Phase 6 Watershed Model – Updates

Modeling Workgroup Conference Call – May 2017

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Presentation Outline

- Hydrology calibration
- Sediment calibration

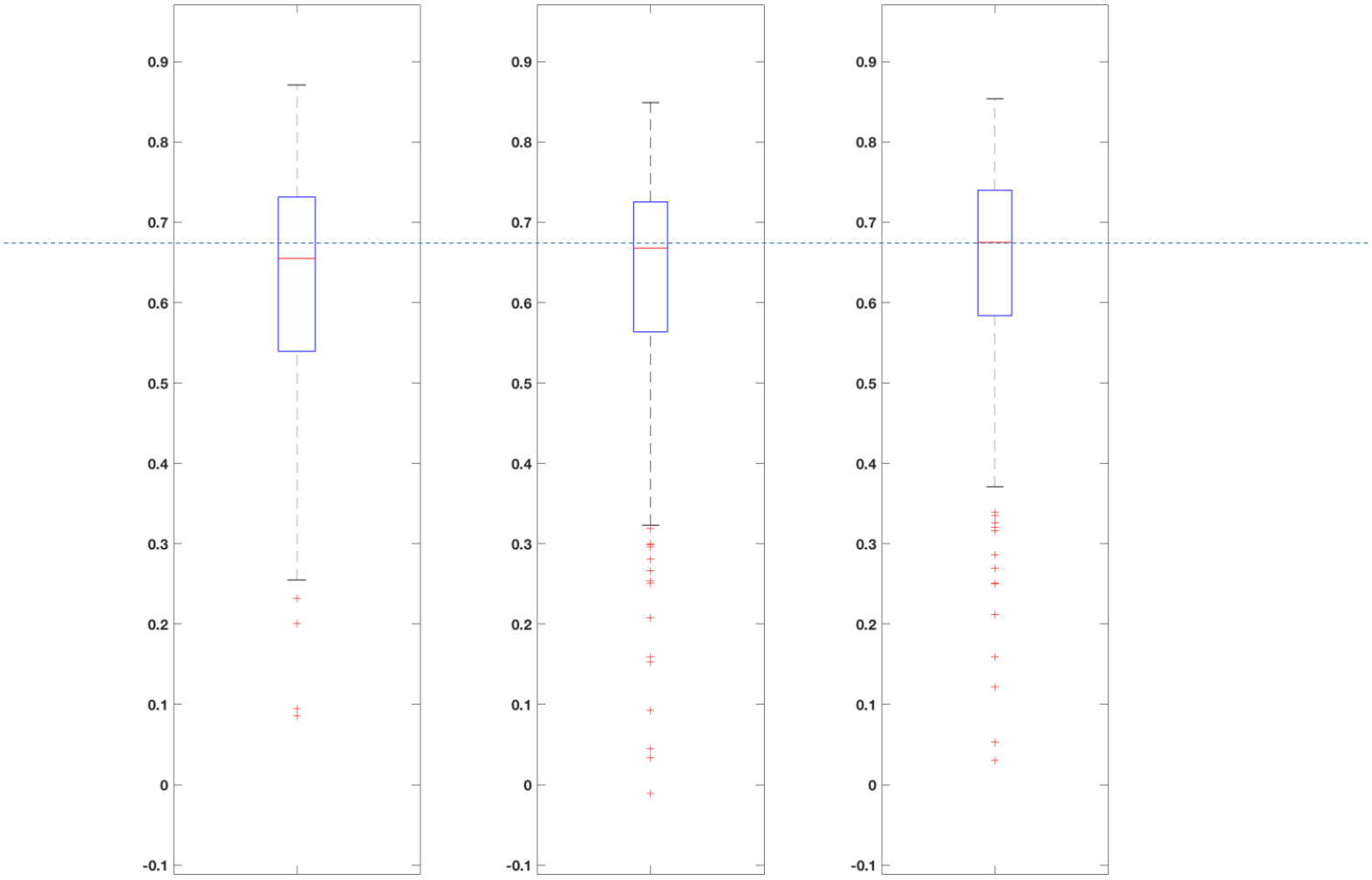
P6 draft - Hydrology calibration

- Revised land-use data set based on high-resolution land-cover data, as well as refinements in the method for back-casting.

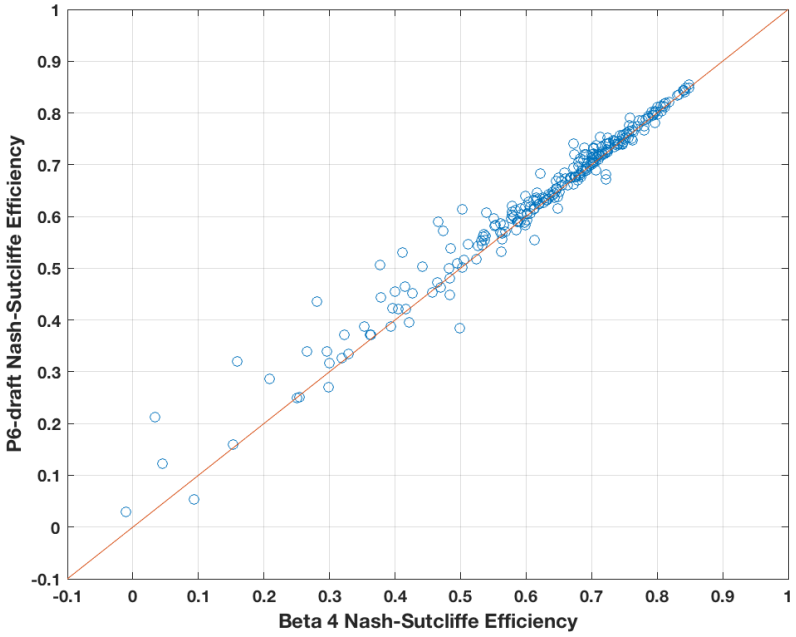
- Refinements to the relative flow proportions between the land-uses to specifically address beta version review comments.

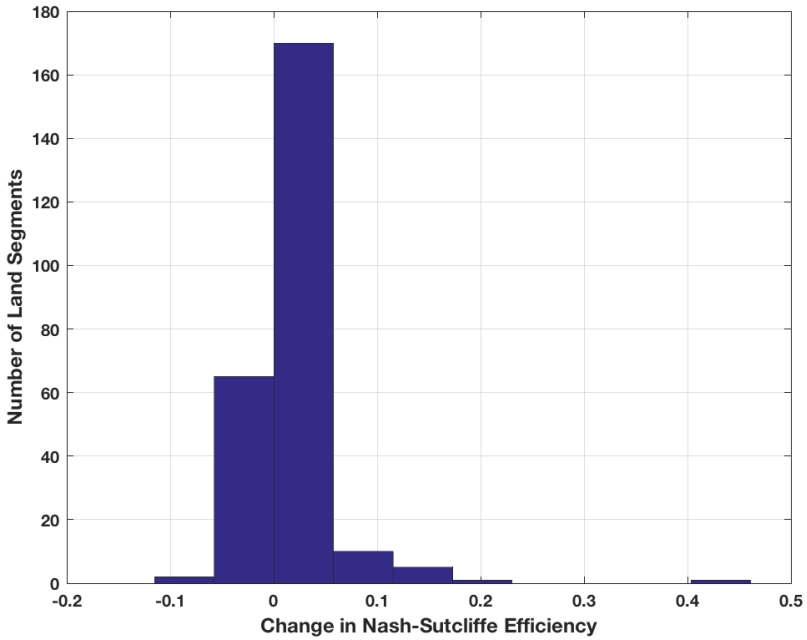
P6 draft - Hydrology calibration

Nash-Sutcliffe Efficiency **at 221 Calibration Stations**



Was any particular river segment impacted severely?





