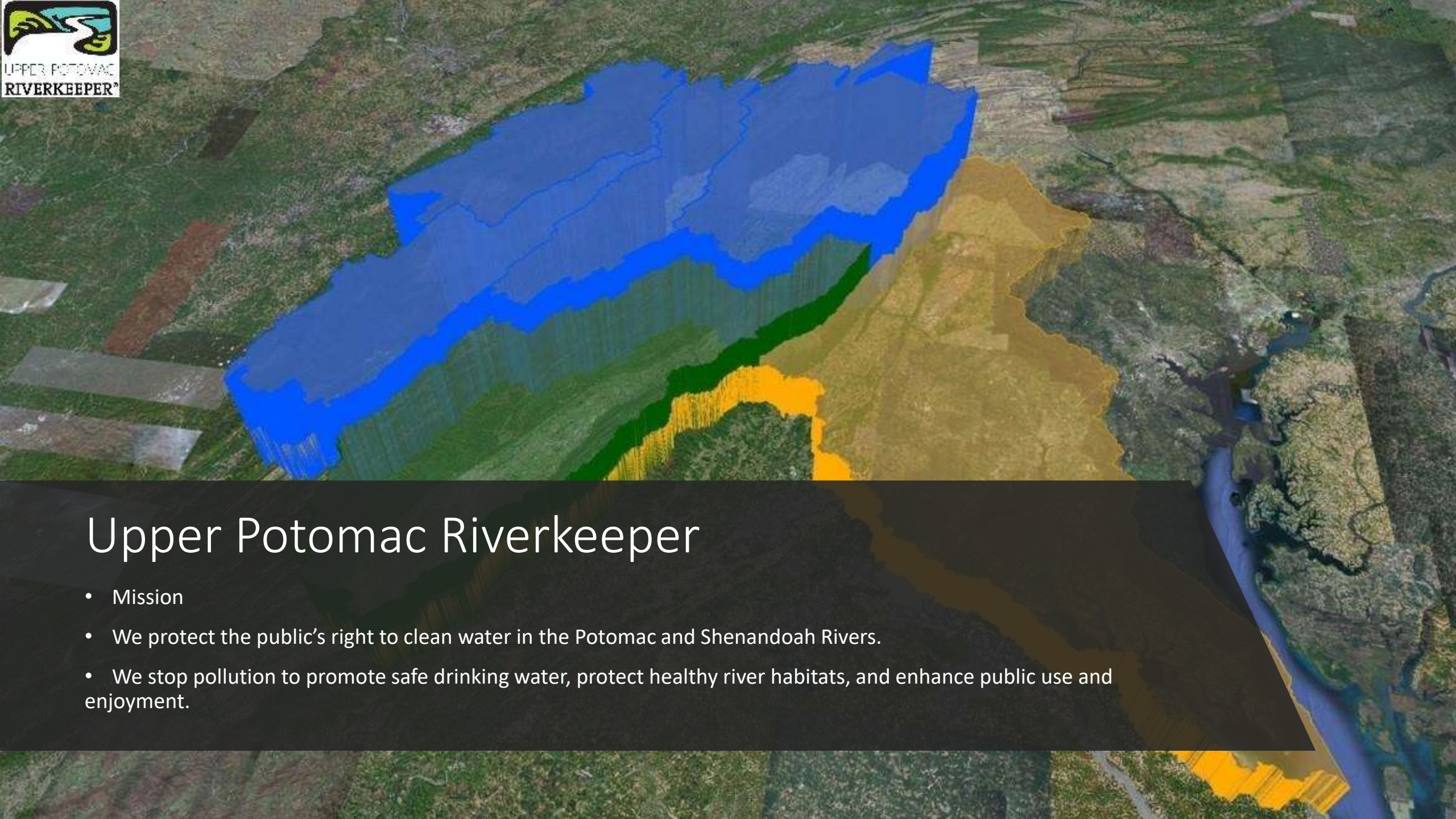
Advocacy Priorities to Address PFAS in Our Watershed

