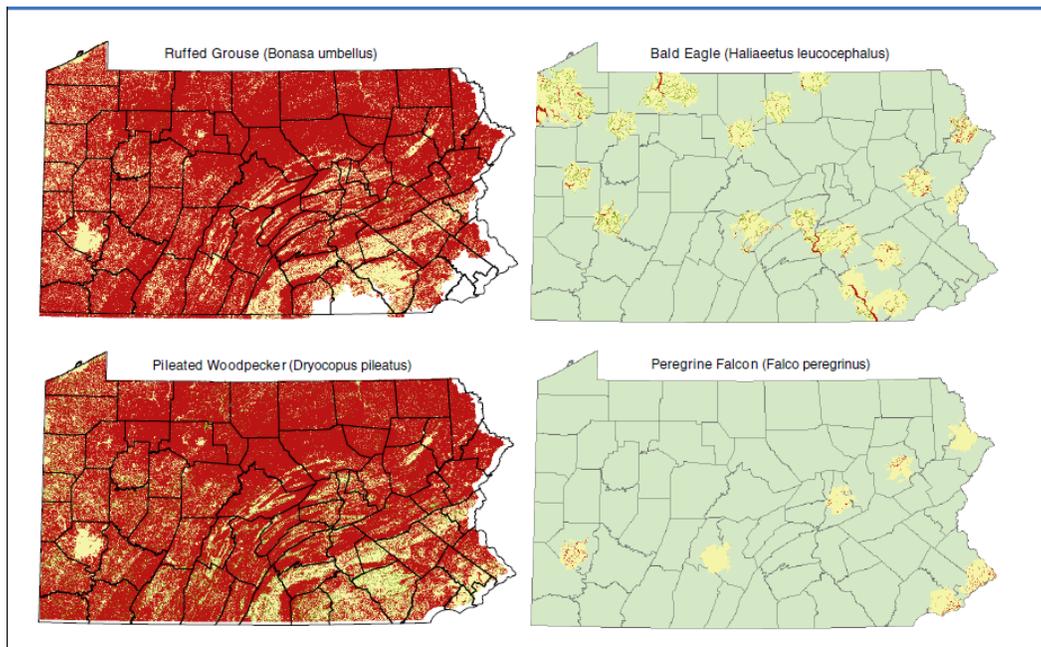


Pennsylvania Spatial Data Access

(PASDA—<http://www.pasda.psu.edu>)



Annual Report

July 1, 2010-June 30, 2011

Submitted

by

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Penn State Institutes of Energy and the Environment

The Pennsylvania State University

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OVERVIEW

Pennsylvania Spatial Data Access (PASDA—<http://www.pasda.psu.edu>), the official public geospatial data clearinghouse for the Commonwealth of Pennsylvania marked its 15th year in 2011. PASDA, which has grown from a small website offering 35 data sets in 1996 to the expansive user centered data clearinghouse that it is today, has become a staple of the GIS community in Pennsylvania. PASDA provides access to thousands of data files, terabytes of data, and hundreds of Internet Map Services, Google Earth KML files, metadata, mapping applications, and other information like guides and tutorials.

Users come from a broad spectrum of organizations and backgrounds, from teachers and citizens to businesses and government agencies--PASDA provides free access to data, applications, and customization tools to meet the needs of every user. PASDA saw a dramatic increase of use in almost every sector driven in part by factors such as Marcellus Shale exploration, environmental conservation, economic development initiatives, expanded use of geospatial data in universities, non profits, and the private sector, and the increased interest from average citizens who are able to access geospatial information via PASDA's data previewer and KML files without the need for specialized GIS software.

The use of PASDA has continually increased over its history. In the past year, almost **1.5 million** files were downloaded from the PASDA FTP site; while usage on the entire site topped **53 million** hits. The PASDA web servers, which provide access to Internet Map Services and PASDA applications like the Imagery Navigator, supported almost **37 million** map views. The statistics this year demonstrate more than any other that there is a wide range of data that is of great interest to the user community. Data (and map services created from data) from our partners at the PA Department of Environmental Protection, PennDOT, PA Department of Conservation and Natural Resources, Allegheny County, the DCNR PAMAP Program, the Delaware Valley Regional Planning Commission, and the City of Philadelphia received phenomenal use—**with map service views and data downloads in the millions or hundreds of thousands.**

In addition, PASDA has created highly significant applications and services that dramatically increase the value of the data available. The Imagery Navigator and legacy Imagery Navigator combined supported almost **4.2 million** views and the Aerial Photo Cache, created and deployed by PASDA in November 2010 supported **4.7 million** views in just over six months.

