Phase 7 Land Use Time Series (1985-2022)

Feedback and Corrections

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Land Use Work Group Office Hours

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

Agenda

- What feedback was received?
- How were the data corrected?
- Results – How do the data compare before and after the corrections?

Data Review

- Data review was conducted in March 2026
  - Reviewed 17, annual land uses from 1985-2022 at the county and Land-River Segment Scales

- CBP Workgroups/Teams who were invited to participate in the review:
  - Land Use Work Group
  - Urban Stormwater Work Group
  - Forestry Work Group
  - Agriculture Modeling Team
  - Water Quality GIT

Feedback

https://www.chesapeakebay.net/files/documents/LandUseTimeSeries-Feedback-Summary.pdf

Feedback Types

- Errors
  - Problems in the data that require corrections.
- Issues
  - Known limitations to the data that will not be corrected.
- Feedback
  - Observations and comments about the data.

Feedback

- Phase 7 trends are an improvement to Phase 6 trends
- Data accessibility issues
  - Land River-Segment scale data was too large.
  - A county FIPS column would be helpful for filtering.
- Documentation
  - More documentation is needed.

Issues

- Development trends are underestimated in heavily developed areas, likely due to the model missing infill, redevelopment, and densification.

Errors

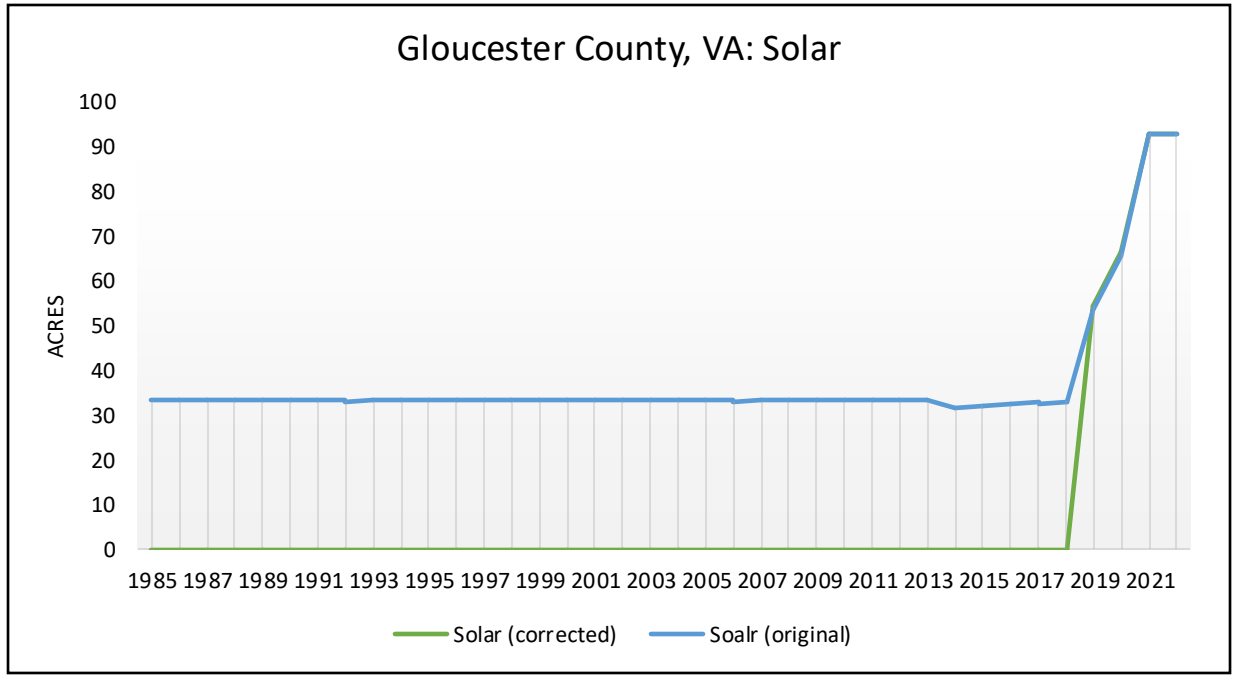
- Solar
  - Solar area incorrectly existed throughout the time series
- Cropland versus Pasture/Hay
  - The separation of cropland from pasture/hay had severe jumps between the two classes.

Corrections

https://www.chesapeakebay.net/files/documents/LandUseTimeSeries-Data-Corrections.pdf

Solar Correction

- Error
  - Reviewers identified solar area persisted throughout the time series (back to 1985).
- Correction
  - The earliest year of utility-scale solar fields per county was calculated from Energy Information Agency (EIA) data.
  - Any solar area prior to the county-specific utility-scale solar year is moved to the other land uses using the National Land Cover Database (NLCD).



