

# Release of CAST-2019

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and the rest of the MWG, the WQGIT, and its workgroups

WQGIT

3/23/2020

# CAST-2019 Changes Approved by the Partnership

- December 2015 WQGIT => the partners will factor in the new information, BMP efficiencies, and data into the present and past history of progress runs at the end of the milestone period
- 2018 - Planning began for the transition from CAST-2017d to CAST-2019
- September 9 and 30, 2019, the list of updates explaining the effects was presented and approved by the WQGIT [https://www.chesapeakebay.net/channel\\_files/34001/2019\\_09\\_09\\_wqgit\\_-\\_model\\_changes\\_and\\_planning\\_targets\\_-\\_gshenk\\_\(002\).pdf](https://www.chesapeakebay.net/channel_files/34001/2019_09_09_wqgit_-_model_changes_and_planning_targets_-_gshenk_(002).pdf), [https://www.chesapeakebay.net/channel\\_files/39994/2019\\_09\\_30\\_wqgit\\_-\\_cast-2019\\_-\\_gshenk.pdf](https://www.chesapeakebay.net/channel_files/39994/2019_09_30_wqgit_-_cast-2019_-_gshenk.pdf)



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## Model Documentation

ABOUT CAST

MODEL DOCUMENTATION

UPGRADE HISTORY

### CAST-2019 version

CAST-2017d is updated to CAST-2019 with changes to data and BMPs used in the Phase 6 model for the milestone period. This follows the Principals' Staff Committee decision of July 9, 2018 that changes are made only in advance of the two-year milestone period. The decision can be found in the July 9, 2018 [PSC meeting minutes](#). These changes were agreed to by the WQGIT and its workgroups. The changes are limited in scope so that they do not: 1) impact modeled runoff during the 1993-1995 critical period; or 2) alter the base conditions (land uses, septs, animals, etc.) from 1984 through 2013. Preservation of these estimates enables a consistent assessment of how new management actions and changes in base conditions have influenced loads over time.

[CAST-2019 Upgrades and Documentation](#)



### Phase 6 Calibration

The Final Chesapeake Bay Program Partnership Phase 6 CAST and Watershed Model documentation is posted as it becomes available. The documentation is for the time-averaged Watershed Model. CAST is the same as the Model. Creating and running scenarios in CAST is simply using an on-line interface to the Model. The documentation for the Model is the documentation for CAST. Due to the length of the documentation, it is divided into sections. Click on the links below to read through the different portions of the documentation. See Draft Beta 3 documentation for draft versions of sections coming soon.

1. [Overview](#)

2. [Average Loads](#)

Appendix 2A: [Agricultural Loading Rates](#)

3. [Terrestrial Inputs](#)

8. [Direct Loads](#) - coming soon

9. [Stream to River](#)

Appendix 9A: [Alternate Stream to River Methods](#)

Appendix 9B: [Excluded Reservoir Catchments](#)

10. [River to Bay and Temporal Simulation](#)

# Base Data changes between CAST-2017 and CAST-2019

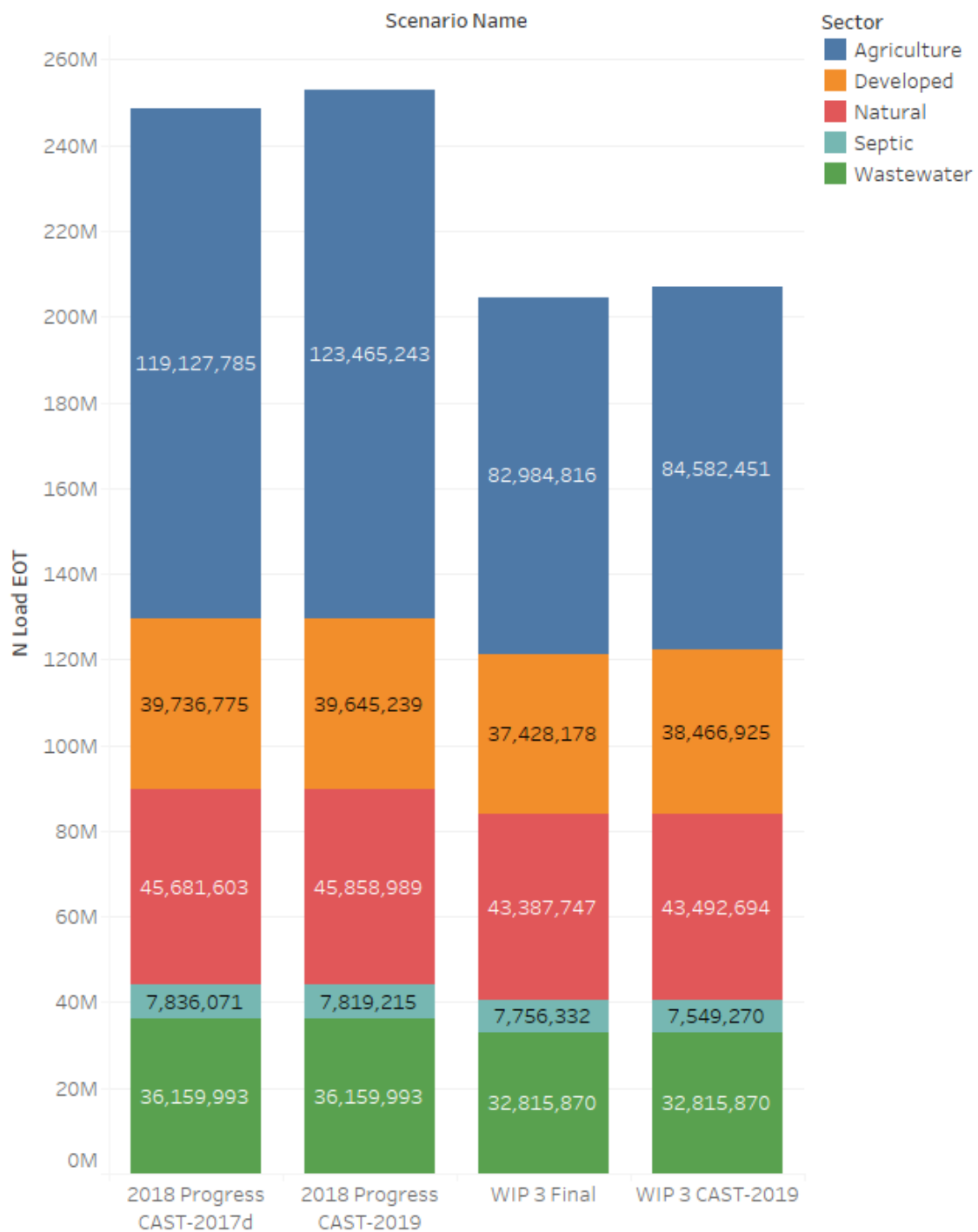
- 2013 – 2025 land use, septic systems, and sewer service area projections
- 2017 Agricultural Census data incorporated into the land use, crop yields, and animal numbers.
- Agricultural and urban fertilizer sales data

