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Sensitivity of the pseudo-global warming method under flood conditions: a case study from the northeastern US

Zeyu Xue et al.

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References

Bretherton, C. S., and S. Park, 2009: A new moist turbulence parameterization in the Community Atmosphere Model. *Journal of Climate*, **22 (12)**, 3422–3448.

Iacono, M. J., J. S. Delamere, E. J. Mlawer, M. W. Shephard, S. A. Clough, and W. D. Collins, 2008: Radiative forcing by long-lived greenhouse gases: Calculations with the AER radiative transfer models. *Journal of Geophysical Research: Atmospheres*, **113 (D13)**.

Jiménez, P. A., J. Dudhia, J. F. González-Rouco, J. Navarro, J. P. Montávez, and E. García-Bustamante, 2012: A revised scheme for the WRF surface layer formulation. *Monthly Weather Review*, **140 (3)**, 898–918.

Neale, R. B., and Coauthors, 2010: Description of the NCAR community atmosphere model (CAM 5.0). *NCAR Tech. Note*, **1 (1)**, 1–12.

Oleson, K. W., and Coauthors, 2010: Technical description of version 4.0 of the Community Land Model (CLM). Citeseer.

Zhang, G. J., and N. A. McFarlane, 1995: Role of convective scale momentum transport in climate simulation. *Journal of Geophysical Research: Atmospheres*, **100 (D1)**, 1417–1426.

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Table S1. Physical parameterizations used in our WRF simulations.

Process	Parameterization
Microphysics	CAM V5.1 two-moment five-class Neale et al. (2010)
Radiation	RRTMG Iacono et al. (2008)
Surface layer	Revised MM5 similarity theory Jiménez et al. (2012)
Land surface model	CLM4 Oleson et al. (2010)
Planetary boundary layer	UW Bretherton and Park (2009)
Cumulus parameterization	ZM Zhang and McFarlane (1995)