Brent Walls

Upper Potomac Riverkeeper



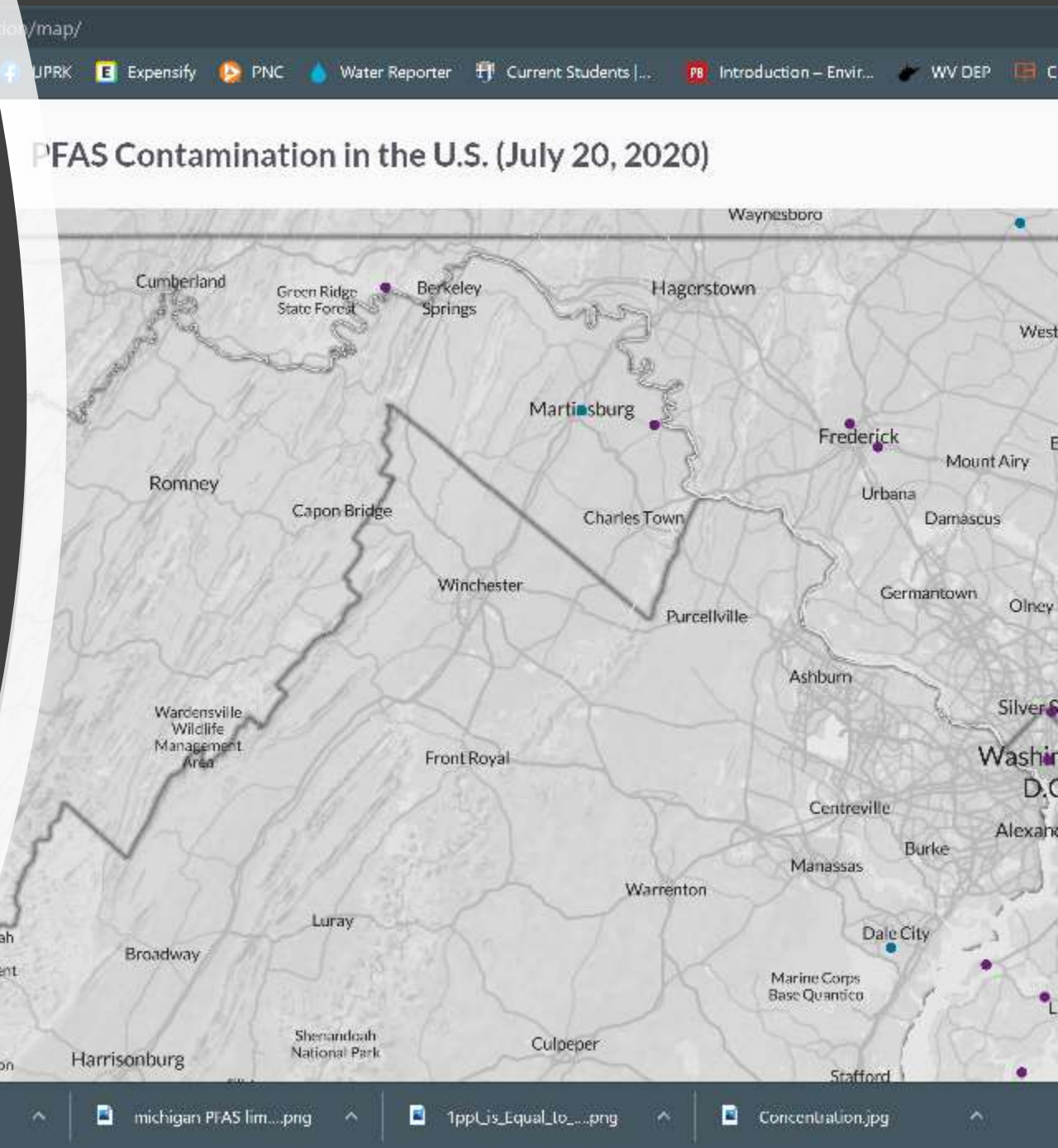
Upper Potomac Riverkeeper

- Mission
- We protect the public's right to clean water in the Potomac and Shenandoah Rivers.
- We stop pollution to promote safe drinking water, protect healthy river habitats, and enhance public use and enjoyment.

Where is PFAS pollution in the Upper Potomac?

- AFFF
  - Martinsburg Air National Guard
  - Thomas Baker Training Site
  - Eastern West Virginia Regional Airport
  - Fort Detrick
  - Frederick Readiness Center
- Municipal/County Landfills
- Possible Industrial sites
  - Maryland Clean Earth – Defense Logistics Agency
  - Valicor Environmental Services - Hagerstown

https://www.ewg.org/interactive-maps/pfas_contamination/map/



UPRK and PFAS Monitoring

- 2016 EPA DW Guidance
  - Martinsburg Big Springs WTP violated guidance – shut down
  - DEP sampled in spring
  - 167th Air National Guard was the source
  - Martinsburg WTP upgraded in 2017 – completed in 2018
- 2019 - CDC and ATSDR (Agency for Toxic Substances and Disease Registry) begin PFAS exposure Assessment
- UPRK sampled for PFAS in 2019
- Fall 2019 - Air National Guard (Martinsburg) released Environmental Monitoring Report
  - GW @ 126,770 ppt PFAS (PFOA+PFOS)

PFAS Exposure

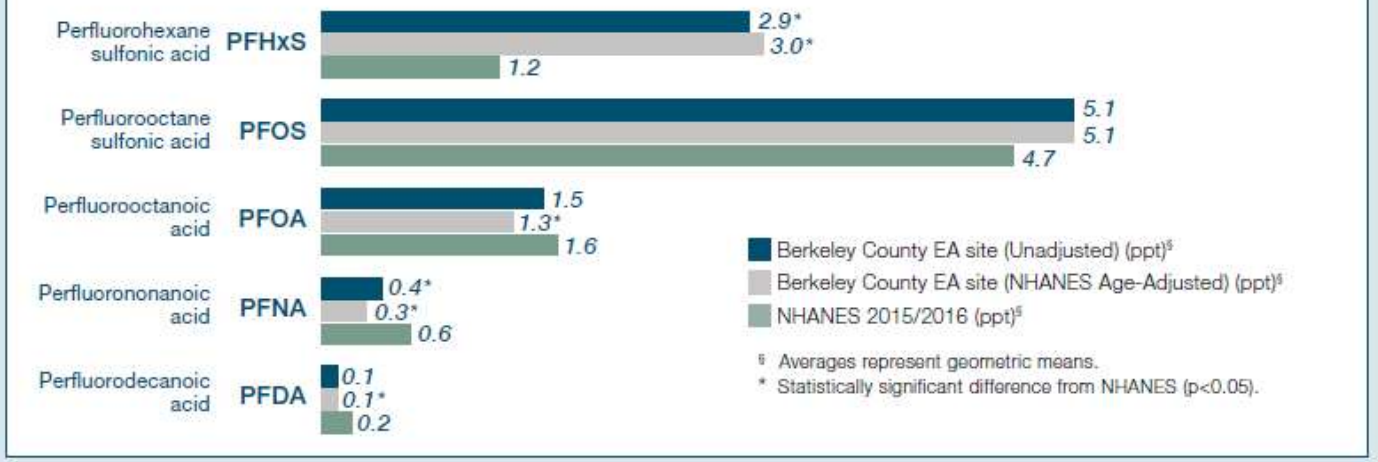
- 275 people tested
- 165 households tested
- PFOS and PFHxS in blood higher than national average

Elevated blood levels of PFHxS may be linked with past drinking water contamination.