- The changes are within the level of tolerance.
- The model performance improved for more number of river segments than it decreased.

P6 draft – Sediment calibration

- Revised sediment tons per acre loads for the agricultural land uses. Separate cover/management factors (C-factors) were used for agricultural land-uses. [Claggett et al.]

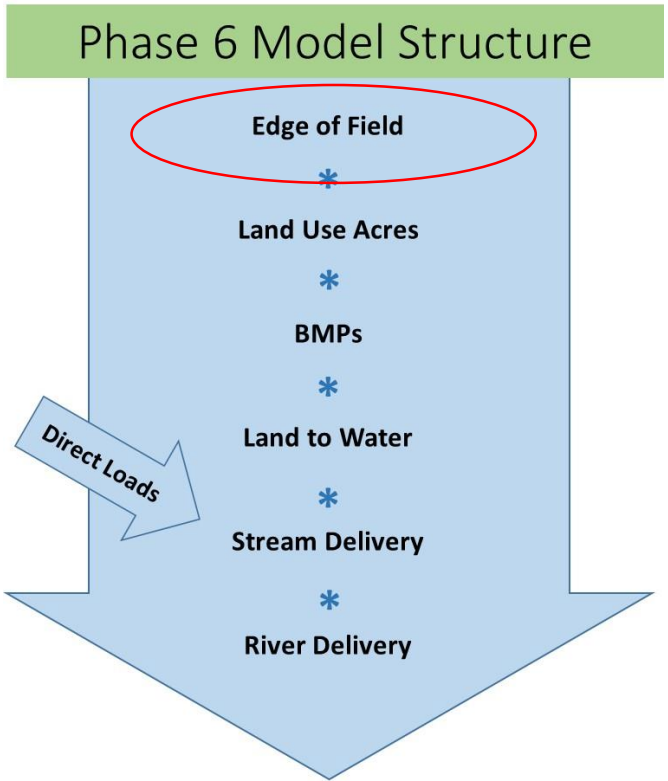
- Sediment delivery factors were also updated based on the new information.

