Shale Gas Monitoring Reports

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DCNR Bureau of Forestry
Resource Inventory & Monitoring Section

NGAC
October 17, 2019

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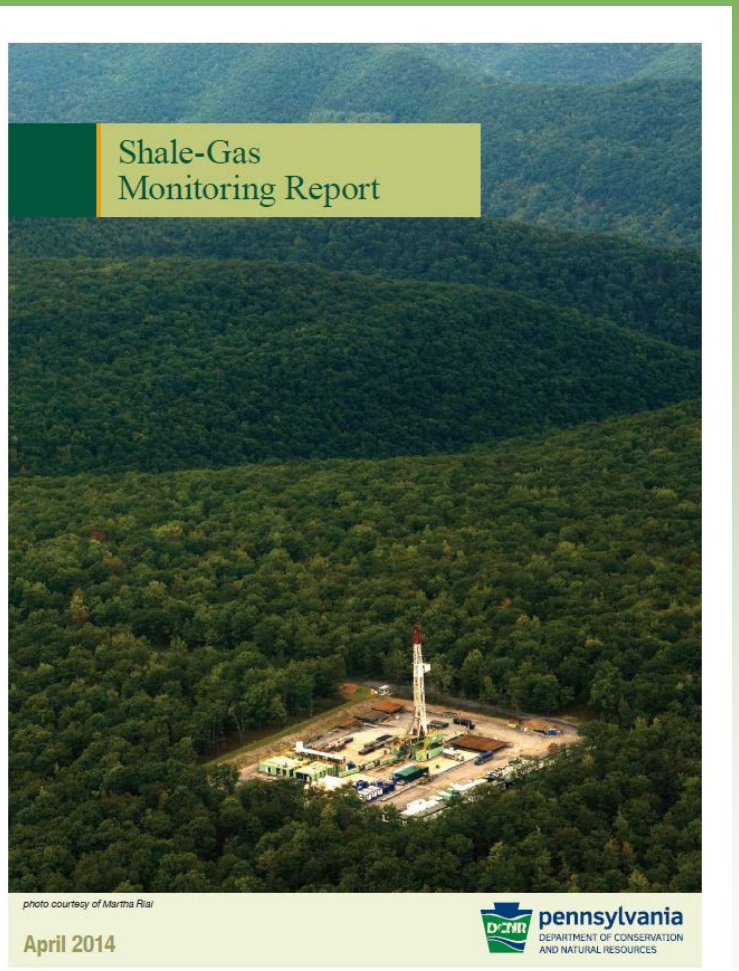
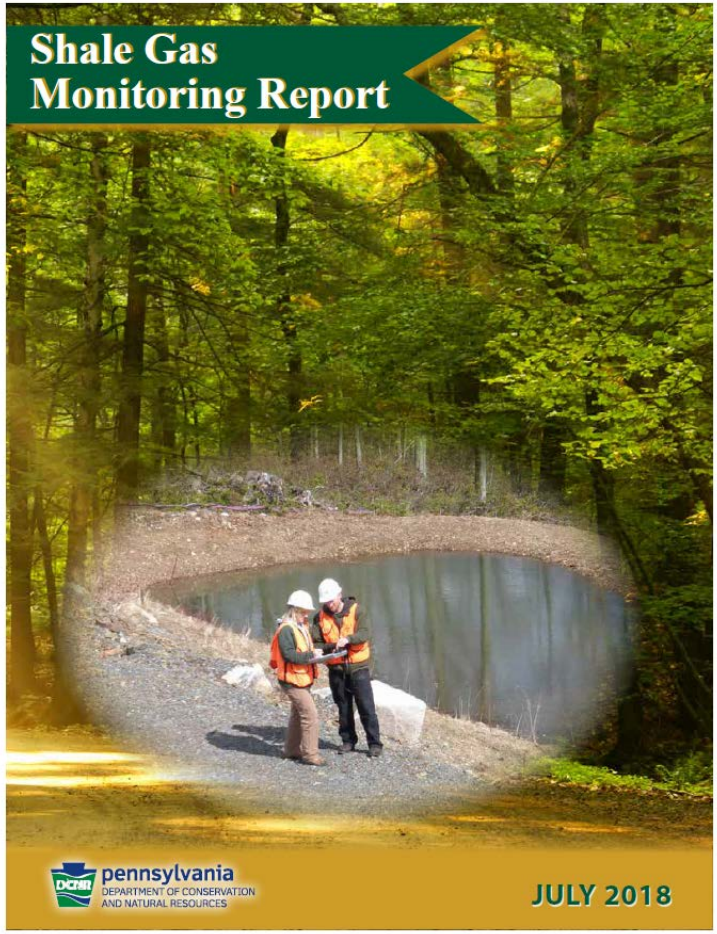
Shale Gas Monitoring Reports





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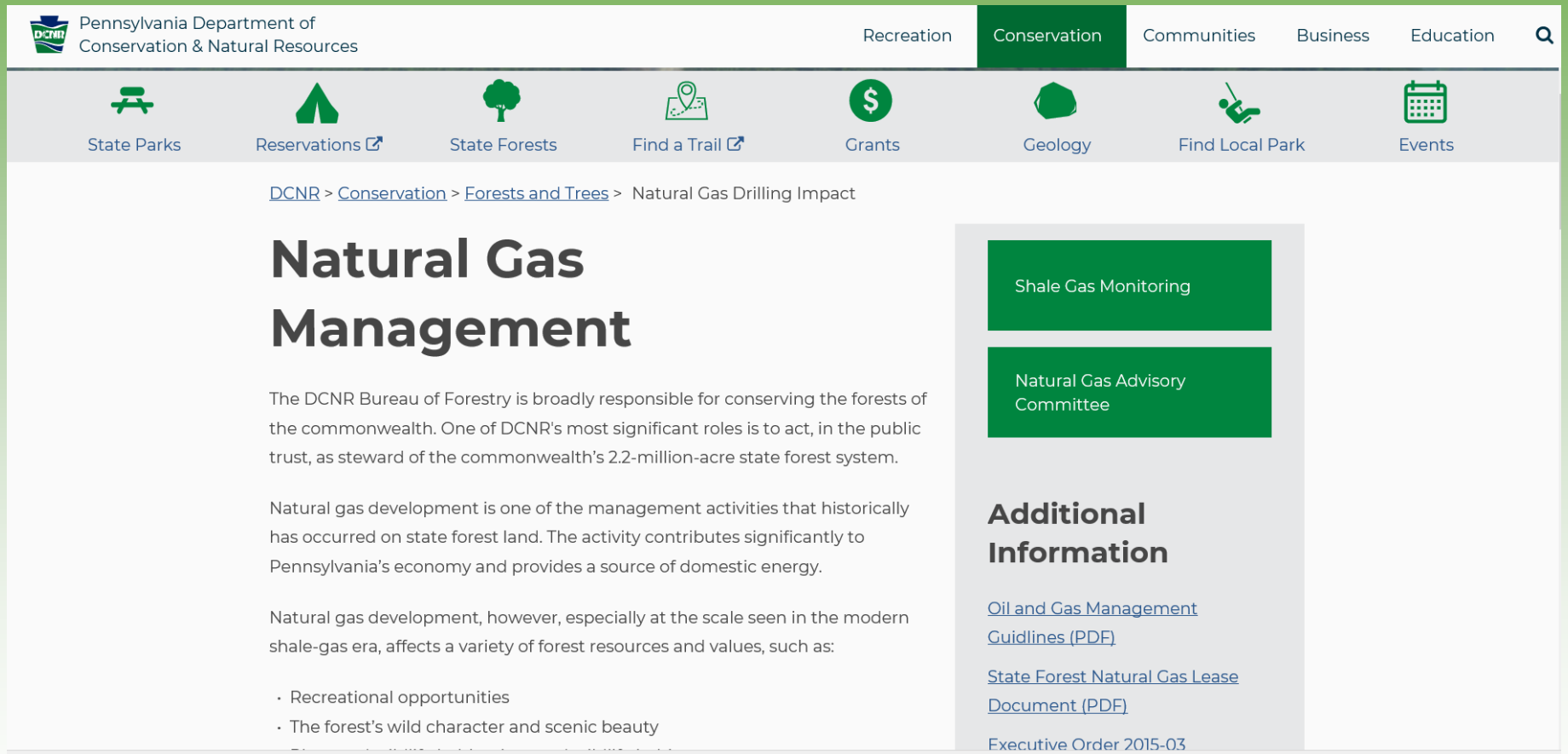
Web Page