One of the most substantial initiatives in the past year involved the development and deployment of a new architecture for PASDA. The intense usage of the site and services and the growing amount of data caused PASDA to look for additional resources available through Penn State University. PSIEE, PASDA's home institute has provided servers and equipment for the past two years allowing the expansion of the available Internet Map Services and storage of large data sets. In addition, the director of PSIEE supported a collaborative effort to acquire additional resources to support our data initiatives. This initiative resulted in a partnership with the Penn State Institute for CyberScience (ICS) and the Penn State High Performance Computing Center (HPC). The ICS and HPC

provided us with additional data storage (approx 50 TB currently) and Windows servers that will allow expansion of data services and data storage for the next two years. This new architecture will also allow for the decommissioning of old systems which are exhibiting performance issues and the redeployment of other systems to new functions.

PASDA has also been able to add new applications and functions to its online mapping systems. A new Imagery Navigator was developed to replace the Navigator developed in ArcIMS. This new Imagery Navigator included pop up dataset selection windows, tabs for navigating through collections, and a new print functionality. PASDA is also deploying a new Pennsylvania Atlas to replace the old Atlas developed in ArcIMS (the redevelopment of these applications will allow PASDA to decommission ArcIMS servers). This Atlas, developed in javascript, will provide users with access to dozens of datasets which can be viewed in the mapper or even printed.

Finally, PASDA has continued to give back to the GIS community. As in past years, PASDA staff have participated in numerous meetings including PA GIS Day planning meetings, the PA GIS conference planning meetings (for both of which PASDA developed sessions, obtained speakers, and also presented), PA NHD committee meetings, PAVIEW meetings, and the Northwest PA GIS conference. PASDA has also provided support and guidance for counties and local governments, regional entities, other states such as New Jersey and North Carolina, and even provided information and guidance on data sharing and clearinghouses to representatives of other countries including Canada, Bermuda, and South Africa.

ABOUT PASDA

PASDA was developed by the Pennsylvania State University as a service to the citizens, governments, and businesses of the Commonwealth. PASDA is a cooperative project of the Governor's Office of Administration, Office for Information Technology, Geospatial Technologies Office and Penn State Institutes for Energy and the Environment of the Pennsylvania State University. Funding is provided by the Pennsylvania Office for Information Technology, Geospatial Technologies Office. The Pennsylvania State University provides additional substantial support to PASDA for system administration, database technologies administration, and infrastructure. PASDA has served for the past fifteen years as the Commonwealth's node on the National Spatial Data Infrastructure (NSDI), Geospatial One Stop, and the National Biological Information Infrastructure.

PASDA is housed at Penn State Institutes of Energy and the Environment (PSIEE). The PASDA staff include:

- Maurie Kelly, Director
- Ryan Baxter, Information Technology Coordinator
- James Spayd, Database Systems and Data Specialist
- Scott Dane, Data Manager

- **Note:** In addition, the PASDA staff would like to gratefully acknowledge the continued assistance and support of Chris Pfeiffer of PSIEE and Jason Holmes and Michael Fenn of the HPC.

The purpose of Pennsylvania Spatial Data Access (PASDA) is to serve as a comprehensive geospatial data digital library by providing free, universal access to geospatial data and information by, for, and about the Commonwealth of Pennsylvania.

The Keystones of PASDA

The success of PASDA is based on a long-term vision that incorporates the ideas of free access to data, outreach, and community service. The keystones in the success of the program are:

Collaboration--PASDA understands that collaboration among the geospatial community benefits everyone in the Commonwealth. Collaboration saves money, time, and makes the most of the limited resources of data providers.

Cooperation--PASDA cooperates with all levels of government, non-profits, academia, business, and citizens to support the geospatial data infrastructure and access to data.

Continuity--PASDA works with data providers to ensure continuity of data access and storage.

Active Engagement--PASDA engages the geospatial community to foster understanding and data sharing.

Efficiency--PASDA's streamlined processes make data sharing fast and easy for our partners.

Free Access--PASDA provides data storage, data access and retrieval, and metadata services free of charge.

PASDA will continue to provide free storage of geospatial data, as well as build partnerships that enhance ease of access and benefit the data provider, and to develop data access resources and innovative tools to enhance the use and benefits of geospatial data for all citizens of the Commonwealth and geospatial community.

