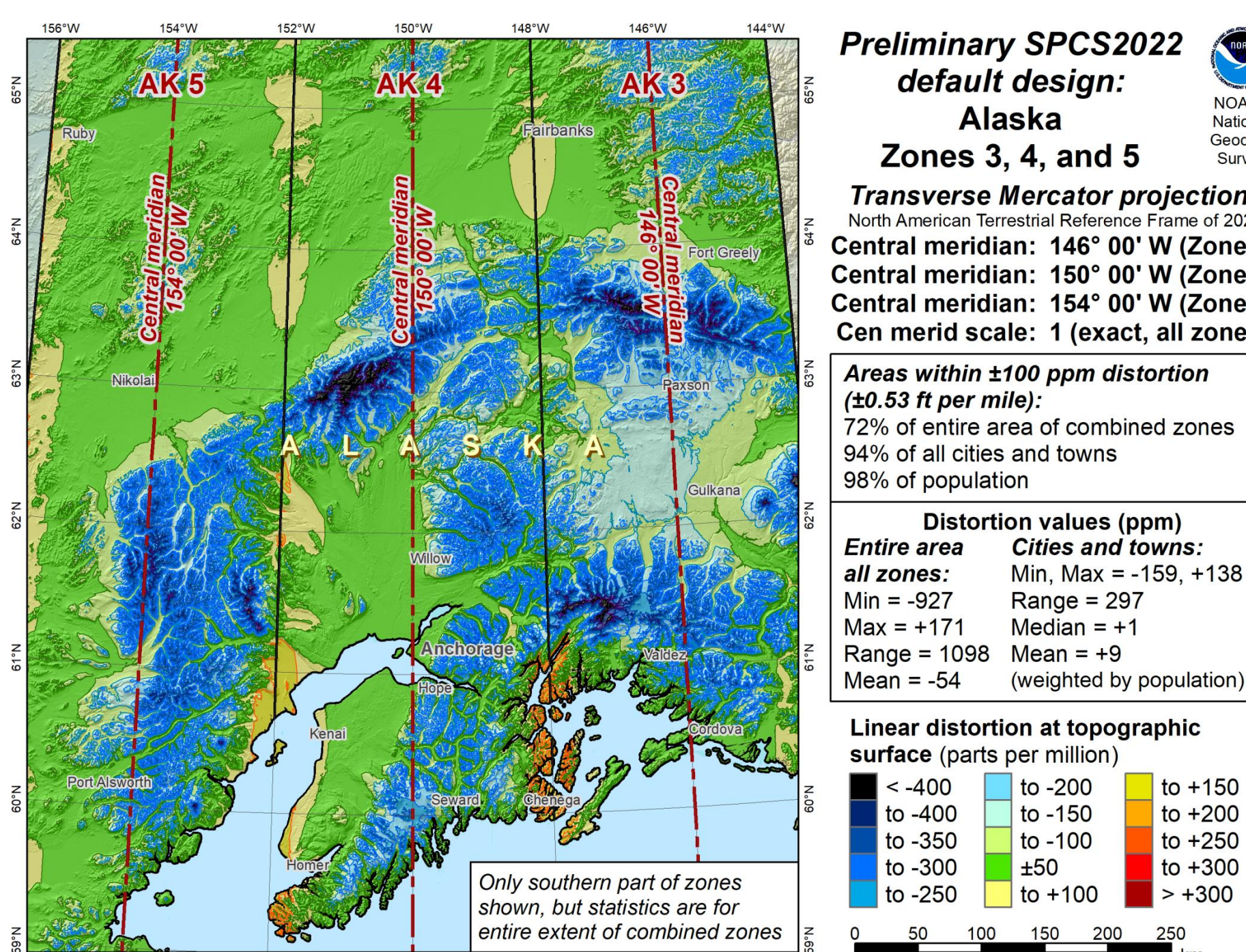
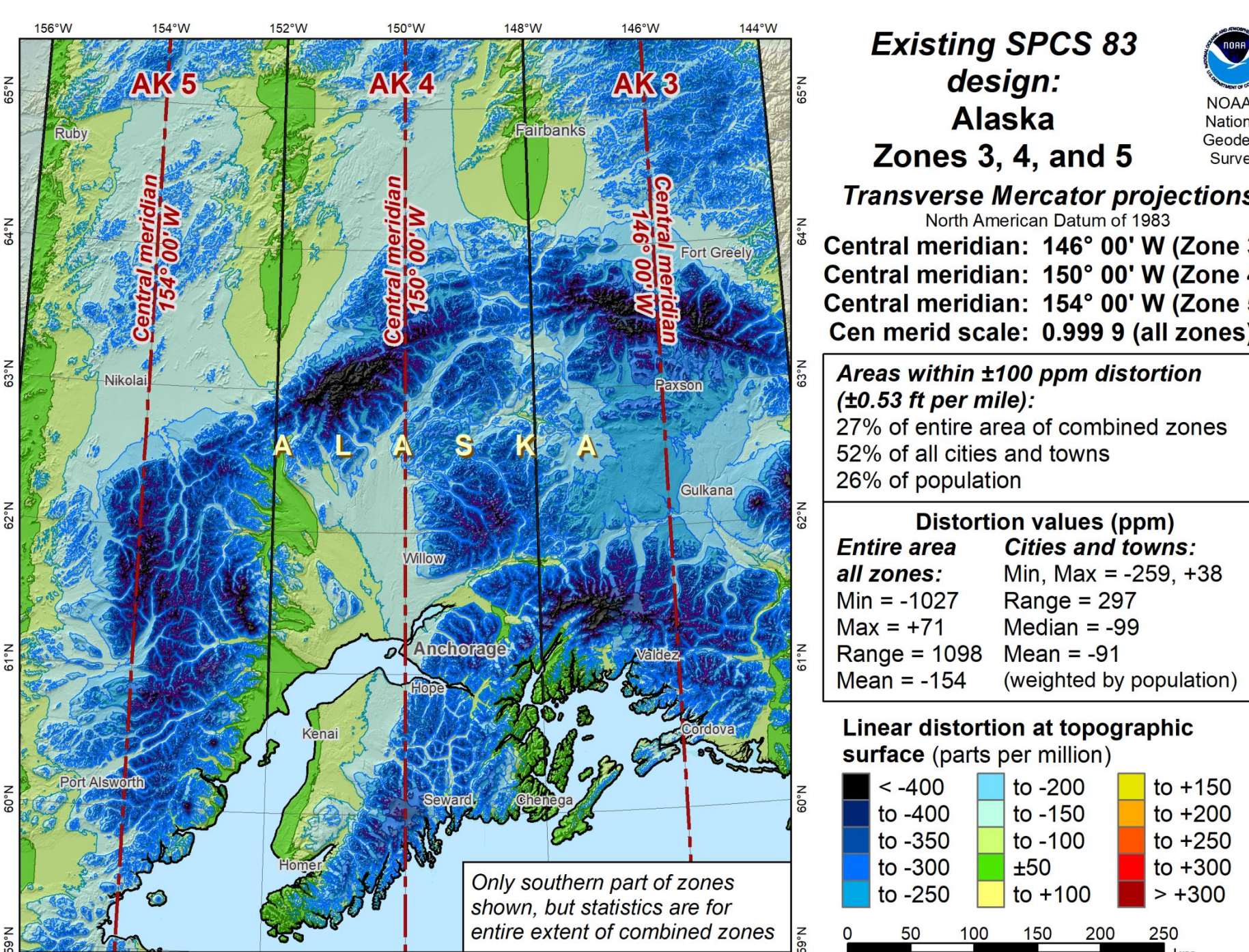