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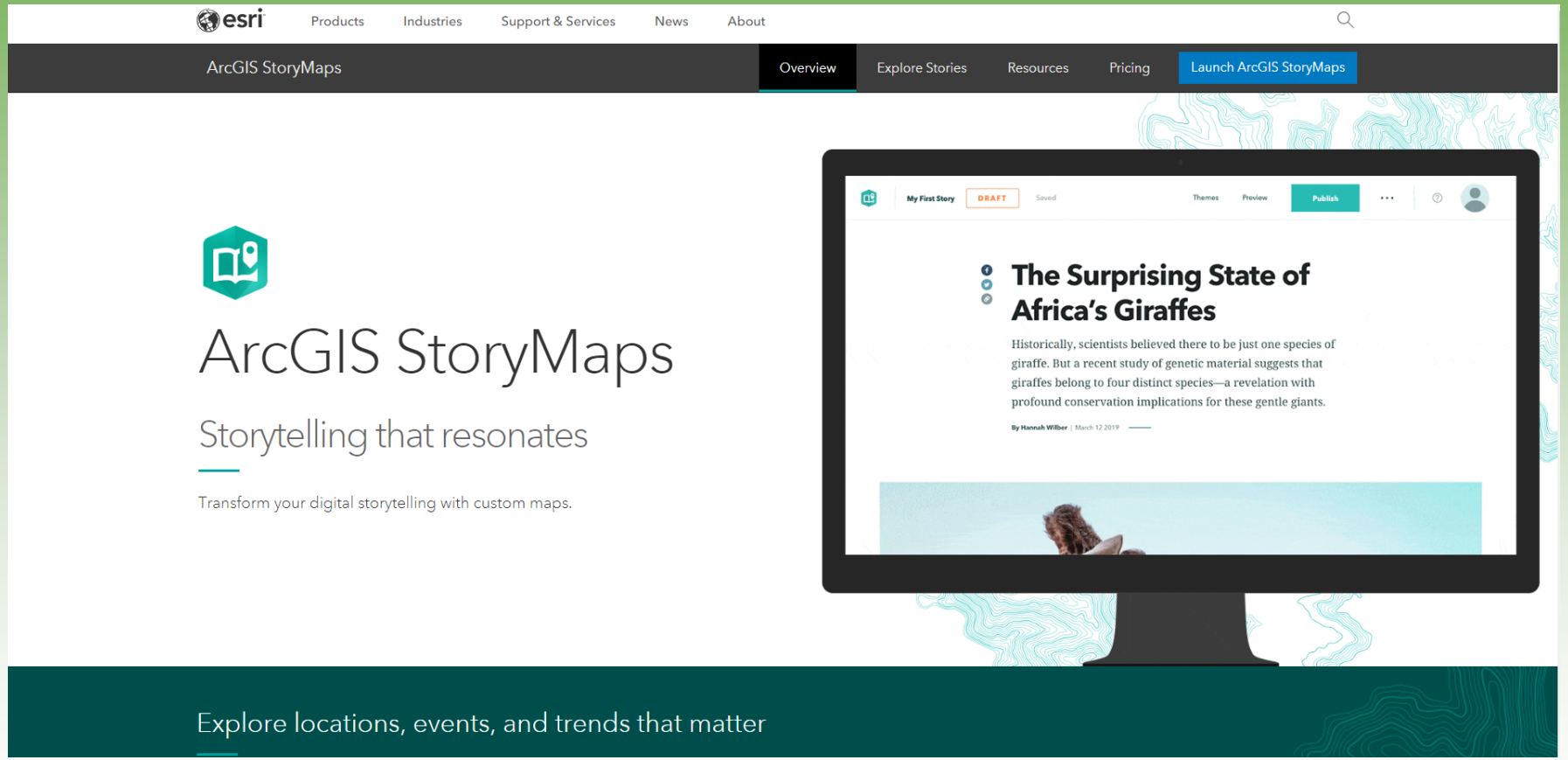
ArcGis StoryMaps