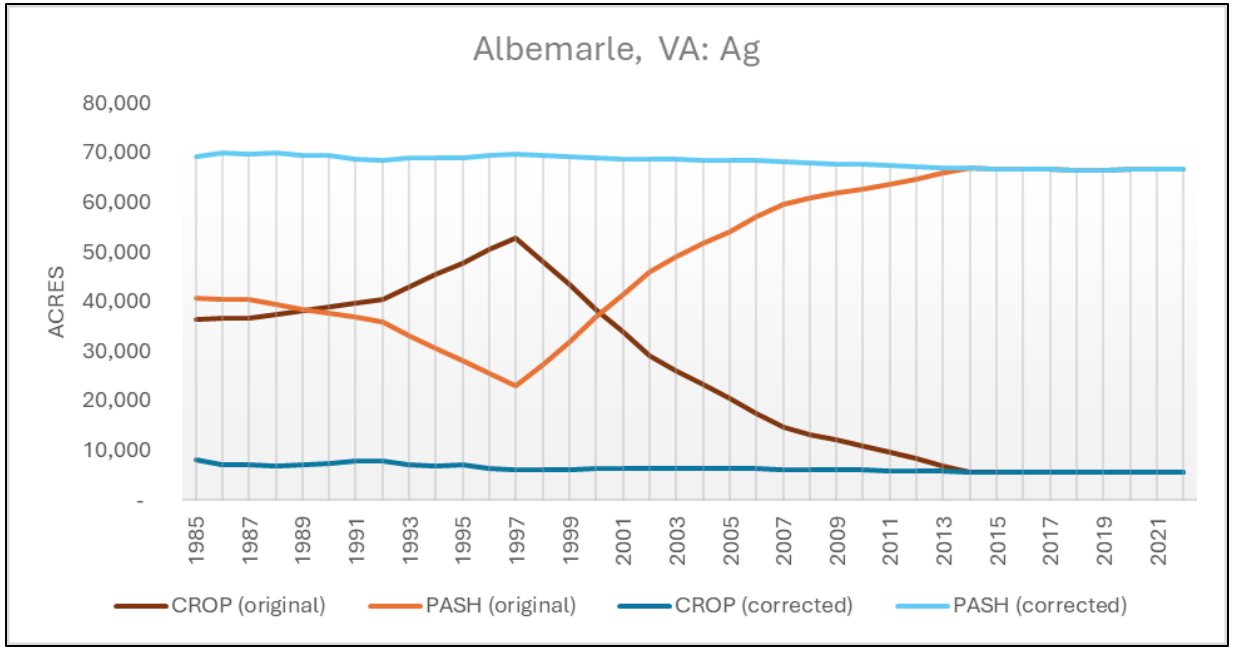
<u>Gloucester, VA Example</u>

- EIA reports Gloucester's first utility-scale solar field was implemented in 2019.
- Solar area drops to 0 acres in 2018.

Cropland versus Pasture/Hay Correction

- Error
  - Although total agriculture trends were valid, reviewers identified that the separation of cropland from pasture/hay had severe jumps between the two classes.

- Correction
  - This issue was corrected by replacing the Census of Agriculture with a “smoothed” version of the census that is used in CAST and previous model versions/phases.
  - The method to separate ag classes did not change, where it takes the reported % crop and % pasture per county and linearly interpolates between report years (1982-2007, 2007-2013/14 high-res mapped ratio). The annual ratios are multiplied by the mapped acres of agriculture to compute acres of Cropland and Pasture/Hay over time.

