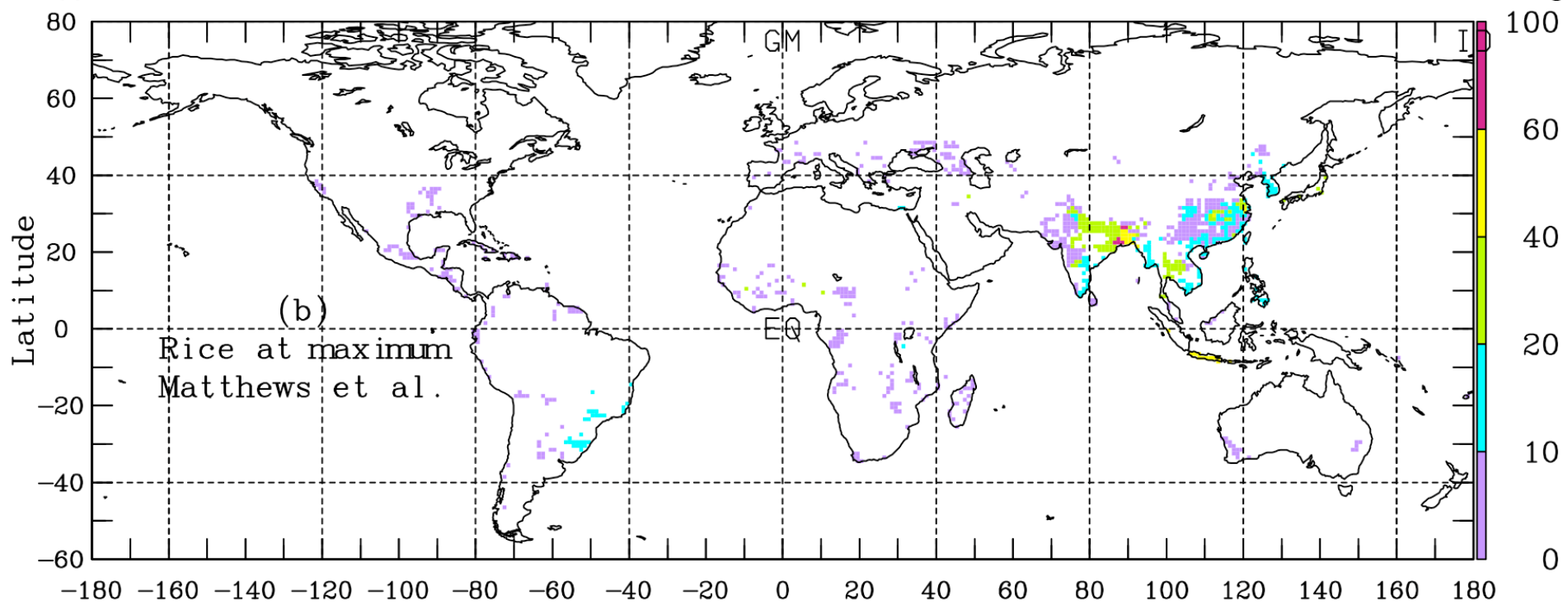
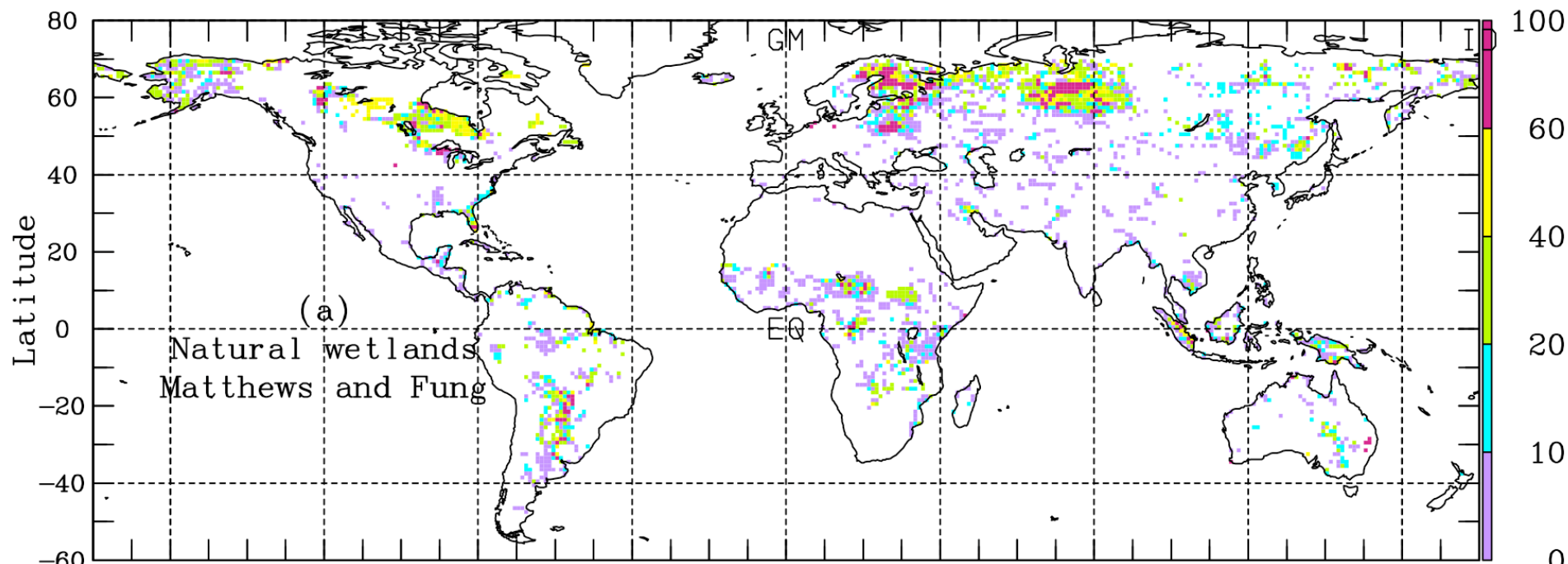


