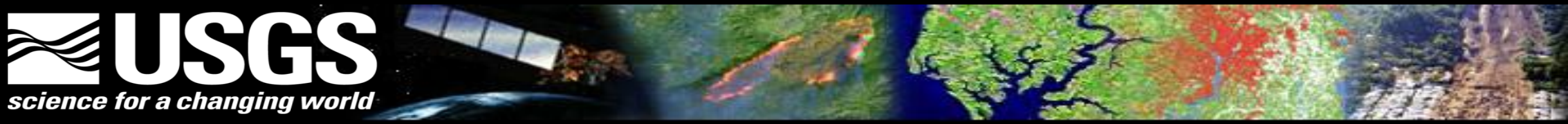


CAST-21 Land Policy BMPs

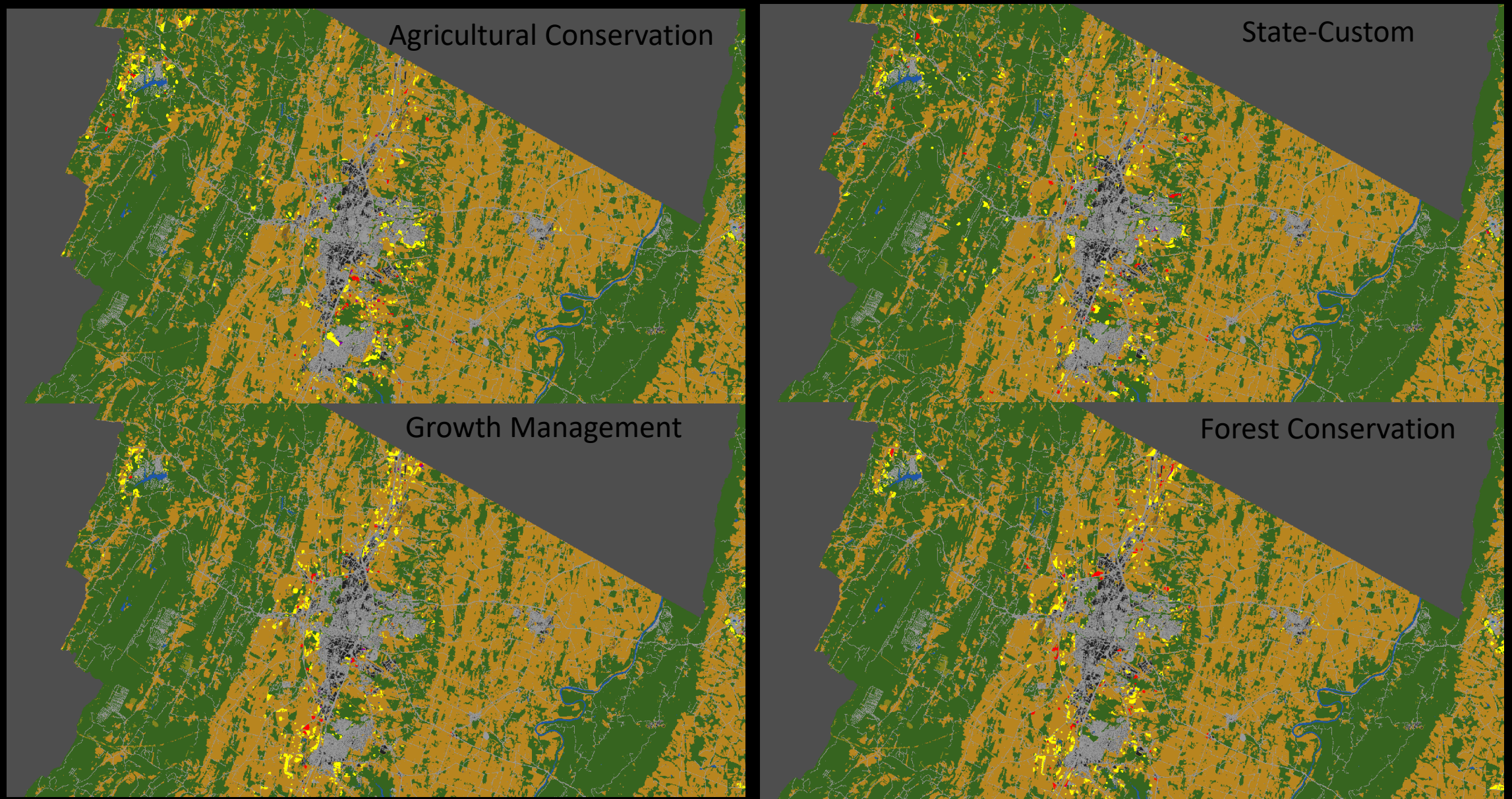
Peter R. Claggett, Labeeb Ahmed, and Sarah McDonald