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Live Demo

PA DCNR Bureau of Forestry

Edit

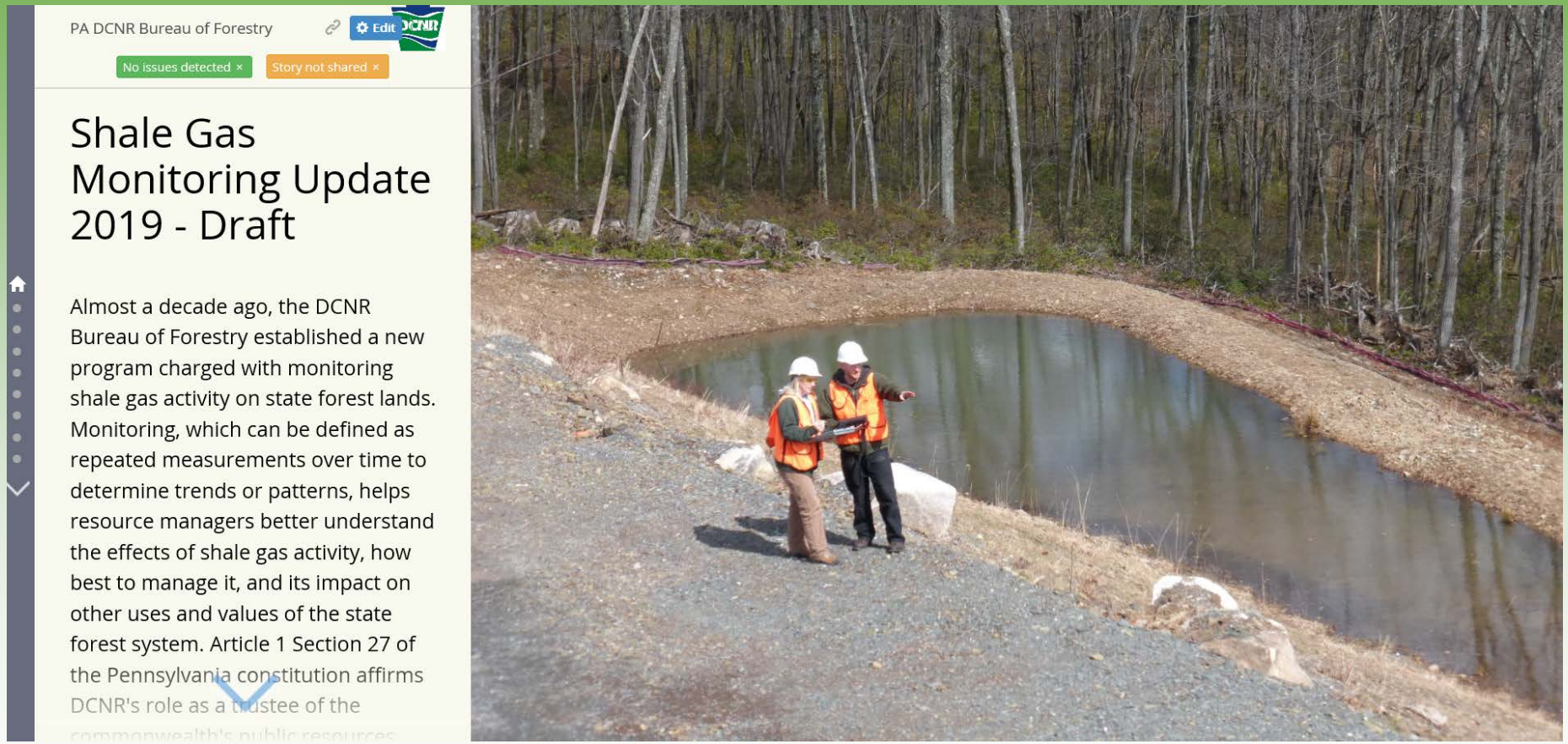
No issues detected ×

Story not shared ×

Shale Gas Monitoring Update 2019 - Draft

Almost a decade ago, the DCNR Bureau of Forestry established a new program charged with monitoring shale gas activity on state forest lands. Monitoring, which can be defined as repeated measurements over time to determine trends or patterns, helps resource managers better understand the effects of shale gas activity, how best to manage it, and its impact on other uses and values of the state forest system. Article 1 Section 27 of the Pennsylvania constitution affirms DCNR's role as a trustee of the commonwealth's public resources

StoryMap



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Sound Monitoring

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Shale Gas Monitoring Update 2019 - Draft

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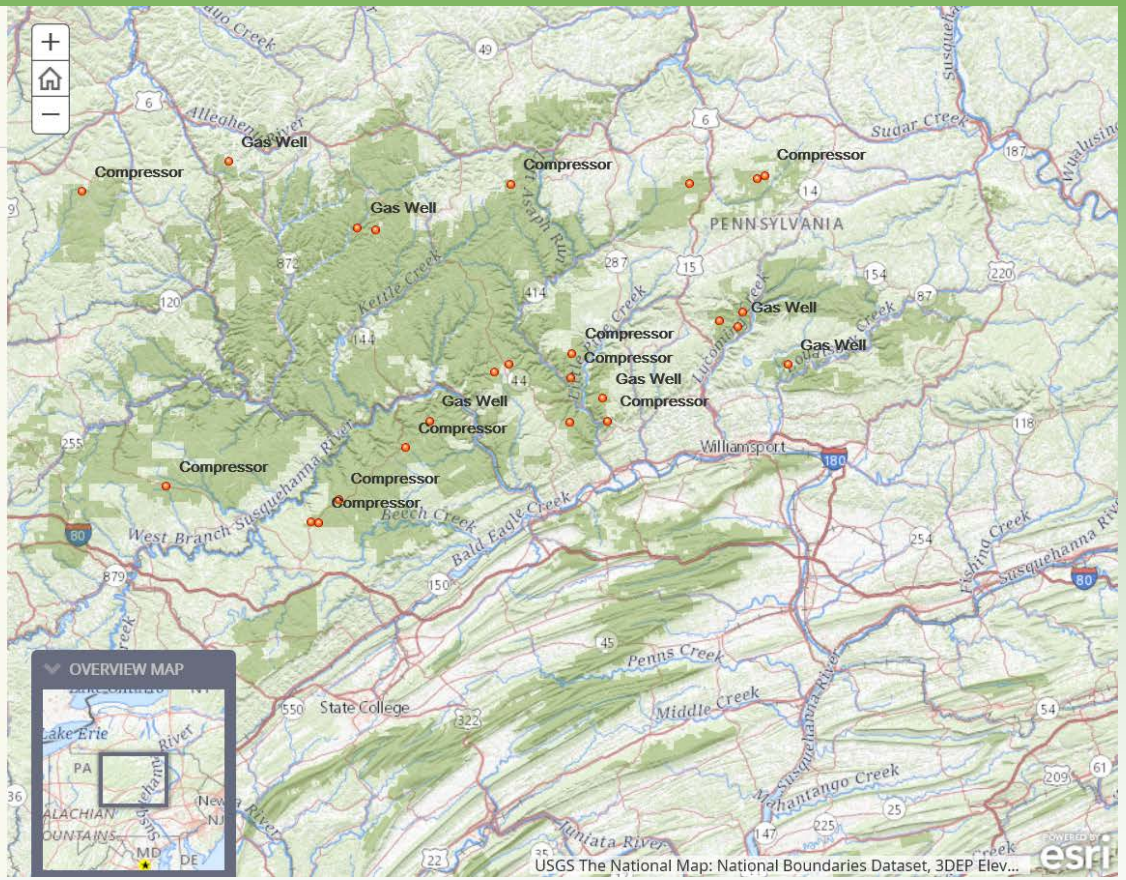
Sound Monitoring

Soundscape is a component of wild character and shale gas development introduces novel sounds to the forest landscape. This is in the form of heavy equipment traffic, drilling, compressor stations, equipment on well pads, and others. To quantify the potential effects to visitors (and wildlife), sound levels at gas infrastructure pads are monitored as part of the monitoring efforts on state forest land.