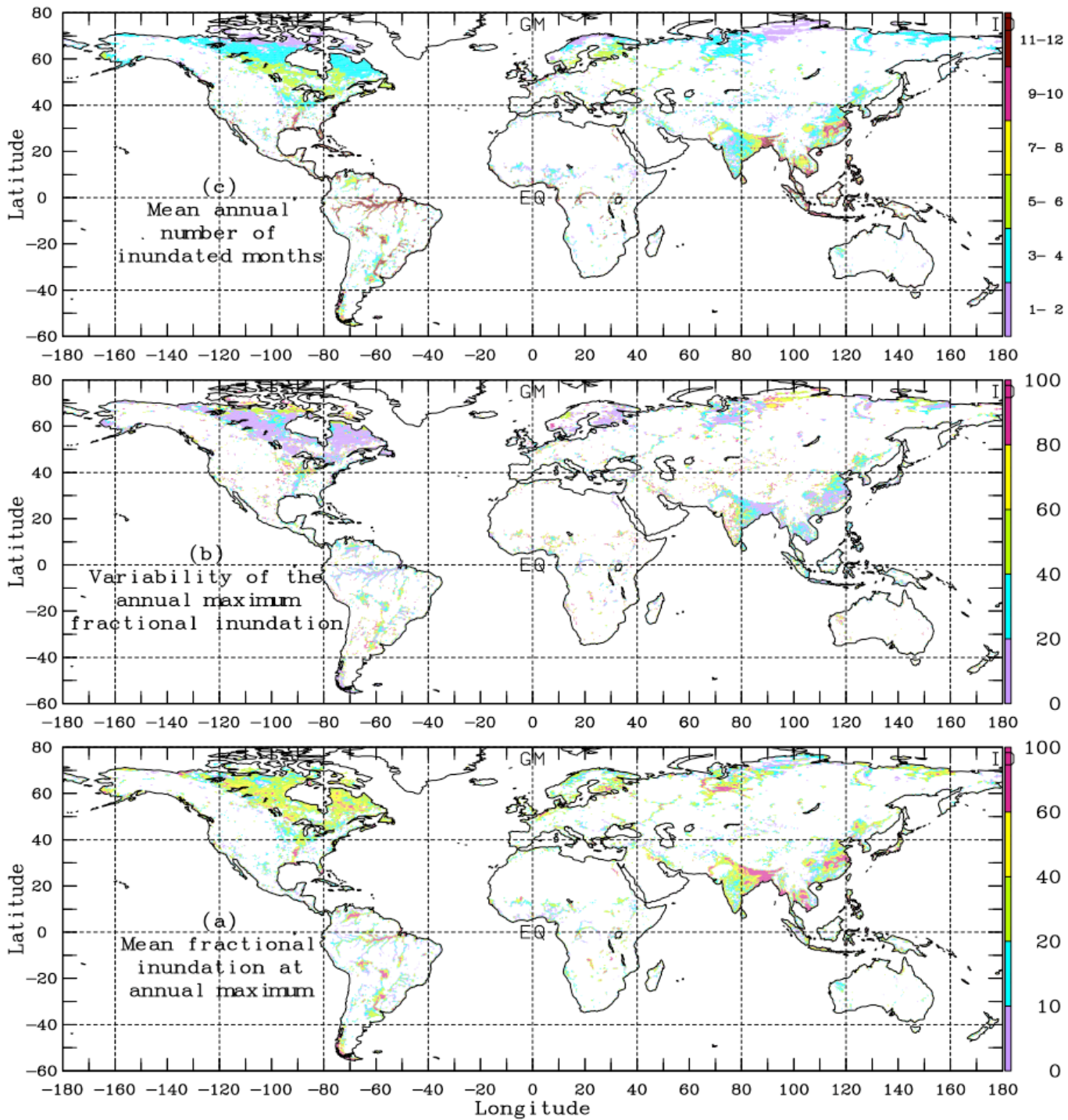
Wetland Methanogenesis and Heat Flux

Estimation of methane respiration and oxidation, as well as latent and sensible heat with a saturated area derived from the topographic index.

Parker Kraus

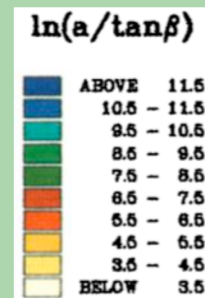
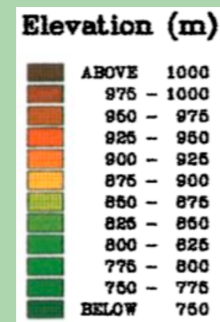


