WV GIS Technical Center
(July 1, 2020 – June 30, 2021)
2021 Annual Report

WV GIS Technical Center

The West Virginia GIS Technical Center, located in the Department of Geology and Geography, West Virginia University, provides focus, direction, statewide coordination, and leadership to users of geographic information systems (GIS), digital mapping and remote sensing within the State of West Virginia. The Center was established by Executive Order 4-93 to provide coordination and technical support in the development and operation of geographic information systems (GIS) for the State. Statewide geospatial activities are coordinated through the WV Office of GIS Coordination, WV Geological and Economic Survey. *Below are selected highlights for GIS Data Development, GIS Map Applications, Web Portals, and GIS Services.*

GIS Data Development

The Center plays a crucial role in not only serving critical spatial data to state users but in updating and integrating local geospatial data within state and national geospatial databases. These data layers are utilized by **state agencies**, **communities**, and the **general public** for applications that include emergency response, risk assessments, economic development, energy resource exploitation and management, transportation, natural resources, community planning, tax assessments, and health studies. This past year the Center focused on the development of the geospatial data layers listed below to enhance the State's Spatial Data Infrastructure. The continued development and publishing of GIS layers through the state clearinghouse node hosted by the Center supports the Mineral Lands Mapping Program and other vital programs in the State that depend on current and accurate mapping layers.

- **Mineral Parcel Mapping:** The Mineral Parcels Map Project is a collaborative effort with the WV Property Tax Division and WV Geological and Economic Survey. This past year the WV GIS Technical Center (WVGISTC) reviewed 24,769 mineral records, mapped 20,590 unique mineral records, and georeferenced 759 well plats. WVGISTC progressed in mapping unmapped mineral records for three counties: Ritchie (28%), Doddridge (31%), and Harrison (27%) counties.
- **Landslides:** A statewide landslide susceptibility map was created from 66,000 landslides captured from the new LiDAR-derived elevation data of which 1,082 landslides have been field verified. Although most of the landslide types are classified as slides, other landslides mapped include debris flows, rock falls, lateral spreads, and multiple failures.
- **E-911 Addresses and Digital Parcels**: A major state contract through WVU Procurement was awarded to a GIS professional services company to enable 15 communities to correct deficiencies with their E-911 addresses or tax maps. During this reporting year, digital tax map projects were completed for Clay, McDowell, Roane, and Tucker counties, while E-911 addressing projects were completed for Clay, Morgan, Preston, Roane, and Wyoming counties. Status Graphic: GIS Reference Data Development.
- **Aerial Imagery:** A state contract executed through WVU Procurement has allowed for 22 counties to capture spring leaf-off imagery at six- or four-inch resolutions between 2019 and 2021. The best available, leaf-off countywide imagery is mosaicked together and published as a statewide aerial imagery map service.   Status Graphic: County Aerial Imagery Year Acquired.

- **Elevation:** Published high-resolution 1-meter digital elevation models and 1-foot contours derived from the 2018 FEMA LiDAR data for Mason, Putnam, Randolph, Roane, Tucker, and Wirt counties. Quality checked and organized all the new FEMA-purchased QL2 LiDAR-derived elevation products for West Virginia which are downloadable from the WV Elevation Download Tool (www.mapwv.gov/elevation). Created new statewide elevation and hillshade grids from the best available elevation sources and published to the State Data Clearinghouse. The statewide FEMA-purchased LiDAR and derived products are valued at $10 million; the State should receive the final QL2 LiDAR deliveries for the remainder of the State in October 2021. Status Graphic: FEMA-Purchased LiDAR Elevation Status.
- **Flood-Risk Buildings:** Completed a statewide building inventory of primary structures in the 1-percent-annual-chance (or 100-year) floodplain. Published to the WV Flood Tool's RiskMAP View 98,000 building-level risk assessments for a 1-percent-annual-chance flood event. Added other flood-risk and mitigated property layers to the WV Flood Tool in support of flood reduction efforts.
- **Highway Plans:** Scanned 9,851 highway plan sets for an ongoing project with the WV DOT.
- **Recreational Trails:** Inventoried and published recreational trails for West Virginia comprised of 5,680 miles of land trails and 3,434 miles of flatwater/whitewater trails. Customized trail maps were made for several state and local agencies including a WV Rail-Trails map.
- **Public Lands:** Coordinated with the Division of Natural Resources and other stakeholders to review the state public lands and local parks for submission to the Protected Areas Database of the United States.
- **Essential Facilities/Community Assets:** Published updated essential facilities and community assets to the State Data Clearinghouse.