The data made available through PASDA is provided by our data partners to encourage the widespread sharing of geospatial data, eliminate the creation of redundant data sets, and to further build an inventory (through the development and hosting of metadata) of available data relevant to the Commonwealth. PASDA serves as a resource for locating data throughout the Commonwealth through its data storage, interactive mapping/webgis applications, and metadata/documentation efforts.

PASDA Services

The data made available through PASDA is provided by our data partners to encourage the widespread sharing of geospatial data, eliminate the creation of redundant data sets, and to further build an inventory (through the development and hosting of metadata) of available data relevant to the Commonwealth. PASDA serves as a resource for locating data throughout the Commonwealth through its data storage, interactive mapping/webgis applications, and metadata/documentation efforts. PASDA services are provided free of charge to all users and data providers. The data on PASDA is provided by federal, state, local and regional government agencies, non-profit organizations, and academic institutions throughout the region.

Data Storage and Access--PASDA works directly with state and federal agencies, local and regional governments, non-profit organizations, and academic institutions to access to the widest variety of data possible. There is no fee to store or provide access to data via the PASDA clearinghouse.

Inventory and Documentation (Metadata)--PASDA will create FGDC standard metadata free of charge for any agency, organization, or data stakeholder. The metadata will also be hosted by PASDA for the purposes of developing the state data inventory.

Data Liaison Activities--PASDA staff work directly with state agencies to identify, document, and provide access to agency data. PASDA works directly with state and federal agencies, local and regional governments, non-profit organizations, and academic institutions to access to the widest variety of data possible. There is no fee to store or provide access to data via the PASDA clearinghouse.

Metadata Training--PASDA staff provide free metadata training and training in the use of PASDA for individual organizations and groups. PASDA offers formal training twice a year at different locations throughout the Commonwealth. If you would like to participate in or host a metadata or PASDA training session, please contact pasda@psu.edu.

Educational Outreach--PASDA works with non-profit organizations such as watershed groups and K-12 schools to promote the knowledge and use of GIS. PASDA develops lessons, tutorials, and guidelines for new GIS users.

Presentations & Seminars--PASDA staff offer seminars and presentations at meetings, conferences, and schools.

User Assistance--PASDA is committed to providing timely user assistance with the PASDA website and the data available through PASDA. Since PASDA is not the originator of the data found on the site, specific questions about data sets are often best directed toward the data contact listed in the metadata. However, feel free to contact PASDA with any question

SUMMARY OF MAJOR ACTIVITIES & ACCOMPLISHMENTS

JULY 1 2010-JUNE 30-2011

The period of July 1 2010-June 30 2011 has been an extremely busy and productive period for PASDA. In the past year, PASDA has received numerous new data sets and updates, moved major components of its architecture to a new environment, upgraded services to new software, presented at several conferences and meetings, served on committees to support GIS activities across the state, developed and deployed new applications, services, and functionality, and supported thousands of users via email, phone, and in person.

Data & Metadata

In the past year, PASDA has received numerous new and updated datasets and metadata. A more detailed listing is included in the detailed description of activities below but the following represents a quick overview of data.

New datasets include the 2008 PAMAP program imagery, the 2008 PAMAP program LIDAR products including the LAS files, new data from the PA DEP, the National Geospatial Agency imagery for western Pennsylvania, the 2010 NAIP imagery (3 and 4 band), Lehigh Valley Regional Planning Commission imagery, new GEOPDF topographic maps from the USGS, data from the PennDOT Bureau of Aviation, game harvest data,

Data updates to existing datasets come to PASDA at different intervals and are based on the update frequency of our data partners. Monthly, quarterly, and annual updates are the norm and include PennDOT, PA Department of Environmental Protection, PA Fish and Boat Commission, PA Department of Health, PA Department of Conservation and Natural Resources, Chester County, Allegheny County, Lancaster County, City of Philadelphia, Southeast PA Transportation Authority, Delaware Valley Regional Planning Commission, PA DCNR Rivers Conservation Program, and the Natural Lands Trust.

INFORMATION FOR THE PERIOD OF PERFORMANCE:

JULY 1, 2010-JUNE 30, 2011

DATA & METADATA

The following is a listing of some of the data PASDA has received in the past year. Most of the data received involves multiple datasets and at times hundreds of files (imagery, lidar, dems, topos).

Note: When data is received by PASDA, metadata is either created for the data or updated to reflect date and distribution (only for existing data sets), data is loaded to FTP site, geodatabases are created, map services and KML files are created for the data. Records are added or updated in the PASDA search database (supports data search on website). Imagery, LIDAR, Topographic maps, DEMs are also added to Imagery Navigator search interface.

