WV GIS Technical Center
(July 1, 2019 – June 30, 2020)
2020 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 46,033 mineral records, mapped 8,353 unique mineral records, and georeferenced 806 well plats. WVGISTC completed mapping records for Marshall and Wirt counties, and progressed in mapping unmapped mineral records for three counties: Ritchie (23%), Doddridge (17%), and Harrison (7%) counties.
- **E-911 Addresses and Digital Parcels**: A major state contract through WVU Procurement was awarded to a GIS professional services company to assist 15 communities in correcting deficiencies with their E-911 addresses or tax maps. During this reporting year, digital tax map projects were completed for Braxton, Calhoun, and Logan counties, while E-911 Addressing projects were completed for Fayette, Hardy, and Pocahontas counties. Status Graphic: GIS Reference Data Development.
- **Aerial Imagery:** A state contract executed through WVU Procurement allowed for 12 counties to capture spring 2020 leaf-off imagery at four-inch resolution. The best available, leaf-off countywide imagery is mosaicked together and published as a statewide imagery map service. Status Graphic: County Aerial Imagery Year Acquired.
- **Elevation:** Processed and published 2-foot contours from the 2012 FEMA LiDAR-derived elevation data for Morgan and Berkeley counties Quality checked and organized all 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 2021. Status Graphic: [FEMA-Purchased LiDAR Elevation Status](.).

- **Landslides:** More than 66,000 landslides were mapped 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, rockfalls, lateral spreads, and multiple failures. The landslide incidents mapped from LiDAR-derived digital elevation models are model inputs for creating landslide susceptibility maps for the State.
- **Flood-Risk Buildings:** Published to the WV Flood Tool more than 25,000 building-level risk assessments for a 1-percent-annual-chance (or 100-year) flood.
- **Highway Plans:** Scanned nearly 9,000 highway plan sets for an ongoing project with the WV DOT.
- **Recreational Trails:** Inventoried and published recreational trails for West Virginia that include 5,314 miles of land trails and 3,373 miles of blue water/whitewater trails. Customized trails maps were made for several state and local agencies.
- **Public Lands:** Coordinated with the Division of Natural Resources and other stakeholders to update the state public lands and local parks for submission to the Protected Areas Database of the United States.

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 completed the WV Water Quality Impact Portal (WVWQIP) which provides information about past and current water quality in the 14 counties where most of the active Marcellus Shale gas development has taken place. Additionally, during this fiscal year, the Center modernized desktop applications for the WV Flood Tool, WV Interagency Tool, WV Wetlands Functional Assessment Tool, WV Trail Inventory Viewer, and WV Elevation Download Tool. A new e-governance solution implemented this past year allows for the WV State Auditor's Office to publish weekly its delinquent properties to the WV Property Viewer (www.mapwv.gov/property) with links to the State Auditor's Delinquent Properties Database. 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 a storage capability of 150 TB. These servers are continuously tuned and configured to attain high-availability performance.

Web usage statistics reveal that MapWV.gov had a significant increase in traffic for FY20 as web map services continue to grow in popularity. Average pageviews per day surged from slightly over 50,000 last year to in excess of 85,000 this year. Total pageviews nearly doubled from 4.6 million to 8.3 million, almost 80% more pages than the previous year. The new WV Property Viewer and Real Estate Assessment Search tools (www.mapwv.gov/property) account for most of this growth. The property and assessment tools have grown in popularity and are used by many organizations in performing multi-county property record searches.

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.

