Creating Phase 6 Land Segments

HOWARD WEINBERG, UMCES
PETER CLAGGETT, USGS
GARY SHENK, EPA

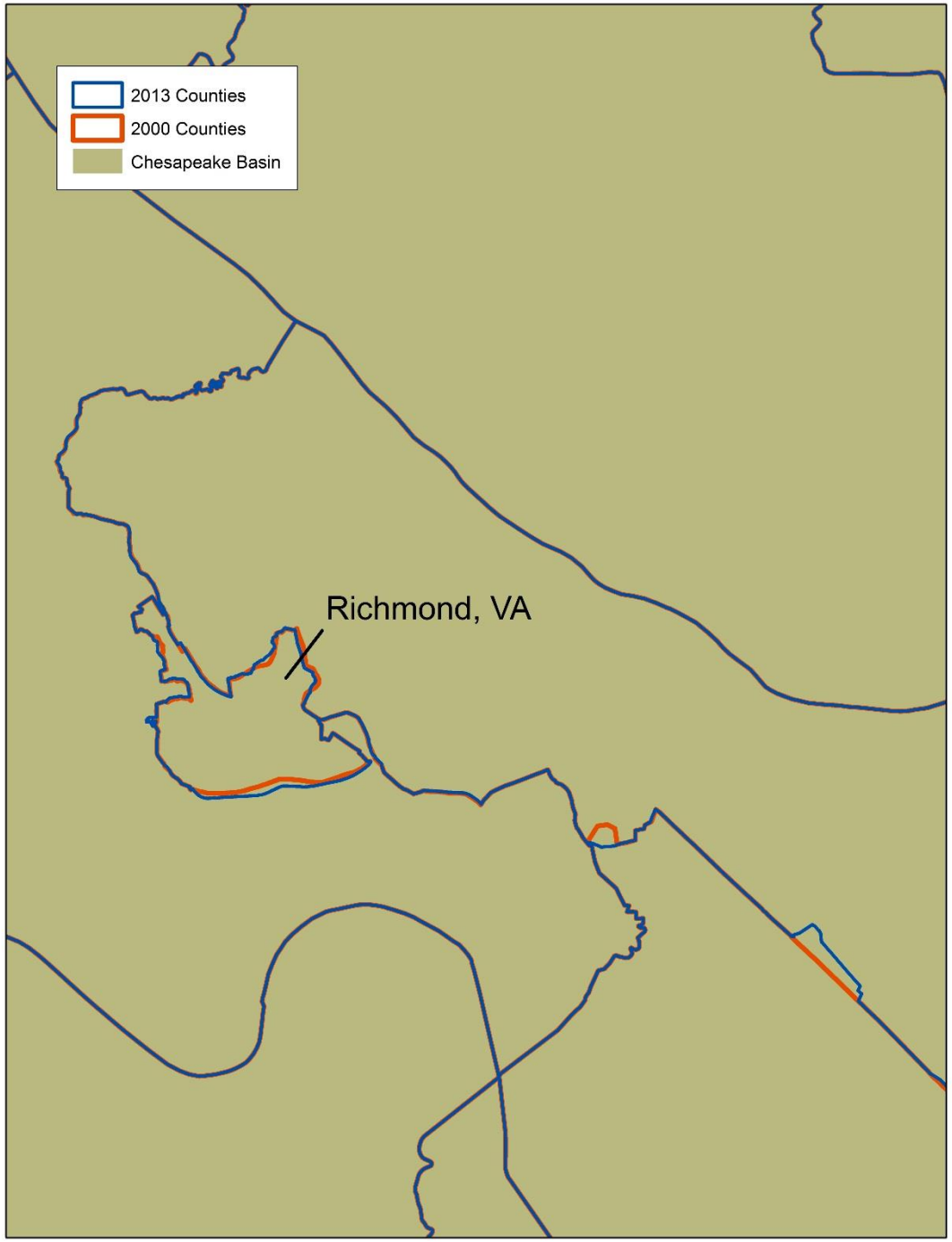
Proposed Phase 6 Land Segment Changes

- Do not include Phase 5.3.2 Federal segments.
- Update county boundaries with newer GIS Data.
- Update county subdivisions based on actual precipitation data.