- Findings suggest common exposure source, such as the City of Martinsburg or Berkeley County Public Service Water District (PSWD) public water supply.
- PFHxS was once detected in in the City of Martinsburg's Big Springs well.
- AFFF contained high levels of PFOS and PFHxS.

Historical maximum concentrations detected:
PFOS: 114 ppt; **PFHxS:** 105 ppt; **PFOA:** 46 ppt

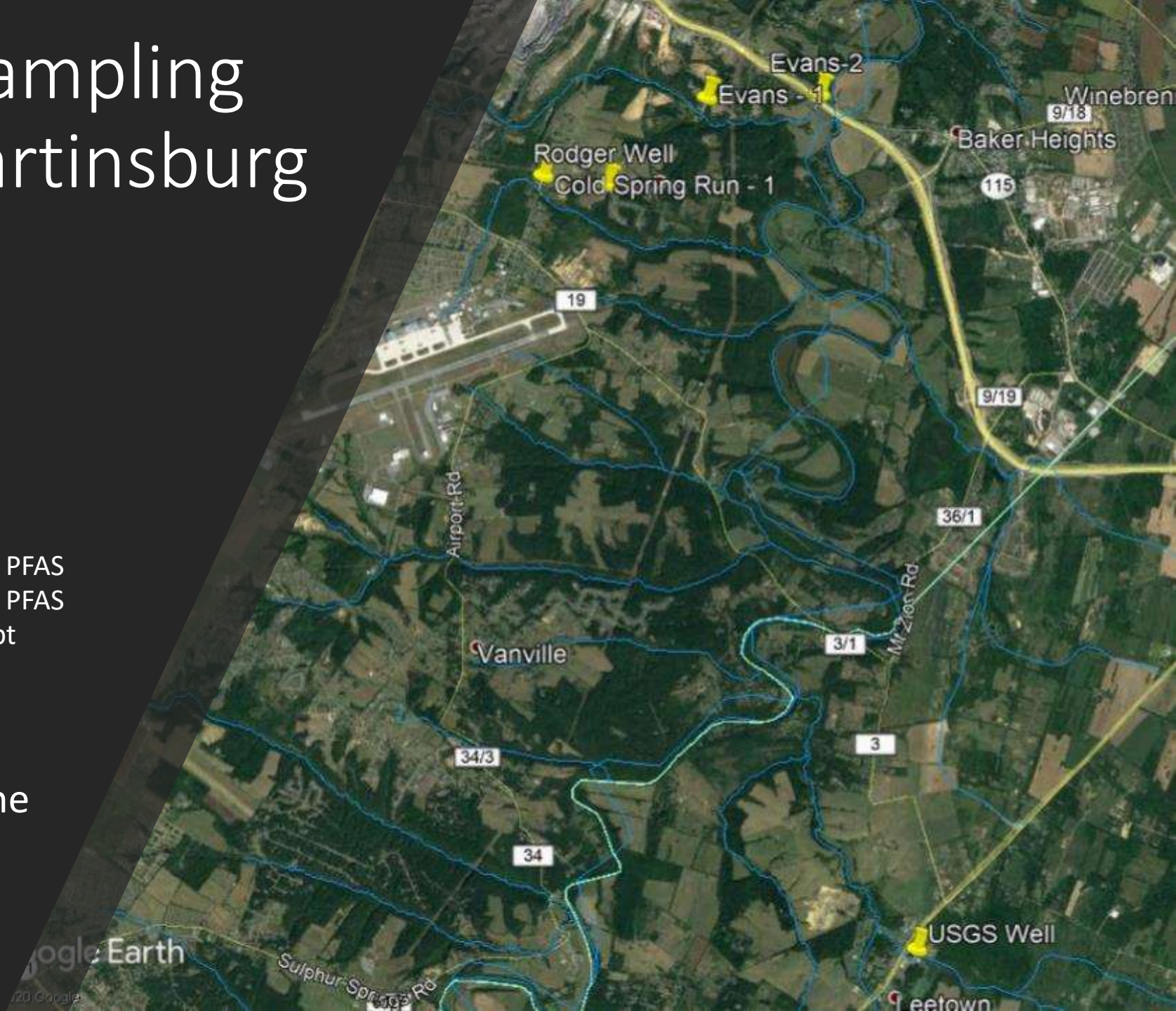
Berkeley County EA site average PFAS blood levels compared to national averages[§]



*ATSDR initially reported PFOS levels were above national average; after statistical analysis this difference was not observed.

UPRK PFAS Sampling Results in Martinsburg

- 2/27/2019
  - USGS well (Leetown, WV)
  - 2 Private wells
  - Results: 2.0 – 6.6 ppt PFAS
- 6/28/2019
  - USGS well = 1 ppt PFAS
  - 3 surface water locations
    - Evans Run-site 2 = 137 ppt PFAS
    - Evans Run-site 1 = 168 ppt PFAS
    - Cold Spring Run = 1,480 ppt PFAS
- Air National Guard had similar results.
- If its in the water, is it in the fish?