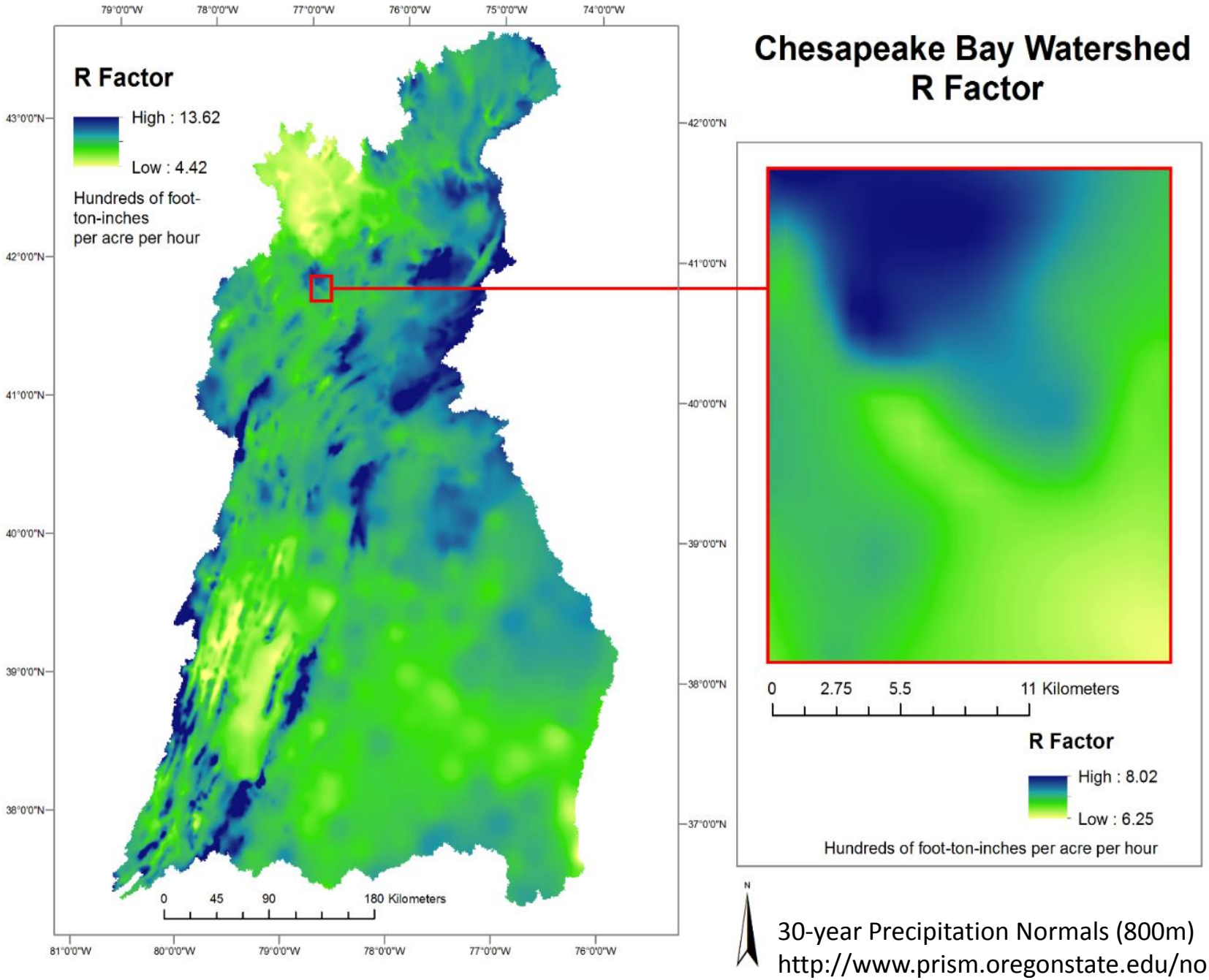
RUSLE => R * K * LS * C * P

- R = Runoff
- K = Erodibility
- LS = slope length

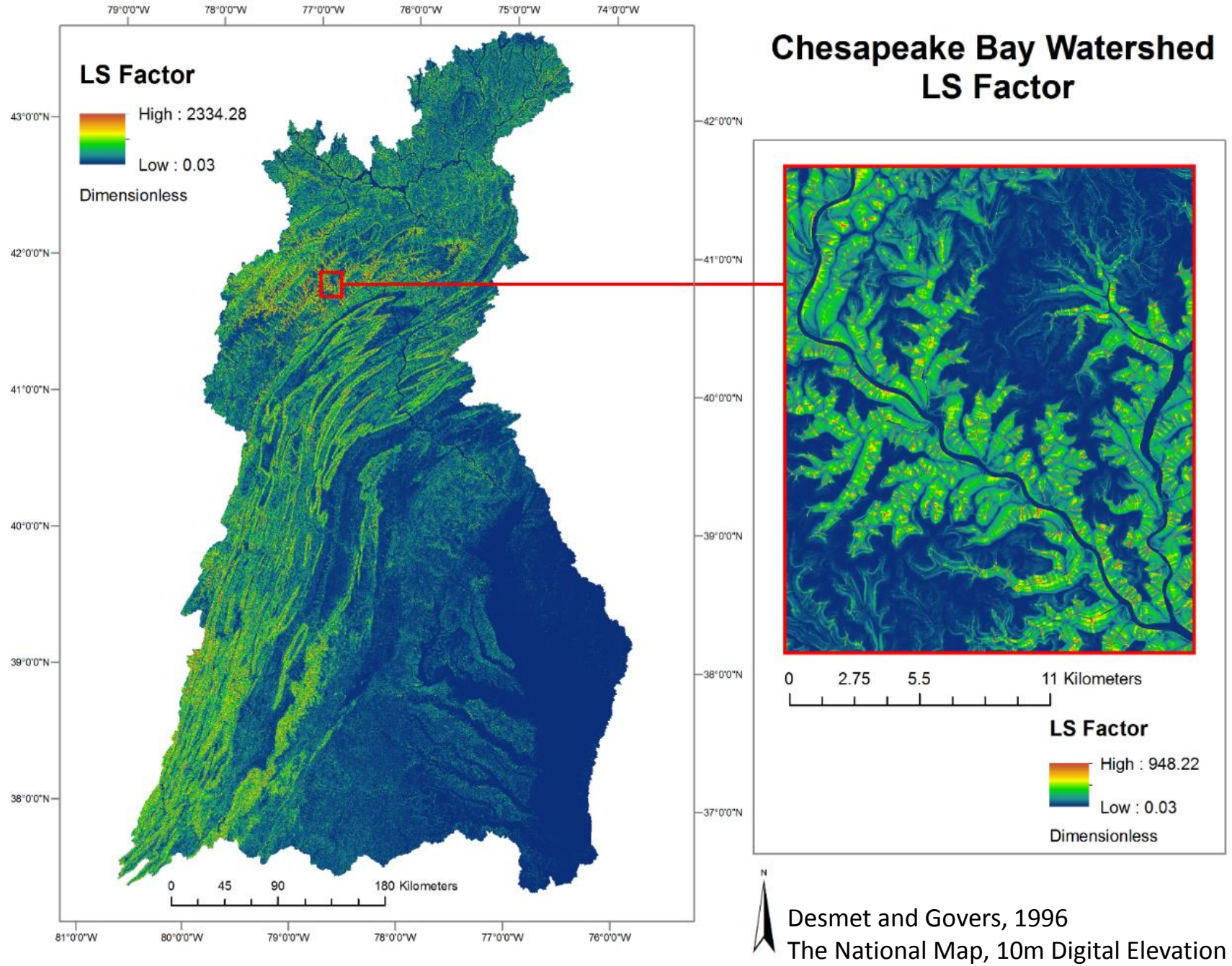
} Evaluated at 10 meter resolution

- C = Cover
  - By land use and Land-River segment
- P = Practice
  - = 1 since no action loads