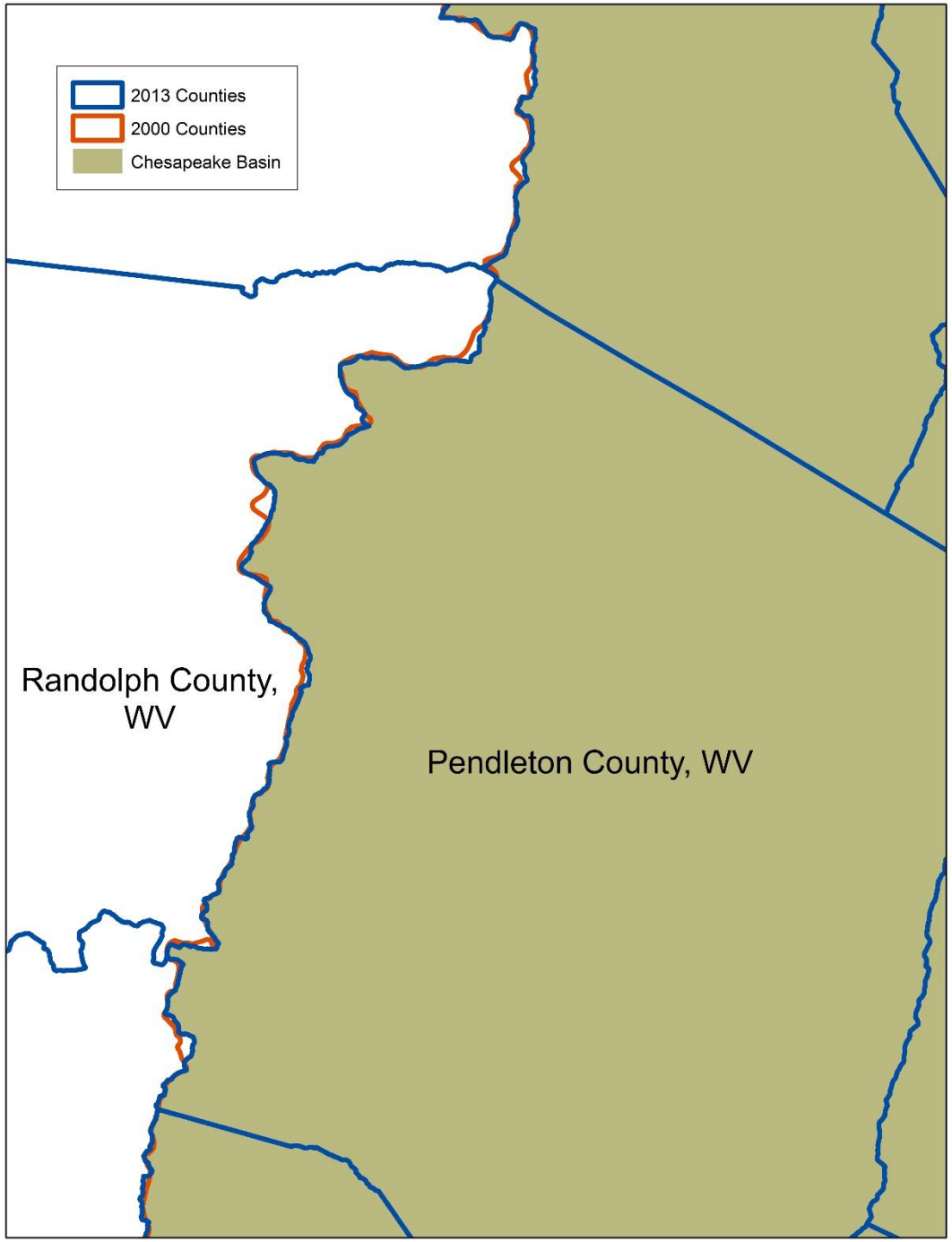
Update County GIS Data

- 2013 TIGER file available from Census Bureau.
- Numerous changes from 2000 data used in Phase 5, albeit most are minor.
- 2013 county boundaries now match the western Chesapeake basin boundary between VA and WV and within WV where they are coincident.

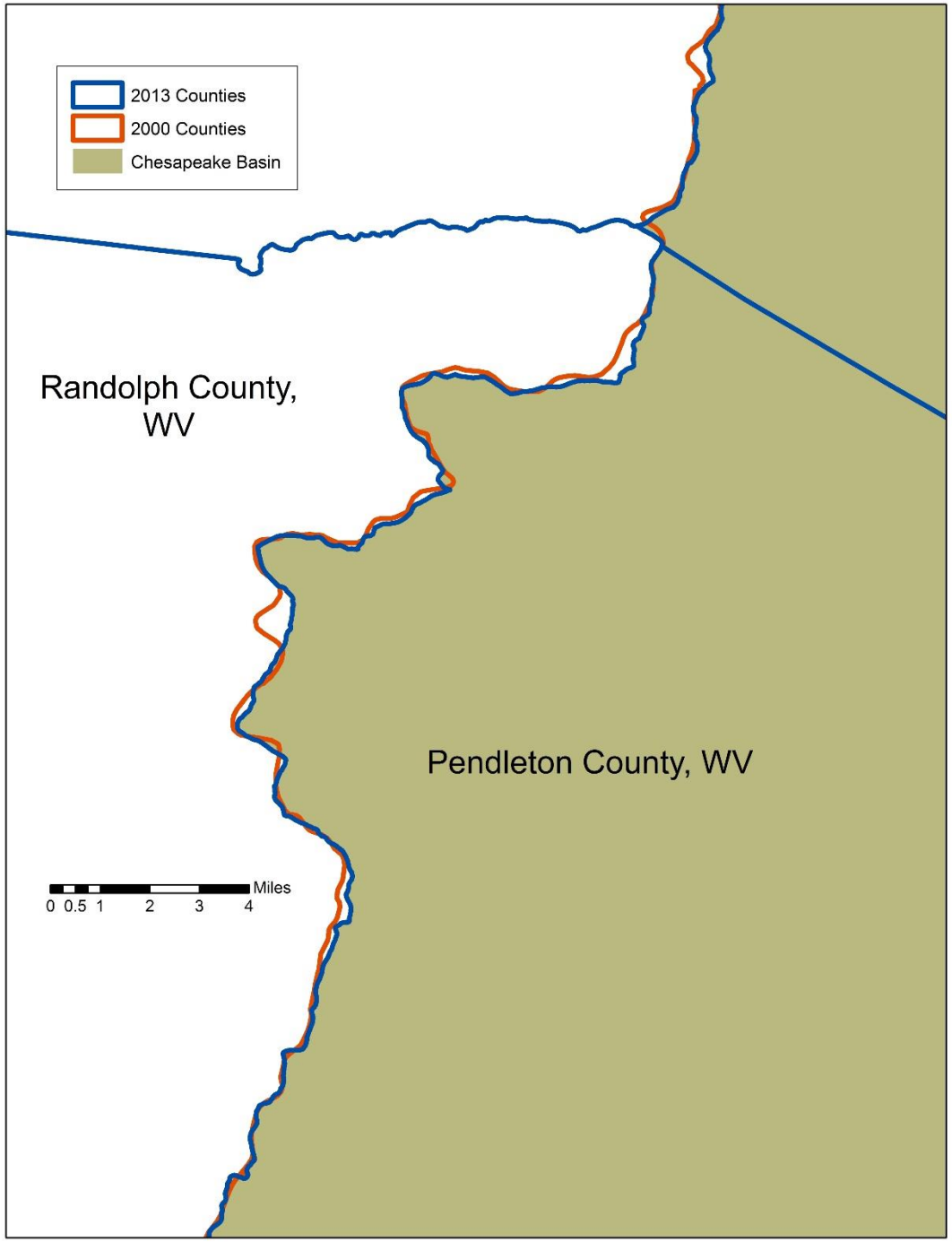
2013 county data compared with county data used in Phase 5.



2013 county data match the western basin boundary.