Sound level is reported in db(A) Ldn which is the unit of measure for the bureau's sound guideline. The guideline reads: "When no suitable alternatives exist, and a compressor station must be sited on state forest lands, the operating noise level of the compressor station should not exceed a Ldn of 55 db(A) at any distance greater than 300 feet from the compressor building. The Ldn metric is the average sound level over a 24-hour period, with a penalty added for noise during the nighttime hours of 10:00 p.m. and 7:00 a.m. This is a standard metric for use in reporting noise magnitude.

You can view sound monitoring reports by clicking the locations on the map.



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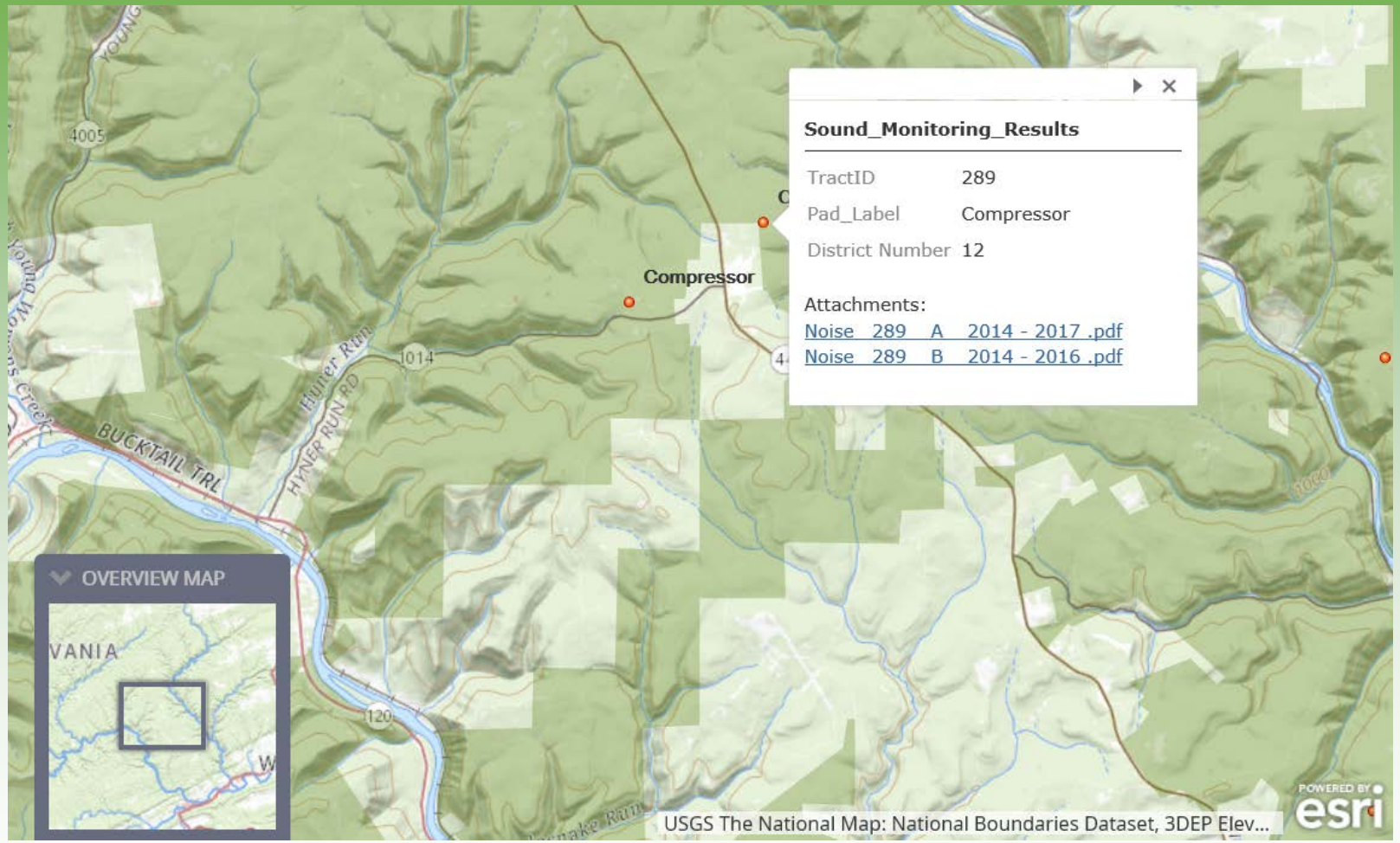
Sound Monitoring



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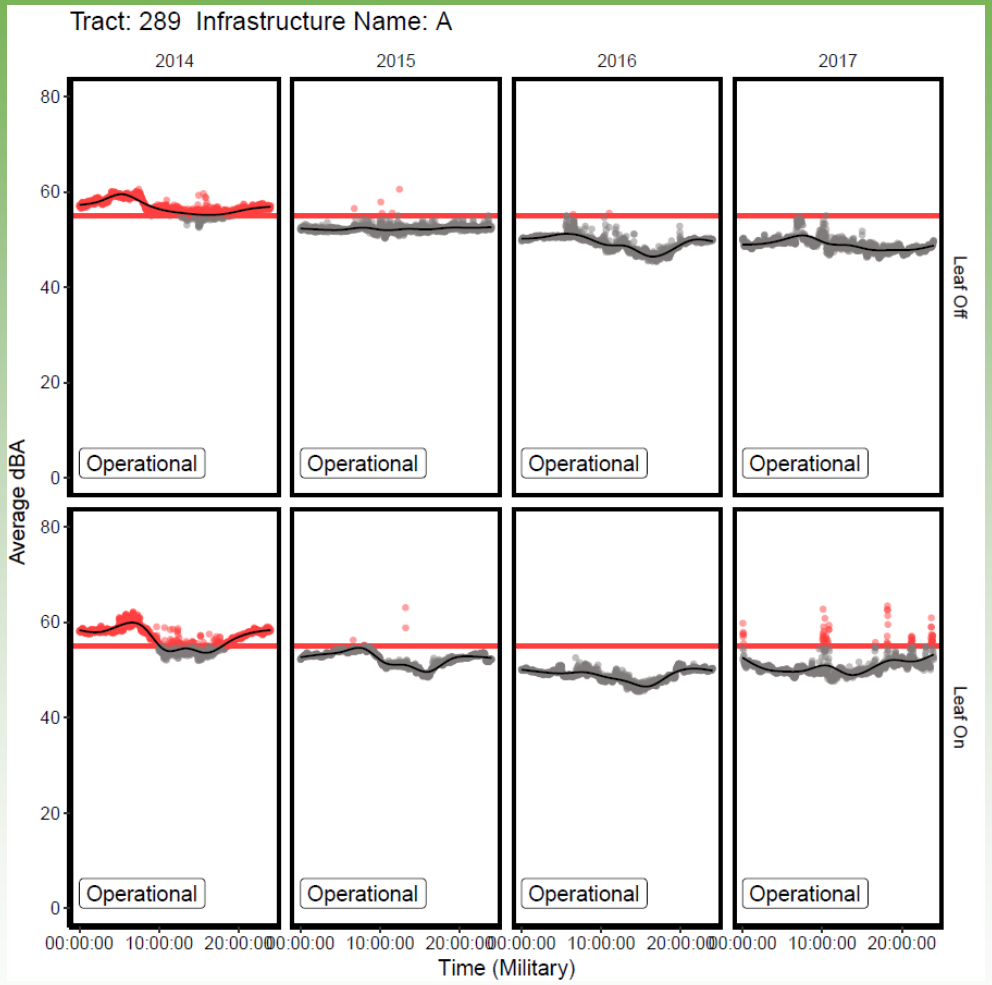
Sound Monitoring