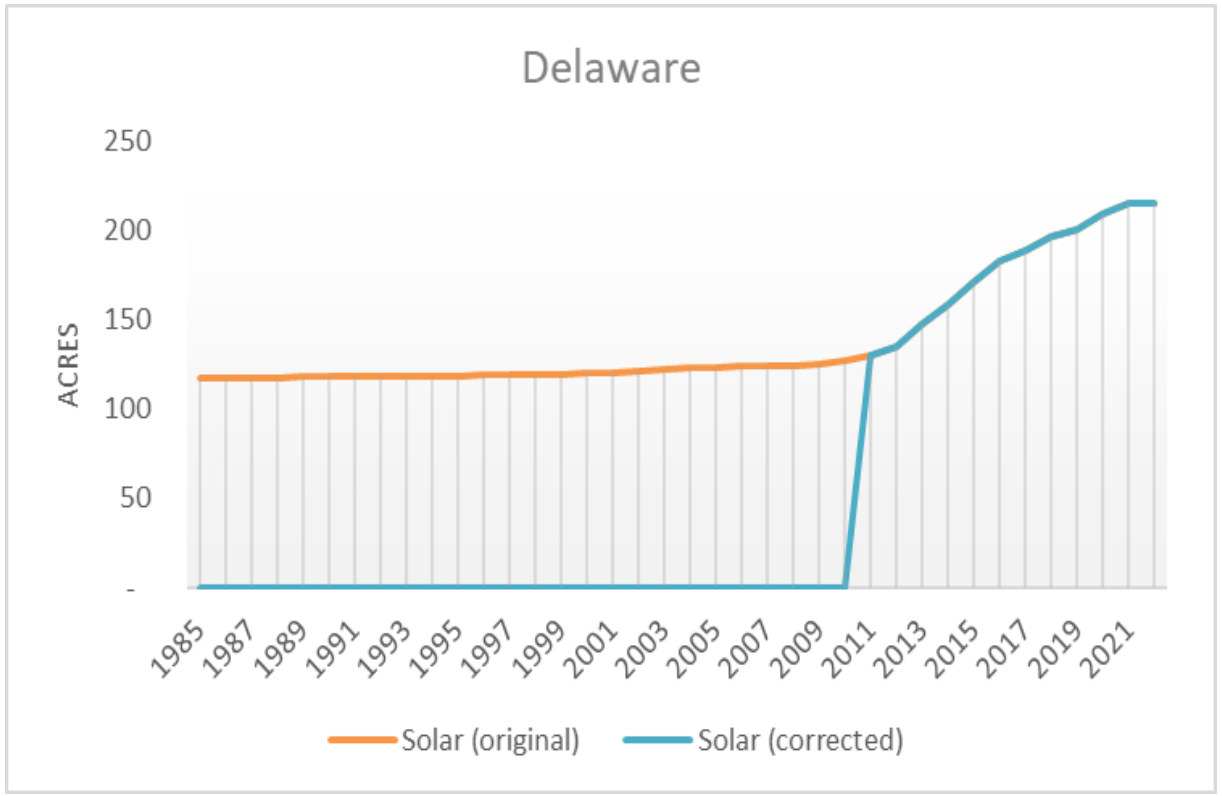


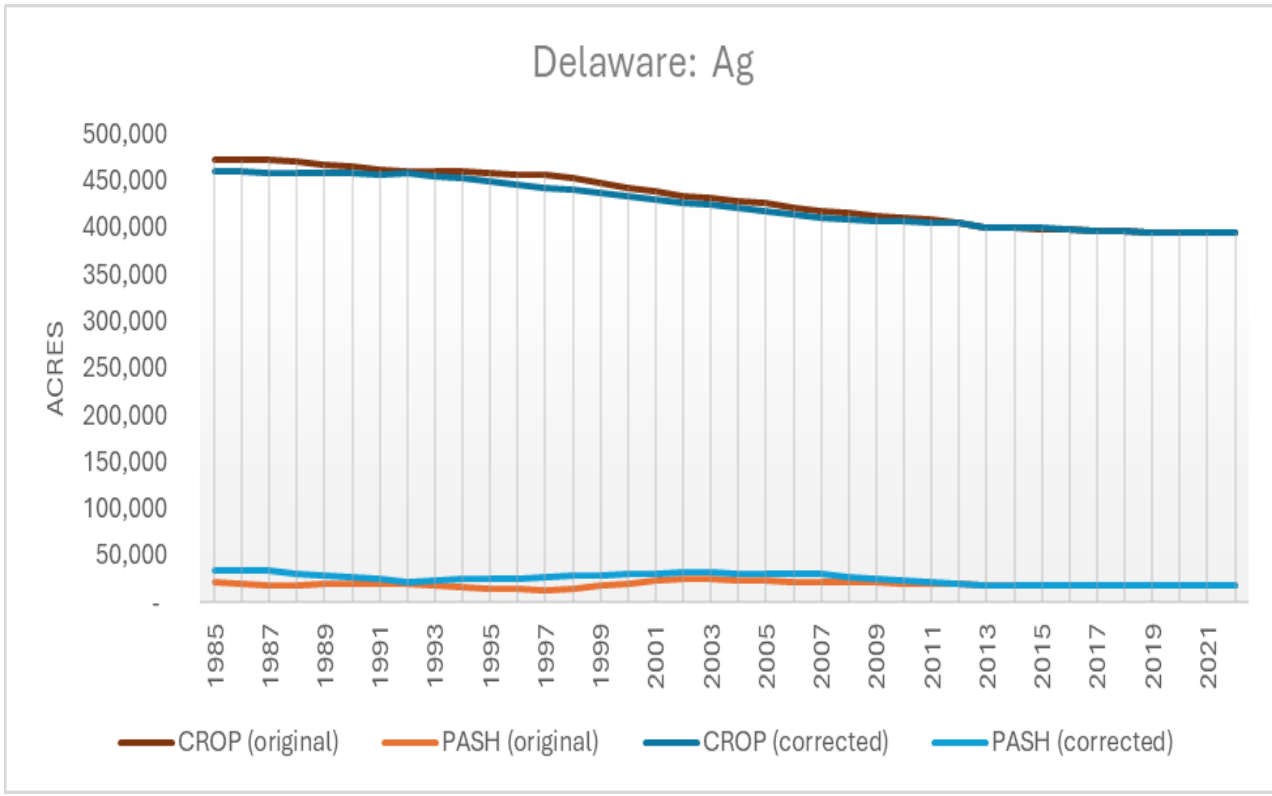
<u>Albemarle, VA Example</u>

- Orange lines are the cropland and pasture/hay acres over time provided for the data review.
- Blue lines are the corrected cropland and pasture/hay acres over time.