GIS Map Applications

Continued application and web programming assistance was provided for state and federal agencies in support of West Virginia and its citizens. These applications support multiple state agencies via e-governance solutions to meet their regulatory and information exchange requirements. (Table 1). This past year, for example, the Center modernized the trail inventory application which displays over 9,000 miles of land and water trials for West Virginia. Additionally, during this fiscal year, the Center modernized desktop applications for the WV Property Viewer, WV Flood Tool, WV Interagency Tool, WV Wetlands Functional Assessment Tool, WV Trail Inventory Viewer, and WV Elevation Download Tool. The Center also supported federal initiatives for the Marcellus Shale Energy and Environment Laboratory (www.mseel.org) and terrestrial biosphere carbon (www.carbonscapes.org).

Table 1: Statewide Map Applications supported by Center

APPLICATION	PURPOSE	SPONSOR
WV Elevation & Lidar Download Tool	Download LiDAR, digital elevation models, and contours (www.mapwv.gov/elevation)	WV VIEW
WV Flood Tool	Flood hazard determinations, floodplain management, building-level risk assessments (www.mapwv.gov/flood)	WV DHSEM, FEMA
SHPO Map Viewer	Conduct Cultural Resource Section 106 reviews (www.mapwv.gov/SHPO)	SHPO
Statewide Addressing & Mapping System (SAMS)	Update address sites and road centerlines required for emergency response (www.mapwv.gov/address)	WV DHSEM, E-911 Address Coordinators
WV Hunting and Fishing	Search and identify hunting and fishing adventures (http://www.mapwv.gov/huntfish)	WV DNR
WV Trail Inventory	View publicly accessible recreational trails in the State (http://www.mapwv.gov/trails)	WV DOT
WV Highway Plans Locator	View and download archival highway plans (http://www.mapwv.gov/dotplans)	WV DOT
WV Conservation Interagency Conservation Tool	Determine conservation planning measures for endangered species in support of environmental site evaluations (www.mapwv.gov/ICT)	WV DNR, NRCS
WV Property Viewer & Property Record Search	Search and display property information for entire State (www.mapwv.gov/property). Includes delinquent properties managed by the WV State Auditor's Office.	WV Tax, WV State Auditor
Wetlands Functional Assessment	A standardized tool for assessing wetlands (https://mapwv.gov/wetlands)	WV DEP
WV Water Quality Impact Portal (WVWQIP)	Obtain information about past and current water quality in the 14 Marcellus Shale gas development counties (https://www.mapwv.gov/wvwqip)	WV DEP, EPA

Web Portals

The Center maintains two major web portals to distribute spatial data and information in the State. Presently the **WV GIS State Clearinghouse** (http://wvgis.wvu.edu) catalogs over 300 unique datasets and 120 web services valued at more than $65 million dollars, while **MapWV.gov** (http://mapwv.gov) provides a public gateway to online mapping resources in the Mountain State. These geospatial services are distributed through virtualized servers and storage devices located at the Center with an expanded storage capability of 197 TB. These servers are continuously tuned and configured to attain high-availability performance.

Web usage statistics reveal that MapWV.gov had increased traffic significantly for FY21 as web map services continued to grow in popularity. A factor for the traffic increase may be attributed to the higher demand from users working remotely due to the pandemic. Average pageviews per day surged from slightly under 86,000 last year to in excess of 131,000 this year. Total pageviews jumped from 8.3 million to slightly over 12 million, almost 50% more pages than the previous year. Similarly, the WV GIS Technical Center's Data Clearinghouse saw a significant increase in traffic, from slightly over 530,000 page views to 713,000 page views. As evident by the web statistics, the WV Property Viewer is the most popular viewer application and has experienced significant user demand.

Services

This past year the WV GIS Technical Center continued to assist the WV Geospatial Community with advisory, training, and outreach services. These services are coordinated with the WV Office of GIS Coordination and WV Association of Geospatial Professionals.