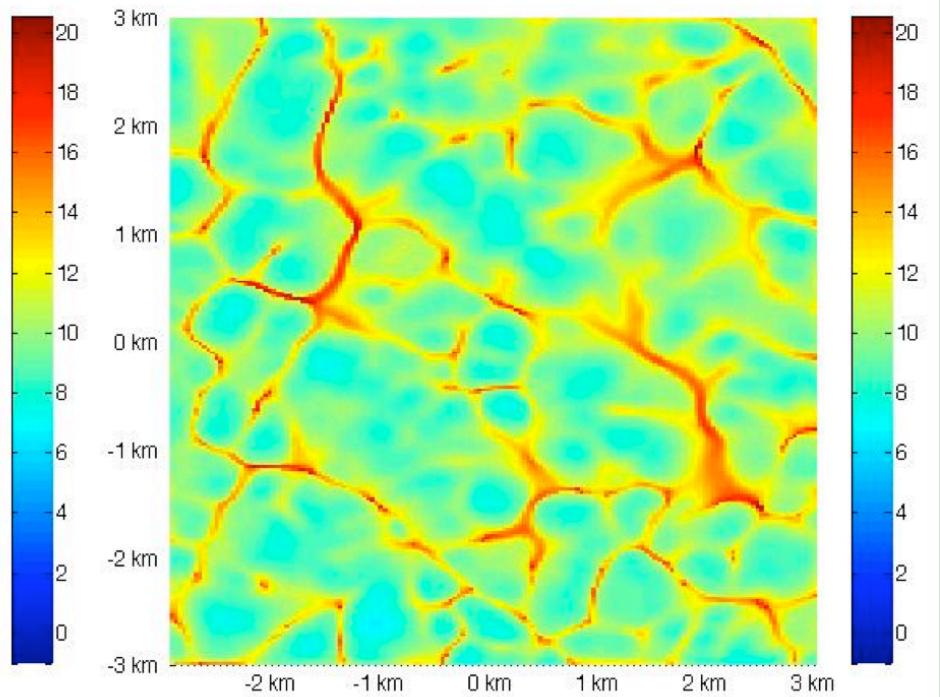
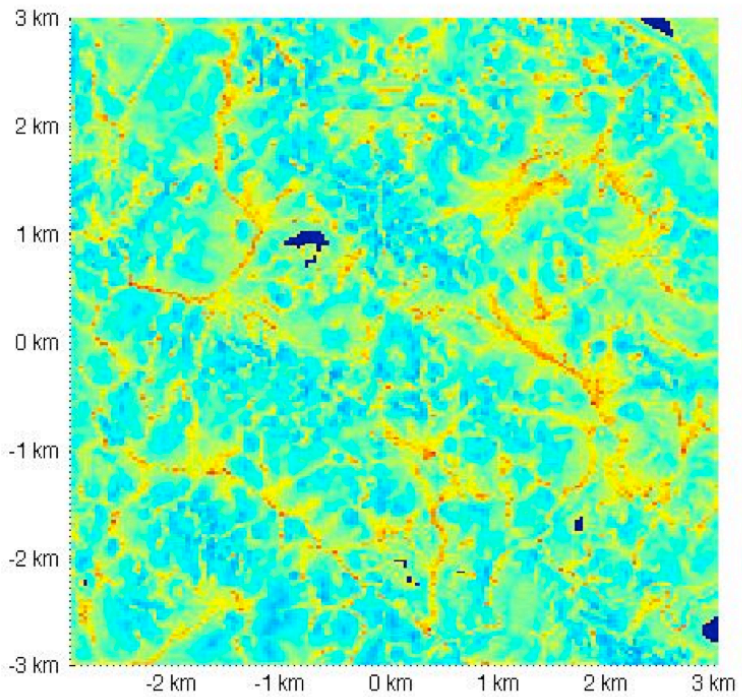
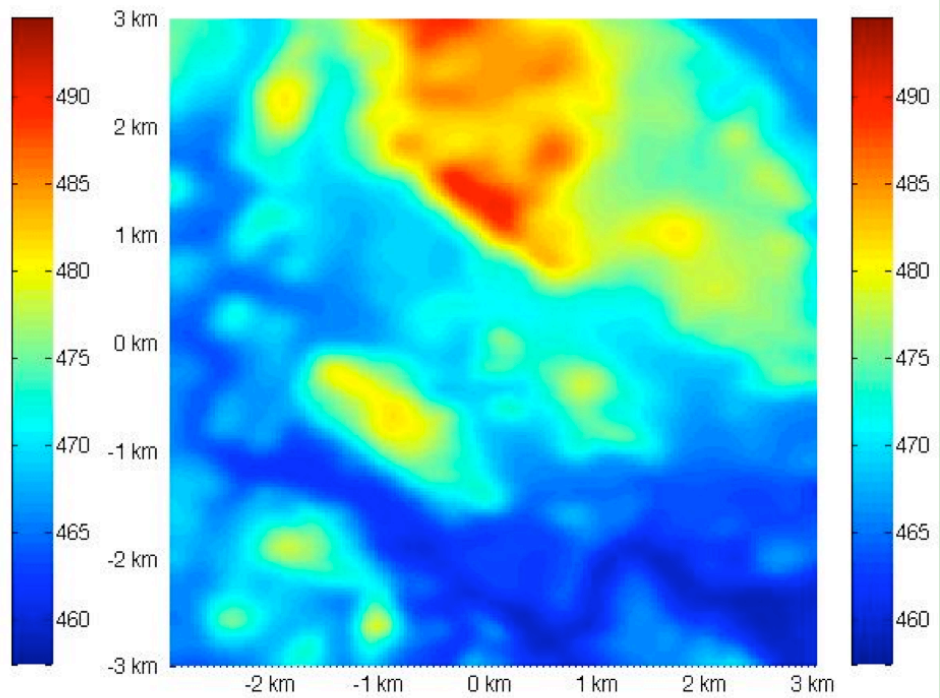
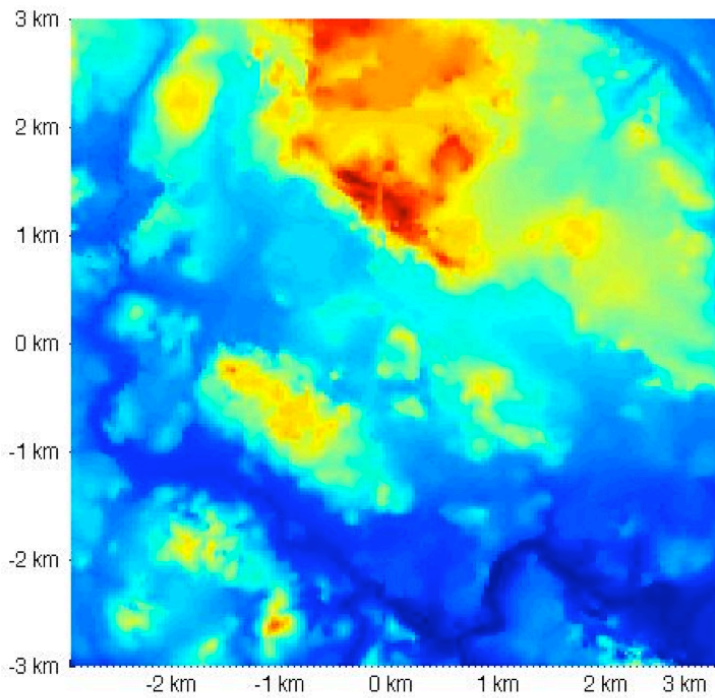