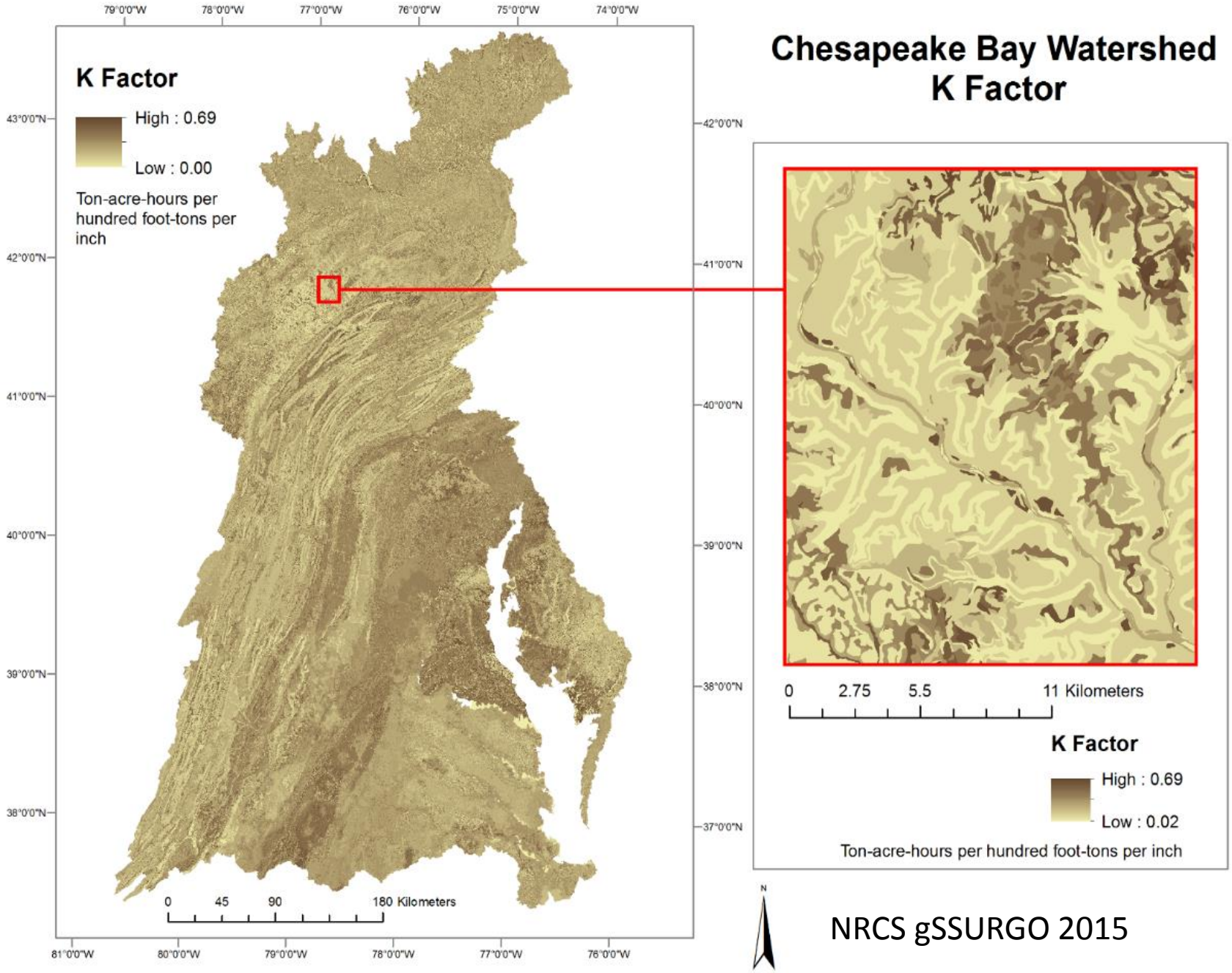


30-year Precipitation Normals (800m)
http://www.prism.oregonstate.edu/normals/



Desmet and Govers, 1996

The National Map, 10m Digital Elevation Model

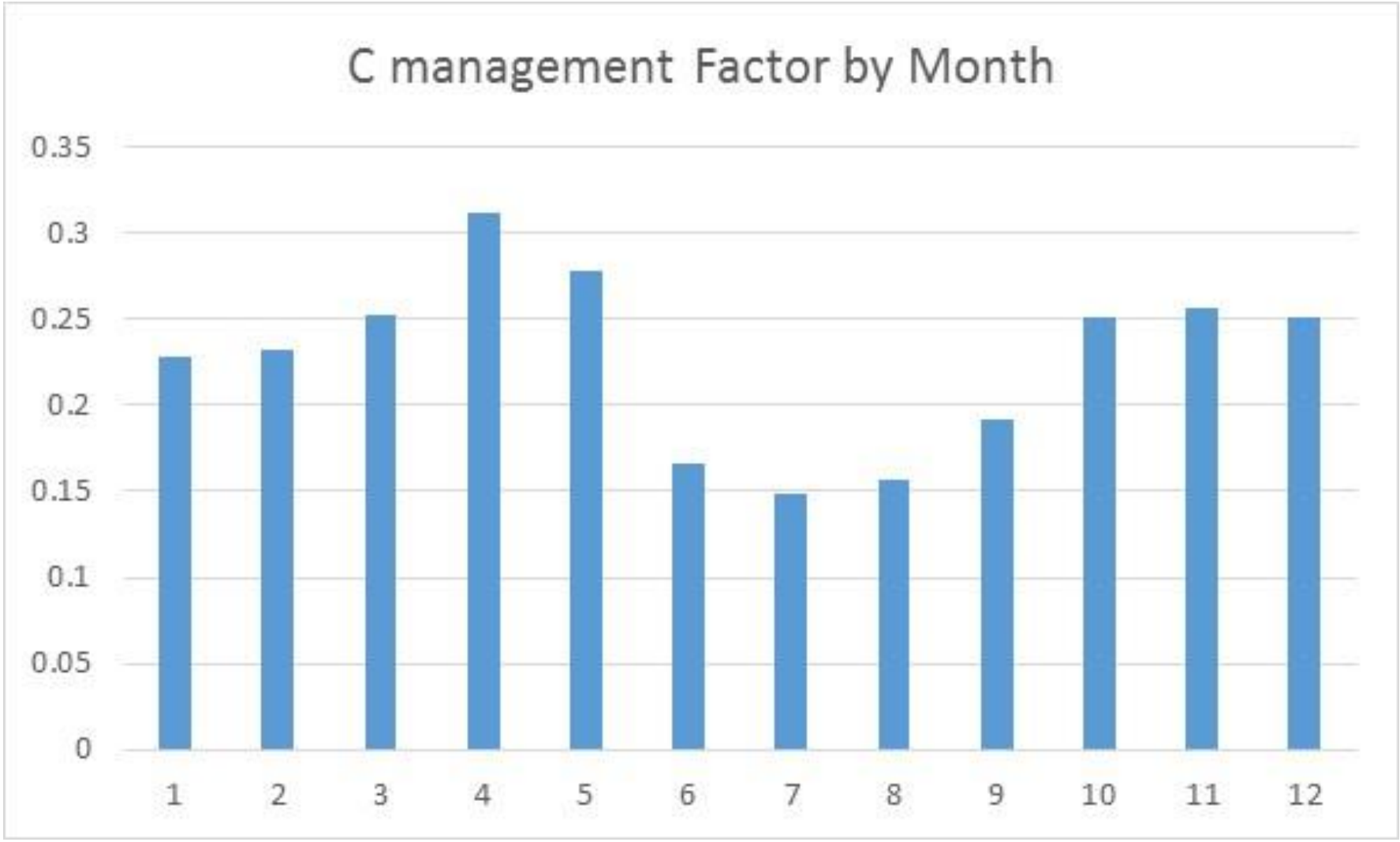


NRCS gSSURGO 2015

C-Factor

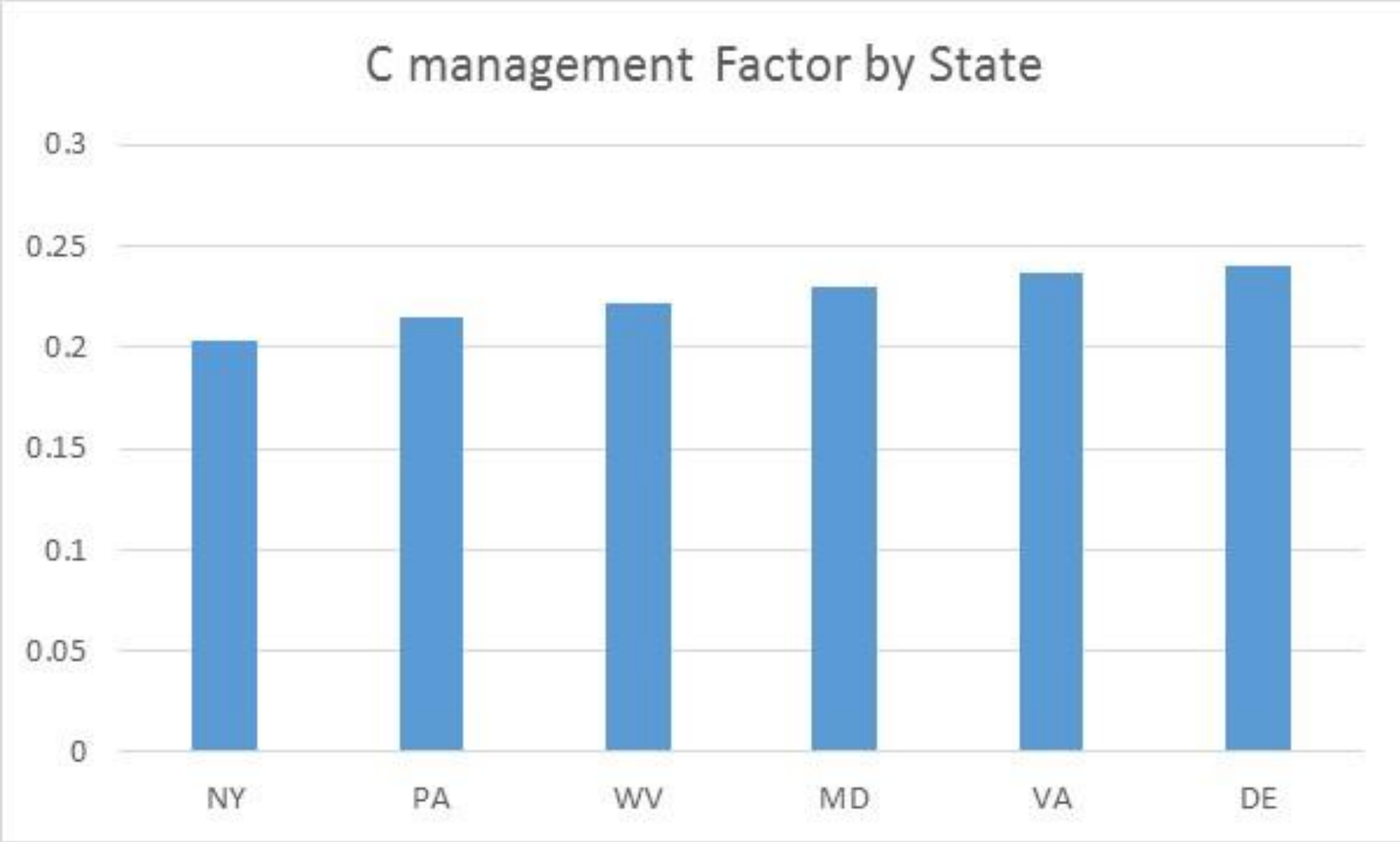
- The C management Factor represents the effect of vegetative cover on erosion rates.
- Agricultural values were challenged during a STAC review and were revised using RUSLE2
- Literature values were used for non-agricultural lands.