- Due to the COVID-19 pandemic, the GIS Technical Center transitioned its regularly scheduled GIS Foundations and ArcGIS Pro courses from in-person to remote training.
- Provided GIS technical services for the WV Geological and Economic Survey on migration to the GeMS (Geologic Map Schema).
- Supported and presented at the WV Association of Geospatial Professionals (WVAGP) annual conference (virtual) June 29-30, 2021. During the conference, activity reports and GIS presentations from governmental, professional, and private organizations were given as well as workshops for ArcGIS Pro and GIS in Addressing.
- Supported the WV Emergency Management Division and communities with mapping support for the Statewide Addressing and Mapping System hosted on the Center's servers.
- Training and outreach services were provided on numerous occasions in support of the WV Flood Tool, an important web application used by floodplain managers and FEMA personnel.
- Continued technical support for statewide multi-hazard risk assessments for 287 communities in West Virginia to supplement local hazard mitigation plans.
- Presented on geospatial activities and projects at state and national conferences/webinars.
- Provided technical advisory services to the state geospatial community. The Technical Center responds to an estimated 15 public calls per week from the public and clients regarding GIS data and applications.
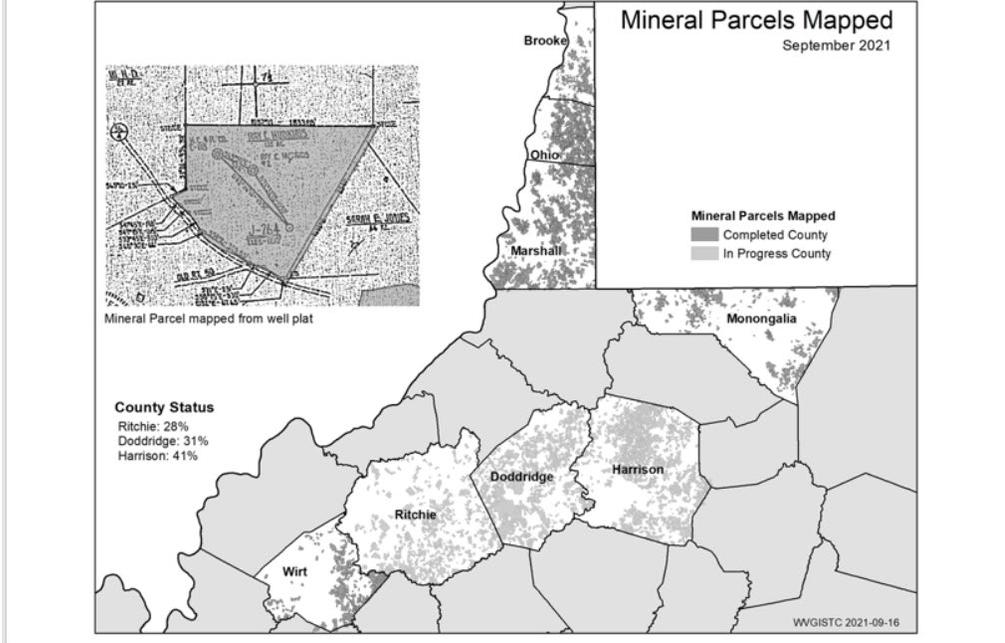
Figure 1. The Mineral Parcels Map Project is a collaborative effort with the WV Property Tax Division and WV Geological and Economic Survey to map mineral parcels.
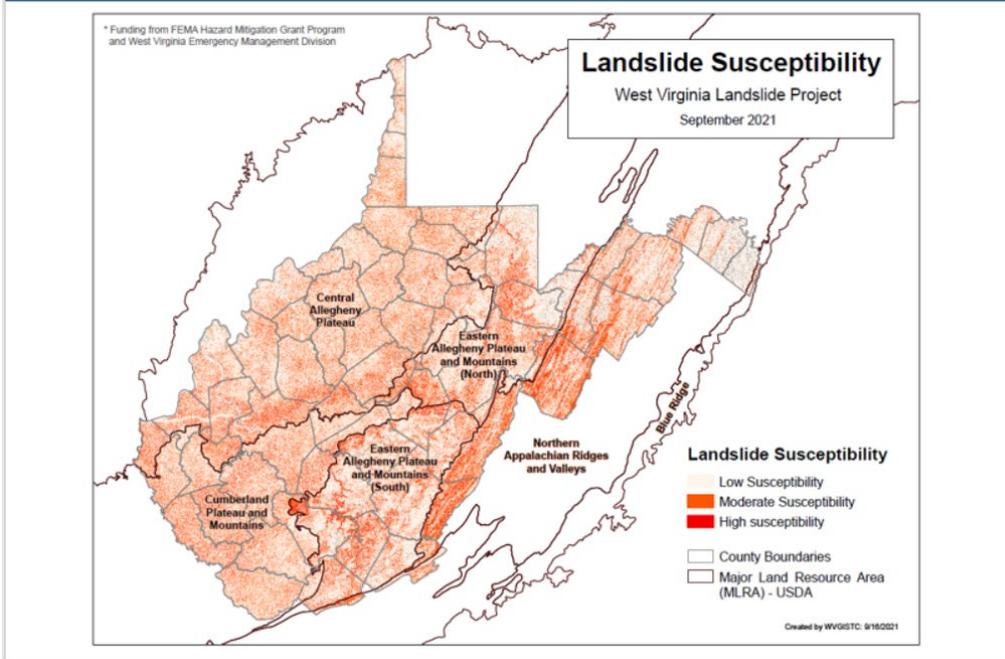