- **US Geological Survey/NGA High Res Orthoimagery**--including: Erie, New Castle, and Pittsburgh, PA
- **US Department of Agriculture NAIP 3 Band Imagery for PA (2010)**
- **2010 Lehigh/Northampton County Imagery**
- **PAMAP Program:** 2008 Imagery & LIDAR Complete & vector data
- **Pennsylvania Fish and Boat Commission** --Spring 2011 update layers include: Accesses, Approved Trout Waterbodies (point, line, polygon), Class A Trout Streams, Fishing Special Regulations (point, line, polygon), Water Trails, Trout Stocked Streams.
- **Pennsylvania Department of Health** update - layers include: Birth Centers, Community Mental Health Centers, Drug Alcohol Treatment Facilities, Home Health Agencies, Hospices, Intermediate Care Facilities, Physical Speech Therapy Facilities, Portable Xray, Psychiatric Residential Treatment Facilities, Rural Health Clinic.
- **US Geological Survey Geopdf's for Pennsylvania** --Layered GeoPDF 7.5 Minute Quadrangle Map. Layers of geospatial data include orthoimagery, roads, grids, geographic names, elevation contours, hydrography, and other selected map features.
- **Pennsylvania Department of Environmental Protection** monthly update....plus Three new layers: DEP Regions, Public Water Supplier's (PWS) Service Areas, Marcellus Gas Well Water Sources.
- **Allegheny County monthly** updates: Parcels , Municipal Boundaries, Wooded Areas.
- **Lancaster County** quarterly updates--municipal boundaries, road centerlines and types, urban and village
- **Pennsylvania Department of Transportation annual** update : Congressional boundaries, County boundaries, Engineering district, state & local roads, Administrative state roads, Traffic counts, Municipality boundaries, Urban area boundary, Planning Agencies Boundaries (MPO/RPO), School districts, Senatorial boundaries, State boundary, State house district boundaries
- **City of Philadelphia** 2011 update layers include: Fairmount park properties, Philadelphia Bike Network, Philadelphia curb edges, Philadelphia Evacuation Routes, Philadelphia Parcels, Philadelphia sanitation areas, Philadelphia sanitation districts, Philadelphia street centerlines, Philadelphia Water Inlets, Philadelphia zoning growth boundary polygons

- **PA Highlands Conservation** Information Center (DCNR conservation grantee)
- **Catawissa and Muddy Run** river conservation plans
- **US Department of Agriculture NAIP 4 Band** Imagery for PA (2010)
- **Pennsylvania Department of Environmental Protection Bureau of Mining and Reclamation** updated data
- **Pennsylvania State University** Bear Harvest by County (2003-2009), Deer Harvest by County (2003), Deer Harvest by Wildlife Management Unit (2004-2009), Turkey Harvest by Wildlife Management Units (2003-2009)
- **Pennsylvania Department of Conservation and Natural Resources** data updates including forests, parks, trails.
- **Pennsylvania Department of Conservation and Natural Resources PAMAP Program** 2008 Imagery
- **Pennsylvania Department of Conservation and Natural Resources PAMAP Program** LIDAR LAS data
- **Chester County** updated data and 13 new datasets
- **Allegheny County** Slope data
- **Pennsylvania Department of Transportation** Part 77 Airport Data, airport runways and obstructions
- **Pennsylvania Department of Conservation and Natural Resources PAMAP Program** 2008 LIDAR data
- **Southeast Pennsylvania Transportation Authority** annual update
- **US National Renewable Energy Lab** data updates
- **Pennsylvania Cleanways** data update
- **Tana** data update
- **Allegheny College** Sediment Thickness Data
- **Clearfield Creek Watershed Association** acid mine drainage sites in Cambria County
- **Allegheny College** glacial maps
- **US Bureau of the Census** census blocks, tracts 2010

SYSTEM ARCHITECTURE & APPLICATIONS

- One of the most substantial initiatives in the past year involved the development and deployment of a new architecture for PASDA. The intense usage of the site and services and the growing amount of data caused PASDA to look for additional resources available through Penn State University. PSIEE, PASDA's home institute has provided servers and equipment for the past two years allowing the expansion of the available Internet Map Services and storage of large data sets. In addition, the director of PSIEE supported a collaborative effort to acquire additional resources to support our data initiatives. This initiative resulted in a partnership with the Penn State Institute for CyberScience (ICS) and the Penn State High Performance Computing Center (HPC). The ICS and HPC provided us with additional data storage (approx 50 TB currently) and Windows servers that will allow expansion of data services and data storage for the next two years. This new architecture will also allow for the decommissioning of old systems which are exhibiting performance issues and the redeployment of other systems to new functions.