State-Level Results

Delaware



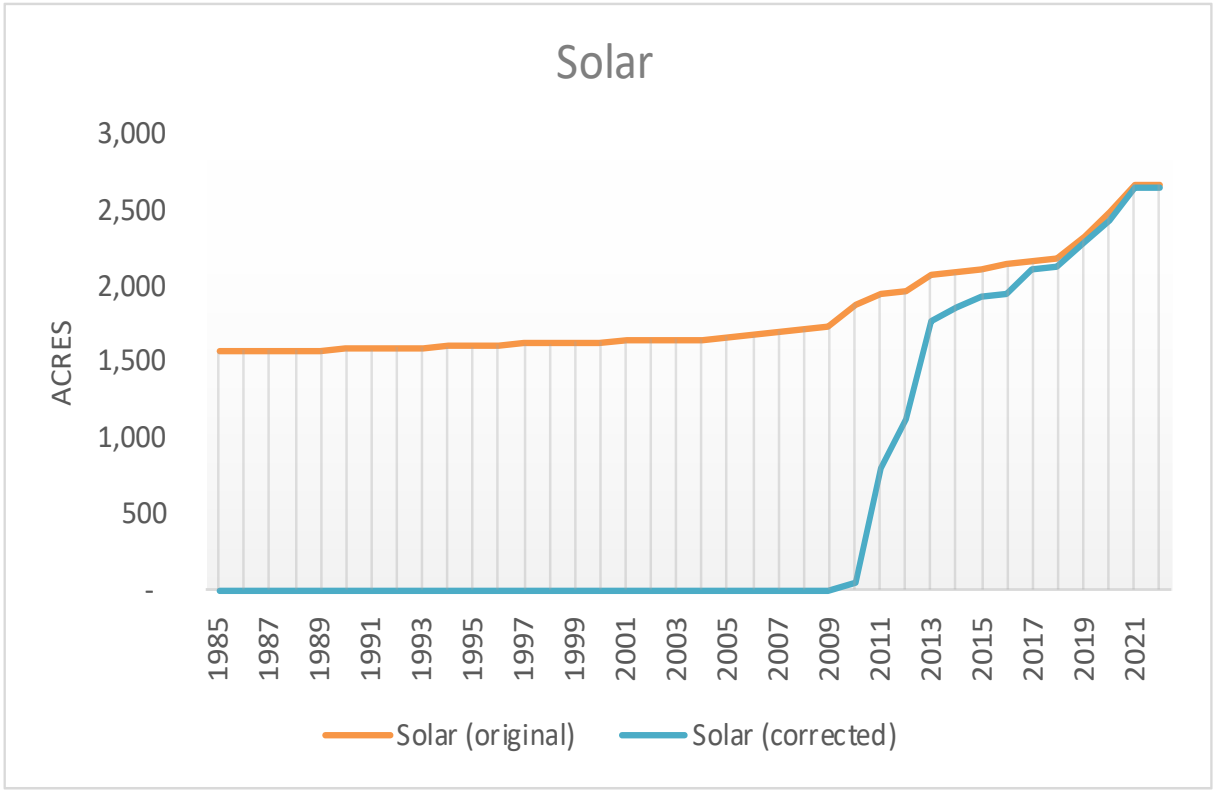


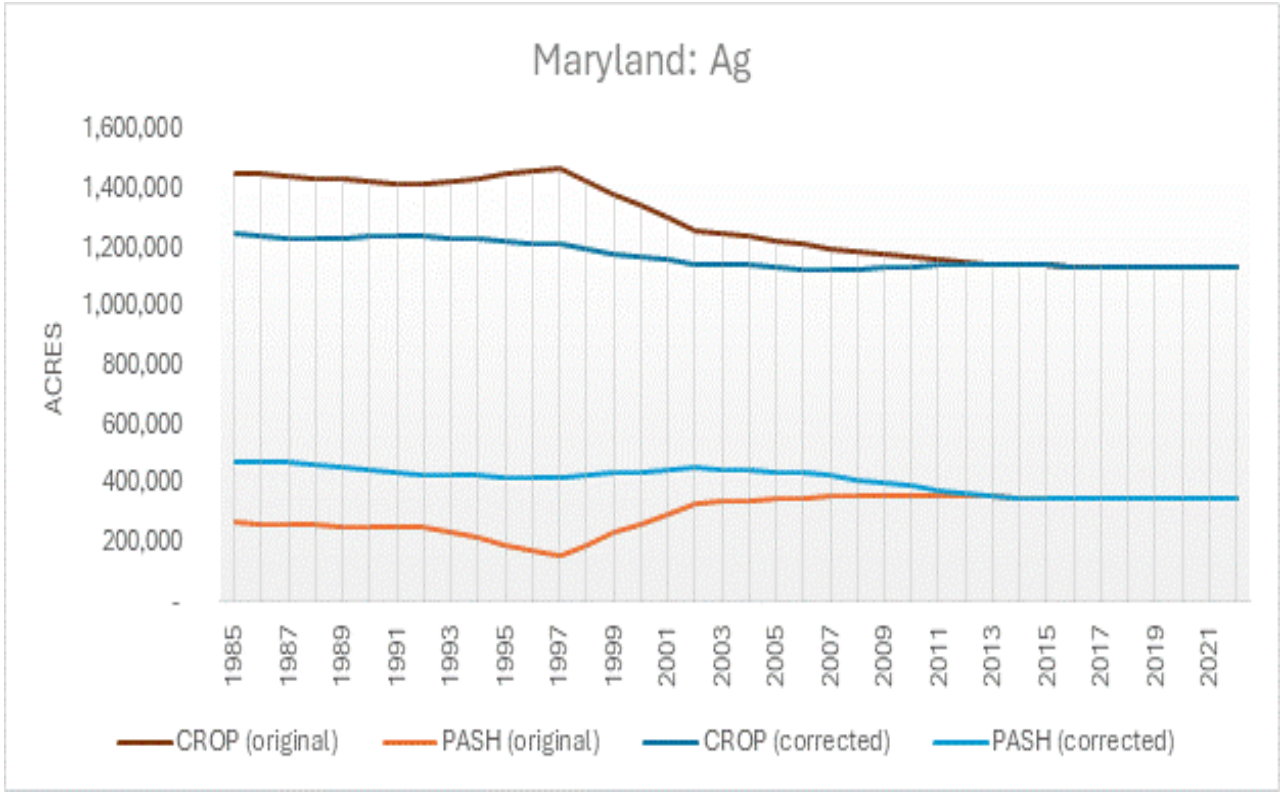
Earliest utility-scale solar field: 2011

Original Crop and Pasture/Hay (oranges)

Corrected Crop and Pasture/Hay (blues)