PFAS in Small Mouth Bass

- USGS and MD DNR sampled small mouth bass in 2018 at mouth of Antietam creek.
- 6 PFAS compounds were analyzed in blood plasma
- Results range from 220 to 574 ng/ml = 220,000 to 574,000 ppt PFOS
- Fish Tissue may have less PFOS
- Why is PFOS so high?
  - No obvious sources of PFAS
- Small Mouth Bass do have a large geographical habitat

Creek Fish Health Collection Site

ample ate	Sex	Age	T.L. (mm)	Wt (gms)	PFNA ng/ml	PFOSA ng/ml	PFDA ng/ml	PFDoA ng/ml	PFOS ng/ml	PFUnA ng/ml
5/2018	M	3	249	175	BD	BD	17.1	12.9	250	21.7
5/2018	M	6	337	524	0.519	1.10	37.3	27.4	346	54.8
/2018	F	4	330	467	BD	0.52	19.4	9.1	373	20.3
/2018	M	4	270	244	BD	BD	22.7	14.2	486	29.1
2018	M	4	304	346	0.924	0.55	28.6	17.9	499	40.7
2018	M	7	396	835	BD	0.94	36.0	28.4	385	54.3
2018	M	6	413	885	1.27	BD	26.8	18.6	538	34.0
2018	F	4	356	569	BD	0.66	31.2	11.5	574	26.5
2018	F	3	305	347	BD	0.50	24.9	11.9	498	23.5
2018	M	5	317	350	BD	BD	19.1	9.0	325	18.7
2018	F	4	336	460	BD	0.56	24.0	11.1	509	23.4
2018	F	3	255	195	0.721	0.80	19.2	12.1	344	22.5
2018	M	3	289	318	BD	0.52	20.1	11.5	398	22.6
2018	F	3	276	281	BD	0.59	18.9	10.6	449	21.2
/2018	M	3	249	171	BD	BD	18.6	11.1	399	22.3
/2018	F	3	261	233	0.535	0.68	21.1	12.5	372	24.0
/2018	F	3	256	183	0.519	0.92	18.1	15.1	254	25.2
5/2018	M	3	277	288	0.662	0.54	21.2	12.0	427	27.6
5/2018	M	5	288	287	0.838	0.62	12.9	8.4	220	13.4
/5/2018	F	4	287	323	BD	0.57	22.1	12.1	393	22.8
0/30/2018	F	4	345	484	BD	0.62	16.7	16.0	260	25.4
10/30/2018	F	7	311	356	BD	BD	16.1	10.9	255	22.7
10/30/2018	M	4	288	319	BD	BD	22.1	14.0	470	29.9
10/30/2018	M	3	288	305	BD	0.86	23.2	16.5	423	36.2
10/30/2018	M	4	334	534	BD	0.99	23.4	22.6	321	44.9
10/30/2018	F	5	332	454	BD	0.69	15.8	11.9	232	18.7
10/30/2018	F	4	325	468	BD	0.78	15.4	19.6	274	28.6
10/30/2018	F	5	322	469	BD	0.51	20.5	14.7	320	25.5
10/30/2018	M	4	331	482	BD	0.76	22.2	33.7	388	46.8
10/30/2018	F	2	248	176	0.595	0.56	13.3	10.1	361	18.1
10/30/2018	F	3	278	240	BD	BD	19.8	9.4	506	23.0

PFAS Analysis on Antietam Creek

- Collected water samples on March 26, 2020
- Tested 11 PFAS compounds (Including PFOS & PFOA)
- Hagerstown WWTP
  - Sum of PFAS = 138.8 ppt PFAS
- Smithsburg WWTP
  - Sum of PFAS = 81.8 ppt PFAS
- Antietam Creek (Burnside Bridge)
  - Sum of PFAS = 13.38 ppt PFAS
- If two wastewater plants in a rural area have PFAS at these levels, what about larger urban areas like DC? Or heavy industrial areas like Baltimore?
- If PFAS is in rural city wastewater, what about PFAS levels in Sludge?

Analysis Name		Units		Hagerstown WWTP		Antietam Creek USGS		Smithburg WWTP
				Result		Result		Result
Perfluorobutanesulfonic acid	PFBS	ng/l	Ppt	N.D.		1.3		N.D.
Perfluorobutanoic acid	PFBA	ng/l	Ppt	25		N.D.		24
Perfluorodecanoic acid	PFDA	ng/l	Ppt	5.4		N.D.		N.D.
Perfluoroheptanoic acid	PFHpA	ng/l	Ppt	5.2		0.86		N.D.
Perfluorohexanesulfonic acid	PFHS CPD	ng/l	Ppt	5.8		1.3		N.D.
Perfluorohexanoic acid	PFHXA	ng/l	Ppt	21		2.5		17
Perfluorononanoic acid	PFNA	ng/l	Ppt	8.4		N.D.		N.D.
Perfluorooctanesulfonamide	PFOSA	ng/l	Ppt	N.D.		0.52		5.5
Perfluorooctanesulfonic acid	PFOS	ng/l	Ppt	24		2.7		N.D.
Perfluorooctanoic acid	PFOA	ng/l	Ppt	23		1.7		6.3
Perfluoropentanoic acid	PFPeA	ng/l	Ppt	21		2.5		29
Total PFAS		ng/l	Ppt	138.8		13.38		81.8