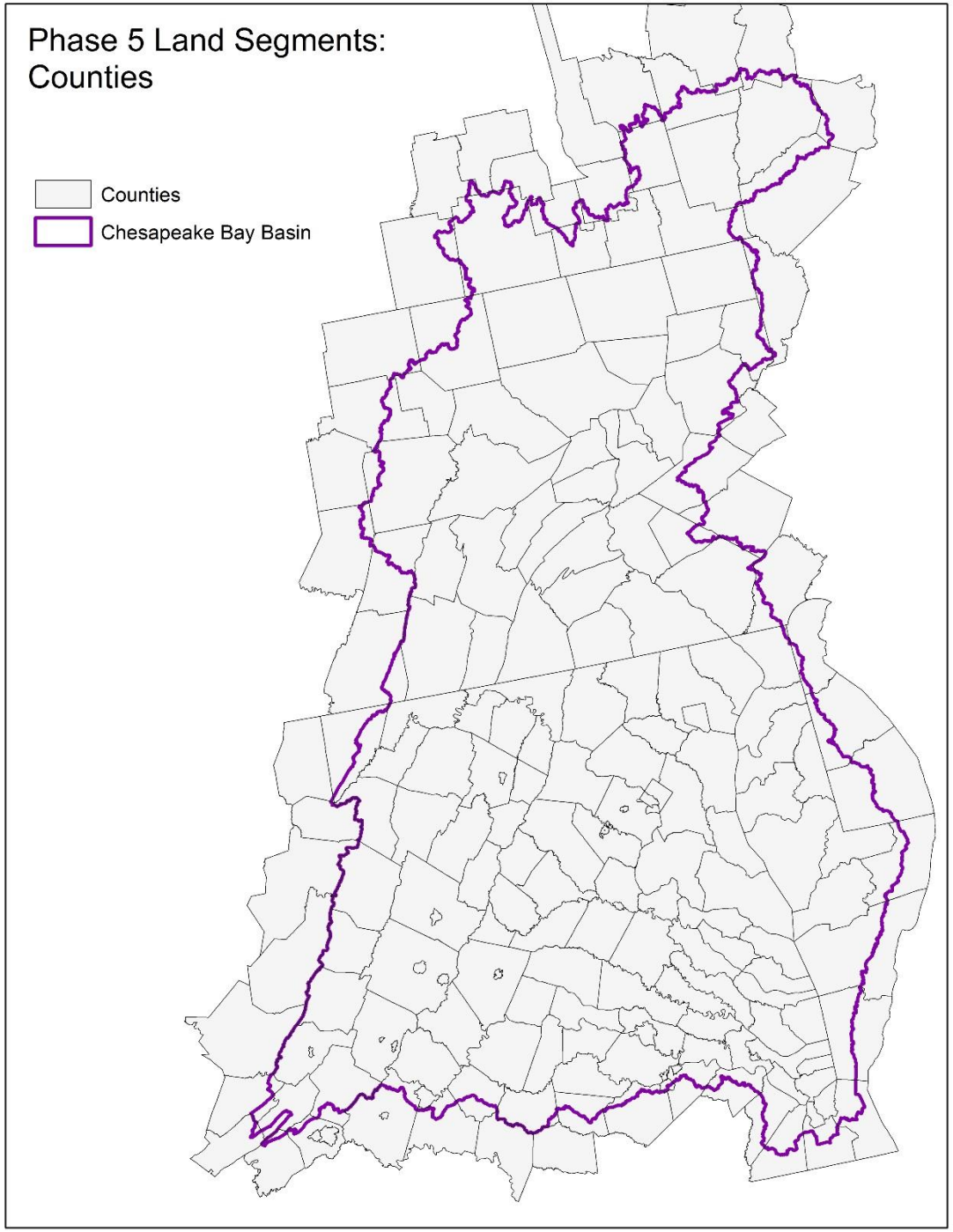


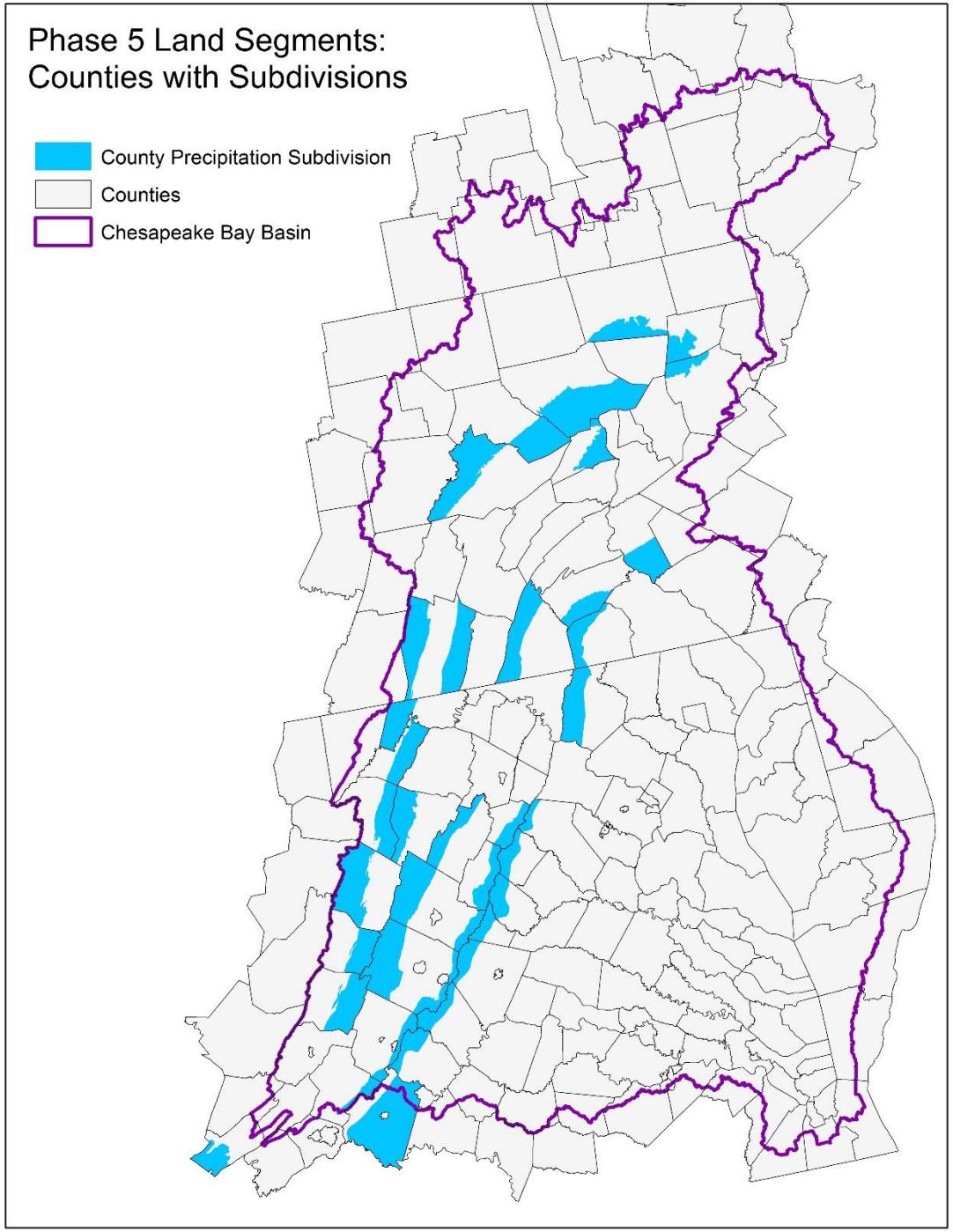
2013 county data match the western basin boundary. (Close-up)



Update County Subdivisions Based on Precipitation

- Phase 5 subdivisions were based on physiography and topography to mimic orographic effects that would create higher or lower precipitation, not on actual precipitation data.
- This seemed imprecise and sometimes arbitrary, stopping at state boundaries.
- Could not tell whether a subdivision was for higher or lower than normal precipitation.