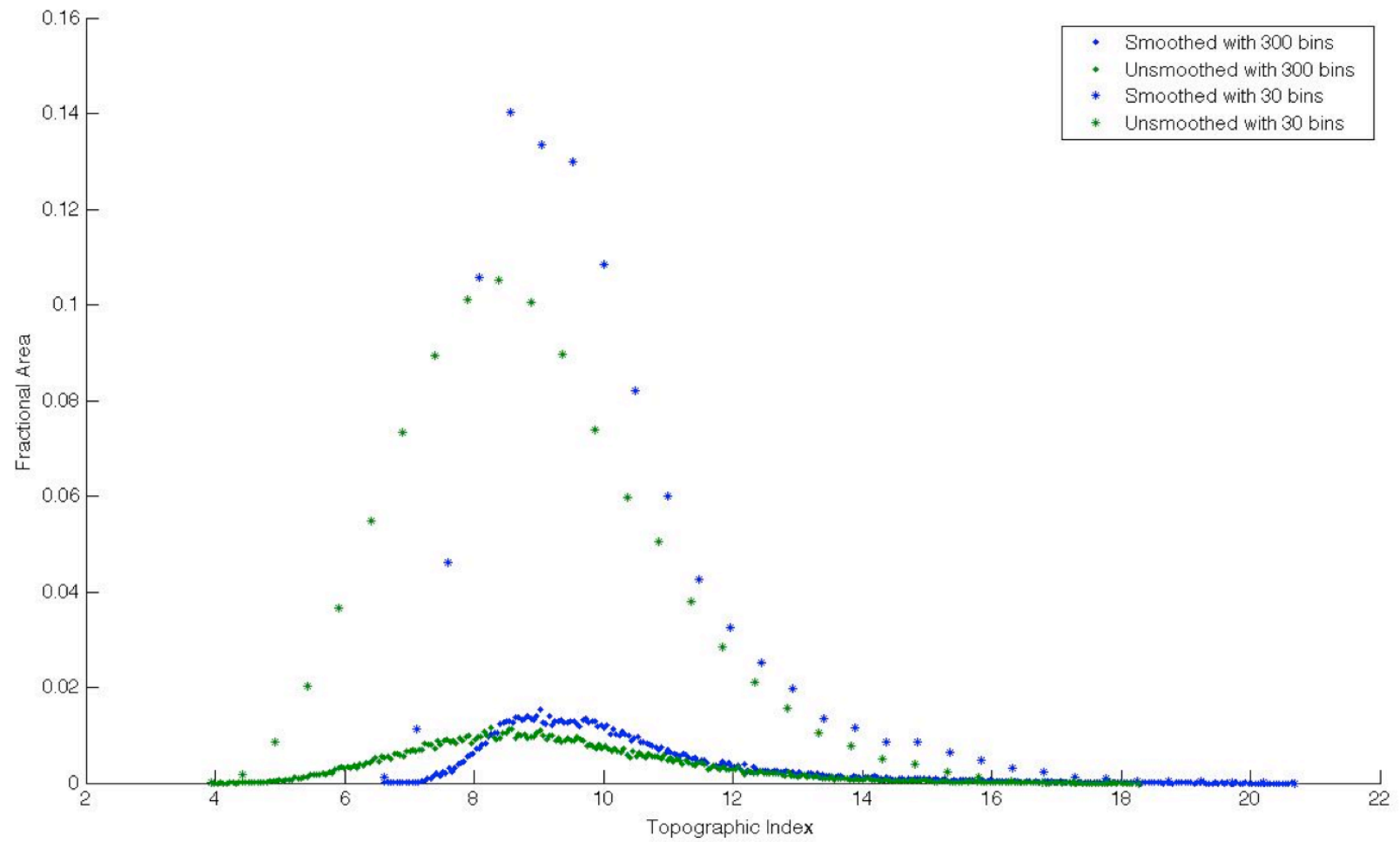


The Topographic Index of TOPMODEL

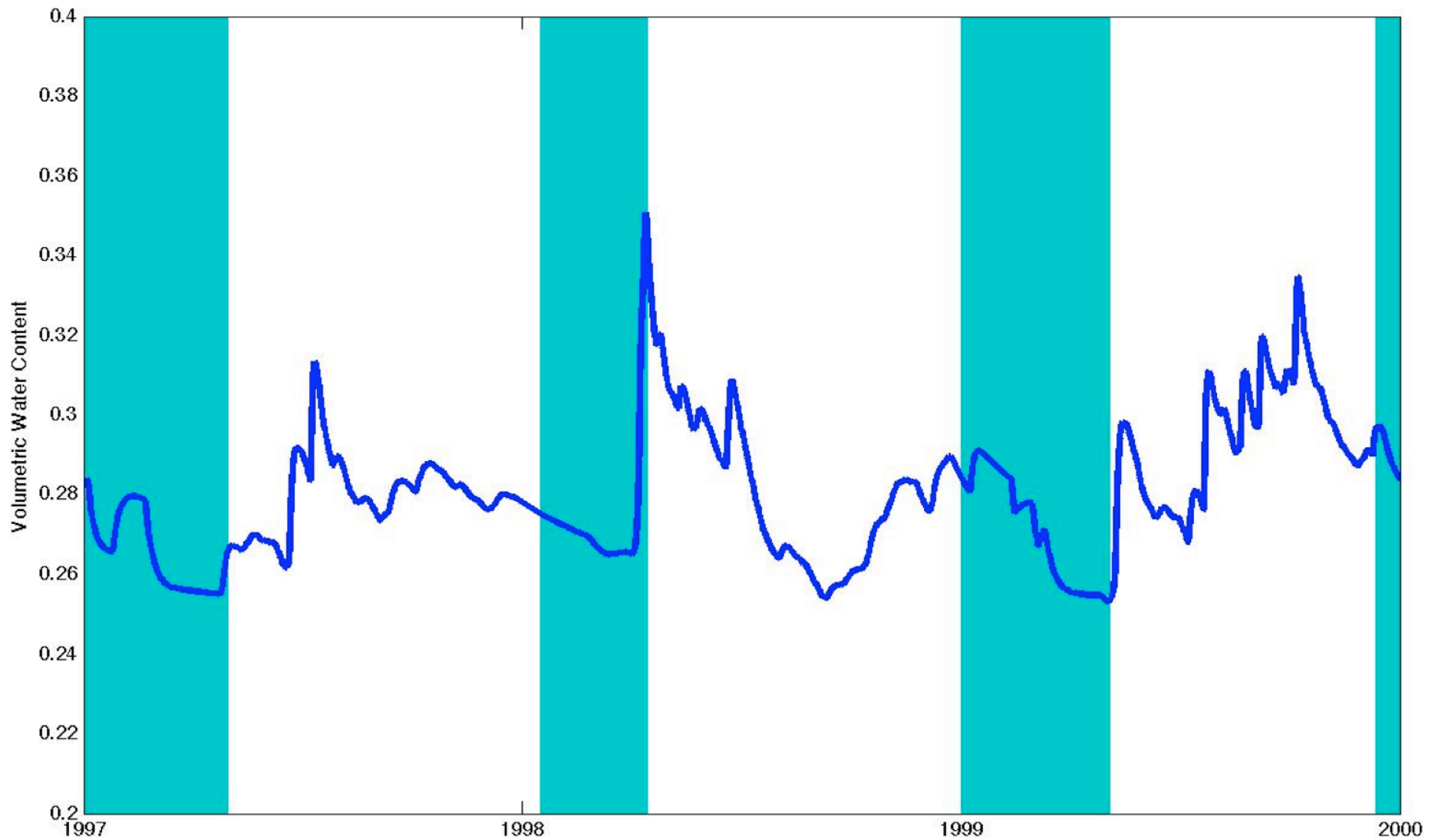
- Hydraulic gradient is equal to the slope.
- Spatially uniform hydraulic conductivity, exponentially decreasing with depth.