PFAS Data and Loading in PRKN Report

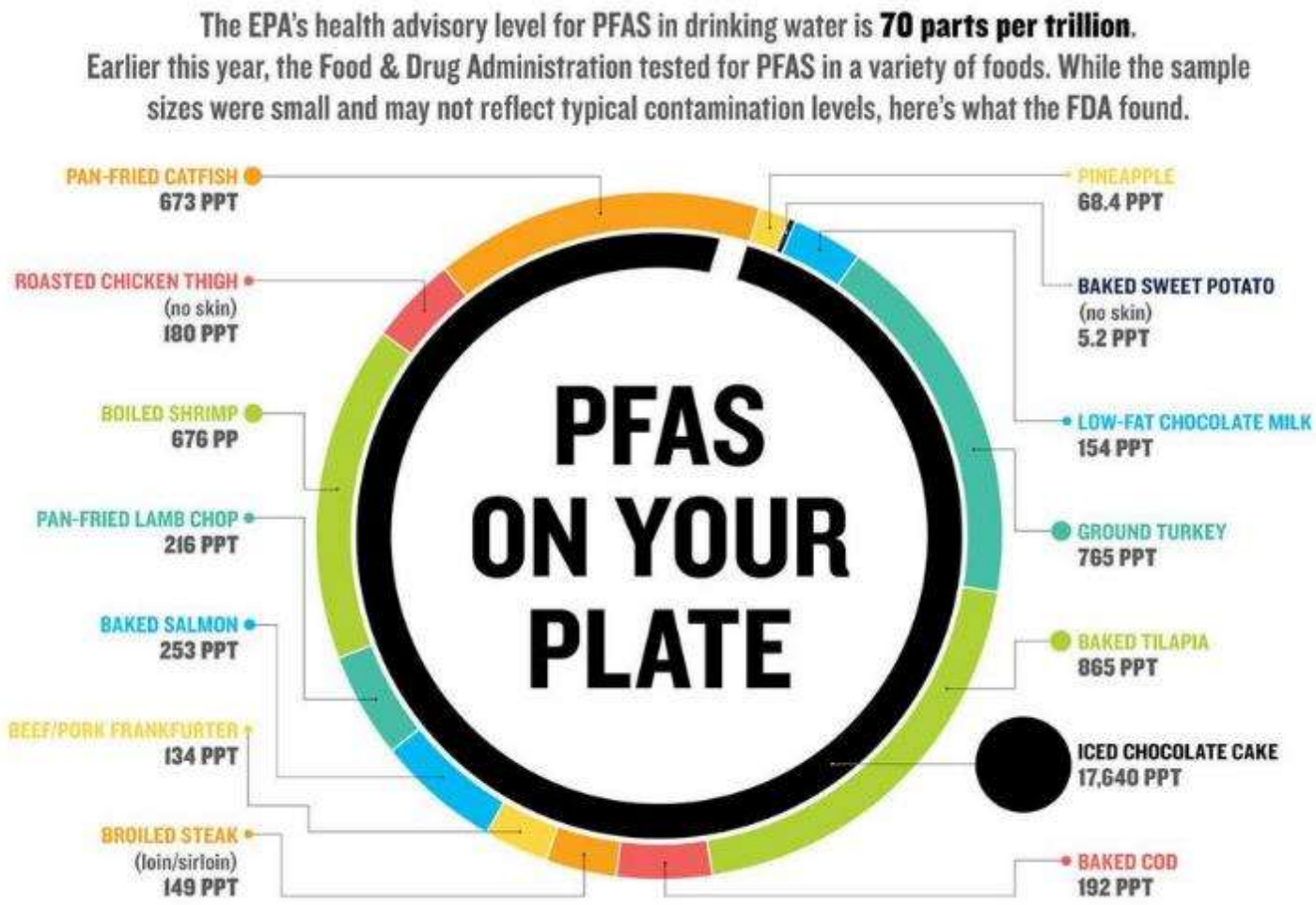
- PFAS Loading from Antietam to Potomac
  - 7.67 lbs/yr
- PFOS and PFOA loading from Antietam
  - PFOS = 1.59 lbs/yr
  - PFOA = 1.00 lbs/yr

Analysis Name		Units		Hagerstown WWTP		Antietam Creek USGS		Smithburg WWTP
				Result		Result		Result
Perfluorobutanesulfonic acid	PFBS	ng/l	Ppt	N.D.		1.3		N.D.
Perfluorobutanoic acid	PFBA	ng/l	Ppt	25		N.D.		24
Perfluorodecanoic acid	PFDA	ng/l	Ppt	5.4		N.D.		N.D.
Perfluoroheptanoic acid	PFHpA	ng/l	Ppt	5.2		0.86		N.D.
Perfluorohexanesulfonic acid	PFHS CPD	ng/l	Ppt	5.8		1.3		N.D.
Perfluorohexanoic acid	PFHXA	ng/l	Ppt	21		2.5		17
Perfluorononanoic acid	PFNA	ng/l	Ppt	8.4		N.D.		N.D.
Perfluorooctanesulfonamide	PFOSA	ng/l	Ppt	N.D.		0.52		5.5
Perfluorooctanesulfonic acid	PFOS	ng/l	Ppt	24		2.7		N.D.
Perfluorooctanoic acid	PFOA	ng/l	Ppt	23		1.7		6.3
Perfluoropentanoic acid	PFPeA	ng/l	Ppt	21		2.5		29
Total PFAS		ng/l	Ppt	138.8		13.38		81.8

Sample site	PFAS ng/l	PFAS mg/l	MGD	lb/day	lb/yr
HagWWTP Annual Avg	138	0.000138	10	0.0115	4.20
HagWWTP Rain Event	138	0.000138	30	0.0345	12.60
SmithWWTP Annual Avg	82	0.000082	0.333	0.0002	0.08
SmithWWTP Rain Event	82	0.000082	0.6	0.0004	0.15
USGS Antietam (300 CFS)	13	0.000013	193.895	0.0210	7.67