Maryland



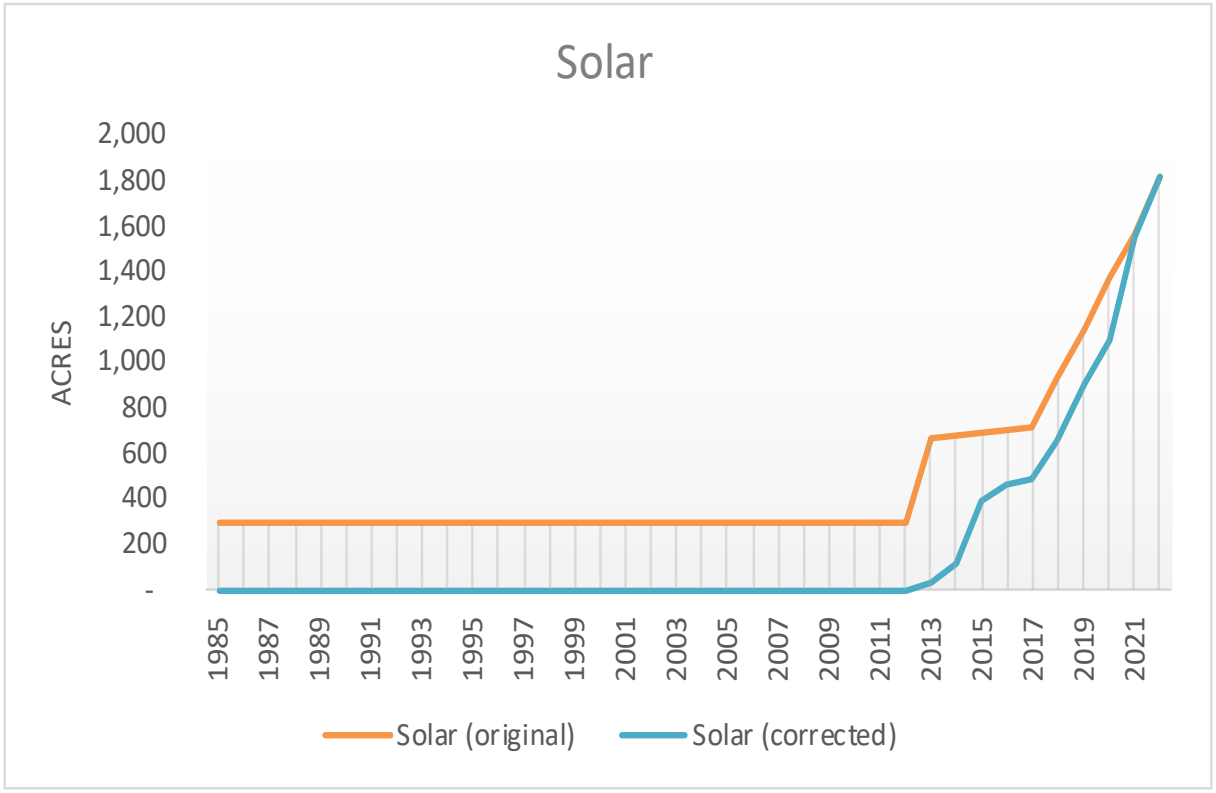


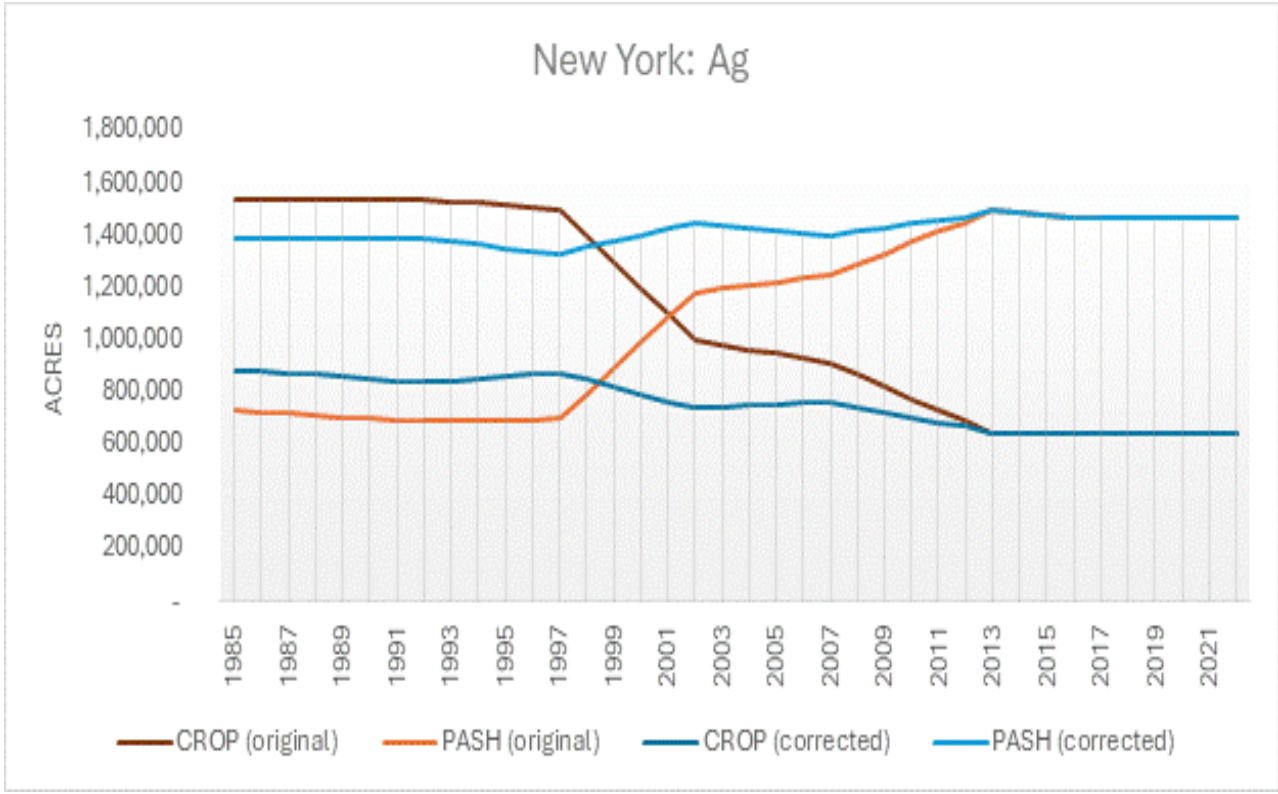
Earliest utility-scale solar field: 2010

Original Crop and Pasture/Hay (oranges)

Corrected Crop and Pasture/Hay (blues)