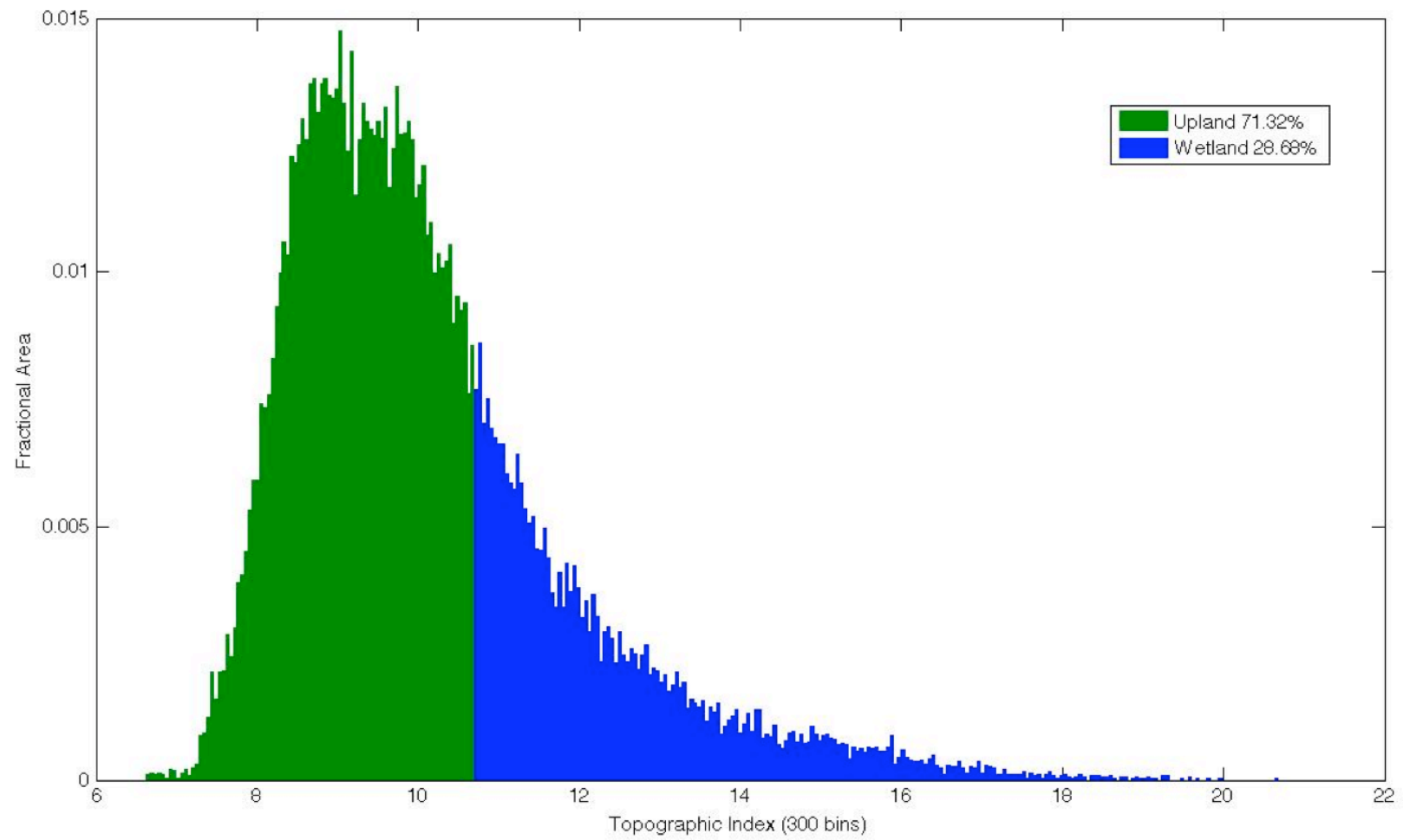


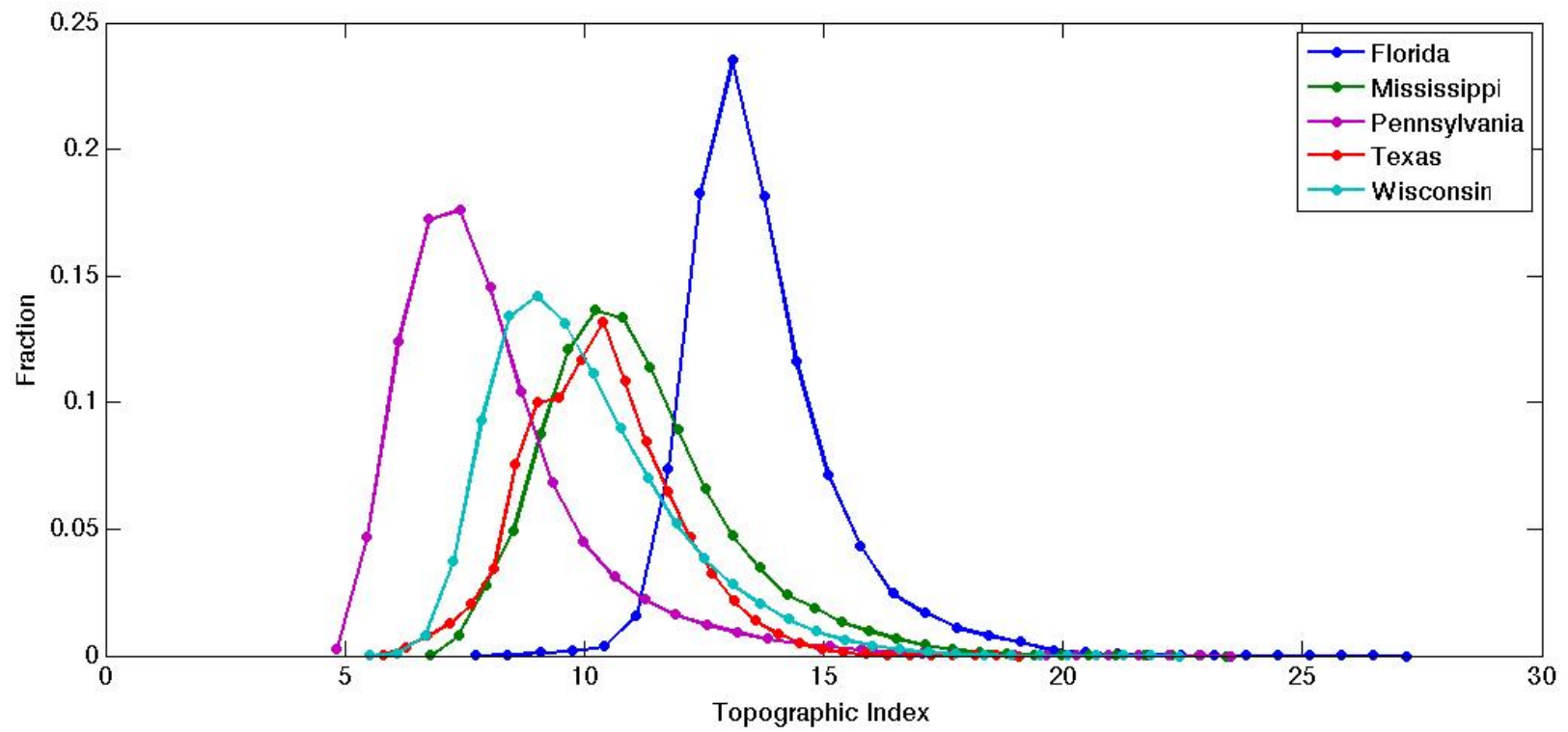




Saturated Area