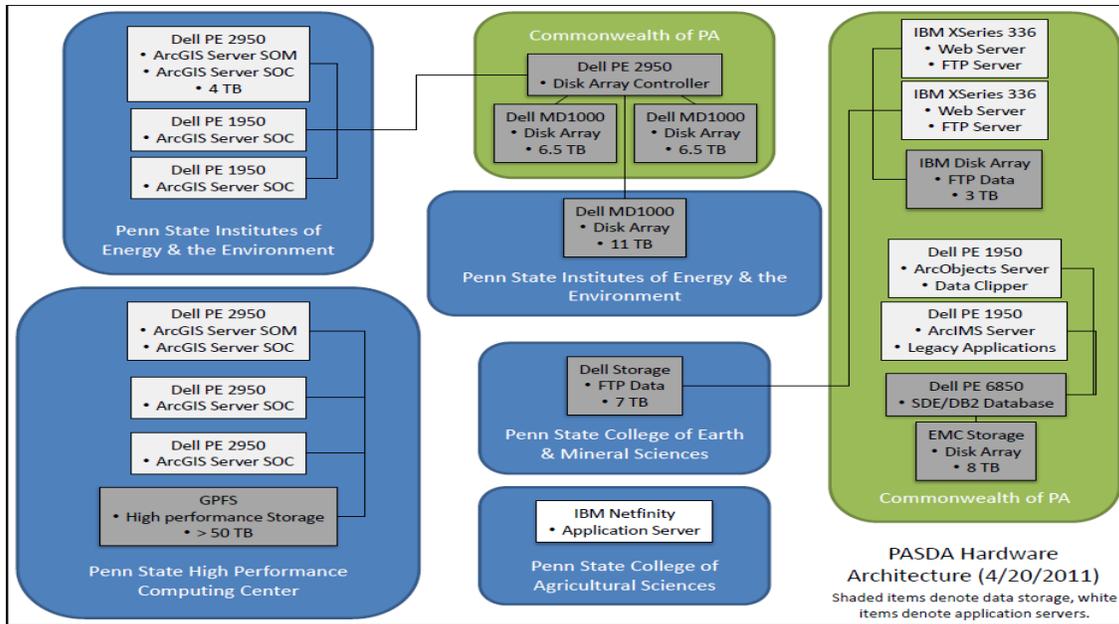


Figure 1. PASDA Hardware Architecture. Penn State HPC architecture is shown on lower left of diagram. This new hardware/systems allows a rearchitecting of existing PASDA resources.

- PASDA developed and deployed beta release and final release of new Imagery Navigator using Javascript/ ArcGIS 10. Interface redeveloped, , tabs, and pop up window functionality developed in beta version. For final version, a print function and additional searches were added.