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Water Monitoring

PA DCNR Bureau of Forestry

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Water

Maintaining and protecting water quality on state forest lands has always been one of the bureau's highest priorities. Most forest land in the core gas districts drain into the Susquehanna River (97.7 percent). A small portion flows into the upper Allegheny River.

The Shale Gas Monitoring program works closely with the regulatory agencies (Susquehanna River Basin Commission, Department of Environmental Protection, and the Fish & Boat Commission) when possible to assist and coordinate with their monitoring efforts. The monitoring program has also worked with the U.S. Geologic Service in their research and monitoring efforts related to water resources.

BOF Widespread Sampling

In 2011, 345 sampling points were established across state forest land in the core gas forest districts to get an initial qualitative visual inspection of many stream reaches along with basic field chemistry measurements. From 2012 to 2016, new sites were added, and original sites have been revisited based on field crew availability. As of 2016, a revisit schedule has been developed to ensure each watershed that may be affected by gas development is entered annually and no sampling locations goes longer than three years between visits.

Click on the links below to view the most current measurements for widespread sampling locations as of June 19, 2019. Clicking on a point will display the most recent results and the date of the last measurements.

Widespread Sampling - pH

Widespread Sampling - Conductivity

Macroinvertebrates

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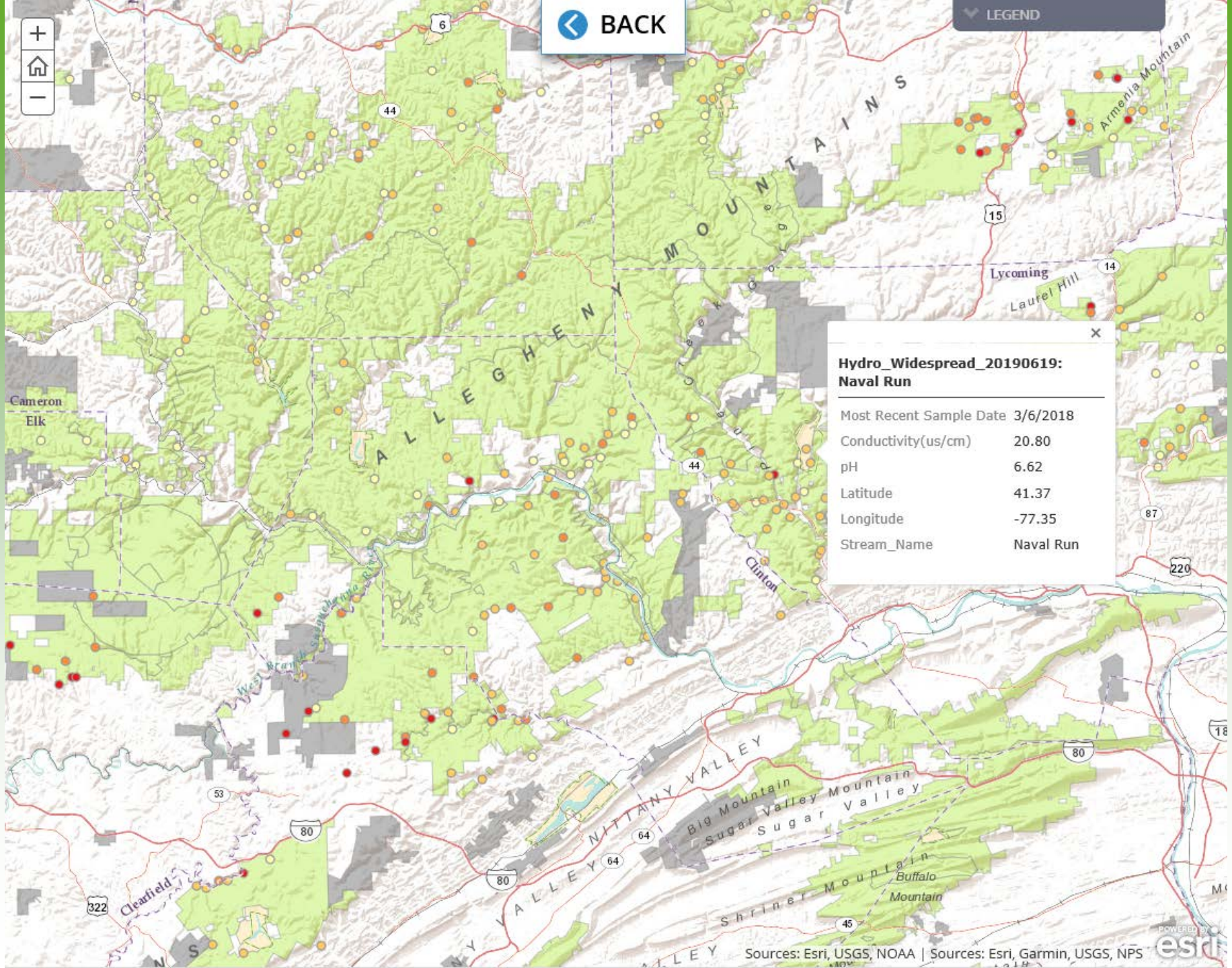
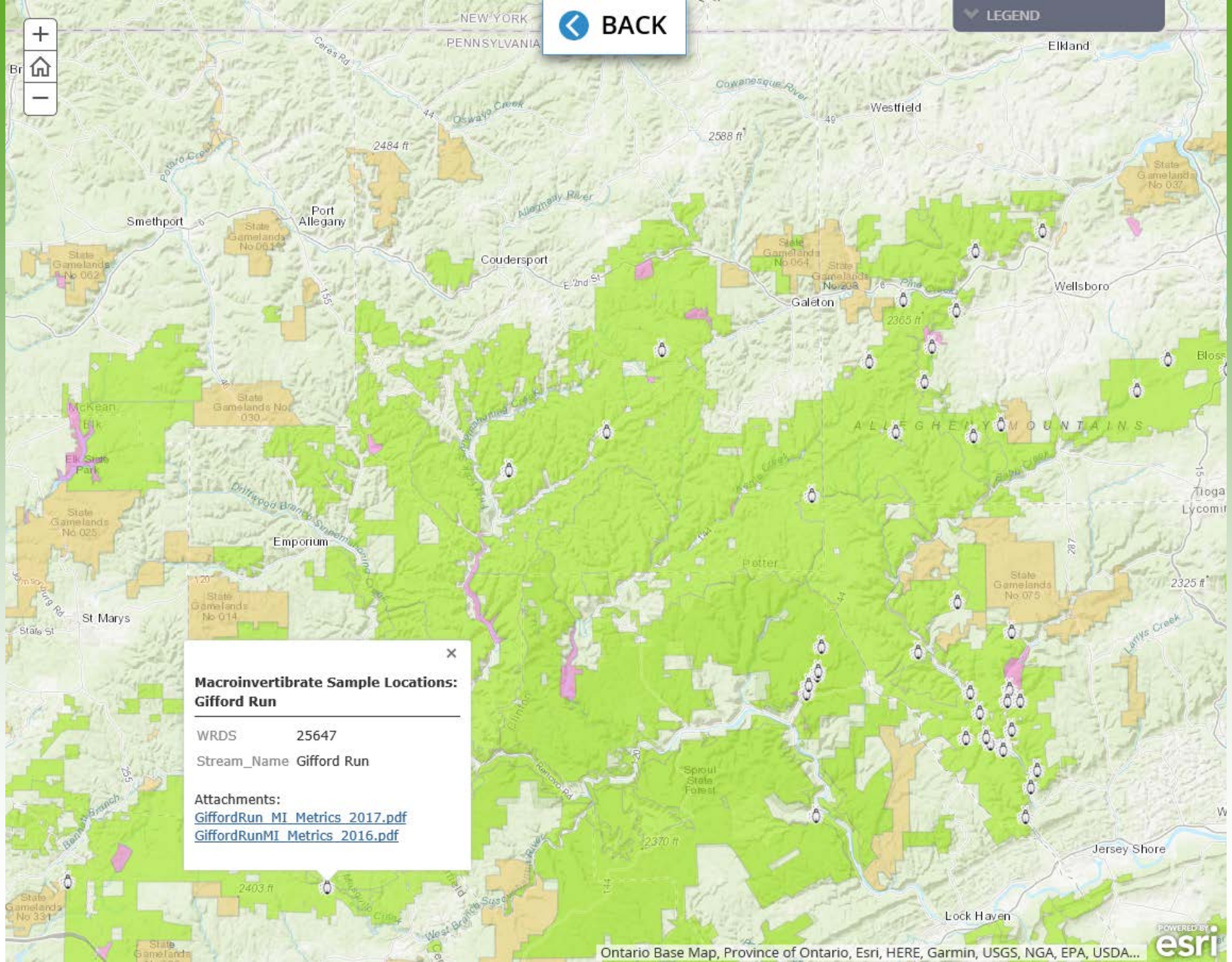