Figure 2. The new FEMA-purchased LiDAR allows for many elevation applications including the mapping of landslide incidents and susceptibility zones (www.mapwv.gov/landslide)
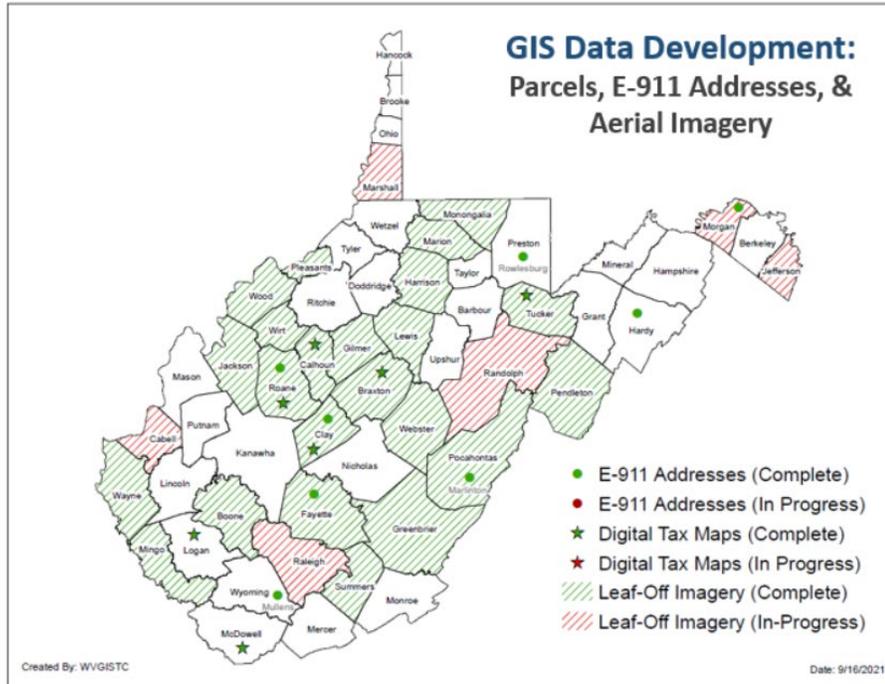
Figure 3. Two statewide GIS contracts through WVU Procurement currently support parcel, address, and aerial imagery data development for multiple communities in West Virginia
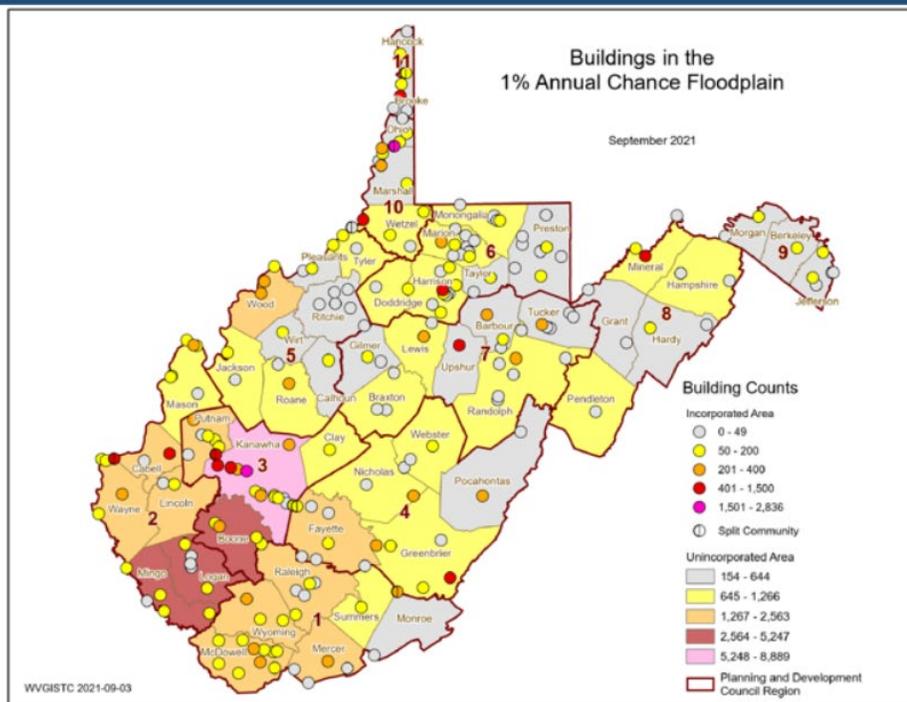