# BMP Changes between CAST-2017 and CAST-2019

- Planning BMPs that are now Official
  - Agricultural Stormwater Management
  - Conservation Landscaping Practices
  - Septic Effluent - Advanced
  - Septic Secondary Treatment - Advanced
  - Septic Denitrification - Advanced
- BMPs - history and current
  - Adjustment to maintain 1995 loads
- BMP costs
- Biofilter credit was updated

# Other changes between CAST-2017 and CAST-2019

- Nitrogen fixation rate for “other haylage; grass silage and green chop”
- Nitrogen fixation inputs for over-winter crops in CAST-2017.
- The definition of a ‘wastewater year’ for all states except VA and DC
- Stream bed and bank loads are now credited by agency
- VA MS4 areas



# Chesapeake Bay Watershed

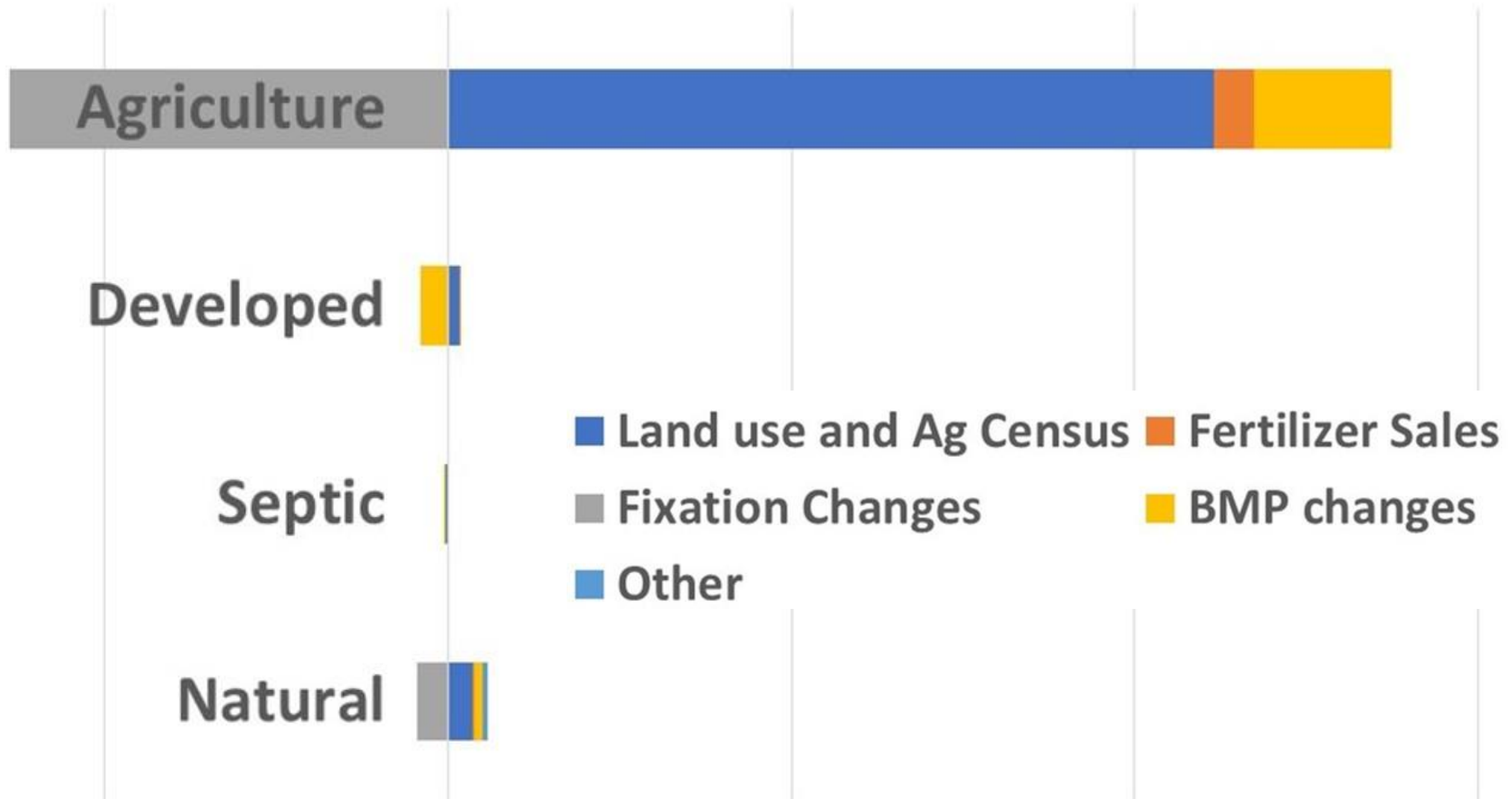
## Nitrogen at Edge-of-Tide

2018 Progress scenario  
+ 4,406,452 pounds

WIP BMP scenario  
+ 2,534,267 pounds

# Changes in Nitrogen Load

2018 progress



-4.00

-2.00

0.00

2.00

4.00

6.00



# Changes in Phosphorus Load

2018 progress

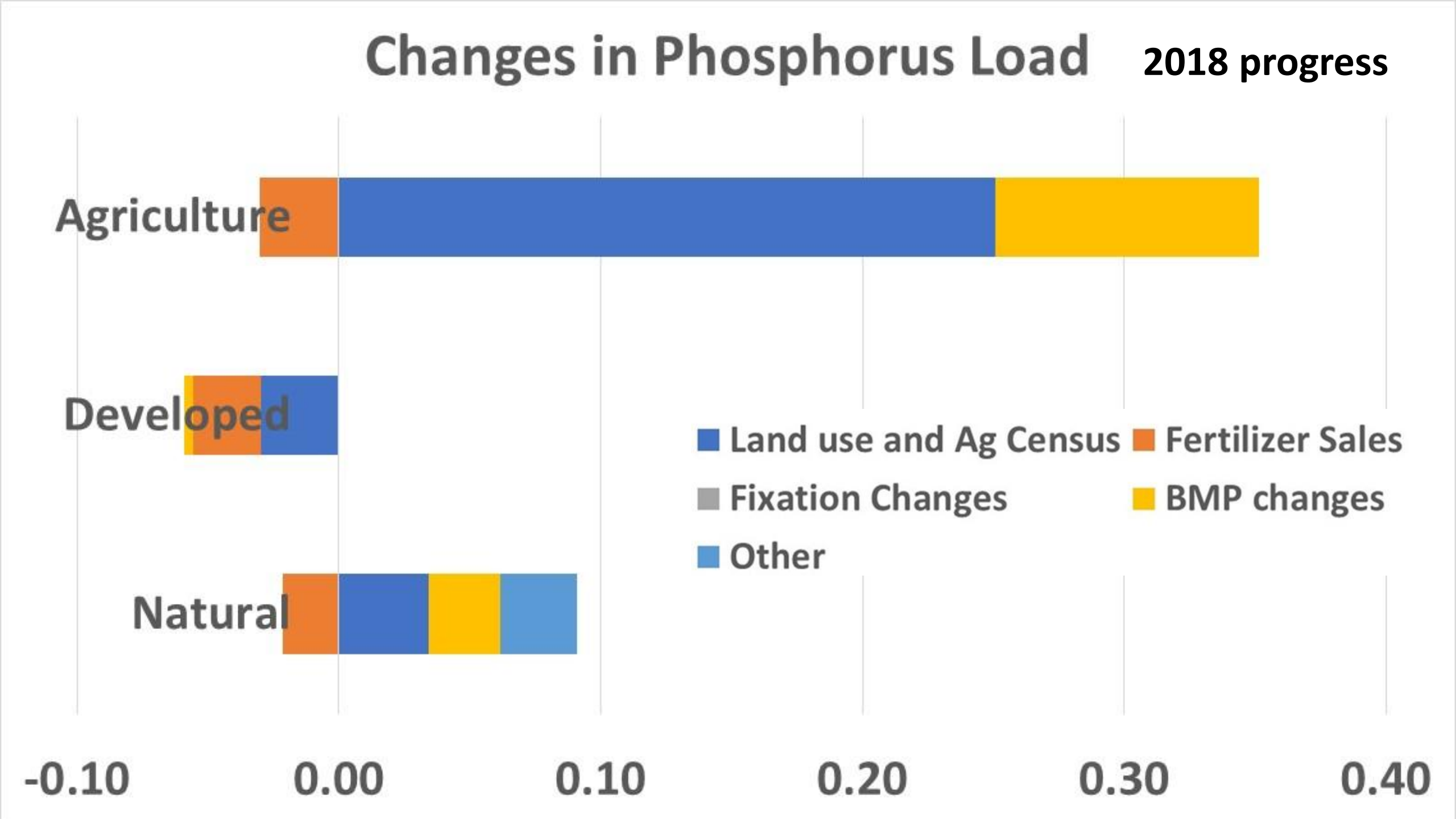
Agriculture

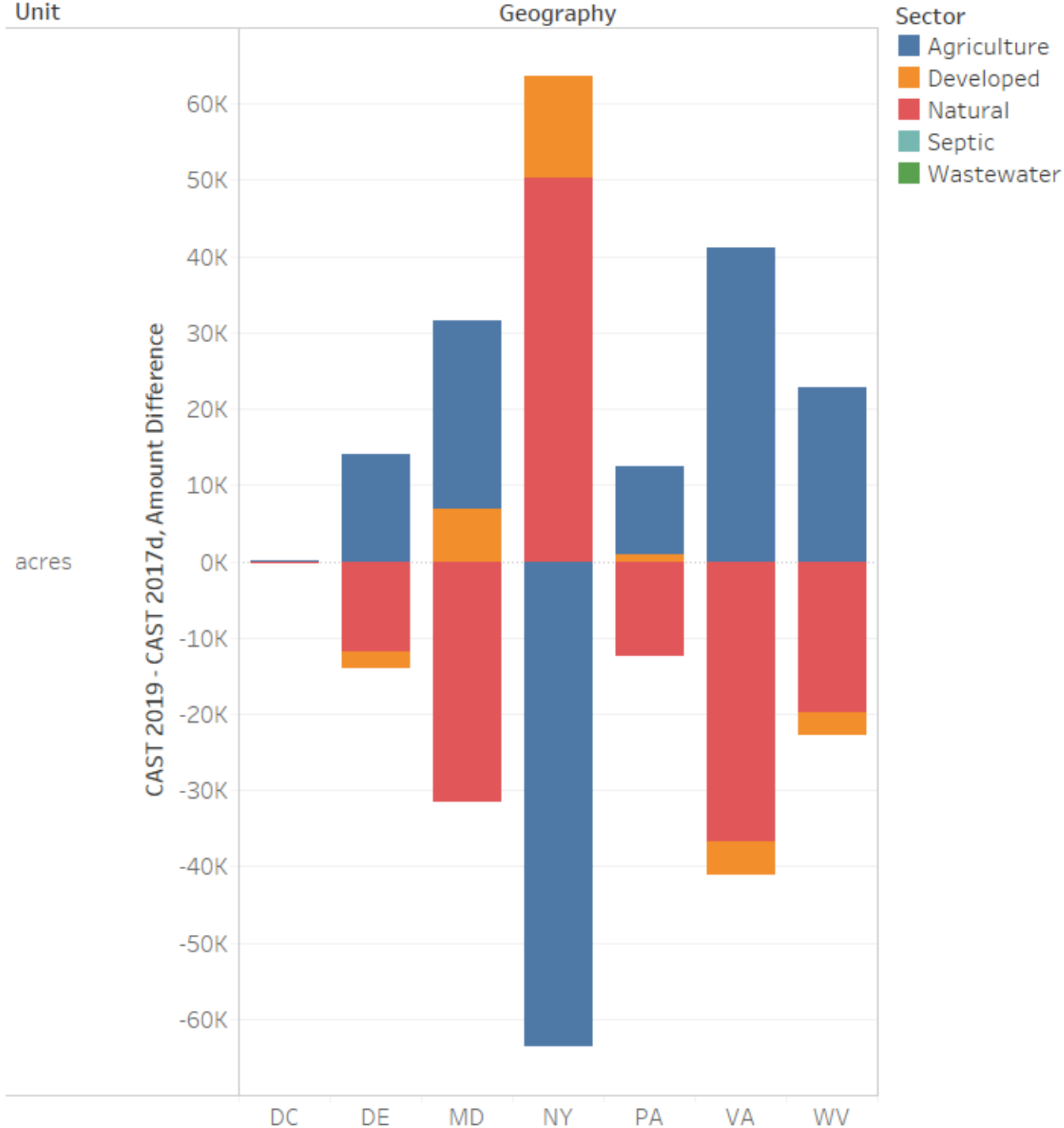
Developed

Natural

- Land use and Ag Census
- Fertilizer Sales
- Fixation Changes
- BMP changes
- Other