New York



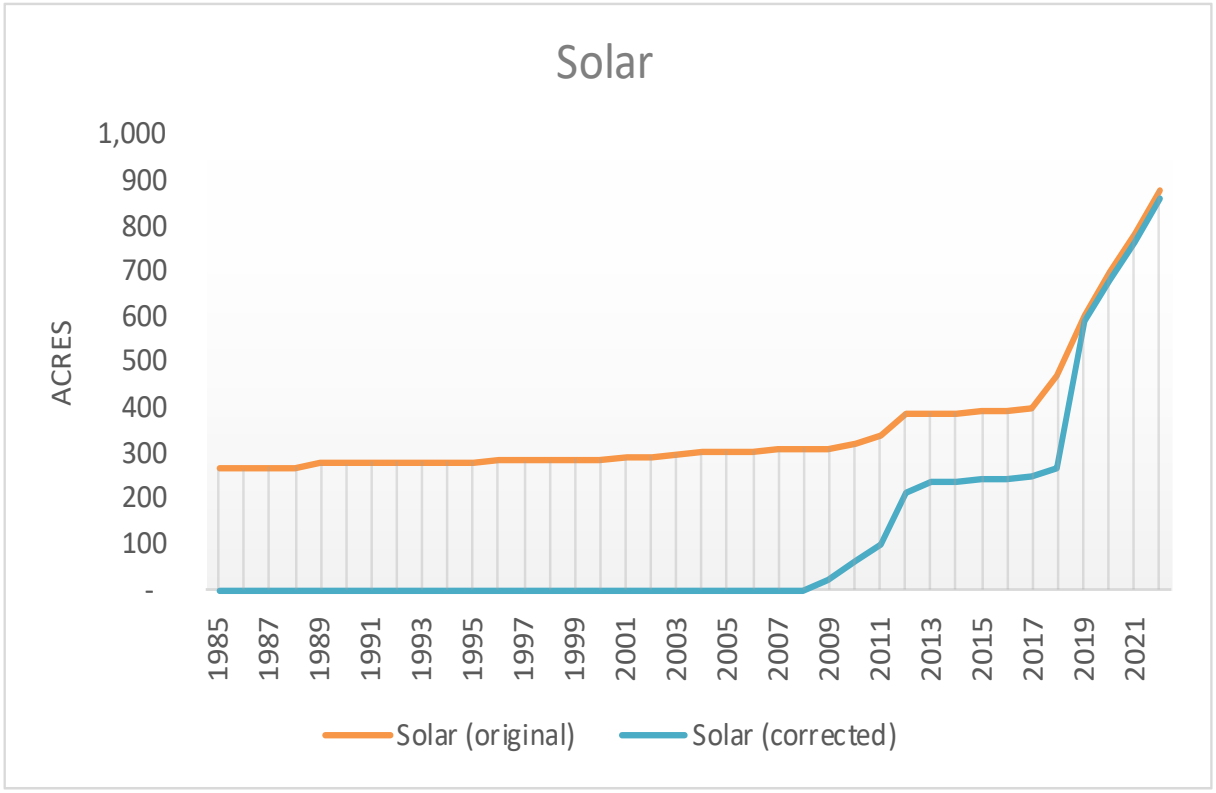


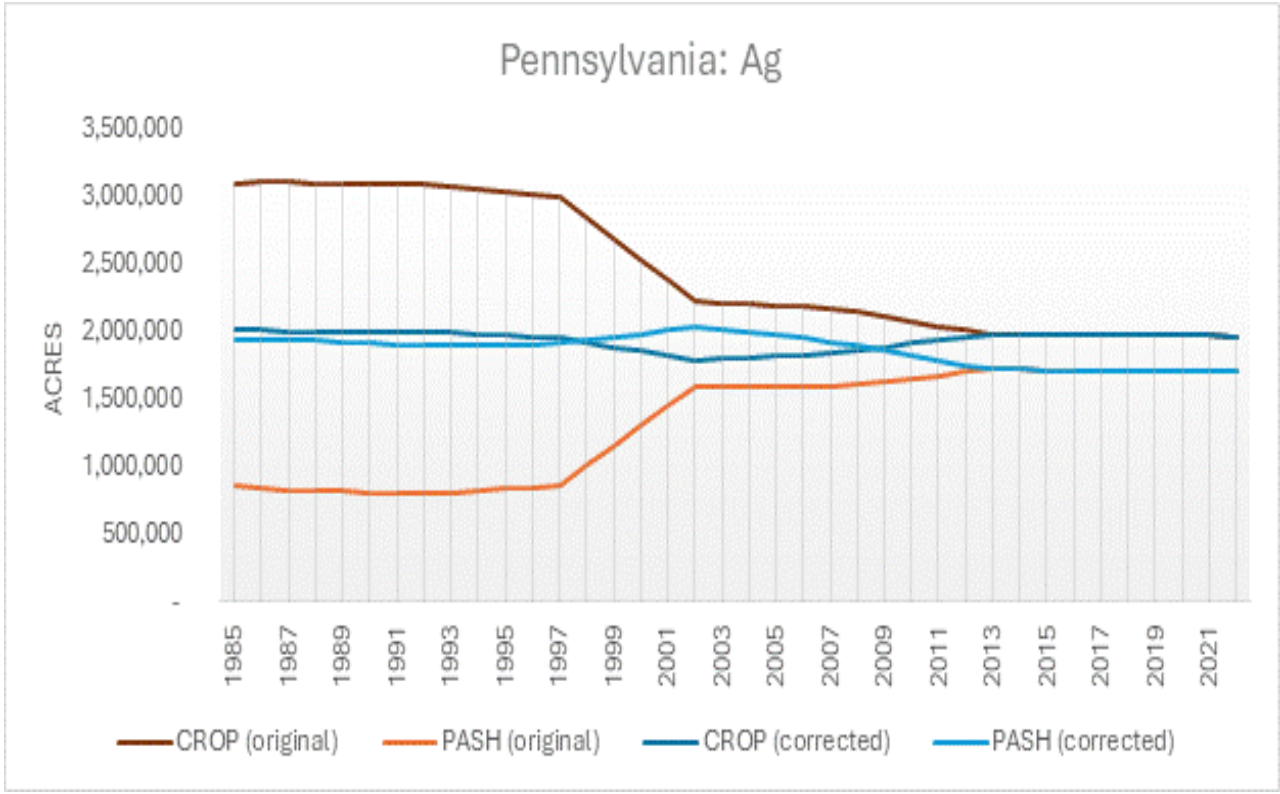
Earliest utility-scale solar field: 2013

Original Crop and Pasture/Hay (oranges)

Corrected Crop and Pasture/Hay (blues)