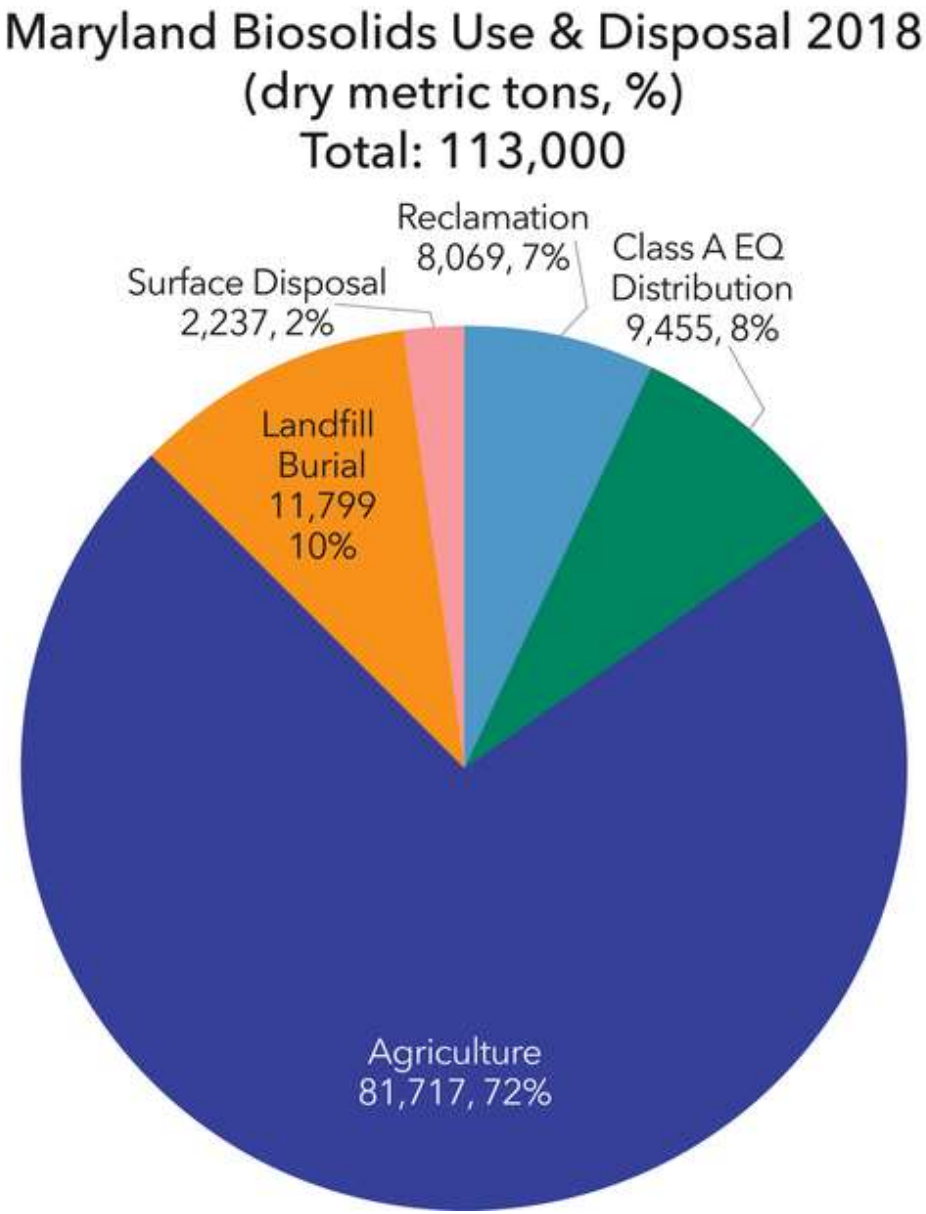
PFAS Biosolid Land Application

- 2012 to 2019 FDA tested a variety of food for PFAS.
  - PFAS was found in milk, meat, seafood, grain, and produce.
  - Concluded that the small amount was of little consequence
- Farms contaminated with PFAS from Biosolids
  - Maine, Michigan, Wisconsin, Alabama and Florida
  - Found in soils, cows and the Farmers' blood
- Advisory of beef from Michigan cattle farm – Jan 2022



