

National Spatial Reference System (NSRS) 2027 Modernization

Geospatial User Readiness Checklist

Use this as a practical, step-by-step prep list for the transition to the modernized National Spatial Reference System (new terrestrial and geopotential datums in 2027). Prepare your organization's workflows, software, equipment and accuracy needs.

1) Governance and Scope

- Identify a team lead to provide guidance concerning the datum change in 2027 (survey, GIS, IT, asset management, hydraulics, mapping).
- Inventory where geospatial data is stored: databases, GIS layers, CAD files, field controllers, web apps, reports, and PDFs.
- Define accuracy classes and critical assets (e.g., control, boundaries, utilities, flood models) that are most sensitive to datum shifts.

2) Current-State Baseline

- Document present reference frames and vertical datums used (e.g., NAD 83 realization, NAVD 88, local tide datums).
- Record metadata practices for each dataset: epoch/date of coordinates, geoid model, transformation history.
- Capture typical project workflows and software versions; list installed transformation grids and geoid models.
- Quantify positional accuracy by data class; note any known systematic offsets

3) Transformations and Tools

- List all transformations you rely on (horizontal and vertical). Note required grid files, geoid models, and software pipelines.
- Obtain and validate official transformation resources when published (e.g., grids, parameters, velocity models).
- Build test workflows in a sandbox: transform sample datasets of different vintages and types; measure residuals vs. control.
- Establish approved forward and backward paths (legacy-to-modernized and modernized-to-legacy) including metadata handling.

5) Software and Systems

- Confirm vendor support and versions needed for the new datums, epochs, and geopotential model integration.
- Plan upgrade windows for:
 - Desktop GIS/CAD and survey suites.
 - Geoprocessing servers and map services.
 - Field data collectors and firmware.
 - Coordinate transformation services and APIs.
- Prepare rollback plans and keep legacy engines available for historical reproduction.

6) Data Migration Strategy

- Classify datasets by action:
 - Transform now and store in modernized frames.
 - Store-as-legacy but transform on-the-fly at read time.
 - Leave unchanged (archival) with clear warnings.
- Prioritize mission-critical layers (boundaries, parcels, utilities, DEMs, floodplains).
- For rasters/DEMs, evaluate regridding or vertical conversion impacts; document uncertainty impacts on analyses.
- Create batch jobs to:
 - Apply transformations.
 - Update spatial indexes.
 - Refresh derived products (tiling, contours, network topology).
- Embed provenance: original datum/epoch, transform method/version, date run, expected uncertainty.

7) Vertical Datums and Water Resources

- Map all uses of NAVD 88/local MSL to the new geopotential datum and the geoid model to be used.
- Recompute critical elevations (flood stages, design grades, levee crowns) where differences are consequential.
- Validate hydrologic/hydraulic models (HEC-RAS, SWMM, etc.) for sensitivity to vertical shifts; update boundary conditions if needed.
- Coordinate with agencies and regulators on required vertical references in submissions.

8) Web Services and Integrations

- Update EPSG/CRS codes and coordinate transformation parameters in:
 - Map services (WMS/WMTS/XYZ), vector tiles, and feature services.
 - Geocoding/routing services and spatial analysis engines.
 - Data exchange formats and ETL jobs.
- Provide dual-publish during cutover (legacy and modernized) with clear layer naming and metadata.
- Version your APIs; communicate deprecation dates for legacy-datum endpoints.

9) QA/QC and Acceptance

- Define acceptance thresholds per data class (e.g., RMSE/95% confidence after transform).
- Establish check procedures:
 - Check against re-observed control.
 - Spot-check high-value assets and boundary corners.
 - Cross-compare against authoritative datasets from partners.
- Document discrepancies and corrective actions; lock in a sign-off protocol.

10) Metadata, Naming, and Cartography

- Update layer names, map legends, and disclaimers to reflect the new reference frames and epochs.
- Standardize metadata fields for:
 - CRS name and EPSG code.
 - Realization/epoch and geoid model.
 - Transformation name/version and uncertainty estimate.
- Review scale bars, graticules, and annotation that may imply old datums.

11) Training and Communications

- Prepare short primers for executives, project managers, field crews, GIS analysts, and external partners.
- Publish a change calendar: test window, dual-publish phase, organization-wide switchover, and support period.
- Clearly state expected magnitude/direction of shifts in your region and where users will notice them most.
- Provide “what to do if” guides (unexpected offsets, mixed-datum overlays, legacy project updates).

12) Contracts, Standards, and Compliance

- Update scopes of work, survey specs, and CAD/GIS delivery standards to reference the modernized NSRS and vertical datum.
- Align with regulatory and funding requirements; verify submittal CRS/datum expectations with agencies.
- Require transformation provenance and uncertainty reporting in vendor deliverables.

13) Partner and Data Supplier Coordination

- Notify adjoining jurisdictions, utilities, and data providers of your timeline and conventions.
- Request their planned adoption details and offer test exchanges to detect cross-boundary seams.
- Establish interim rules for mixed-datum environments (e.g., always transform to project datum at ingest).

14) Risk Management and Rollback

- Identify high-risk datasets/processes and define hold points.
- Keep read-only snapshots of pre-change systems and data.
- Define a rollback trigger and steps if QA fails or critical partners are not ready.

15) Post-Cutover Monitoring

- Track incidents (offset reports, failed transformations) and resolve root causes.
- Re-run key analyses and dashboards; confirm results are consistent with expectations.
- Schedule periodic checks for epoch/velocity updates and geoid model refreshes; plan maintenance windows.

Practical next step: turn this into a tailored runbook. Start by filling a one-page inventory table listing each dataset/system, current datum/epoch, owner, action (transform/store/OTF), priority, software dependency, and target date.