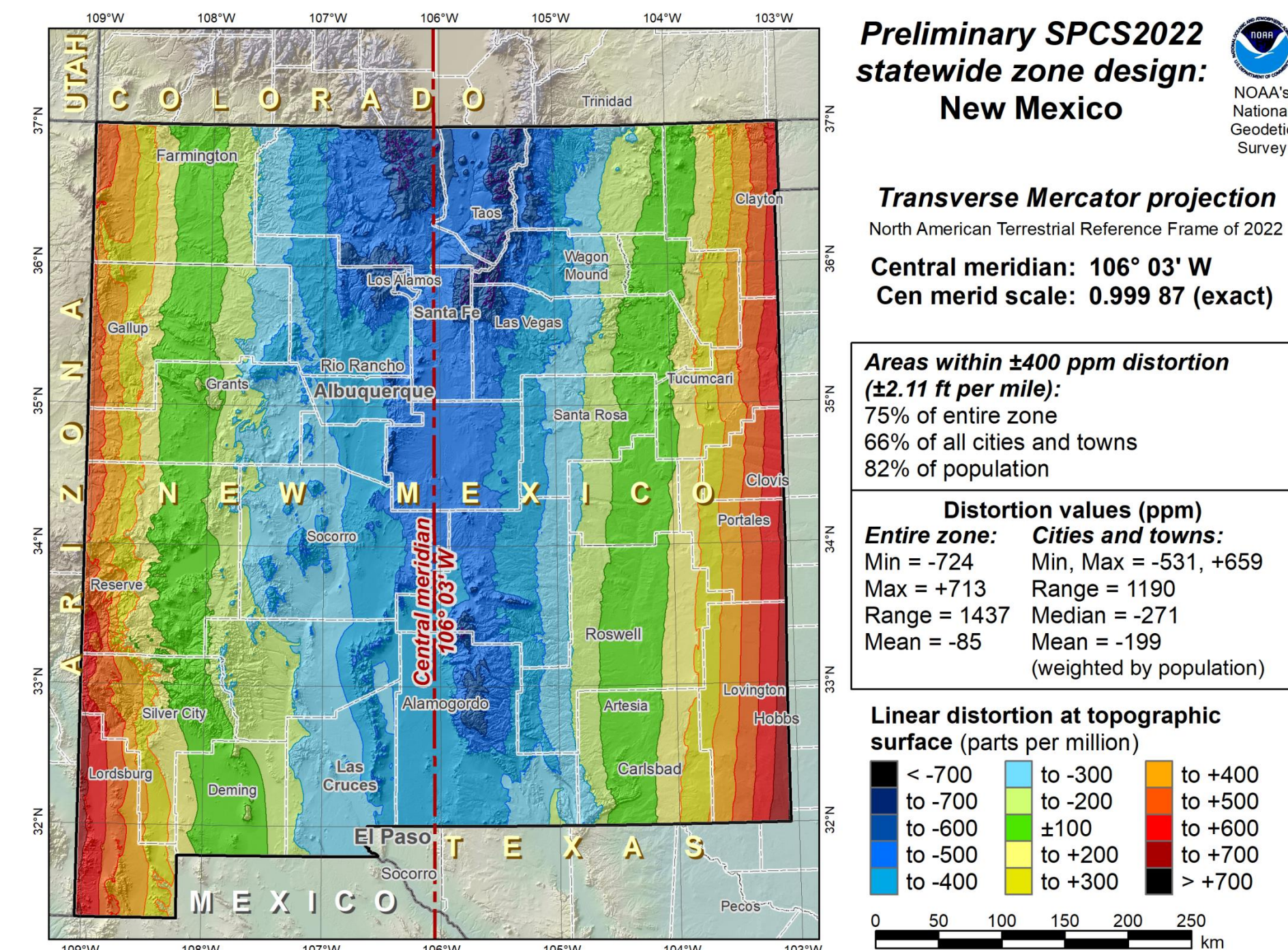
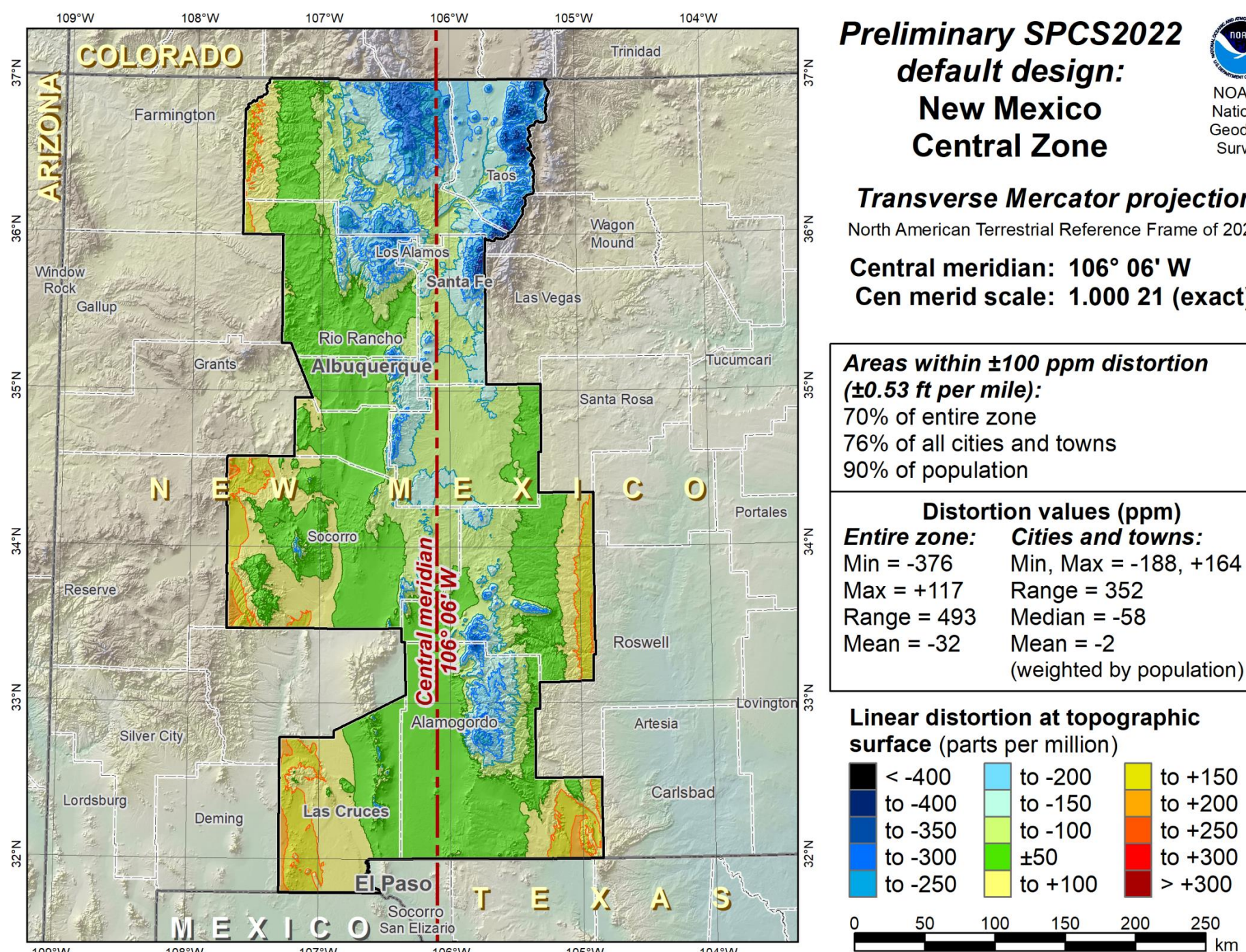