Lower Mississippi-Gulf Water Science Center, U.S. Geological Survey, Annapolis, MD 21403

Land Use Workgroup Meeting
December 1, 2021

U.S. Department of the Interior
U.S. Geological Survey

Land Policy BMPs alter the quantity and patterns of development



Effects of Land Policy BMPs on Land Use in 2025

(compared to the Current Zoning baseline)

State-Custom	Development	Natural	Agriculture	OpenSpace
Delaware	(4,103)	(1,528)	5,837	(206)
District of Columbia	(16)	16	-	(0)
Maryland	(4,278)	2,724	1,500	55
New York	-	-	-	-
Pennsylvania	55	361	(406)	(9)
Virginia	(3,553)	7,341	(3,880)	91
West Virginia	(158)	(5)	152	10

Forest Conservation	Development	Natural	Agriculture	OpenSpace
Delaware	821	1,697	(2,653)	135
District of Columbia	(61)	61	-	(0)
Maryland	371	2,628	(3,187)	188
New York	31	50	(81)	0
Pennsylvania	628	1,777	(2,424)	20
Virginia	(750)	13,512	(13,155)	393
West Virginia	(245)	225	(13)	33

Growth Management	Development	Natural	Agriculture	OpenSpace
Delaware	(1,329)	1,561	(296)	65
District of Columbia	(122)	122	-	(0)
Maryland	(7,076)	3,892	3,479	(294)
New York	(53)	46	6	0
Pennsylvania	(4,374)	1,742	2,695	(63)
Virginia	(14,523)	11,884	3,242	(603)
West Virginia	(876)	571	321	(16)

Agricultural Conservation	Development	Natural	Agriculture	OpenSpace
Delaware	(2,187)	(2,169)	4,551	(195)
District of Columbia	(52)	52	-	(0)
Maryland	(1,709)	(4,146)	6,499	(644)
New York	(168)	(159)	331	(3)
Pennsylvania	(5,056)	(7,666)	13,111	(389)
Virginia	(17,366)	(5,877)	24,945	(1,702)
West Virginia	(785)	(927)	1,796	(84)

Both Growth Management and Agricultural Conservation significantly reduce future development but for different reasons.

Effects of Land Policy BMPs on Wastewater in 2025

(compared to the Current Zoning baseline)

Land Policy BMPs	SepticSystems	PopOnSeptic	PopOnSewer
Delaware	(734)	(1,819)	1,819
District of Columbia	-	-	(0)
Maryland	(2,374)	(6,675)	6,675
New York	-	-	-
Pennsylvania	455	1,190	(1,190)
Virginia	(1,252)	(2,885)	2,885
West Virginia	(685)	(1,744)	1,744

Growth Management	SepticSystems	PopOnSeptic	PopOnSewer
Delaware	(2,731)	(6,895)	6,895
District of Columbia	-	-	(0)
Maryland	(10,082)	(27,042)	27,042
New York	(370)	(881)	881
Pennsylvania	(16,759)	(41,955)	41,955
Virginia	(23,572)	(60,334)	60,334
West Virginia	(1,466)	(3,752)	3,752

Forest Conservation	SepticSystems	PopOnSeptic	PopOnSewer
Delaware	402	984	(984)
District of Columbia	-	-	(0)
Maryland	609	1,253	(1,253)
New York	37	88	(88)
Pennsylvania	1,554	3,996	(3,996)
Virginia	4,714	14,778	(14,778)
West Virginia	(899)	(2,289)	2,289

Agricultural Conservation	SepticSystems	PopOnSeptic	PopOnSewer
Delaware	(451)	(1,235)	1,235
District of Columbia	-	-	(0)
Maryland	(1,684)	(5,149)	5,149
New York	(12)	(28)	28
Pennsylvania	1,078	2,835	(2,835)
Virginia	1,315	5,704	(5,704)
West Virginia	(860)	(2,189)	2,189

Only Growth Management consistently reduced the future number of septic systems across all jurisdictions

Effects of Land Policy BMPs

- Forest and farmland conservation deflects growth into agricultural and forested areas respectively.

- Growth management actions reduce the overall amount of land conversion through infill, redevelopment, and densification.

- County-level patterns of forest, farmland, development densities, and wastewater service strongly influence the overall water quality effects of Land Policy BMPs.

- Development of farmland results in greater land use change (conversion of formerly farmed backyards to turf grass) compared to development in forested lands (that maintain the majority of trees on the lot). These assumptions are coded in the CBLCM.


USGS
science for a changing world