-0.10 0.00 0.10 0.20 0.30 0.40

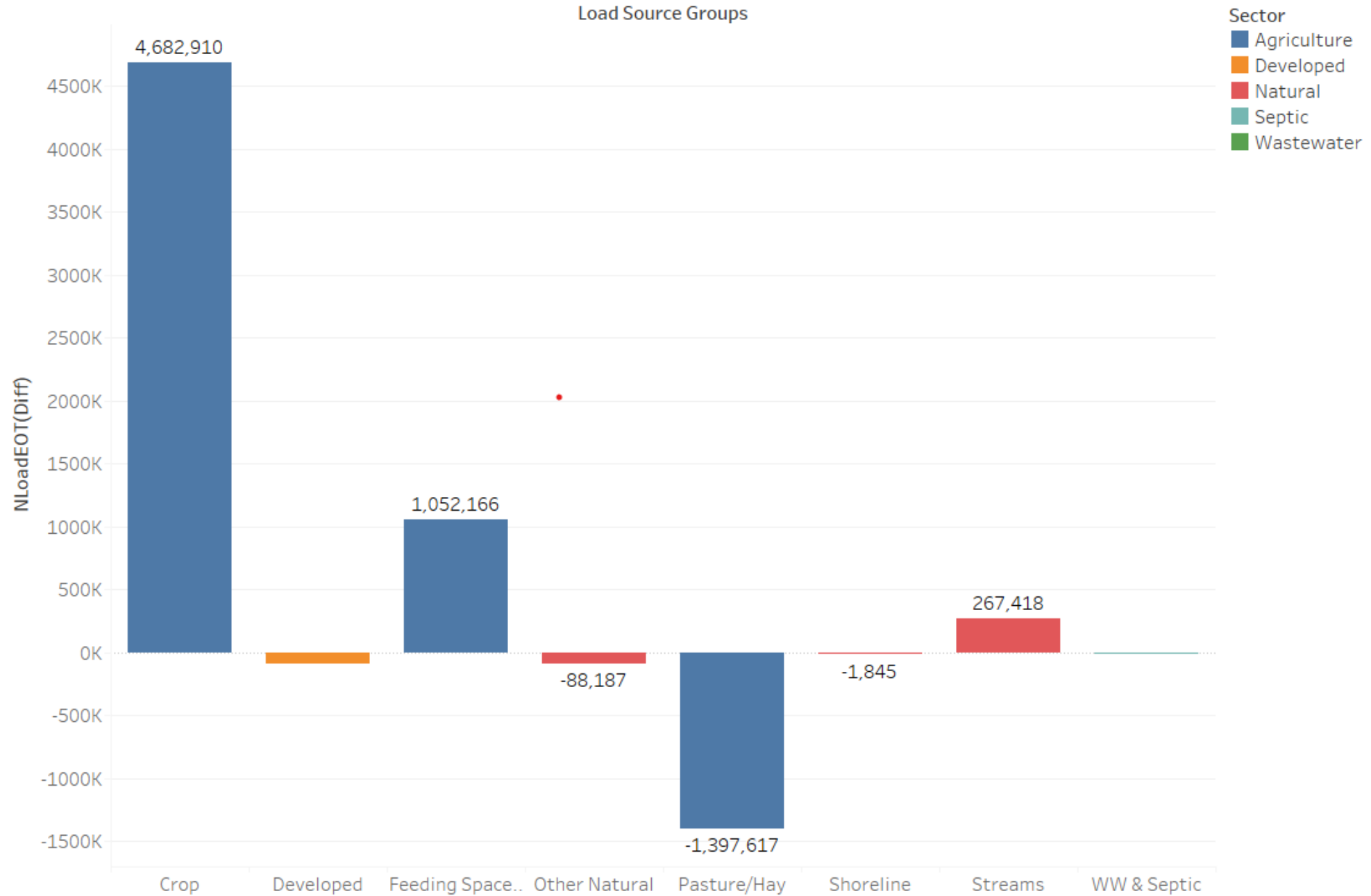




Chesapeake Bay  
Watershed

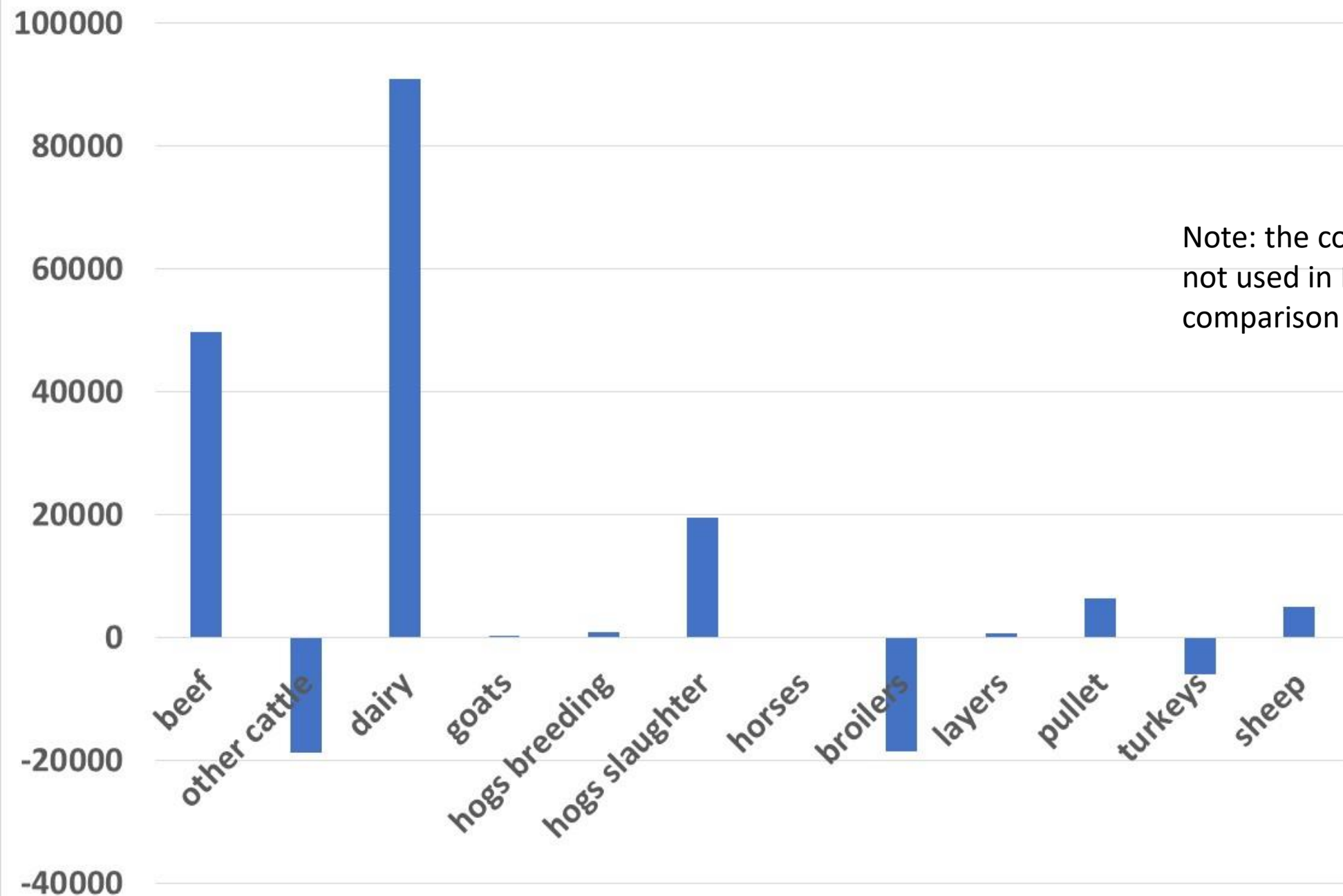
Change in 2018  
Acres