Agricultural C-management factor

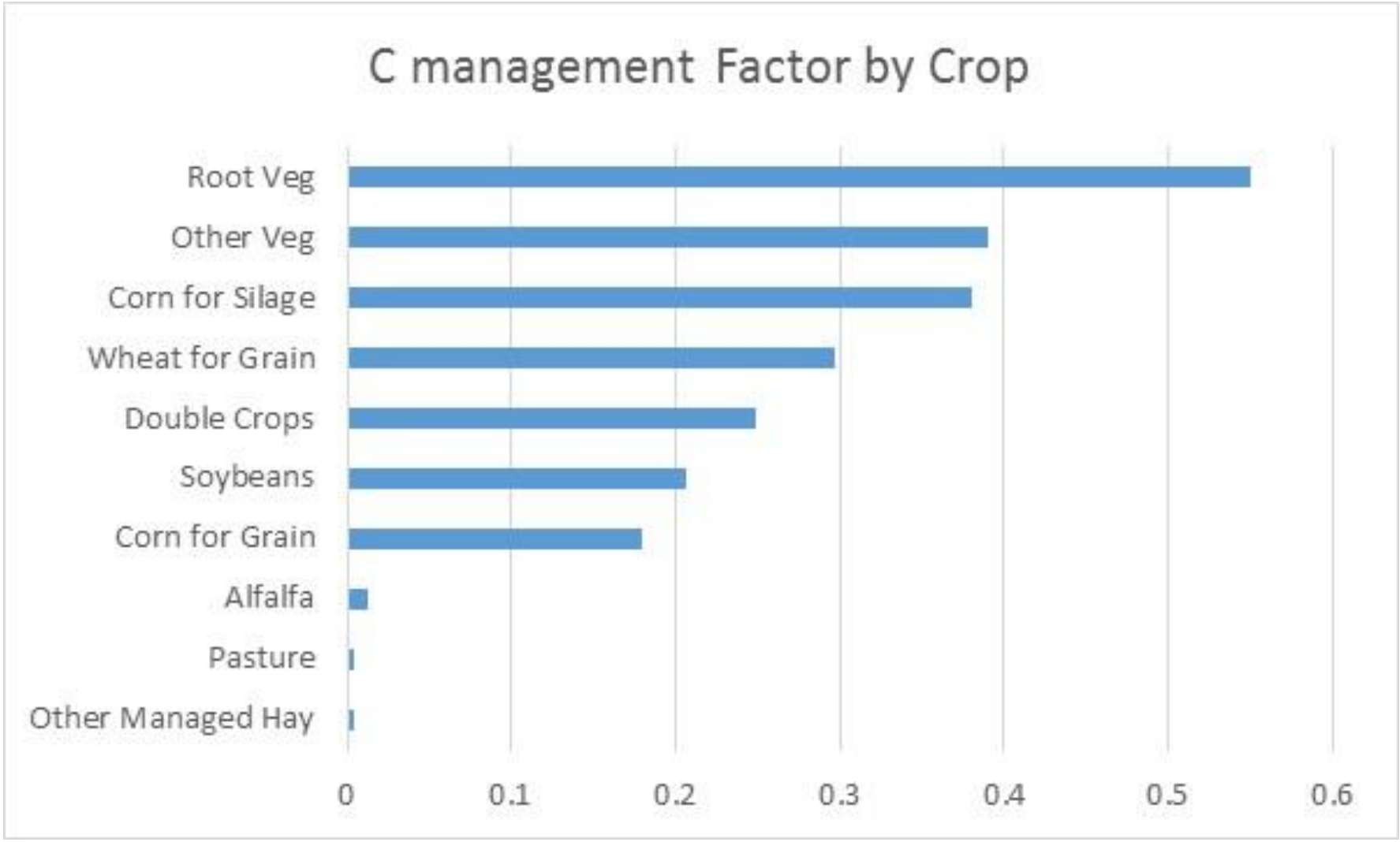


Simple average

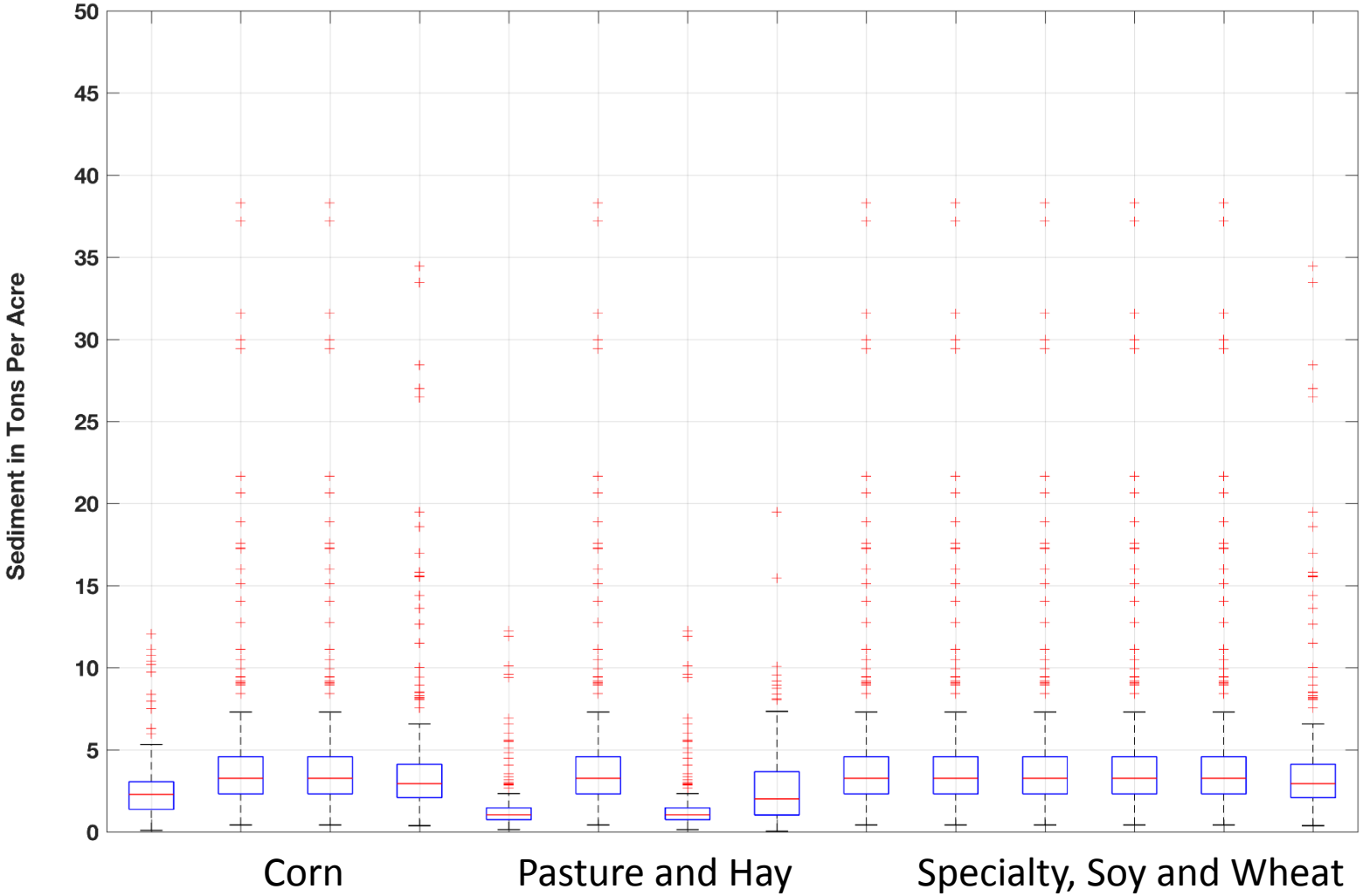
Agricultural C-management factor



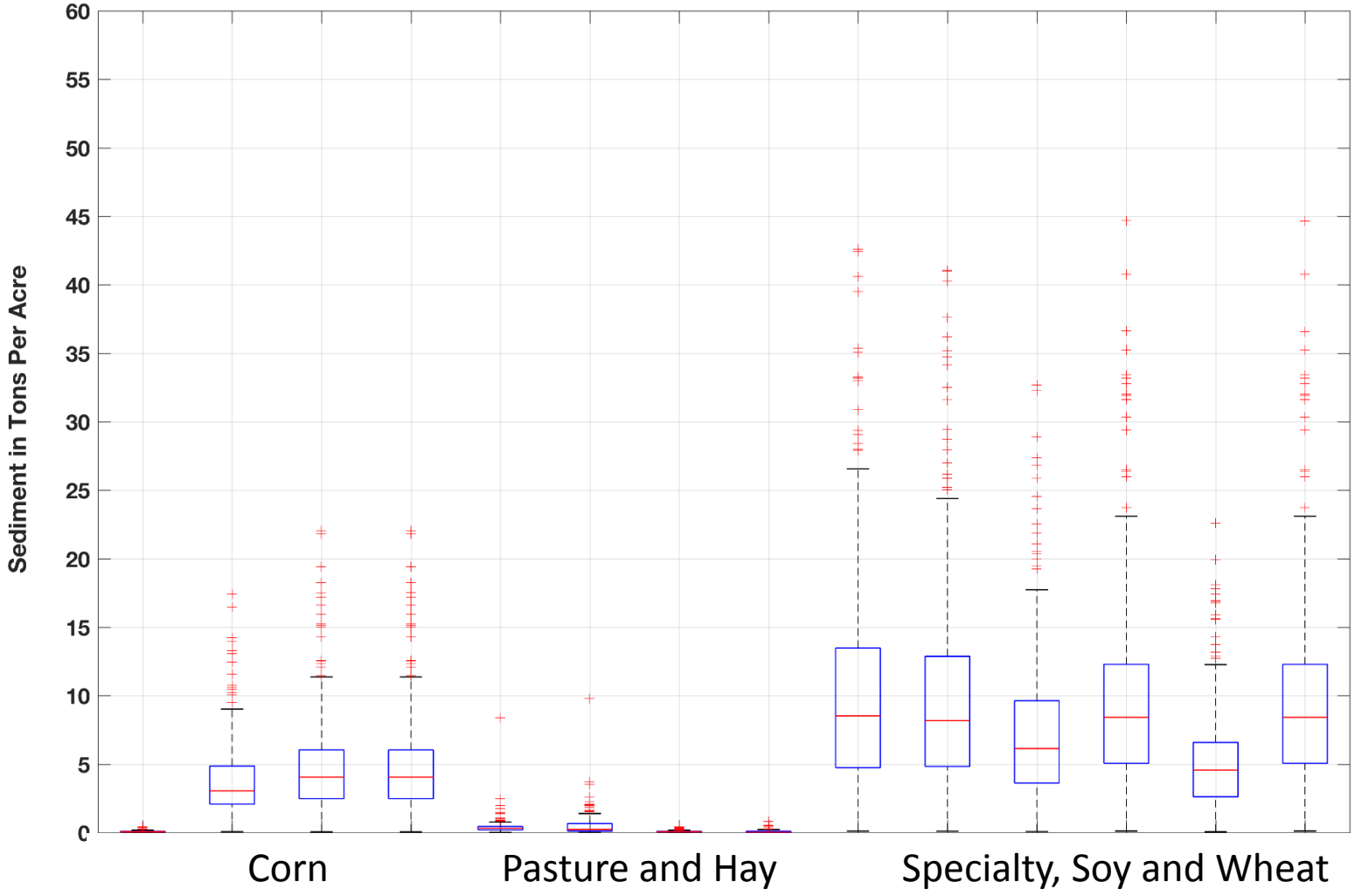