Phase 5 Land Segments:
Counties
Counties
Chesapeake Bay Basin

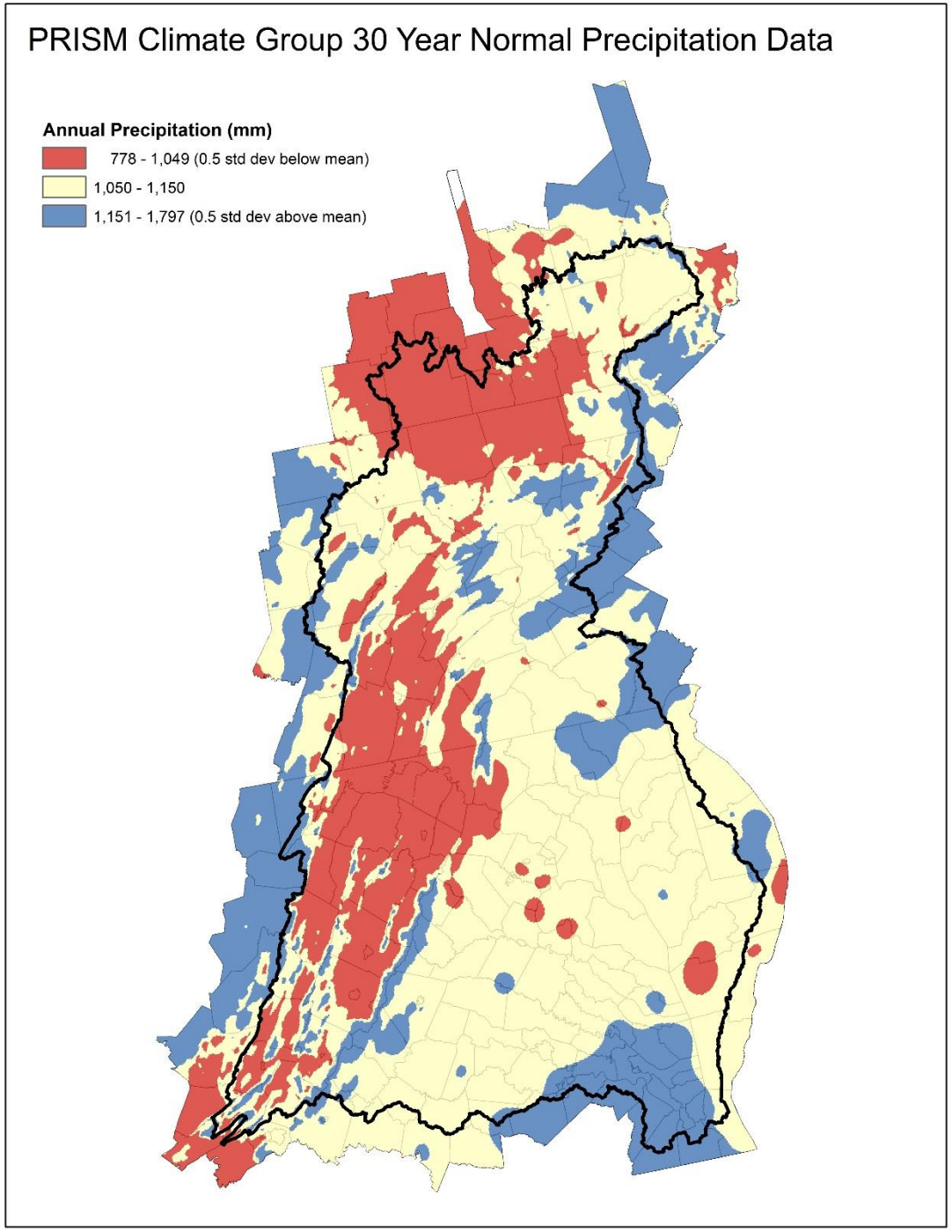

Phase 5 Land Segments:
Counties with Subdivisions
County Precipitation Subdivision
Counties
Chesapeake Bay Basin

Update County Subdivisions Based on Precipitation

- Use PRISM Climate Group "Normals" data.
- 30 year long term average data (1981-2010).
- 30 sec (~800m) modeling resolution.
- http://www.prism.oregonstate.edu/documents/PRISM_datasets.pdf

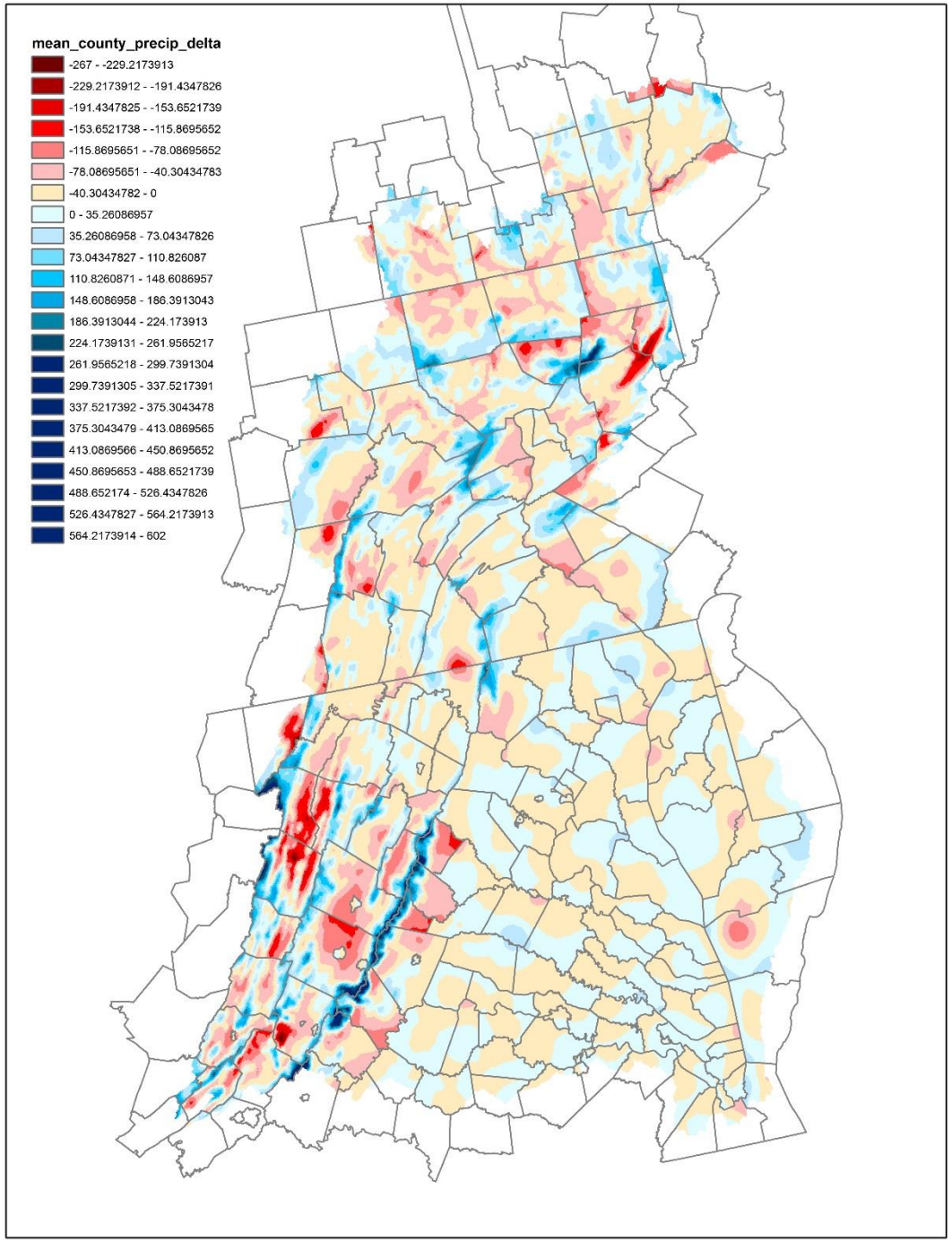
PRISM Climate Data:

Deviation from mean for the entire basin county region.