Difference between  
CAST-2019 and  
CAST-2017d



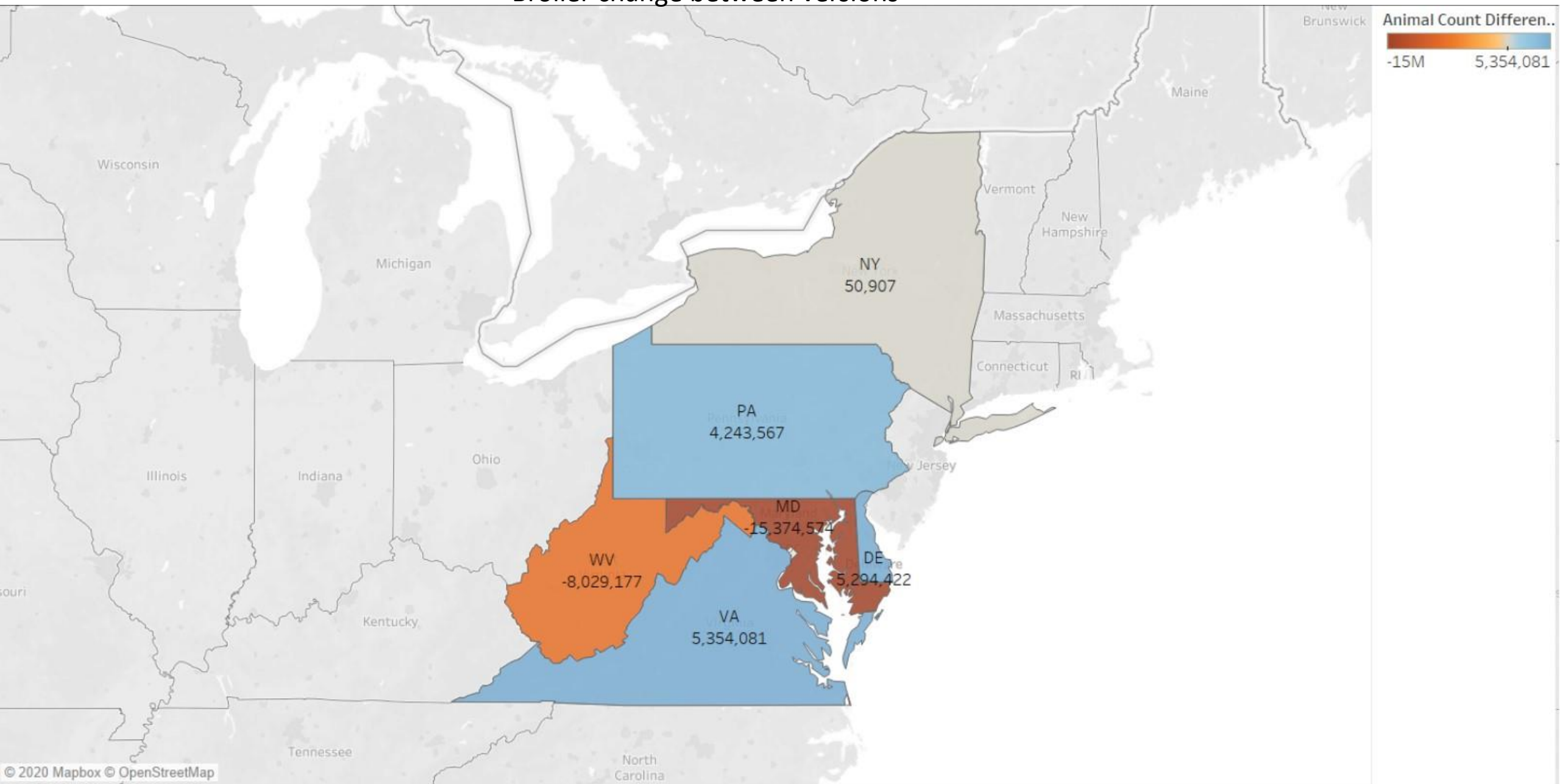
Chesapeake Bay Watershed: 2018 Nitrogen Loads in CAST-2017d and CAST-2019<sup>11</sup>