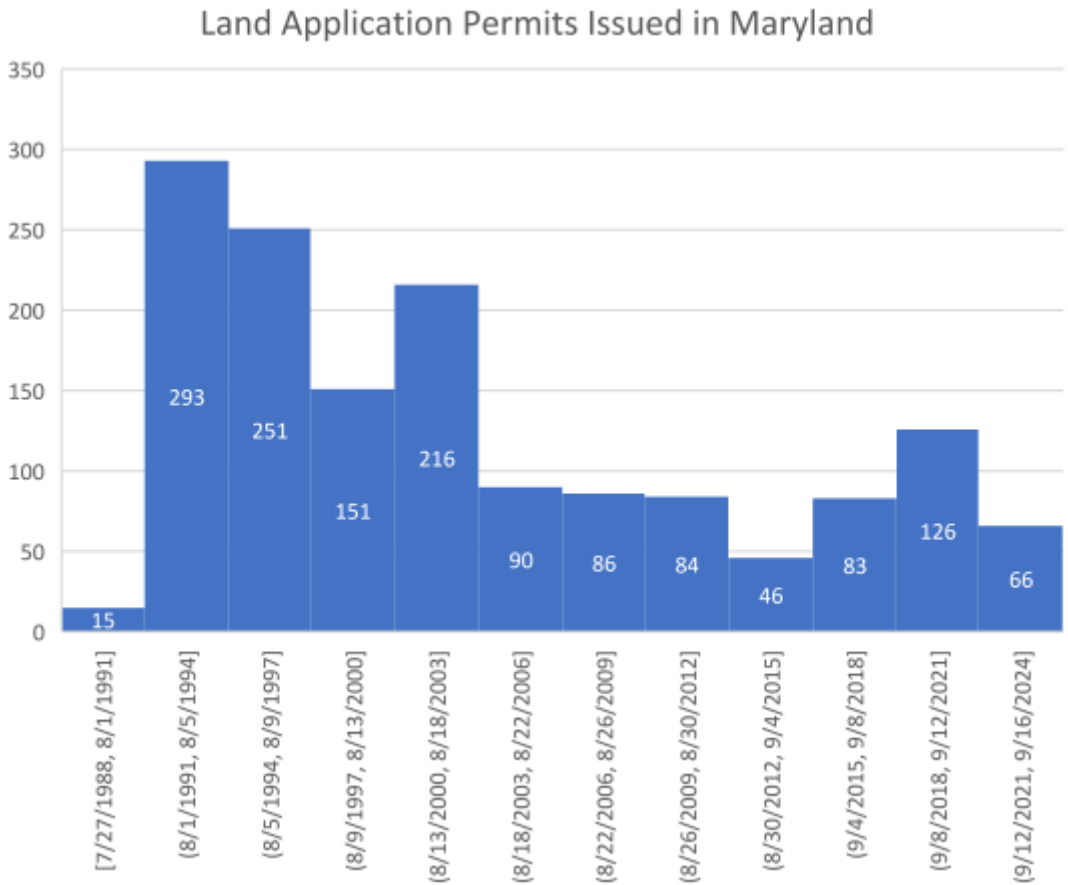
Maryland Use of Biosolids

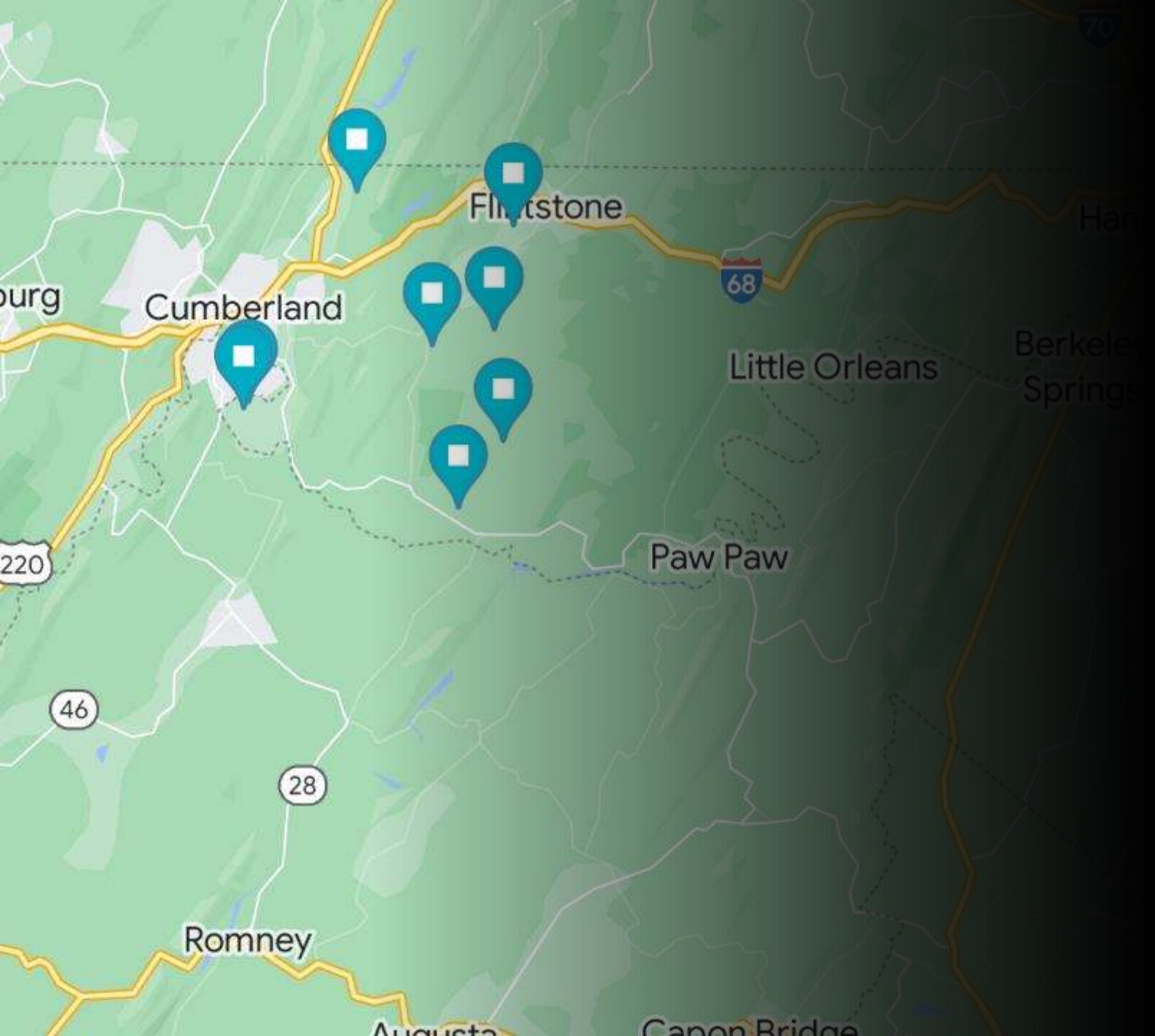
- What about Biosolids?
- Where is it applied?
- What is the land use allowed?
- Crops?
- Run off into streams?