Agricultural C-management factor



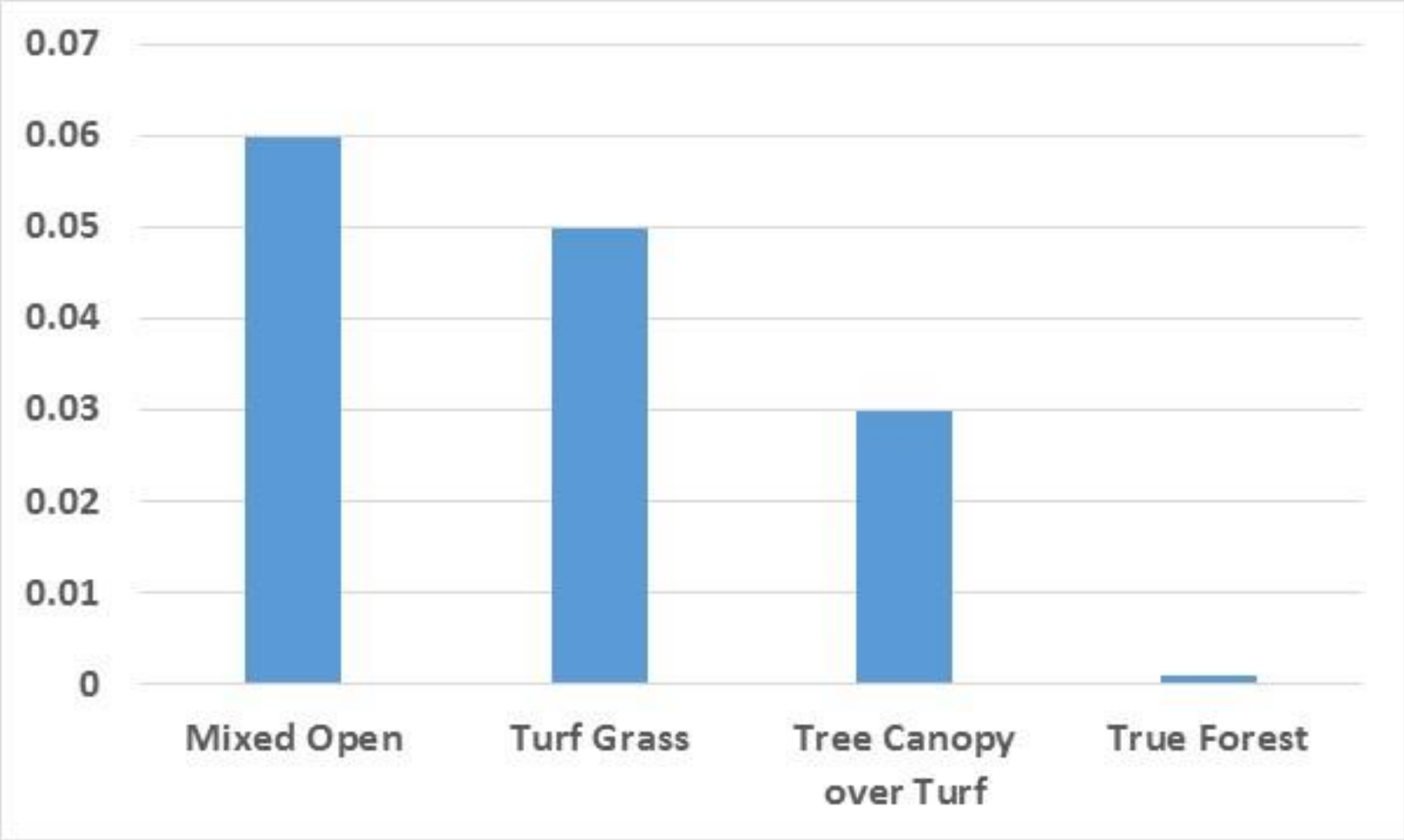
Beta 4 Sediment Tons Per Acre Load



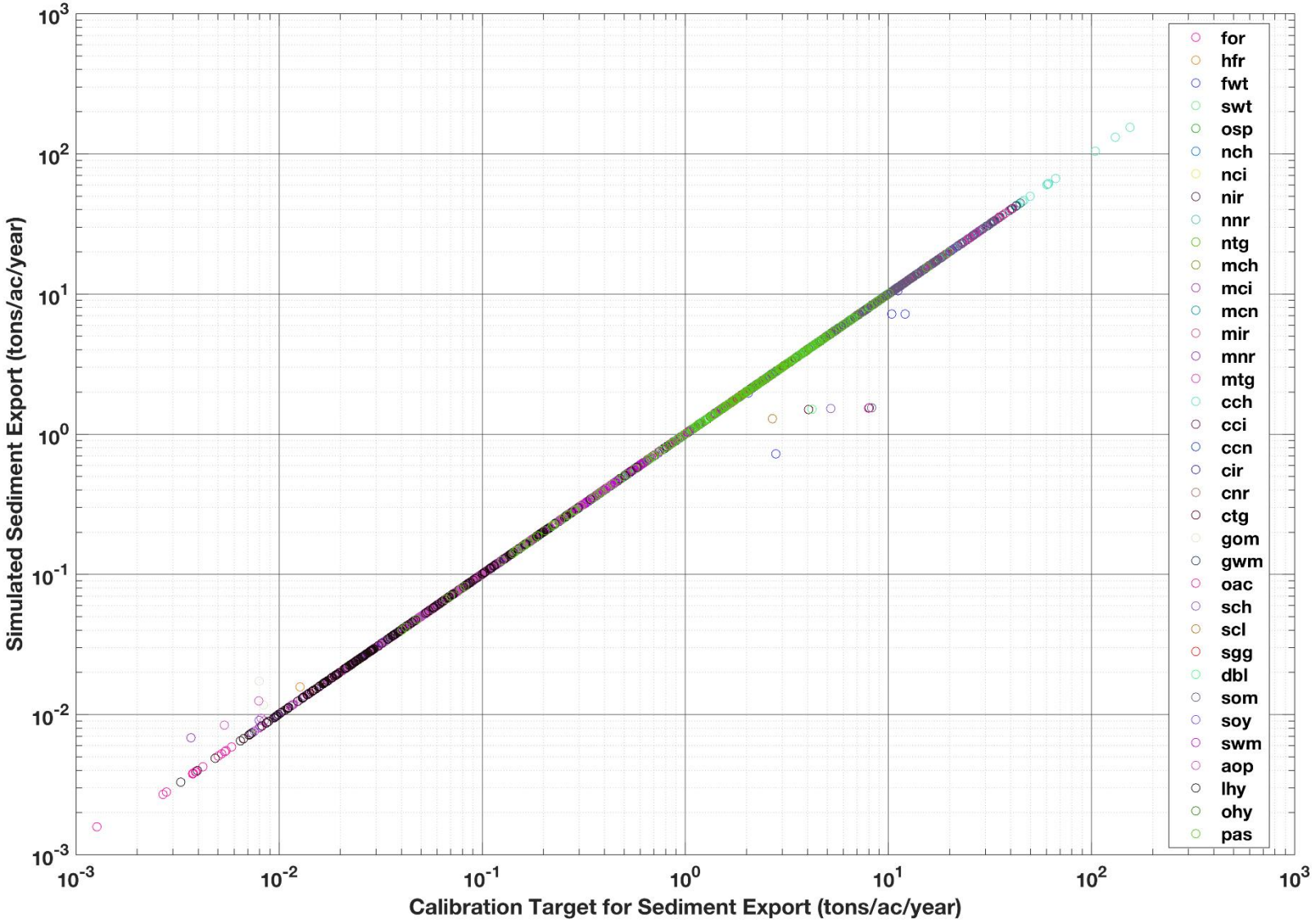
P6 draft Sediment Tons Per Acre Load



Non-Agricultural C factors