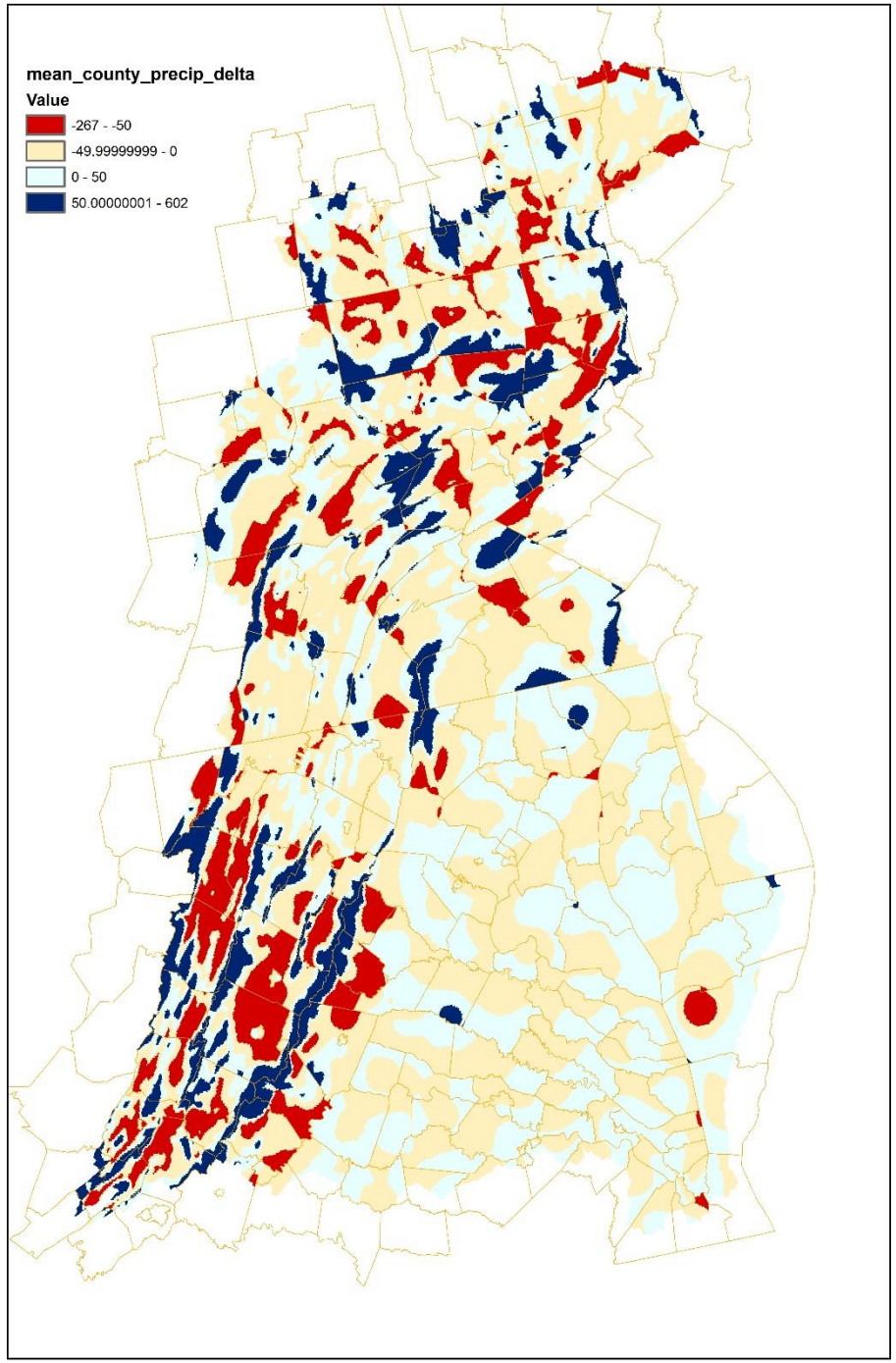


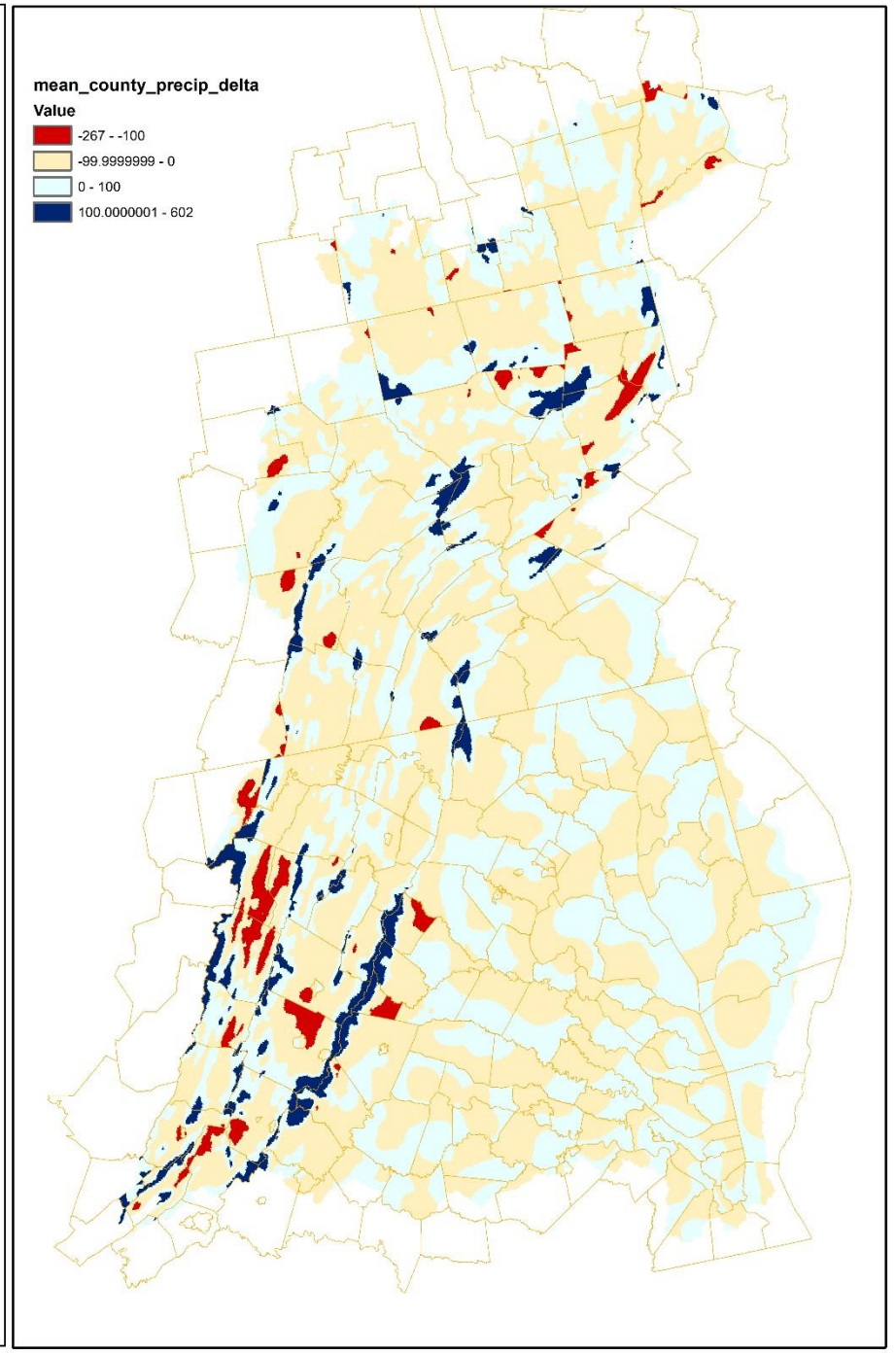
PRISM Climate Data:

Deviation from mean for each individual county.