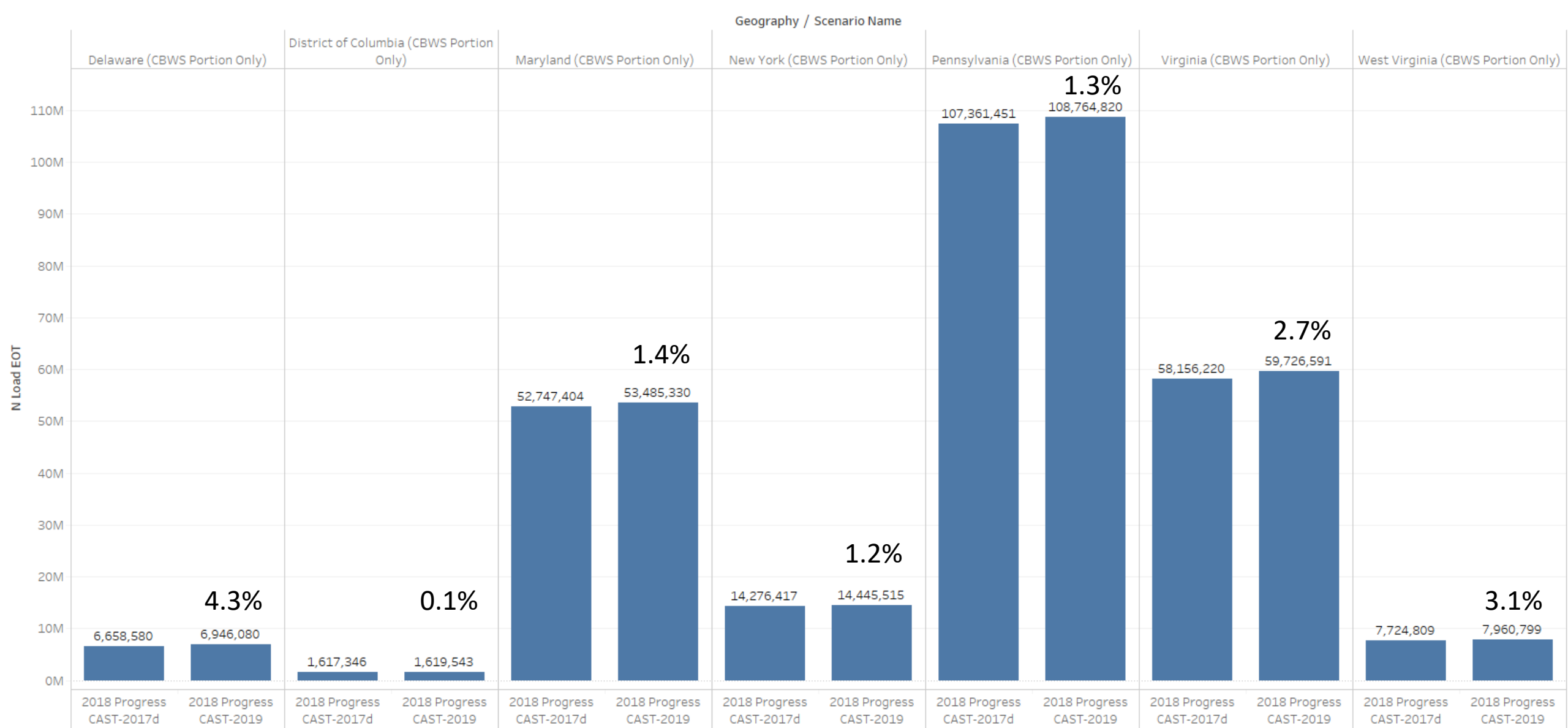
## Change in Animal Units CAST-2017 to CAST-2019



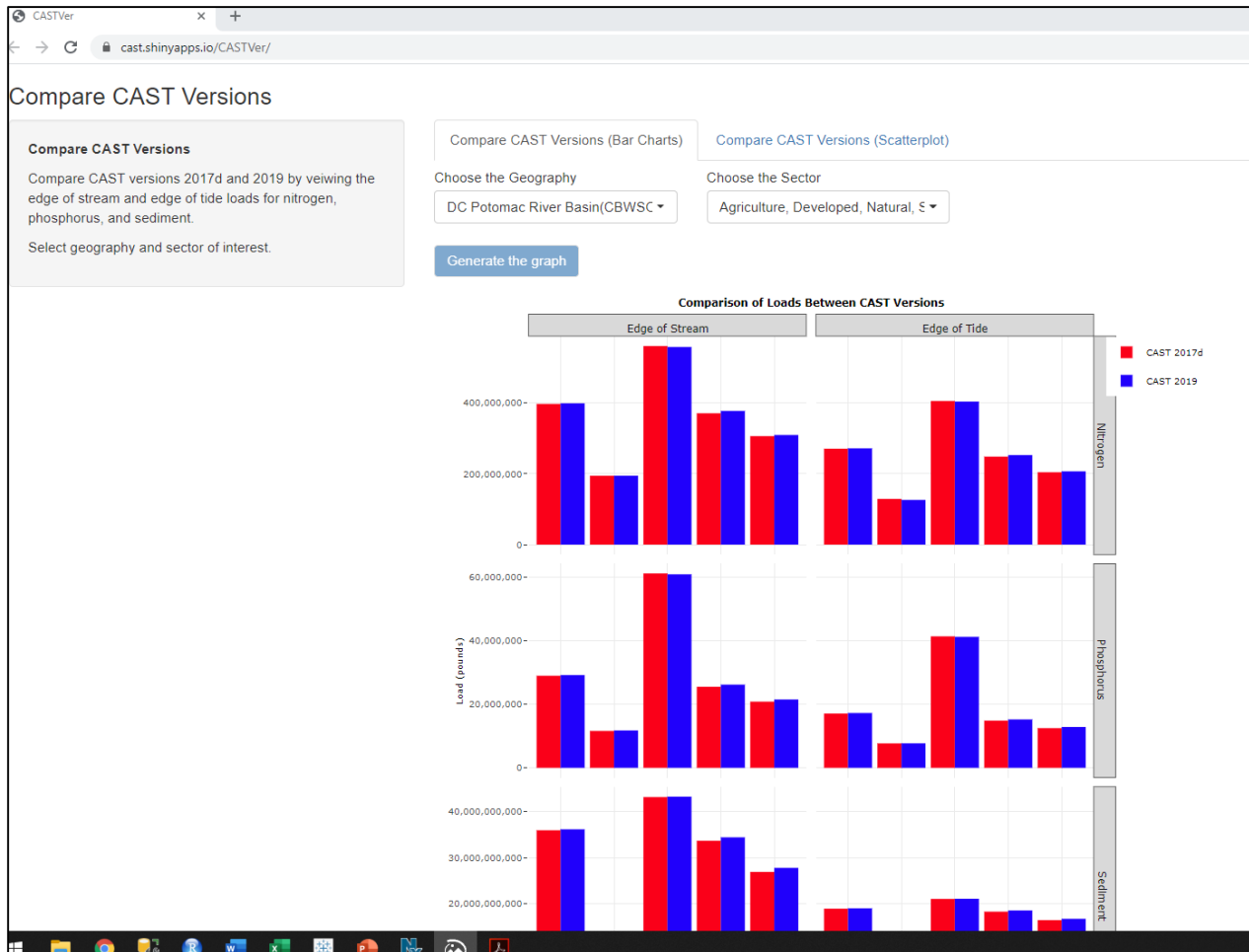
Note: the concept of 'animal units' is not used in Phase 6. This graphic is for comparison purposes