P6 draft – Sediment calibration



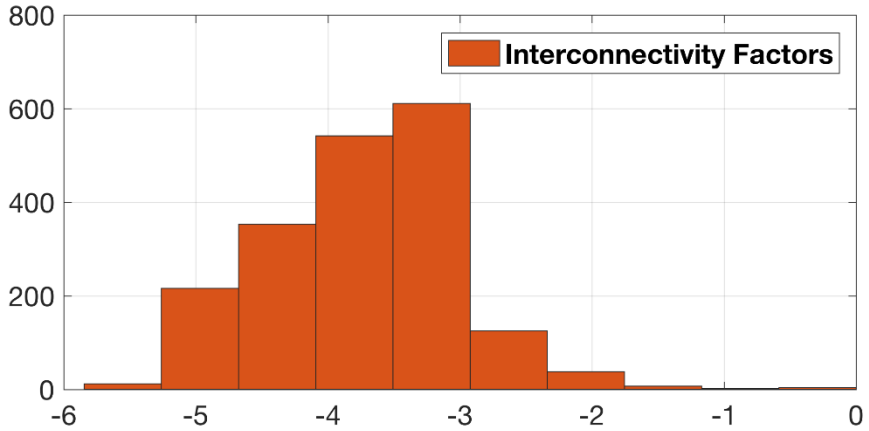
Sediment delivery ratio (SDR)

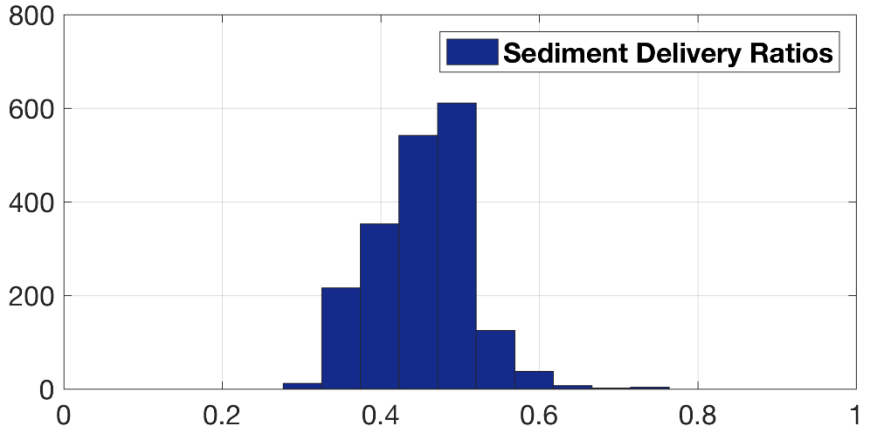
- SDRs were calculated from the Interconnectivity factors.