BACK
LEGEND
Hydro_Widespread_20190619:
Naval Run
Most Recent Sample Date 3/6/2018
Conductivity(us/cm) 20.80
pH 6.62
Latitude 41.37
Longitude -77.35
Stream_Name Naval Run
ALLEGHENY MOUNTAINS
Cameron
Elk
Clinton
Lycoming
Laurel Hill
Armenia Mountain
Clearfield
NITTANY VALLEY
Big Mountain
Sugar Valley Mountain
Sugar Valley
Shriner Mountain
Buffalo Mountain
Sources: Esri, USGS, NOAA | Sources: Esri, Garmin, USGS, NPS



Macroinvertibrate Sample Locations: Gifford Run

WRDS	25647
Stream_Name	Gifford Run

Attachments:
GiffordRun_MI_Metrics_2017.pdf
GiffordRunMI_Metrics_2016.pdf

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BUREAU OF CLEAN WATER
MACROINVERTEBRATE SAMPLE SUMMARY

9/7/2018 7:45:40 AM

STATION ID: 20170413-0930-dagower

Export Data to Excel

SAMPLE SUMMARY

STATION ID: 20170413-0930-dagower	**SECONDARY STATION ID:** Kettle Run	**LATITUDE:** 40.23615260	**LONGITUDE:** -76.34051770	
STREAM NAME: Painter Run (01183208)		**HUC8** 02050205 Pine. Pennsylvania.		
SURVEY ID: 70120		**METHOD:** 6-Dframe Composite, 200 subsample		
SUBSAMPLED BY: Jeremy Miller	**IDENTIFIED BY:** Richard Dietsch	**QUALITY ASSURED:** N	**QUALITY ASSURED BY:**	**PASSED QUALITY ASSURANCE:** N

STATION LOCATION COMMENT:
40 14 10.5N, -76 20 25.6W, upstream from pedestrian bridge, spoke with caretaker

BIOLOGY / HABITAT COMMENT:

LAND USE COMMENT:
SGL upstream, full shaded

IMPAIRMENT COMMENT:

TAXA

# grids from first pan = 8	# grids from second pan = 26	Subsample Size = 210

TAXA NAME	INDIVIDUALS	PTV	FFG	BCG COLD	BCG WARM
Diphetor	3	6	CG	2	2
Epeorus	53	0	SC	2	2
Cinygmula	33	1	CG	1	1
Drunella	16	1	SC	2	2
Ephemerella	6	1	CG	3	2
Paraleptophlebia	15	1	CG	2	2
Lanthus	1	5	PR	2	2
Pteronarcys	1	0	SH	1	2
Amphinemura	11	3	SH	3	3
Leuctra	1	0	SH	2	2
Isoperla	2	2	PR	2	2
Sweltsa	1	0	PR	3	3
Polycentropus	1	6	FC	4	4
Diplectrona	5	0	FC	2	2
Hydropsyche	3	5	FC	5	5
Rhyacophila	5	1	PR	2	2
Neophylax	1	3	SC	3	3
Oulimnius	12	5	SC	3	2
Prosimulium	28	2	FC	3	3
Chironomidae	12	6	CG	5	5