Pennsylvania



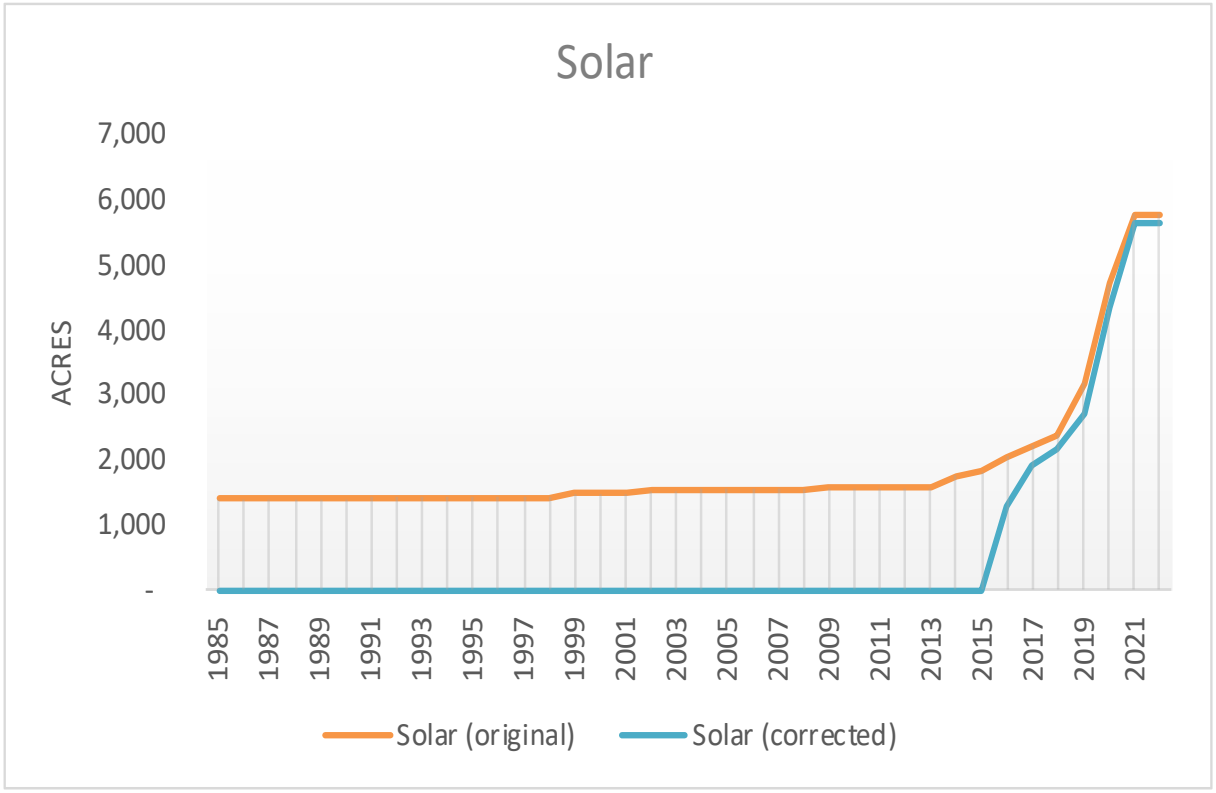


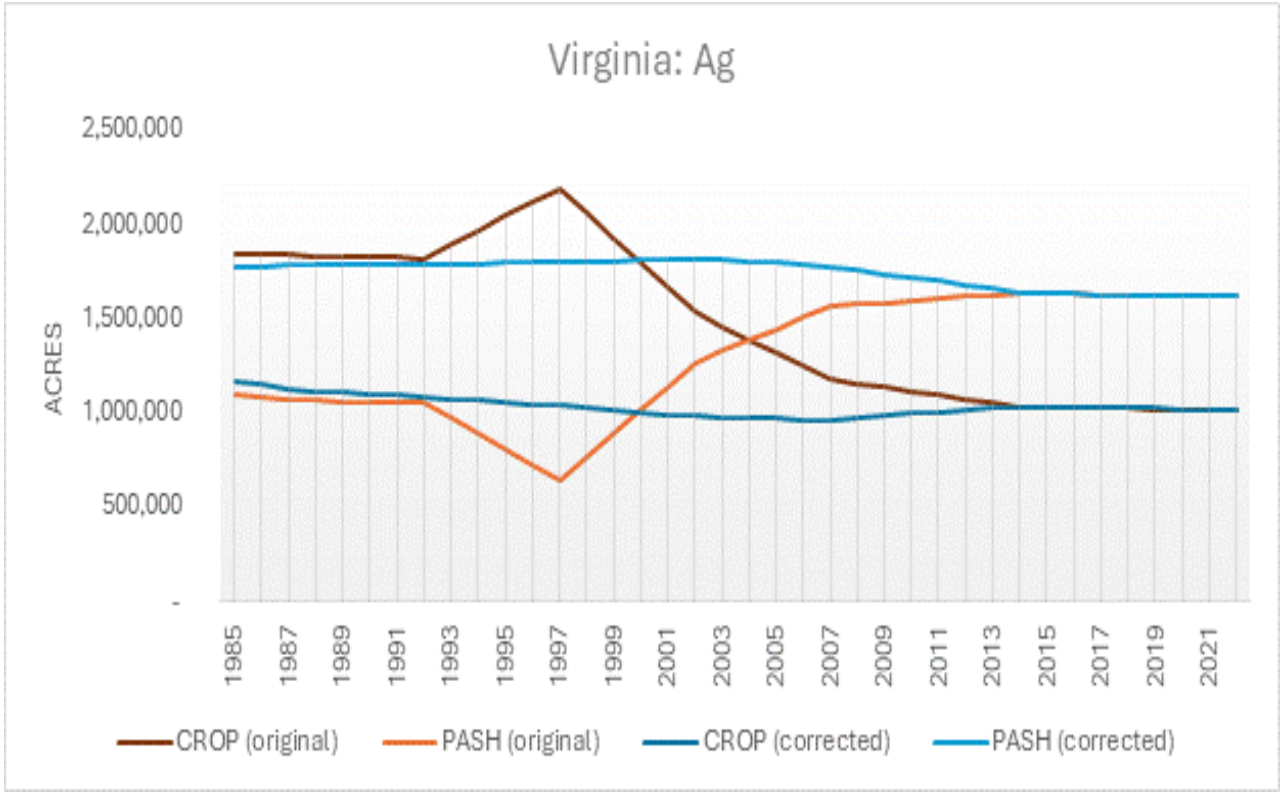
Earliest utility-scale solar field: 2009

Original Crop and Pasture/Hay (oranges)

Corrected Crop and Pasture/Hay (blues)