Observed at RIM[a] (tons)	4,772,570
to large stream[b]	6,372,900
to small stream[c]	8,180,872

0.49

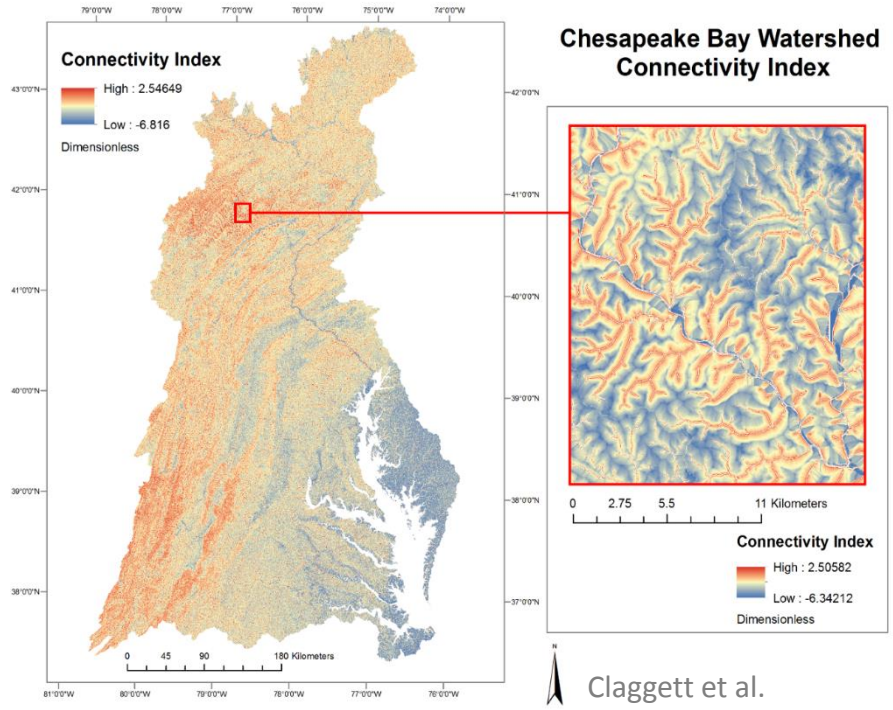
Post BMP	16,532,506
Pre-BMP	18,523,051



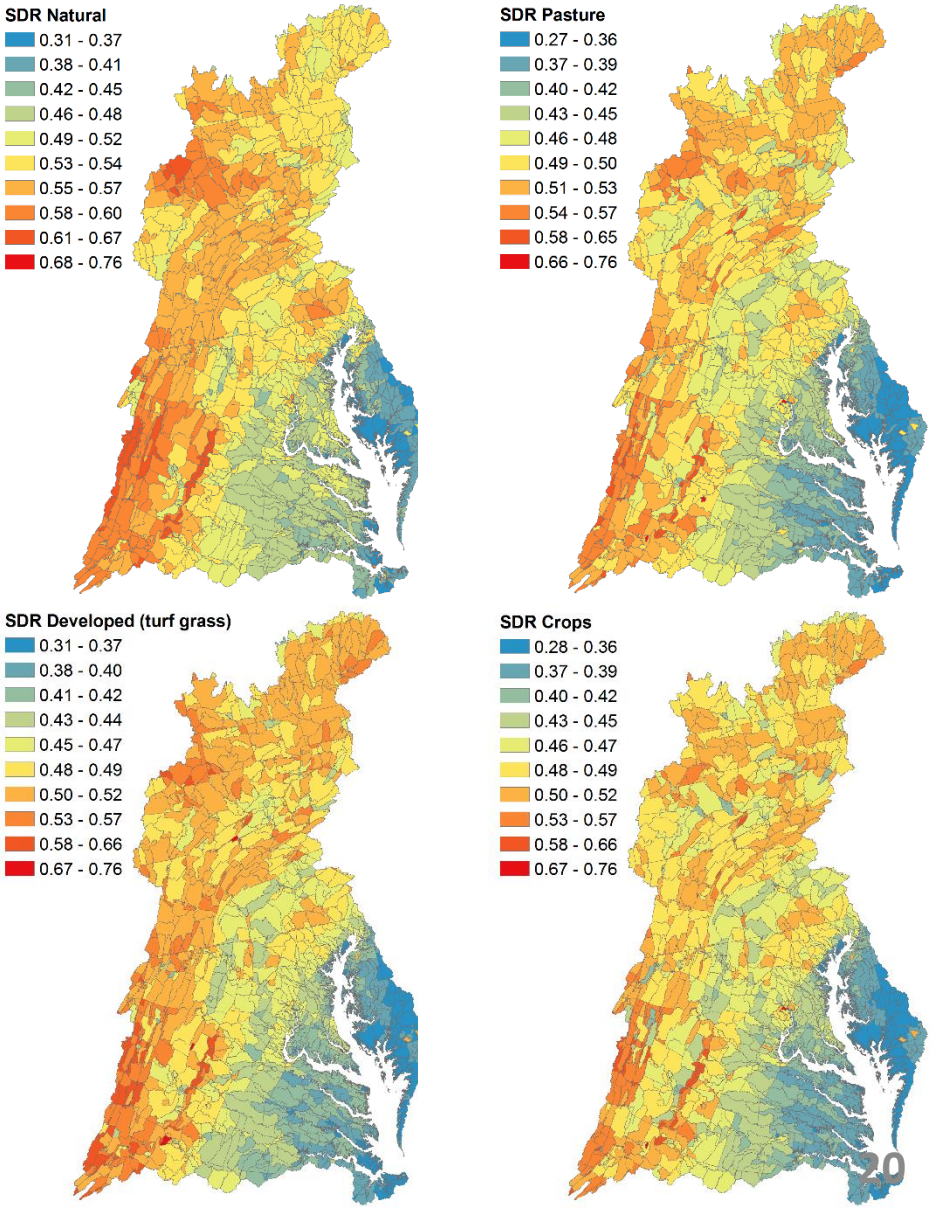


[a] WRTDS
[b] SPARROW, WRTDS, P532
[c] SPARROW

Sediment delivery ratio (SDR)



Claggett et al.



Conclusions and Next steps

- Hydrology and sediment calibrations are now complete based on the Phase 6 draft model inputs.
- The model performed well with the new dataset.
- Use the hydrology and sediment calibration for the river water-quality calibration.