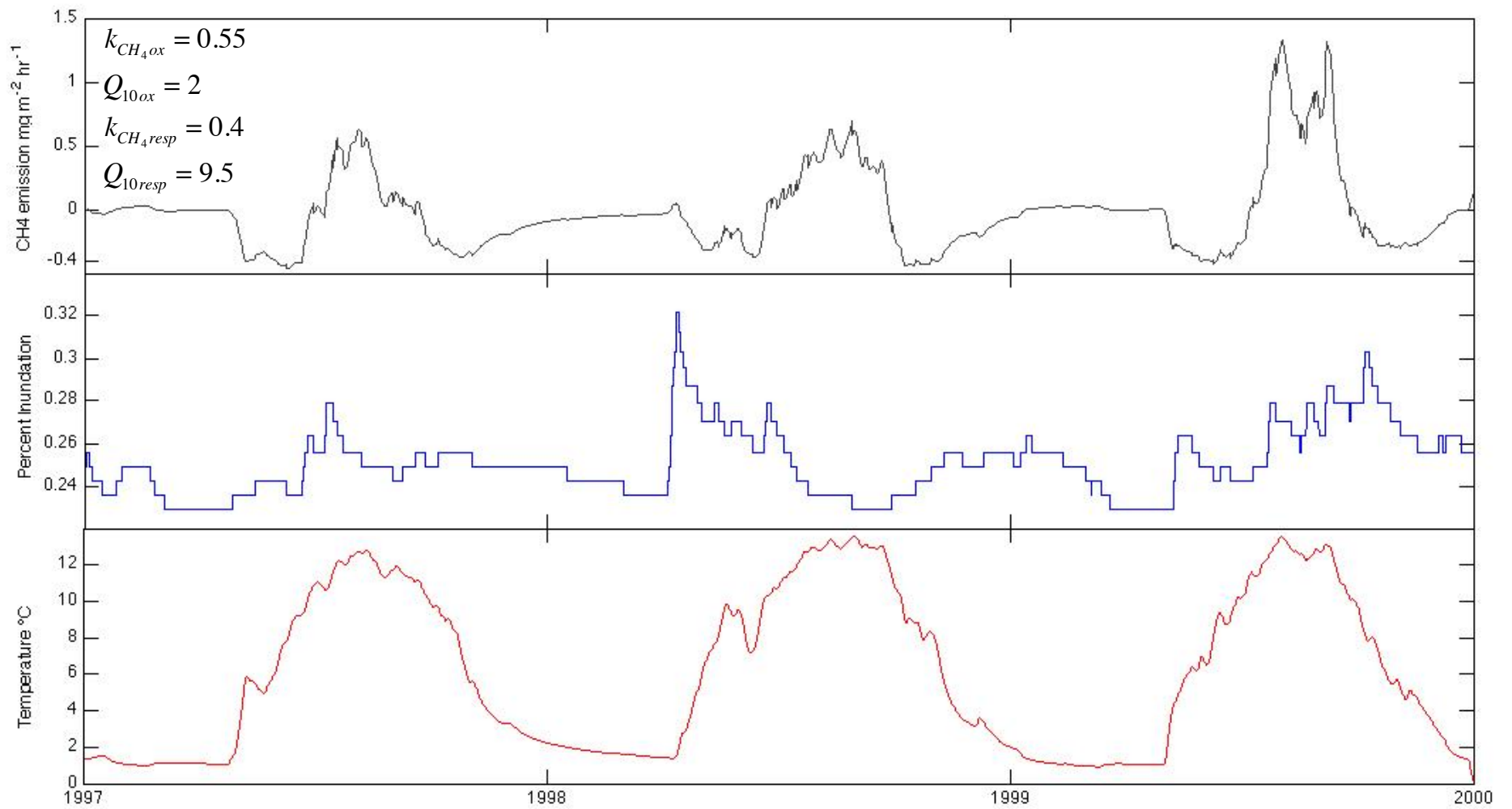




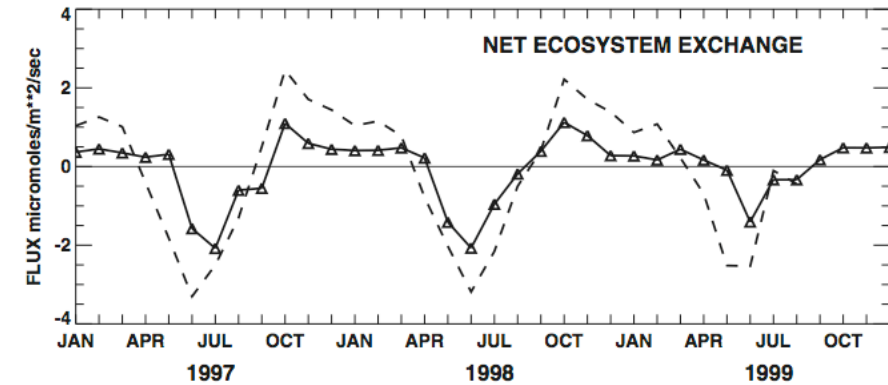
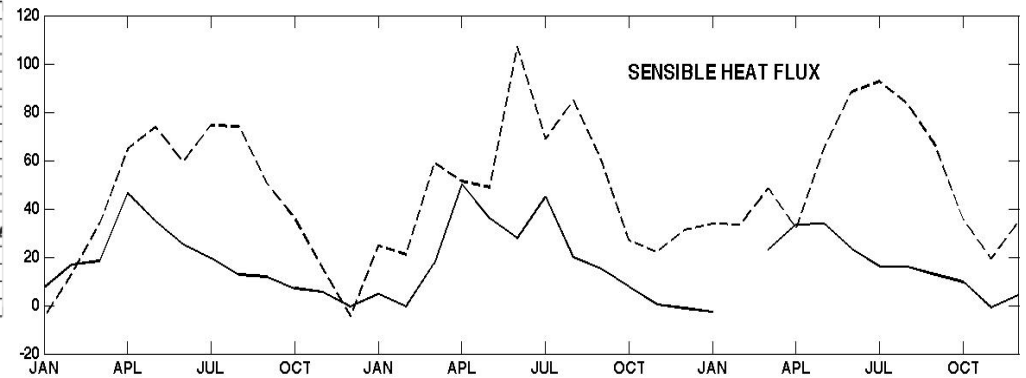