METRICS

METRIC NAME	RAW VALUE	Freestone Riffle-Run 6D200 2013 SMALL	2013 LARGE	2D100	MULTIHABITAT POOL GLIDE	LIMESTONE 2009
Total Richness	20	60.6	64.5		64.5	111.1
Ephemeroptera Richness	6				100.0	
Trichoptera Richness	5				45.5	
EPT Richness	16			104.6	94.1	200.0
Trichoptera Richness (PTV 0-4)	3			83.3		
EPT Richness (PTV 0-4)	13	68.4	81.3			
Becks Index (version 3)	27	71.1	122.7			
Becks Index (version 4)	24			120.6	109.1	200.0
FC + PR + SH Richness	11			94.8		
Hilsenhoff Biotic Index	1.65	103.0	120.1	123.9		135.6
% Sensitive Individuals (PTV 0-3)	84.80	100.4	127.1			
% Tolerant Individuals (PTV 7-10)	0					101.5
Shannon Diversity	2.37	82.9	82.9		97.5	111.3
	IBI SCORE	80.5	88.1	95.6	83.6	100.0

% Ephemeroptera	60.0	% Ephemeroptera (PTV 0-4)	58.6	% Dominant Taxon	25.2	BCG Richness Ratio	5.67
% Plecoptera	7.6	Ephemeroptera Richness (PTV 0-4)	5	% Chironomidae	5.7	BCG Individuals Ratio	12.13
% Trichoptera	7.1	Plecoptera Richness	5	% Simulidae	13.3		

IMPAIRMENT

Not Impaired	N	Insufficient Data	Y

HABITAT

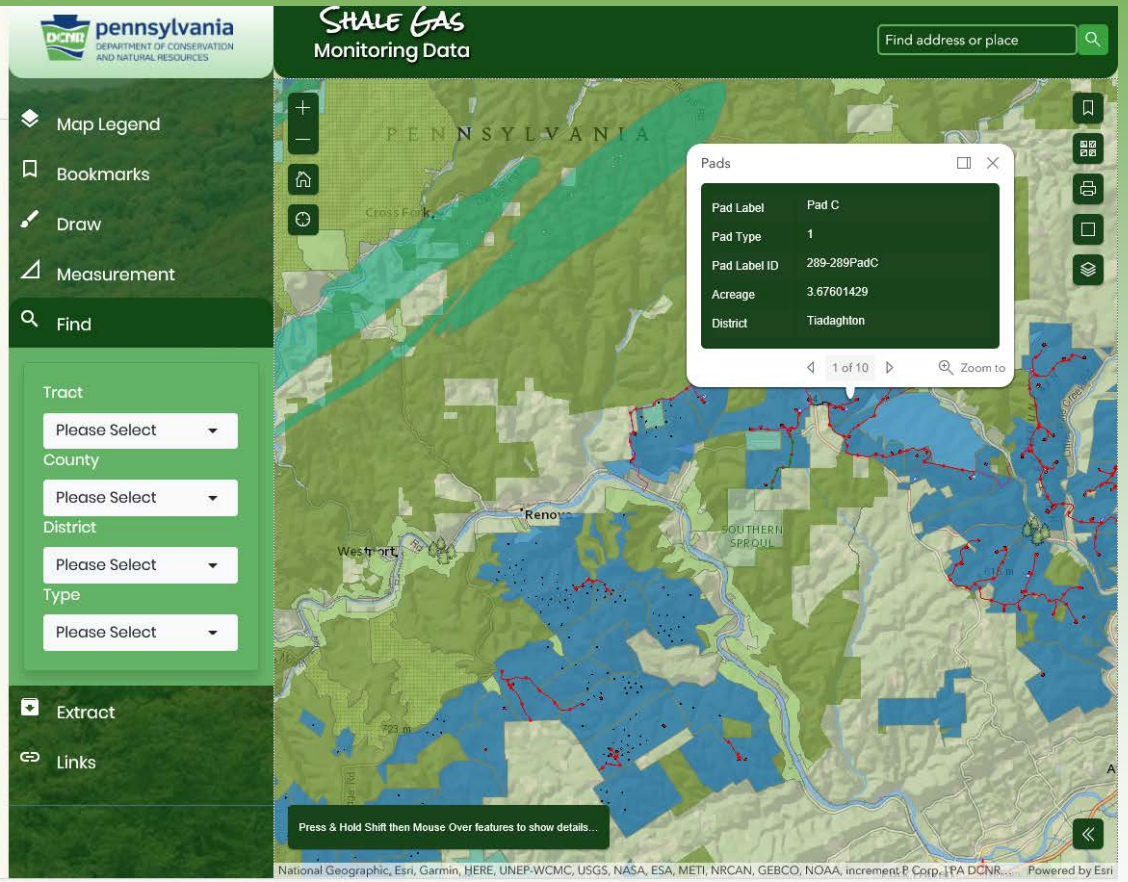
Instream Cover	18	Substrate / Cover		Frequency of Riffles	17	Bank Vegetation	16
Epifaunal Substrate	18	Velocity/Depth Regimes	17	Channel Flow Status	18	Disruptive Pressure	18
Embeddedness	16	Pool Variability		Channel Alteration	18	Riparian Zone	17
Pool Substrate		Sediment Deposition	16	Condition of Banks	16		

Pool-Glide Assessment? N | Instream Score = 68 | Riparian Score = 49 | Total Score = 205

FIELD MEASUREMENTS

Temperature (°C)	7.80	Dissolved Oxygen (mg/L)	11.27	Flow (CFS)	
pH	6.09	Total Alkalinity (mg/L as CaCO3)	4	Conductivity (uS/cm)	44.10