Figure 4. Completed a statewide building inventory of primary structures in the 1-percent-annual-chance (or 100-year) floodplain
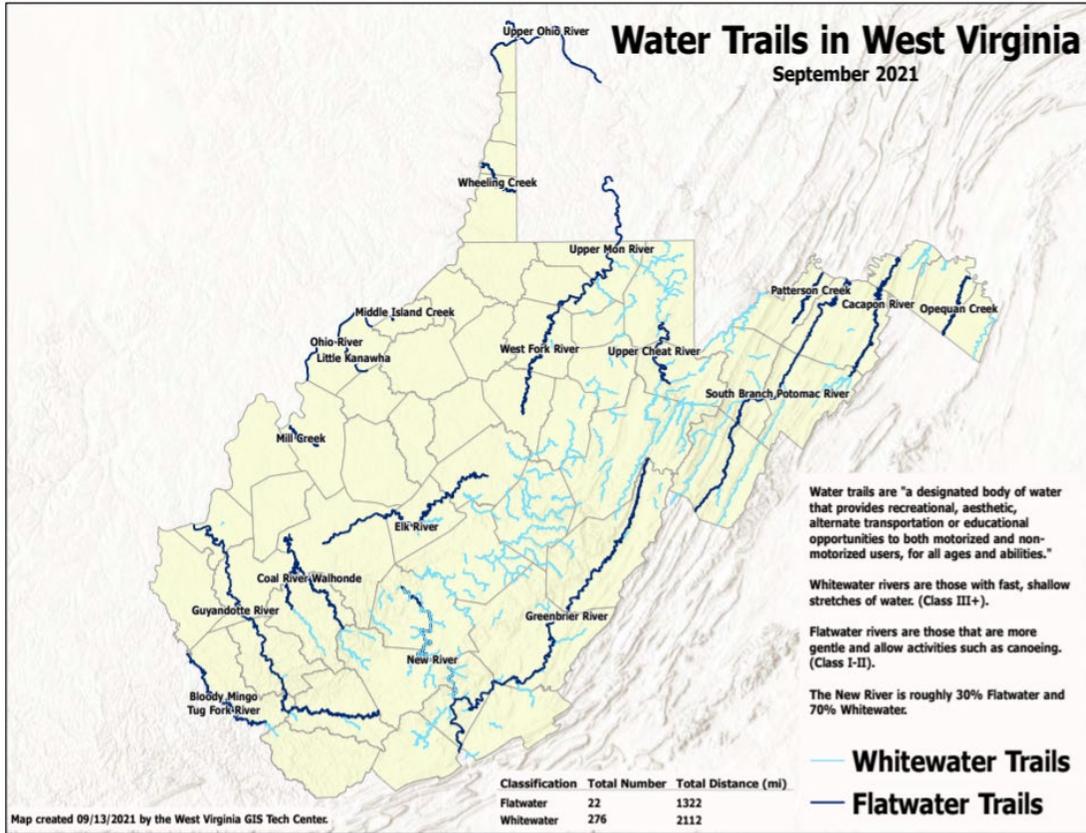
Figure 5. Inventoried and published recreational trails for West Virginia comprised of 5,680 miles of land trails and 3,434 miles of flatwater/whitewater trails

Figure 6. The WV Property Viewer and Property Search Tool for searching and viewing property records (www.mapwv.gov/property) continues to grow in popularity