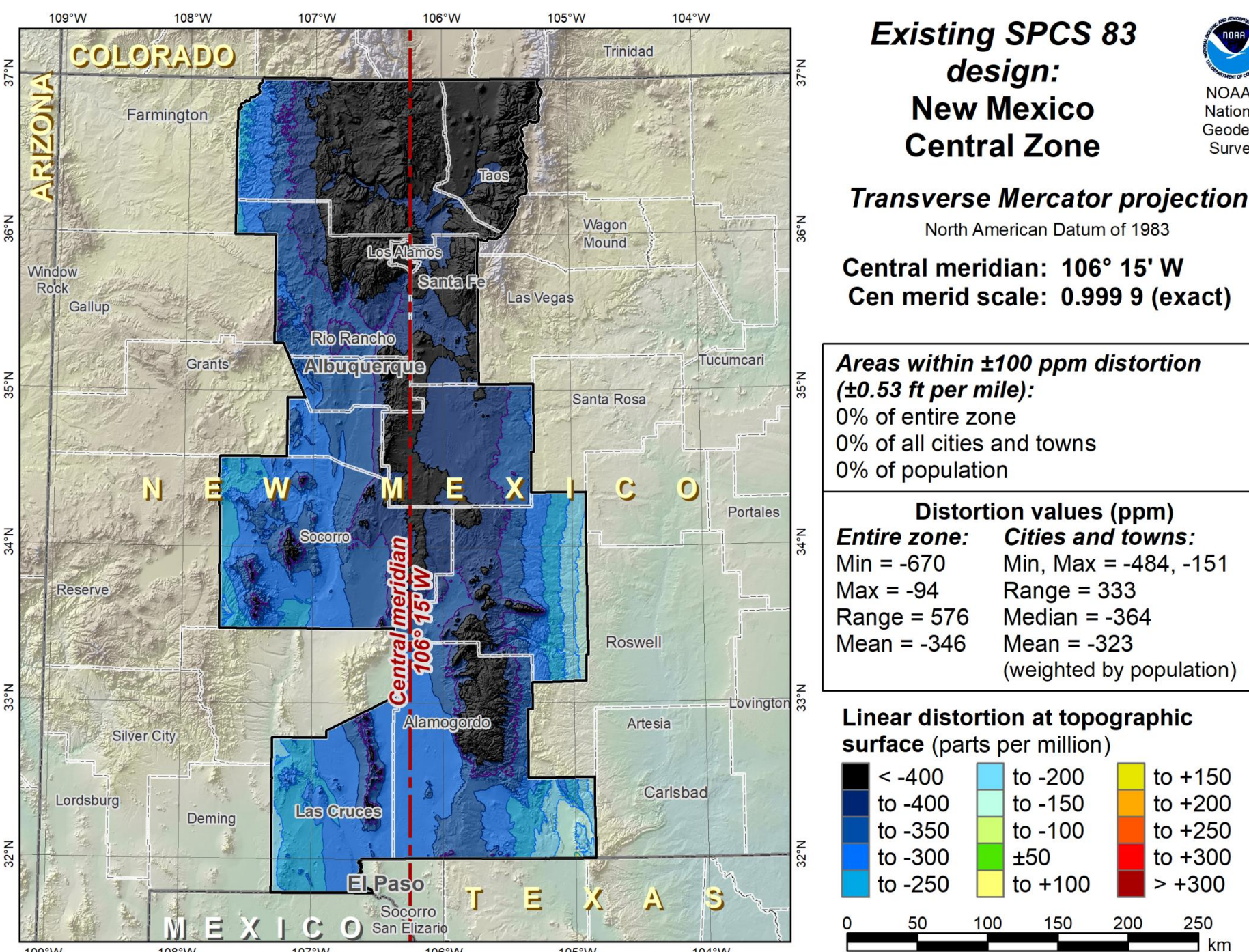
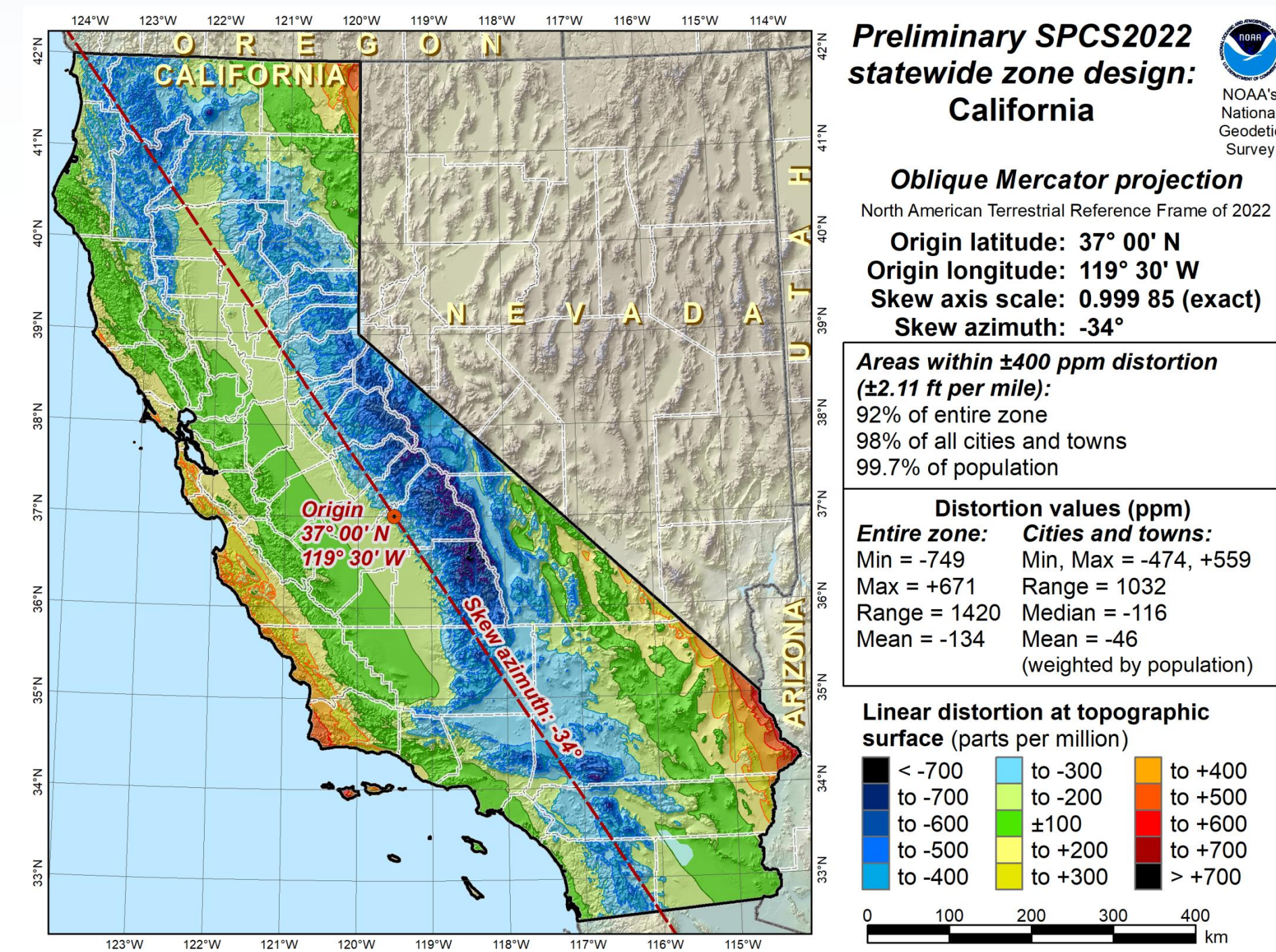