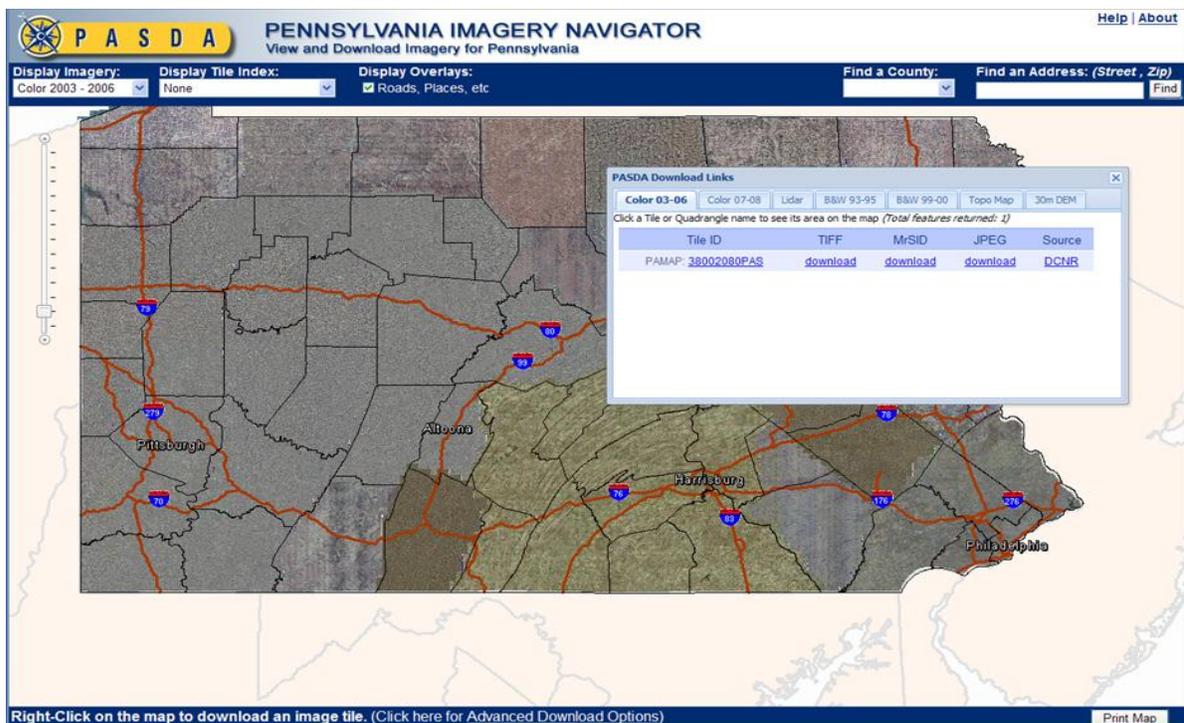


Figure 2. The new Imagery Navigator.

- PASDA is also upgrading the PA Atlas and related data from ArcIMS to ArcGIS server using Javascript. The PA Atlas, to be deployed in July 2011, was redeveloped in ArcGIS server 10 using Javascript.

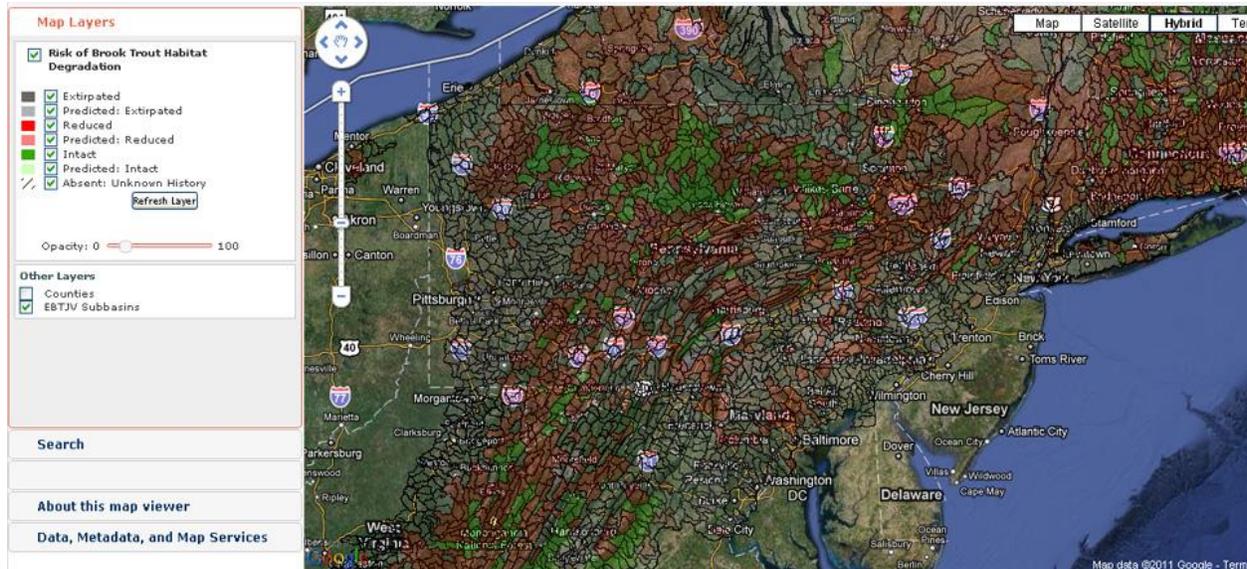


Figure 3. Beta PA Atlas to be deployed July 2011.