## Broiler change between versions





2018 Nitrogen Loads in CAST-2017d and CAST-2019



# Effects of Updates

<https://cast.shinyapps.io/CASTVer>

CBPO Staff are available for discussion

# CAST-2021 Schedule

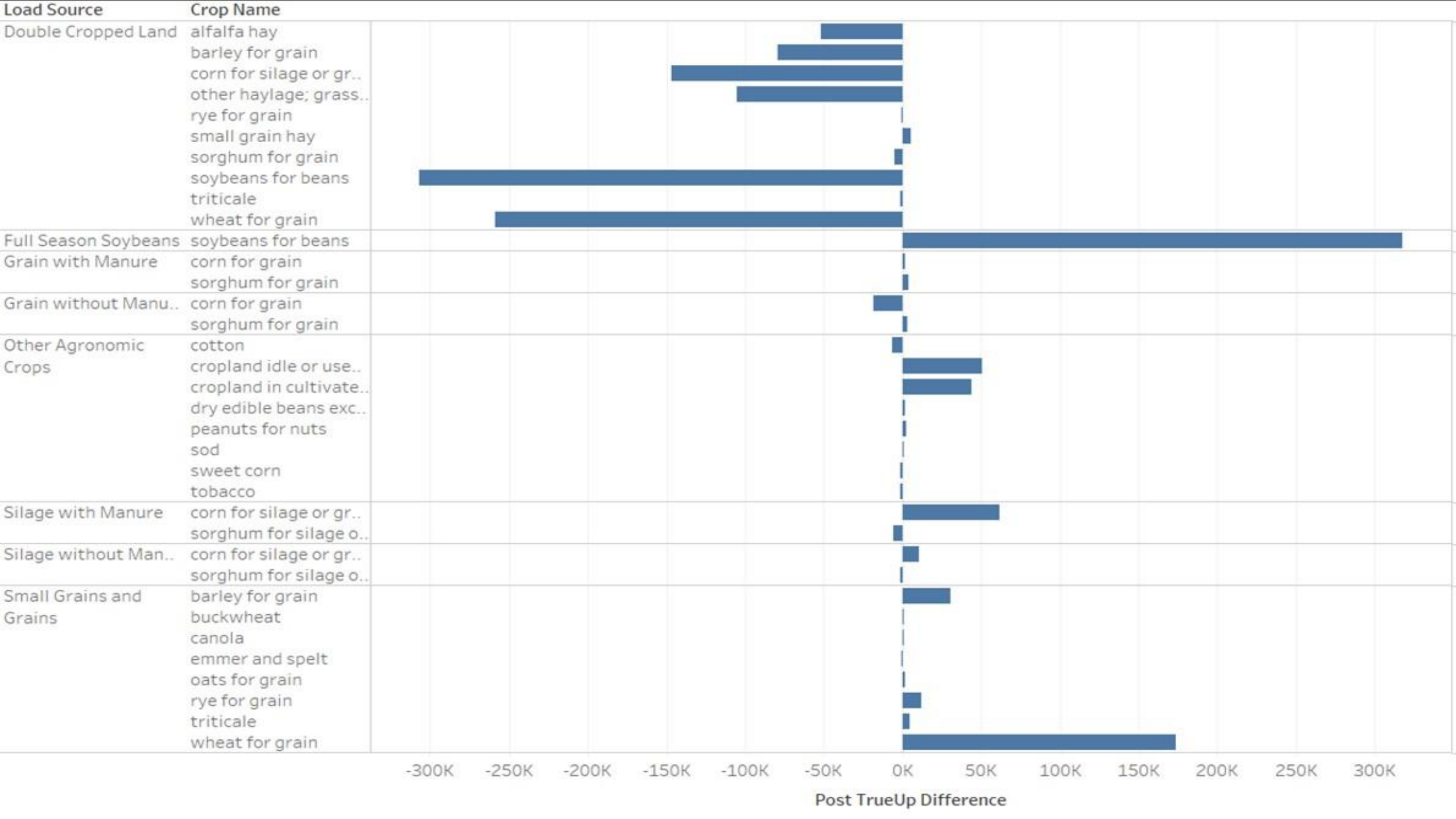
- September 1, 2021 - all data and approved methods
- November 1, 2021 - Beta CAST-2021 release
- January 1, 2022 - Final CAST-2021 release



# Questions



extras



## Land use change between versions