Virginia



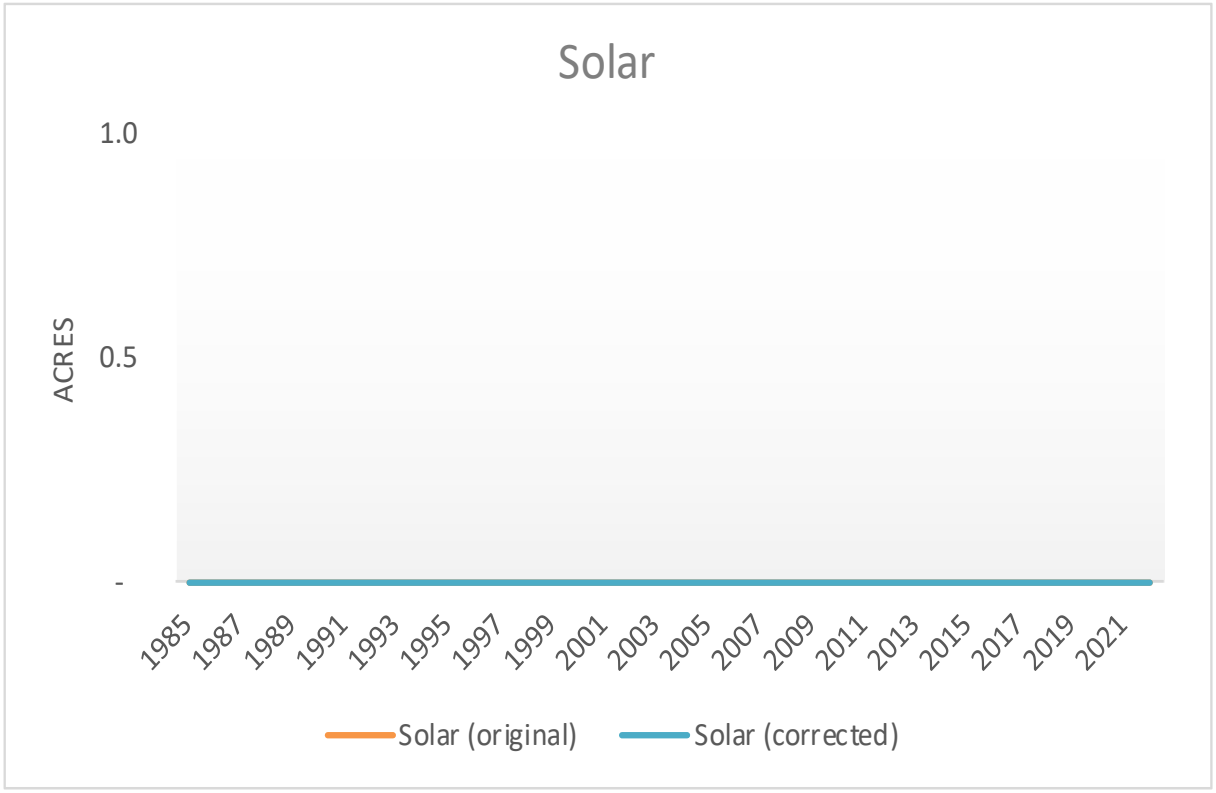


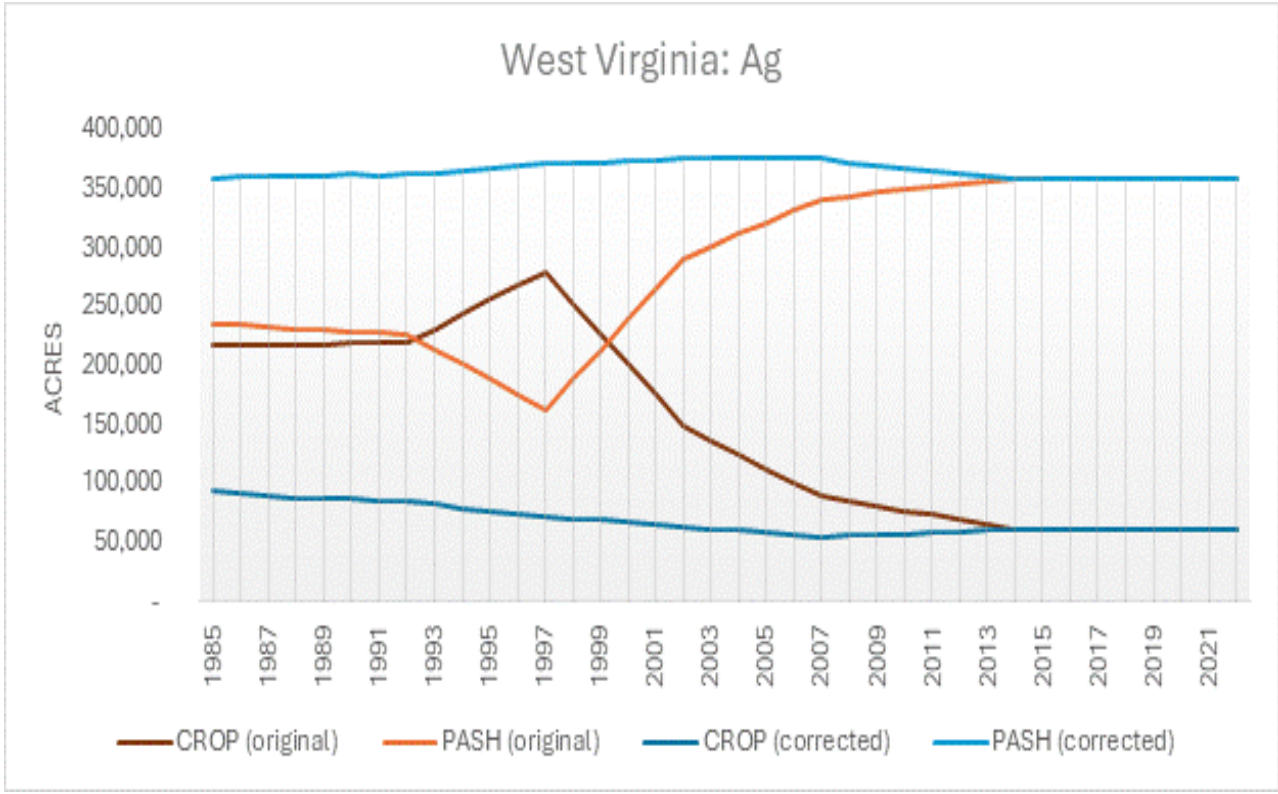
Earliest utility-scale solar field: 2016

Original Crop and Pasture/Hay (oranges)

Corrected Crop and Pasture/Hay (blues)

West Virginia





Earliest utility-scale solar field: None in observed period 1985-2022

Original Crop and Pasture/Hay (oranges)

Corrected Crop and Pasture/Hay (blues)

Next Steps

Next Steps and Wrap Up

- Deadline for partners to confirm the changes have been made is tomorrow

- After tomorrow, data will be delivered to the CAST team to be run through CAST and used to calibrate the model

Questions/Comments/Concerns?

- Contact
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  - smcdonald@usgs.gov