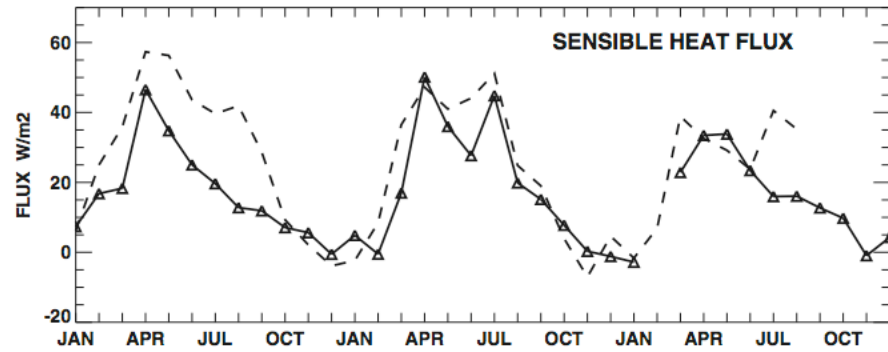
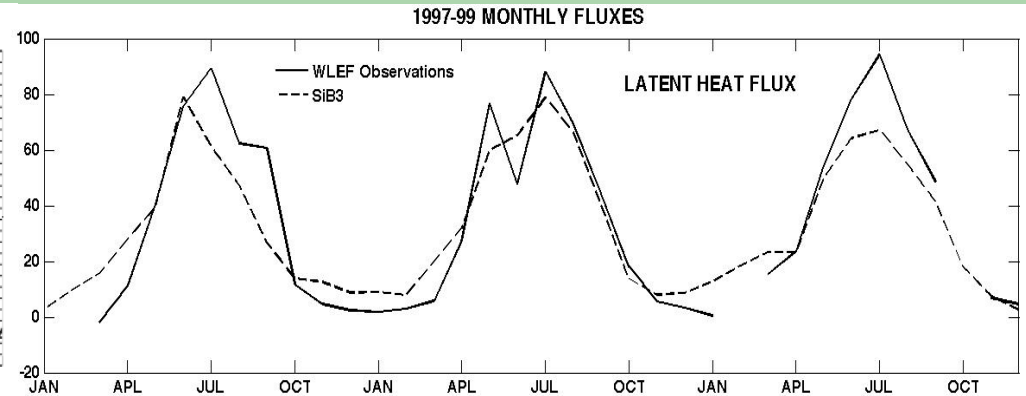
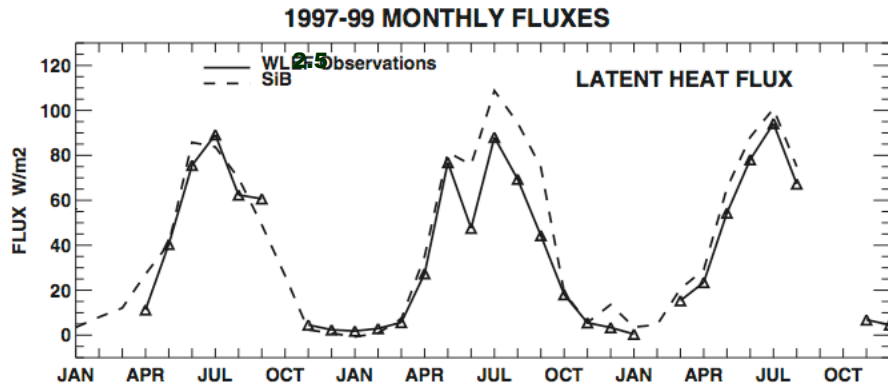
Methanogenesis