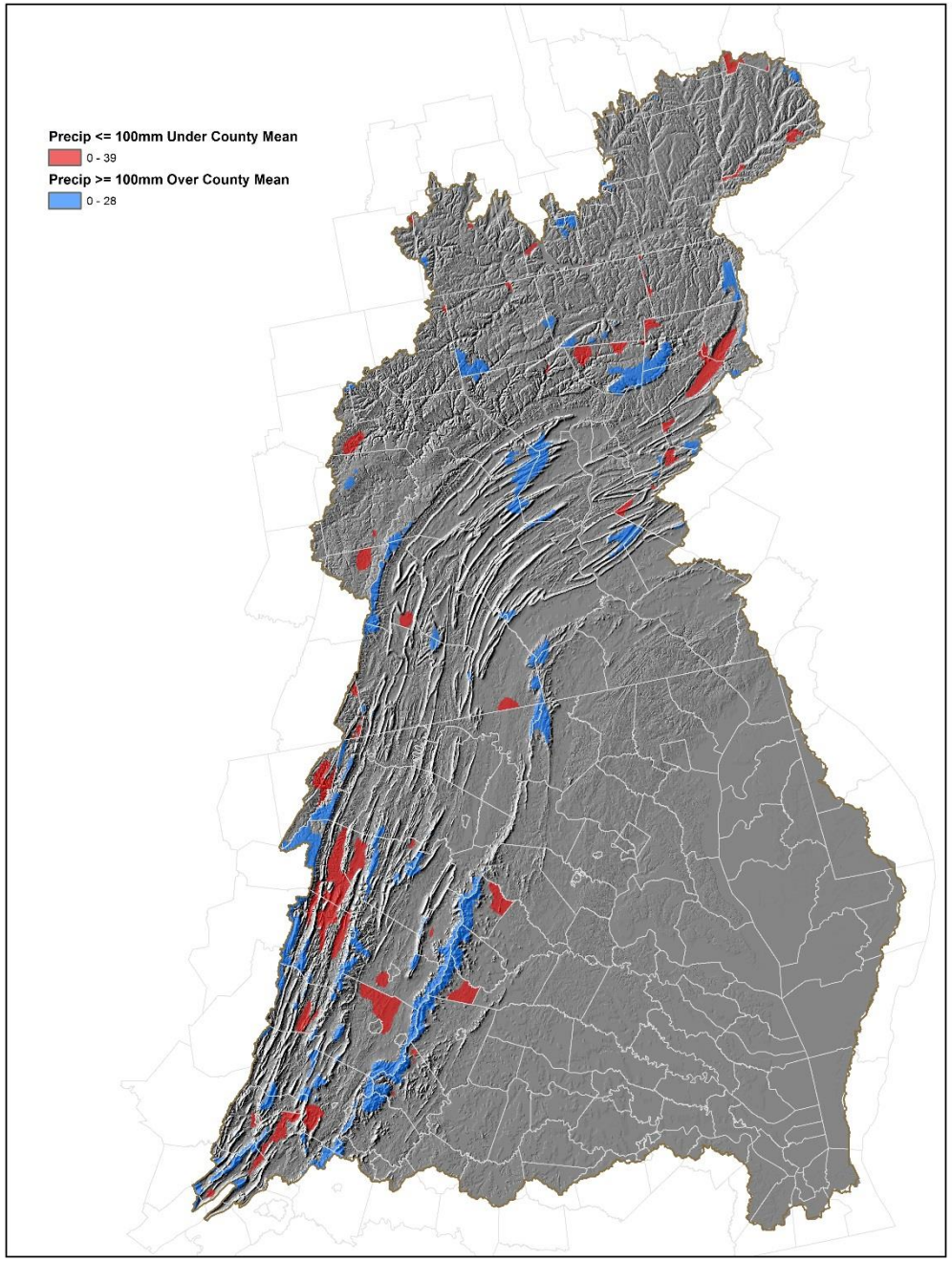
Looked at various precipitation thresholds from the county mean.