MEETINGS/OUTREACH/OTHER

- GTO weekly status meetings
- PASDA weekly staff meetings
- PA GIS Day meetings
- Meetings with High Performance Computing Center staff Mondays 8:30am
- PA GIS Conference planning meetings
- PA NHD committee meetings
- Provided info to PA DEP BIT about rest services and imagery navigator to support their oil and gas well app
- Worked with PennDOT to help with traffic count question
- Worked with PA DOH to help with birthing center question
- Provided system architecture diagram to GTO
- Meetings with PAView committee Tom Mueller (California University), Yassar Ayad (Clarion University), Céleste Barthel (Wilson College), Guillaume Turcotte, (Villanova University)
- Meeting with South Central Terrorism Task Force
- Conference call with Southwest PA Commission regarding data metadata review
- Provided data inventory to GTO
- Provided 2010 stats to GTO

- Conference call with ESRI to discuss optimization of ArcGIS 10 implementation
- Meetings with Cyberscience institute to prepare for use of additional storage
- Provided support and data for WV State GIS Coordinator
- Conference call with Allegheny County GIS coordinator
- Meeting with ESRI regarding upgrade to ArcGIS 10
- Presented at the Library of Congress data meeting
- Meeting with Philadelphia DOT
- Meeting with PA DCNR GIS coordinator and GTO
- Meeting with Chris Markel/PAMAP program re LAS files
- Provided metadata support for Michael Stettino GTO
- Conference call with Google State and Local Team manager
- Meeting with Centre County GIS
- Conference call with Jeff Brown, GISP Coordination Program Manager, Center for Geographic Information and Analysis, State of North Carolina, Office of the State Chief Information Officer
- Meeting with Mercer County
- Provided New Jersey OIT to provide imagery for topo project

USER SUPPORT & ASSISTANCE

Assistance Provided to the Following (some examples): PA Breeding Bird Atlas Project, Delaware Valley Regional Planning Commission, DCNR Bureau of Forestry, Dewberry, Aerocon Photogrammetry Services, Borton Lawson, Eastern Geosciences, University of Pittsburgh, SEDA COG, Groundwater Environmental Services, UGI Utilities, Bear Creek Services, JBA Designs, PA DEP, HiFive Development Services, Chesapeake Energy Corporation, US Department of Defense/Philadelphia, Philadelphia Police Department, Greenway Engineering, URS Washington Division, New York Natural Heritage Program, GeographIT, Rockford Map Publishers, West Virginia University., US Office of Surface Mining, DCNR PAMAP program, GeographIT, Mining & Environmental Engineers, Philly.com, PennDOT, DEP Pottsville district mining office, Willbros Engineering, NOAA Coastal Services Center, Lebanon County, Bechtel Engineering, PA Highlands Conservation Information Center, World Sites Atlas, Salmon Oil Company, Nolan Capital, Kaufman Engineering, USDA Farm Service, Venango County, PA Sea Grant Consortium, PEMA, Cambria County, Pixel Farm, PA National Guard, PA Fish and Boat Commission, Consolidated Energy, RPG Associates, Sierra Club, Fisher Associates, US DOE, Richland Communities, AMEC, Barr Enright, Klineschmidt Assoc, HRG, Millersville University, PA Cleanways, US Army Corps of Engineers, Corelogics, Gannett Fleming, Resource Technologies, Range Resources, PA DPW, City of Philadelphia, Avencia, Stroudsburg University, University of Pittsburgh, Clarion County, DEP Moshanon District, National Weather Service SC Office, Sampson Consulting, Hamilton College, Michael Baker Inc, I3, GAI Consulting, PA Game Commission, PA BBA, Global Mapping Solutions, Whitman, Requardt & Assoc., US Fish and Wildlife Service, Hanover Engineering Associates, The Nature Conservancy, Anshutz Exploration Corp, PA Audubon, Clearfield County, Enterprise Geographic Information Systems (GIS) Senior Technical Development Program U.S. Department of Defense, University of Pennsylvania, Salvage Direct Inc, Tanglewood Exploration, EQT Inc, Range Resources Appalachia LLC, Clean Air Council, Peach Bottom Atomic Power Station (Excelon Corp),