Biosolid Land Application in Maryland

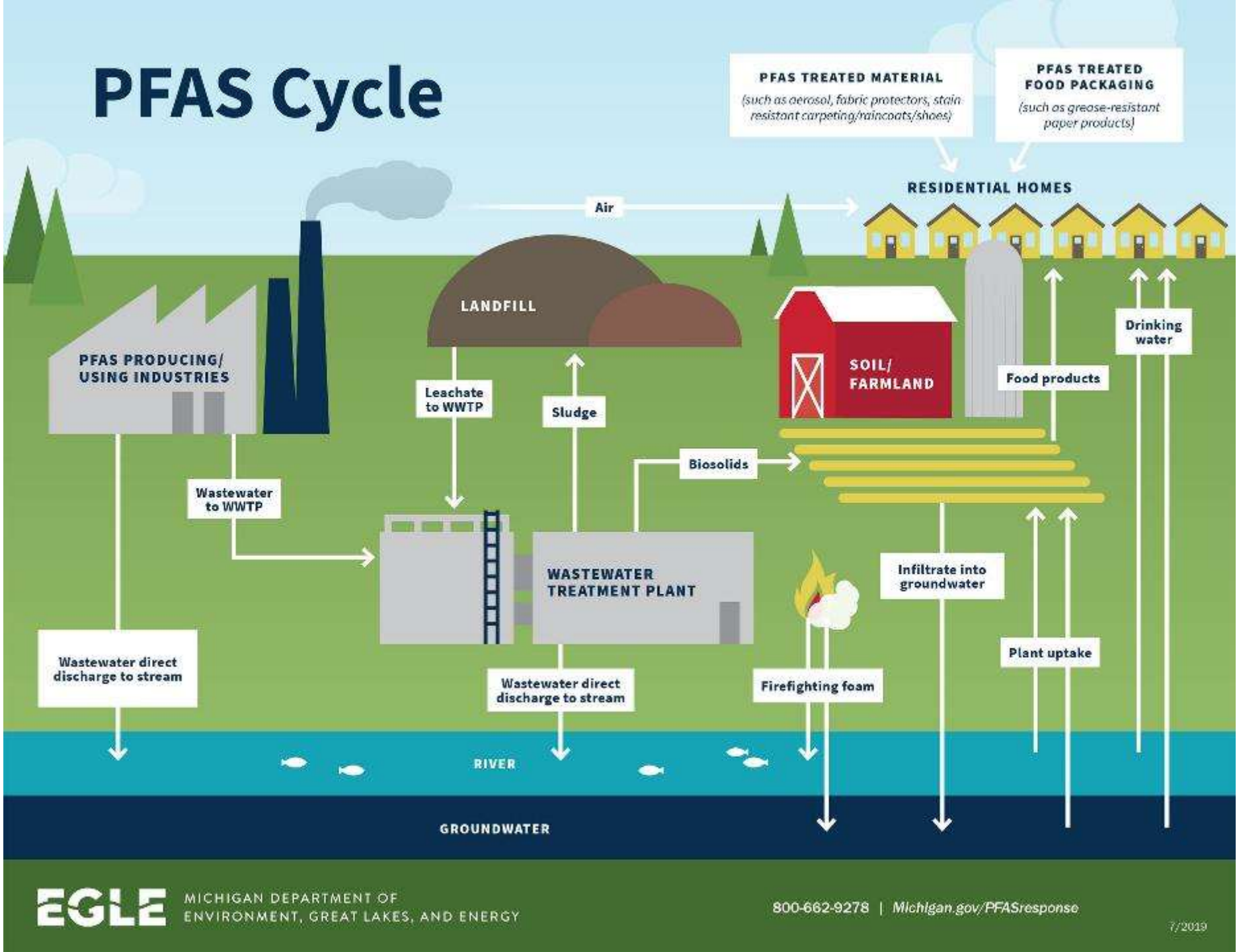
- 1507 permits issued since 1988
- 225 active permits
  - Frederick – 28
  - Charles – 23
  - Allegany – 21
- Allowed to grow corn, hay and grazing cattle
- Biosolids from Synagro
  - Mix of sludge (mostly Eastern shore of MD)





Sampling of Farm Field Runoff for PFAS

- Identified 3 sites for testing
- Collected 2 samples – Cyclopure
- Follow up sampling using PACE labs


PFAS Cycle
PFAS TREATED MATERIAL
(such as aerosol, fabric protectors, stain resistant carpeting/raincoats/shoes)
PFAS TREATED FOOD PACKAGING
(such as grease-resistant paper products)
RESIDENTIAL HOMES
Air
LANDFILL
PFAS PRODUCING/ USING INDUSTRIES
SOIL/ FARMLAND
Drinking water
Food products
Leachate to WWTP
Sludge
Biosolids
Wastewater to WWTP
WASTEWATER TREATMENT PLANT
Infiltrate into groundwater
Plant uptake
Wastewater direct discharge to stream
Wastewater direct discharge to stream
Firefighting foam
RIVER
GROUNDWATER
EGLE
MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY
800-662-9278 | Michigan.gov/PFASresponse
7/2019

PRKN Actions

- Passed MD Legislation
  - The George Walter Taylor Act
  - Stops the use of PFAS in rugs & carpets, food packaging and AFFF
  - Restricting the Disposal of products with PFAS
- Fish collection on Opequon Crk
  - Consumption advisory
- PFAS sampling from biosolid land application sites
  - Determine if PFAS is polluting waterways
- Active in VA PFAS Work Group
- Public Awareness through Social Media