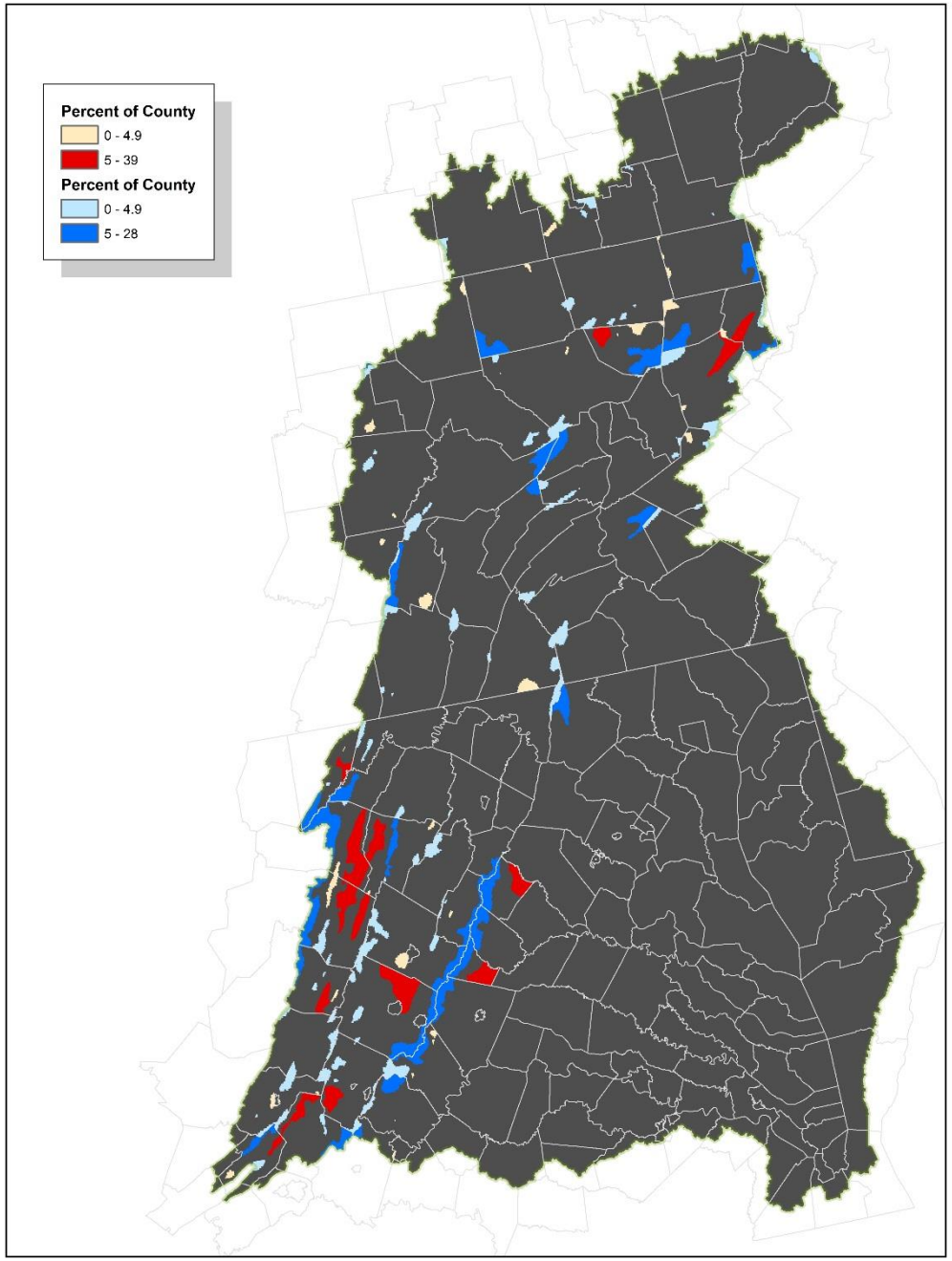


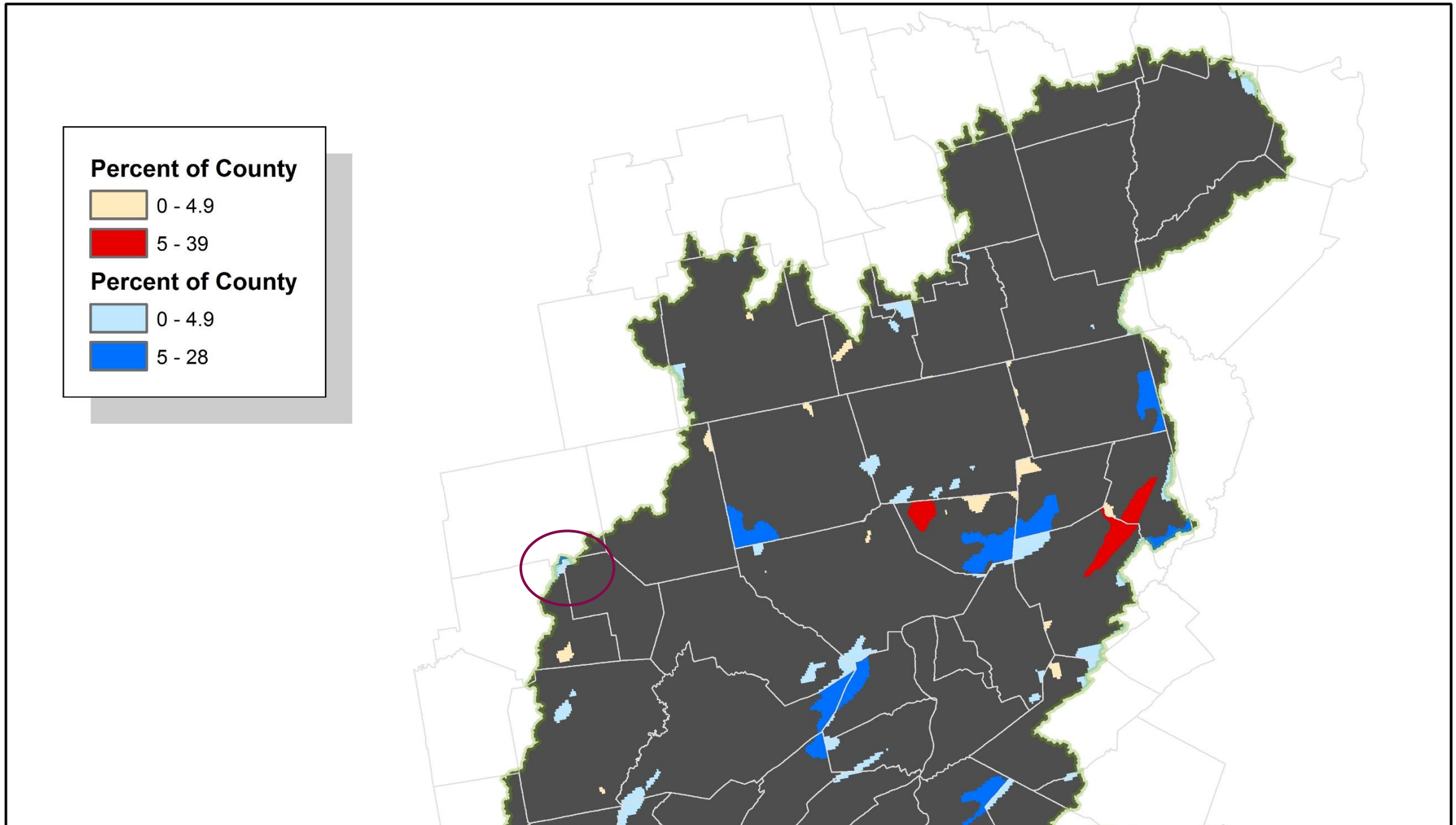
Higher than average precipitation areas found at higher elevations, on ridges.

Lower than average precipitation areas found generally at lower elevations, in valleys.