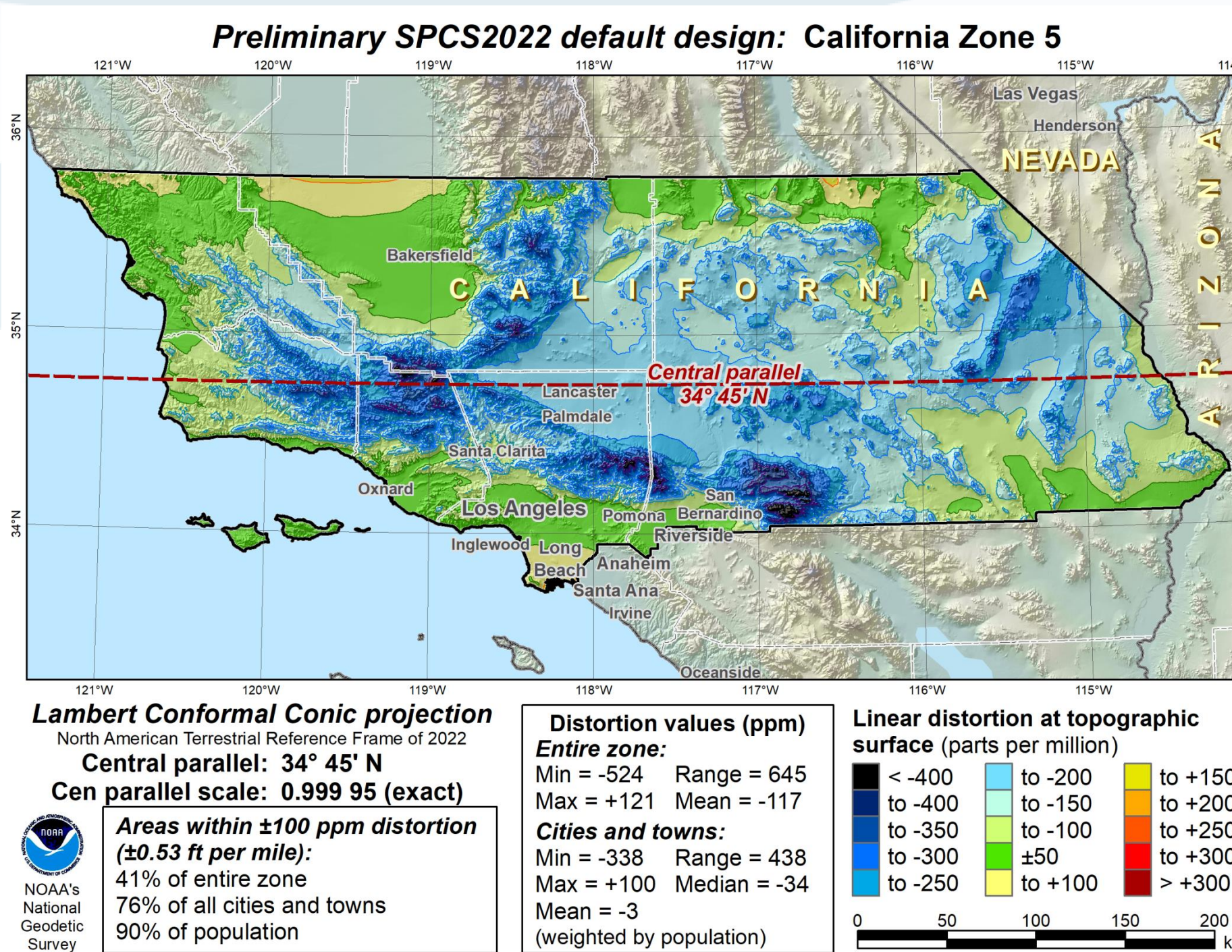
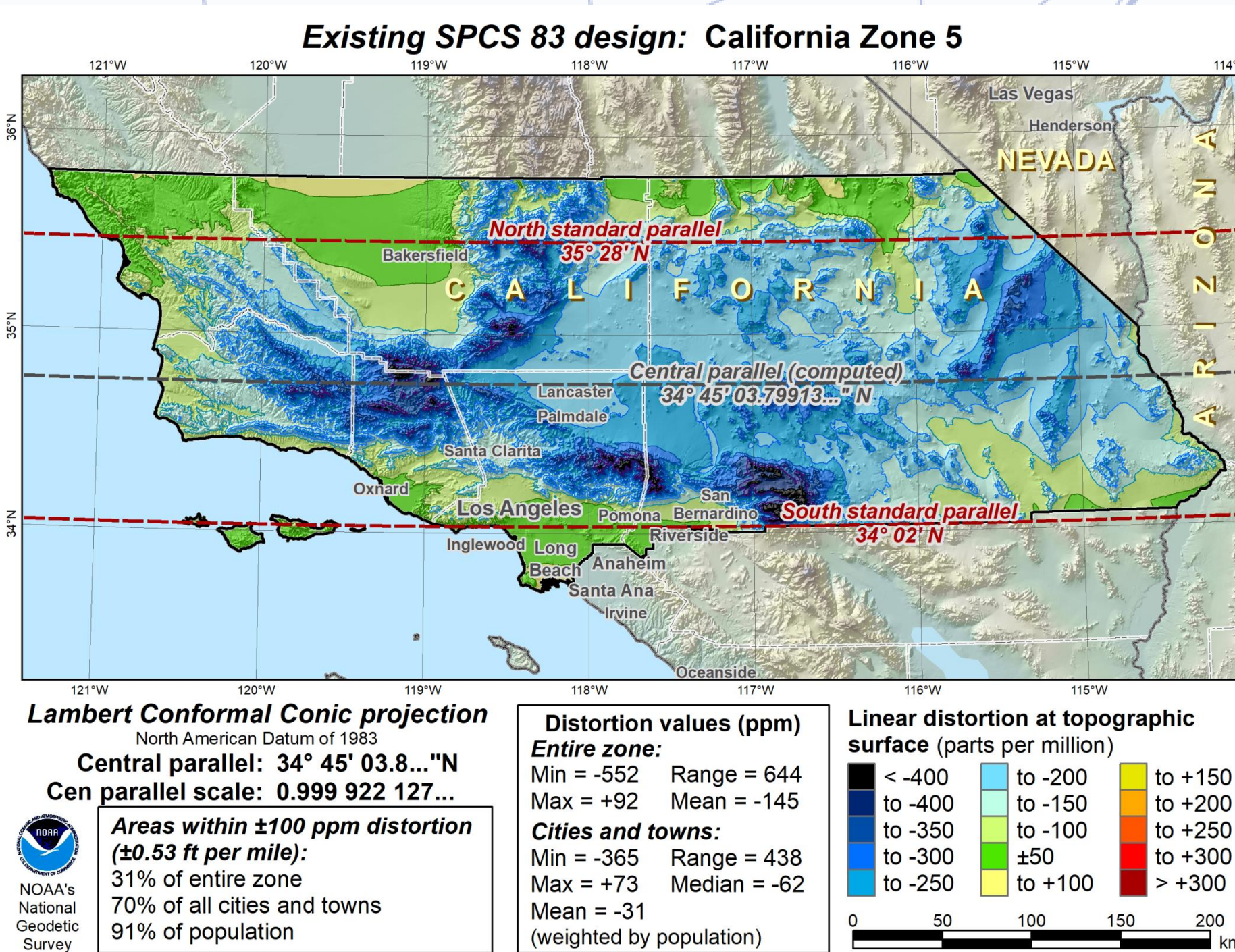


Deadlines for Stakeholder Involvement

August 2018: proposed policy/procedures feedback (Federal Register notice)

December 2019: state zone requests/proposals to NGS

December 2020: state zone designs to NGS

Existing SPCS 83
DesignPreliminary SPCS2022
Default DesignPreliminary SPCS2022
Statewide Design

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