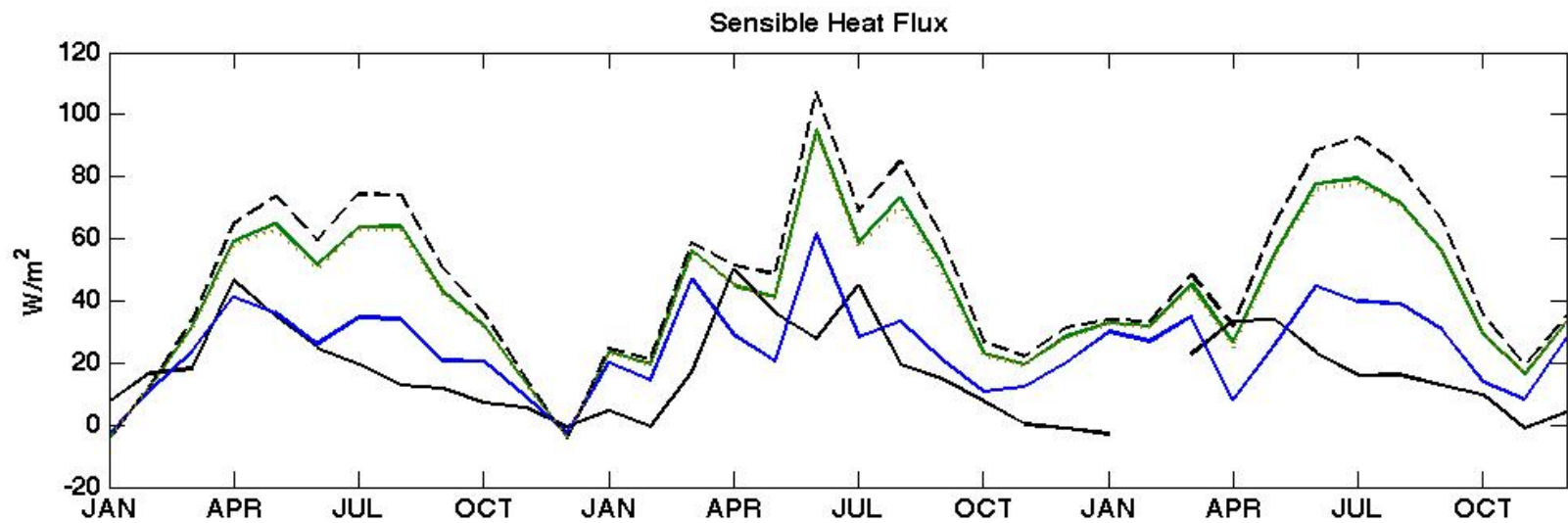
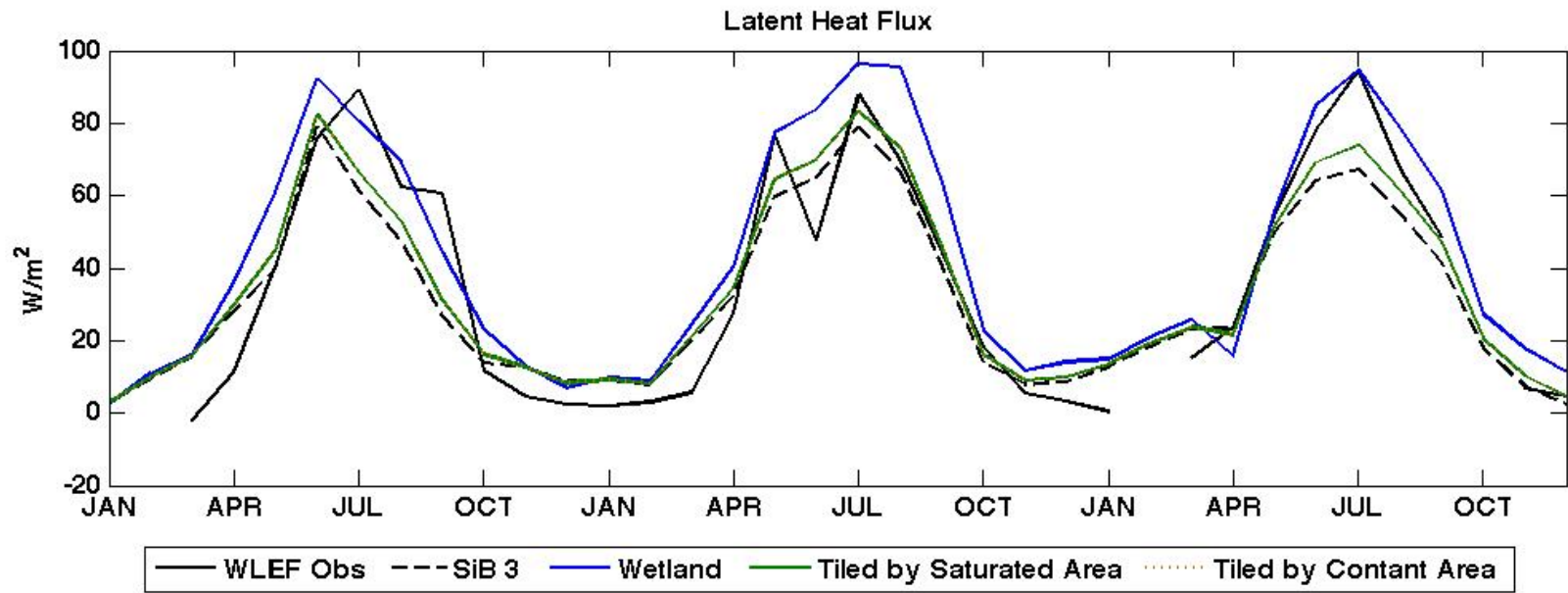
$$F_{CH_4} = -k_{CH_4ox} \cdot Q_{10ox}^{\left(\frac{T(t)-T_0}{10}\right)} + k_{CH_4resp} \cdot SatArea(hist(\Gamma), vol_{H_2O}) \cdot Q_{10resp}^{\left(\frac{T(t)-T_0}{10}\right)}$$

- Flux equals the sum of two Arrhenius-type equations representing methane respiration and oxidation.
- Could add third, distinguishing between saturated and unsaturated respiration.
- Estimates of Q_{10resp} commonly range from 2-9, nine is an enormous value, I've heard of people using values of 100, even 1,000.
- Q_{10resp} may be variable within the observed temperature range.



Heat Flux





References

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