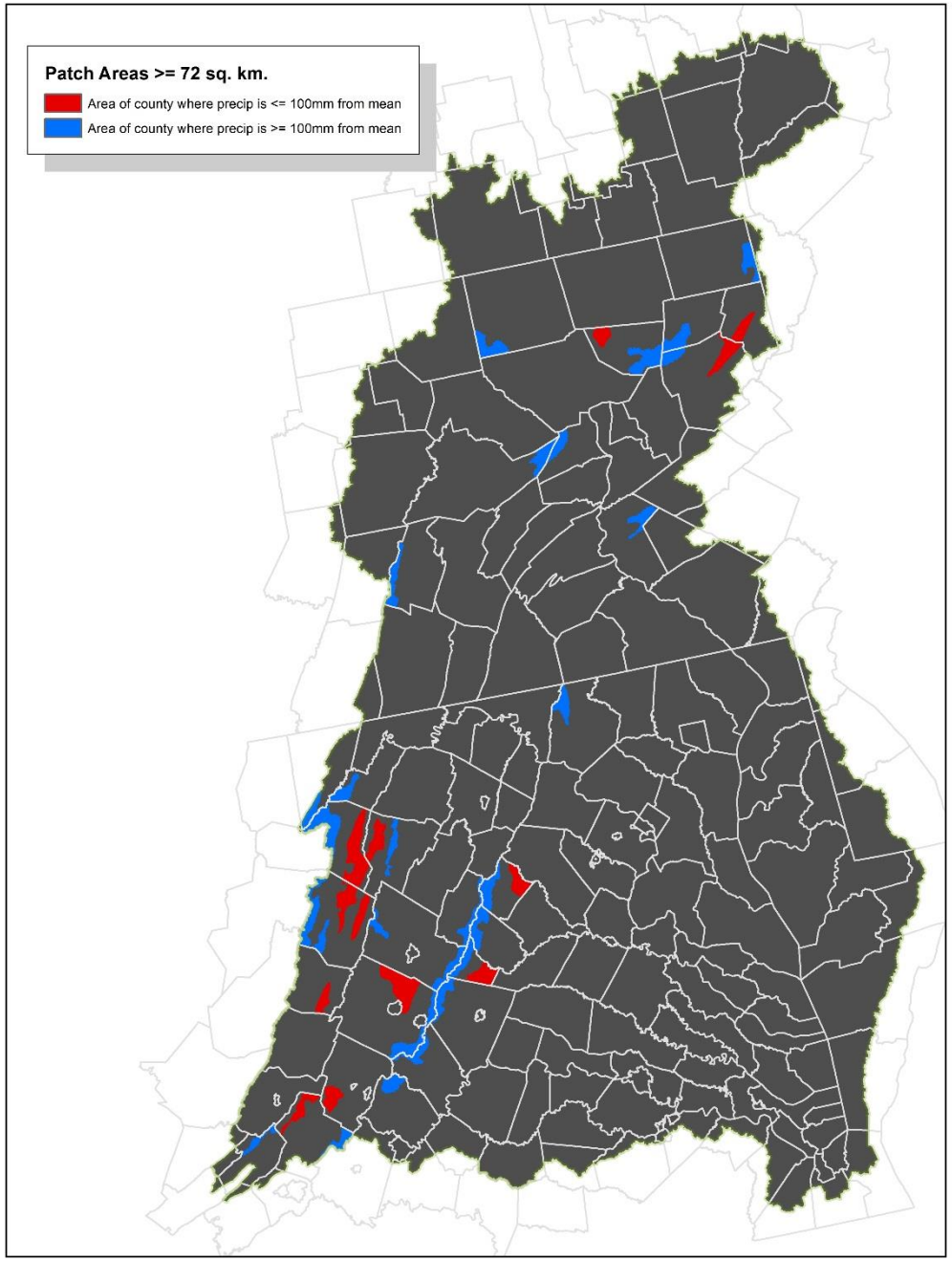
Examined different scenarios for patch areas as percentages of the county area within the basin.



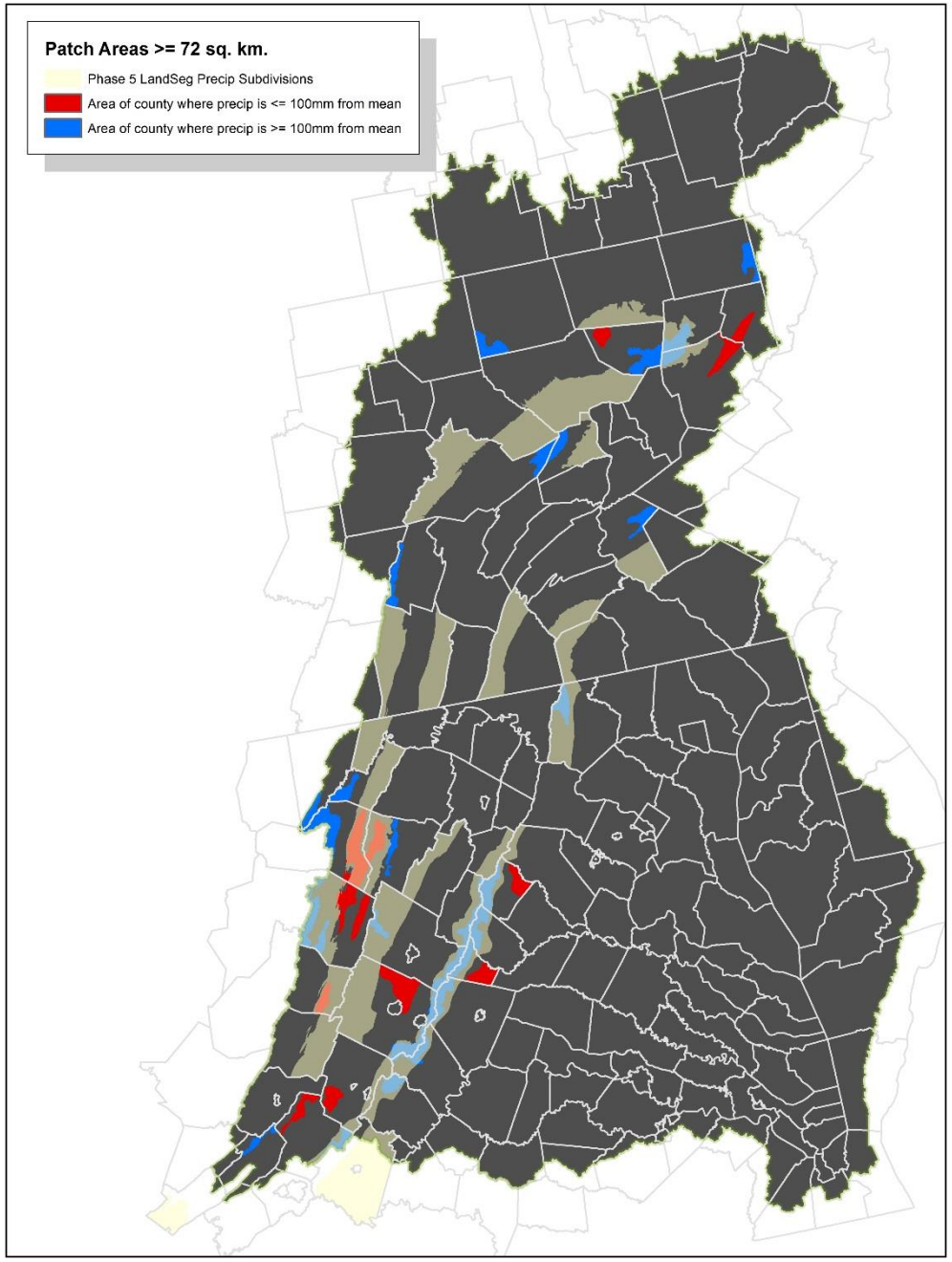

Percent of County
0 - 4.9
5 - 39
Percent of County
0 - 4.9
5 - 28

Discarded percentage of county idea and decided on a straight patch size threshold.

Ended up with 72 sq. km. minimum, which is half the area of an NLDAS-2 cell.



Comparison of Phase 6 precipitation subdivisions with Phase 5 precipitation subdivisions.



Recommendations for Phase 6 Land Segments

- Use 2013 county boundary data.
- Use precipitation subdivisions based on
  - 100 mm greater or lesser than county mean threshold and
  - minimum 72 sq. km. patch size.

Next Steps

- Create polygons from the new precipitation subdivisions, which are currently clusters of cells, and conflate their boundaries to the new county boundaries.
- Overlay the new Phase 6 Land Segments with the Phase 5.3.2 River Segments to create Phase 6 Land-River Segments.