- The GIS Technical Center provided GIS Foundations in-person training at the WVU Morgantown campus and the Division of Highways in Charleston. Due to the COVID-19 pandemic, the Center transitioned to remote training for its ArcGIS Pro and ArcGIS Online courses.
- Provided limited mapping support to the WV Development Office for mapping schools in support of fiber deployments. In addition, the Center supported a WV Development Office's request for a statewide trail map that was required for a planning document.
- Supported the WV Emergency Management Division and communities with mapping support for the Statewide Addressing and Mapping System hosted on the Center's servers.
- Coordinated with FEMA's National Hazard Modeling Team on the development of its Flood Assessment Structure Tool (FAST).
- Provided the WV DHHR with address geocoding support for the COVID-19 pandemic emergency.
- 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.
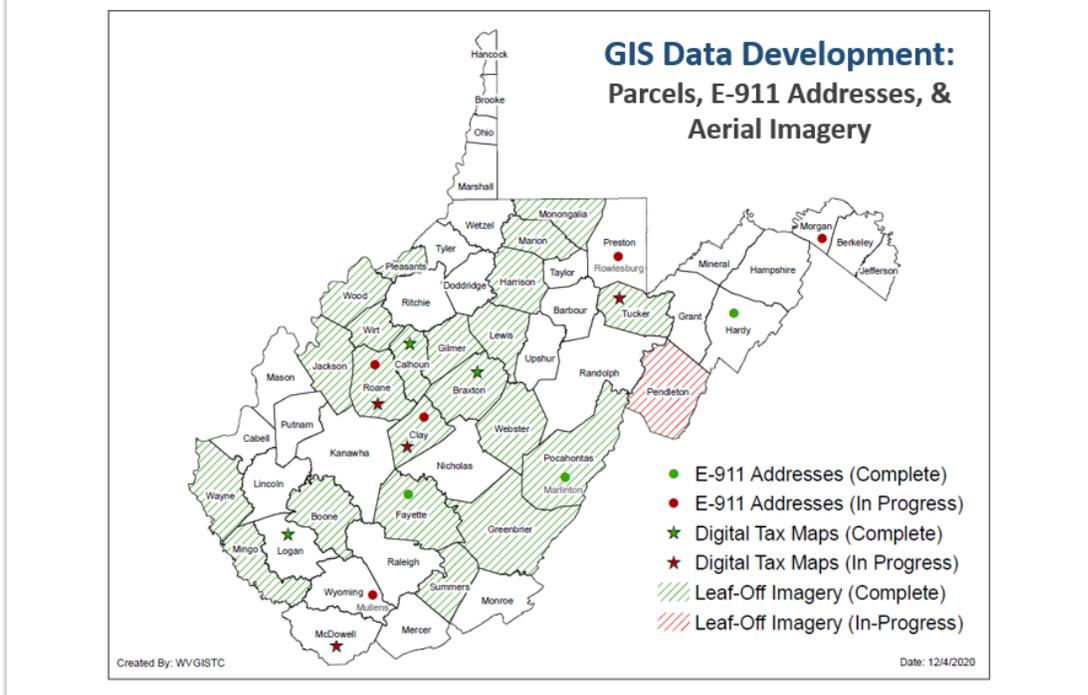
Figure 1. Two statewide GIS contracts through WVU Procurement currently support parcel, address, and aerial imagery data development for multiple communities in West Virginia
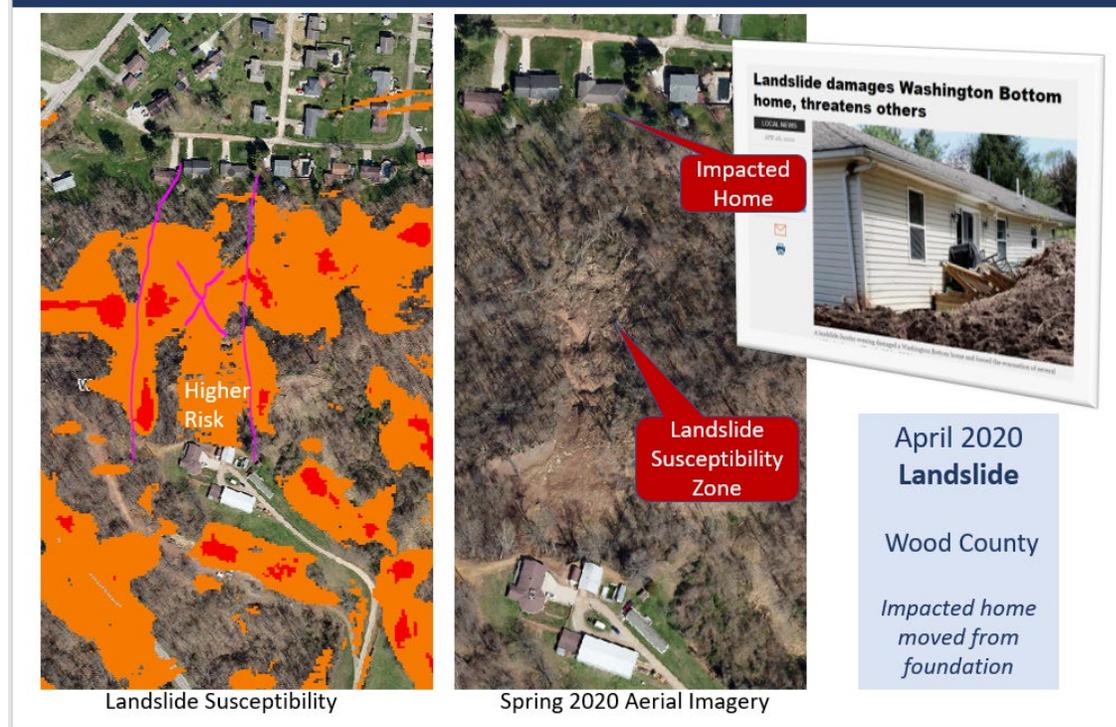