Infrastructure Monitoring



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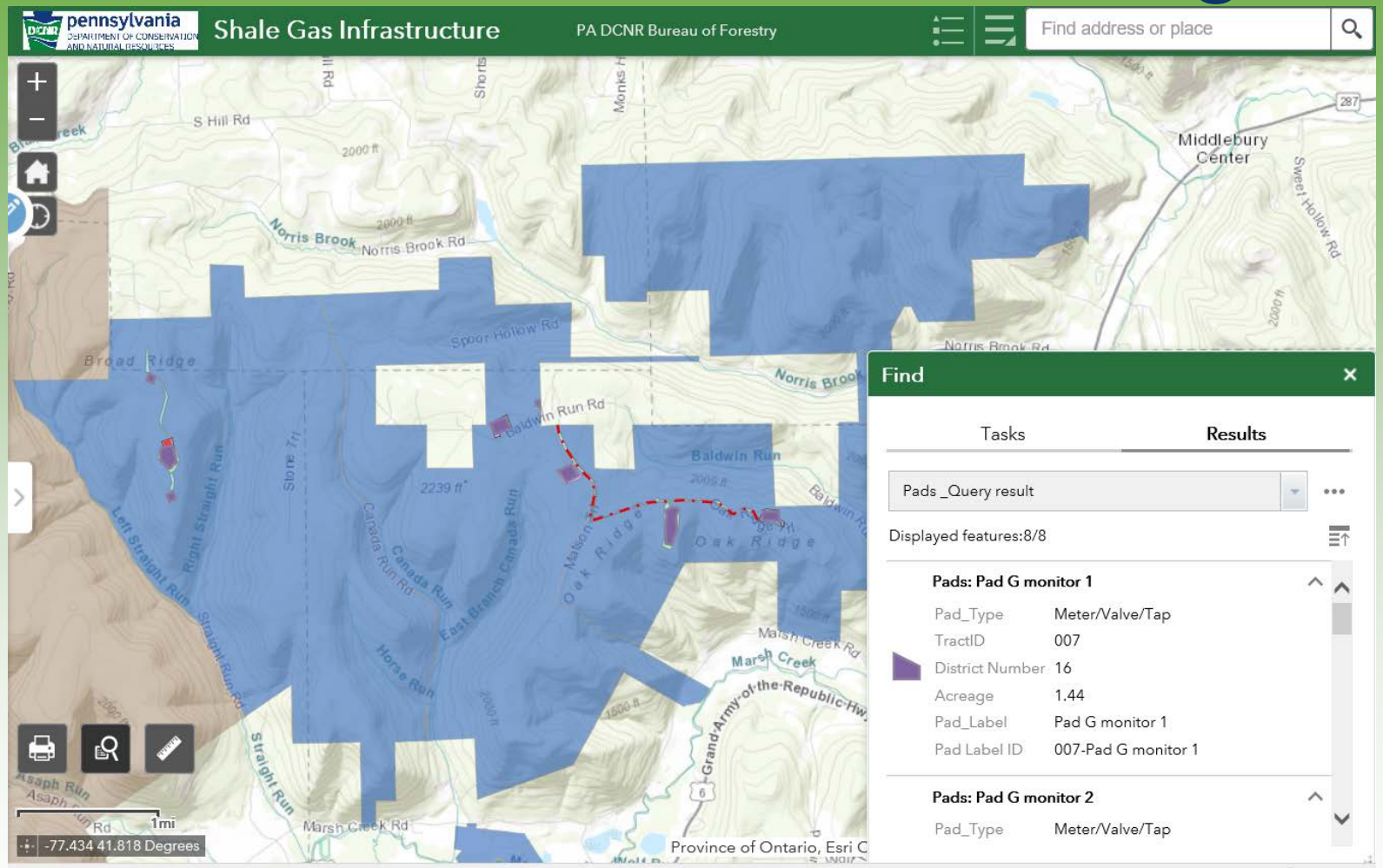

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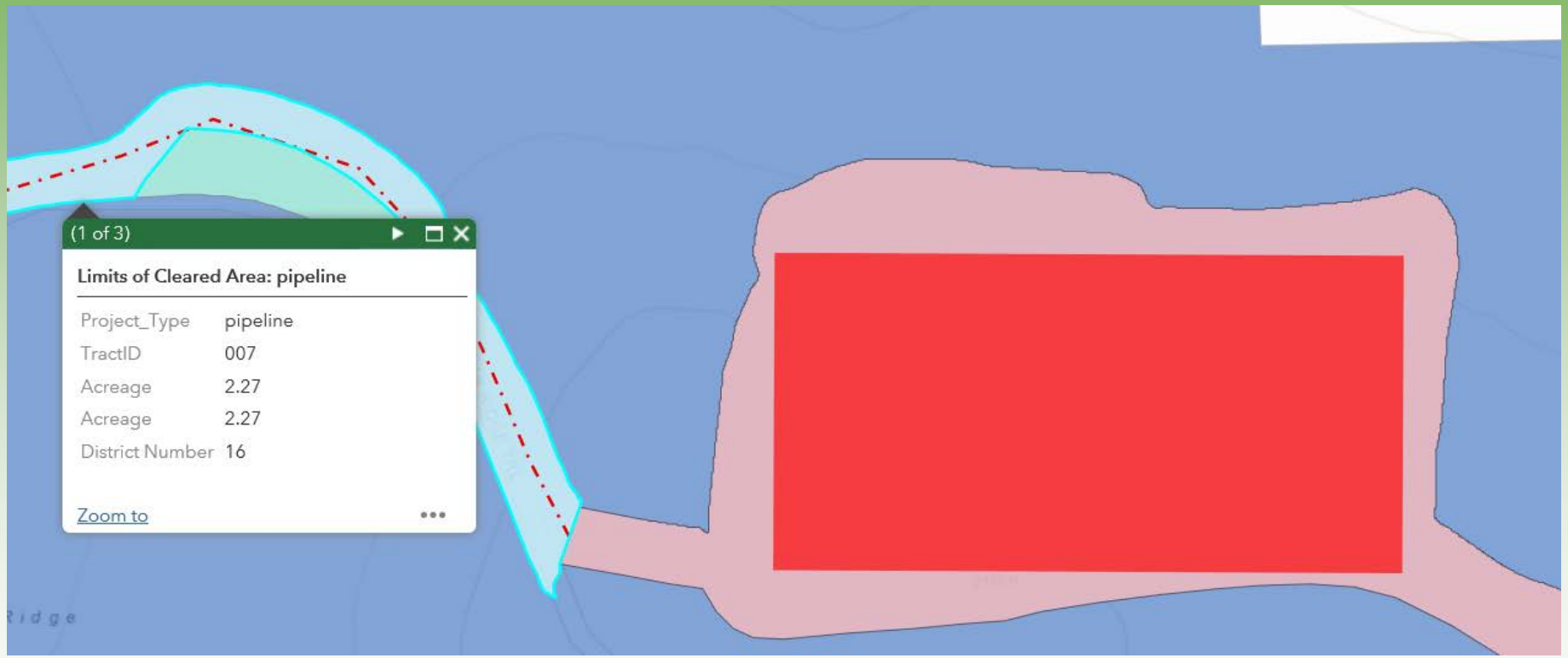

Digital vs. Print

Pros

- Timely
- Low cost
- Widely accessible
- Attractive to wider audience?

Cons

- Less comprehensive
- Difficult to cite
- How to archive?

Not necessarily one or other

Benefits of this Media

- Timeliness
  - Annual updates possible on continuous basis
    - Infrastructure – January/February timeframe
    - Volumes and Revenue – April
    - Plants – December/January
- Cost/Effort
  - No printing costs
  - Text creation and review
    - Data and information content focus

Shale Gas Monitoring Report

Discussion/Thoughts?