Philadelphia Planning Department, Association of Watersheds, Range Resources LLC, Rex Energy, Corte Associates, National Energy Technology Lab, PA DEP BIT, City University of New York, US Environmental Protection Agency, EDR Inc, AMEC Inc, Amfire Mining, Sarcinello Planning, Natural Lands Trust, Richland Communities, Allegheny County, Mackaich environmental center, Slippery Rock University, Clarion University, Indiana County, PA Game Commission forest management, ARM Group, York County Planning Commission, Natural Lands Trust, Drexel University, PA Natural Heritage Program, Gannett Fleming, Susquehannock State Forest, Legislative Data Processing Center (PA legislature), University of Pennsylvania, Stahl Sheaffer Engineering, CDS Business Mapping LLC, City of Philadelphia Planning Dept, Centre County, Tri County Regional Planning Commission, PA DEP Meadville, Enterprise Geographic Information Systems US Dept of Defense, Clean Air PA, US Oakridge National Lab, McTish Associates, California University of PA, Coastal Resources Management Program DEP, Rettew Assoc, Alder Run Engineering, Shoup Engineering, New Meadow Run, Allegheny County, Range Resources, , PixelFarm, Butler county, ReMax Real Estate, Carnegie Mellon University, Villanova University, School of Health University of Pittsburgh, Boy Scouts, Consolidated Energy, Sierra Club, RPG Associates, Fisher Associates, Byer Realty, Shoup Engineering, McCormick Taylor Group, Parsons Brinkerhoff, Benchmark Engineering, Peters Consultants, Yale University, Entech Engineering, South Central Regional Office DEP, Center for Healthy Environments and Communities University of Pittsburgh Graduate School of Public Health, HDR Inc., Regional Center for Workforce Excellence, Homestead Nutrition, Montclair State University, White Township, PA Legislative Data Processing Center, Natural Lands Trust, GIS Strategic Planning City of Philadelphia, Seneca Nation of Indians, South Greensburg Borough, DC Gohn Assoc., Ministry of Environment, Planning and Infrastructure Strategy Government of Bermuda, DDMS Inc, Alder Run Engineering, GeoDecisions, Azavea Inc, NY Electric, PennDOT Engineering District 3-0, Sustainable Solutions LLC, Landvest Inc., USDA NRCS, Groundwater and Environmental Services Inc., Adams Electric Cooperative, GeoDecisions, Princeton University, TRC Inc, Hill Engineering, Lancaster County, SAIC Energy, Chester County, Inflection Energy, Bucknell University, Lower Allen Township, George Washington University, Shippensburg University, NY Electric & Gas, Indiana County, Entech Engineering, Water & Natural Resources US Midwest Region, EA Engineering Science and Technology, Millersville University, Walton, Mulvena, and Assoc, Bucks County Chapter Trout Unlimited. BPI (Boston Productions Inc), Aguilla, Choptank River Heritage Assoc. , Garmin International, Stream Restoration Inc, AKT Peerless Environmental & Energy services, Susquehanna Valley Orienteering, SEPTA, Environmental Resources Management, WV GIS coordinator, Worley Parsons Inc, Regional Plan Association of NY (regional landscape project), California University of PA (working on data dictionary project for DCNR), Huntingdon County, Weather2Hunt.com, Bankson Engineers, Univ of Penn College of Arts and Sciences, DelVal Soil and Environmental, Bethlehem Township Volunteer Fire Company, Flood Zone Correction Inc, Princeton University, Oxford High School, PennDOT Environmental Quality Assurance Division, US Army Corps of Engineers, US Library of Congress, Pittsburgh Post Gazette, PDC Energy, Pike County, Kleinfelder Inc, Synergis, Johnsonburg Area Transportation Authority, PA NHD committee, Farihnger, McCarty, & Grey, Resource Geoservices, North Carolina GIS, Spatial Solutions, Chesapeake Bay Program, Mercer County, Global View Technology, Wesex Corp., Zosh Architects, Hampton Township, Amec Corp, Site Design Concepts, National Geospatial Intelligence Agency, Tristar Investors, CRI + IGEN, Berks County Conservancy, Pennoni Assoc, Petroleum

Development Corp, Stiffler, McGraw & Assoc., NEP Cell Corp, DVRPC, Geomatics Centre—Ontario Ministry of the Environment, Geokinetics, Ecotone Inc, Ride-the-City (Philadelphia), NEP Cell Corp, Maponics LLC, PennDOT Aviation Bureau, US Army Corps Phila, Dept of Homeland Security—Information Infrastructure group, Ministry of Works and Engineering--Government of Bermuda, Dewberry, Aerocon Photogrammetry Services, Borton Lawson, Eastern Geosciences, SEDA COG, Groundwater Environmental Services, UGI Utilities, Bear Creek Services, JBA Designs, HiFive Development Services, Chesapeake Energy Corporation, , Greenway Engineering, URS Washington Division, New York Natural Heritage Program, Rockford Map Publishers, West Virginia University, Hetzmann Corp, Maryland Department of Forestry, Lockheed Martin.