Figure 2. The new FEMA-purchased LiDAR allows for many elevation applications including the mapping of landslide incidents and susceptibility zones (www.mapwv.gov/landslide)
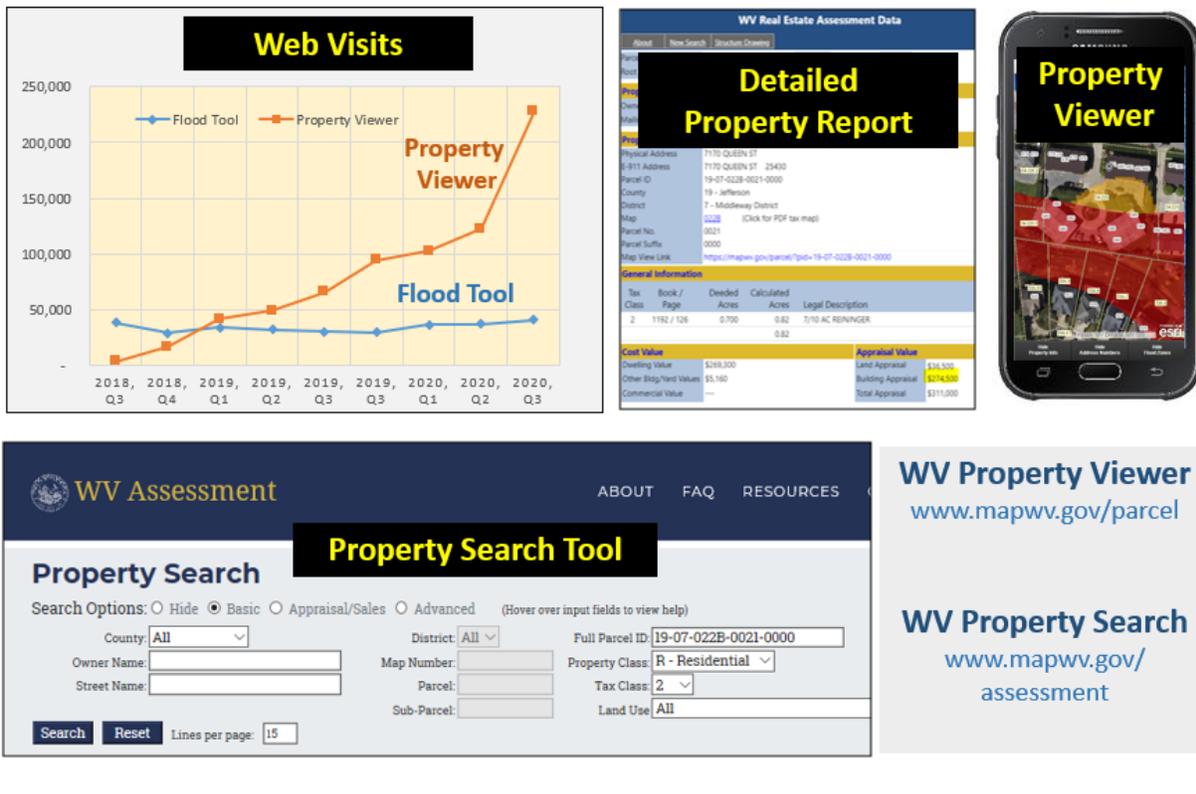
Figure 3. The popular WV Property Viewer and Property Search Tool for searching and viewing property records (www.mapwv.gov/property)