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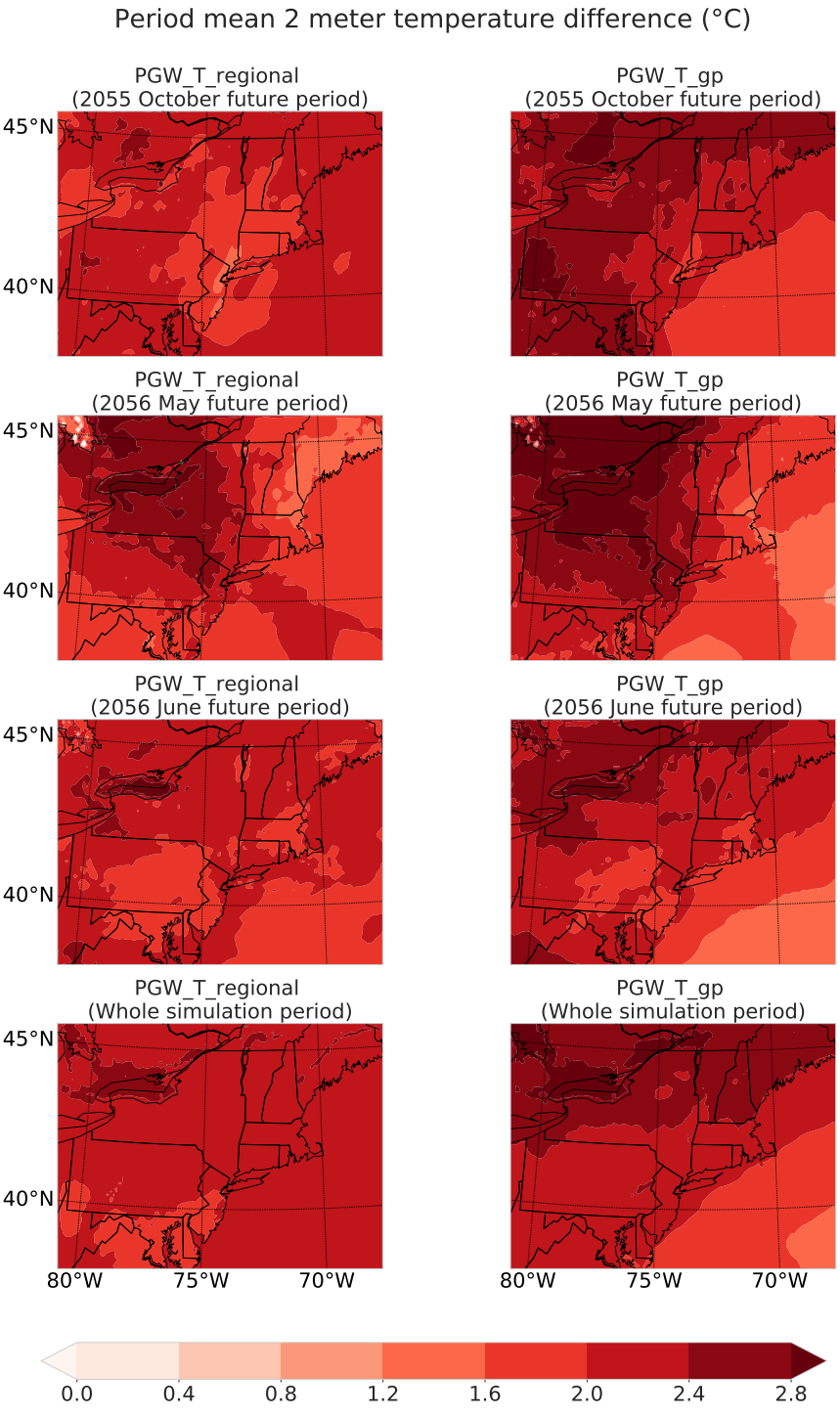
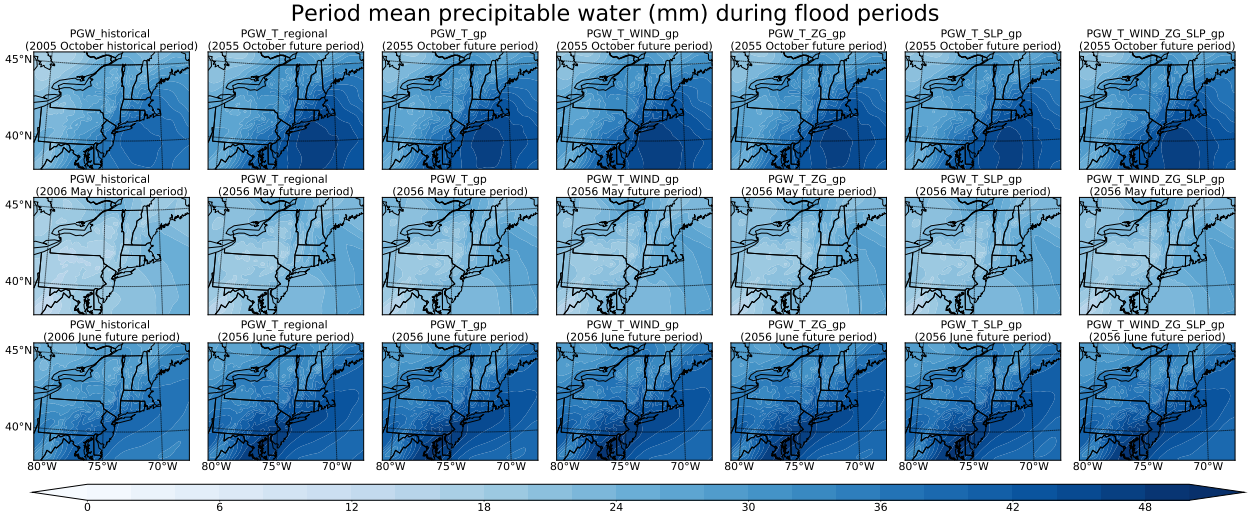


Fig. S1. Period mean temperature deltas at 2 meter (°C) over the inner domain from the simulation with temperature perturbation at regional mean scale and the simulation with temperature perturbation at each gridpoint (the baseline simulation in both columns is the historical 2000s flood period).



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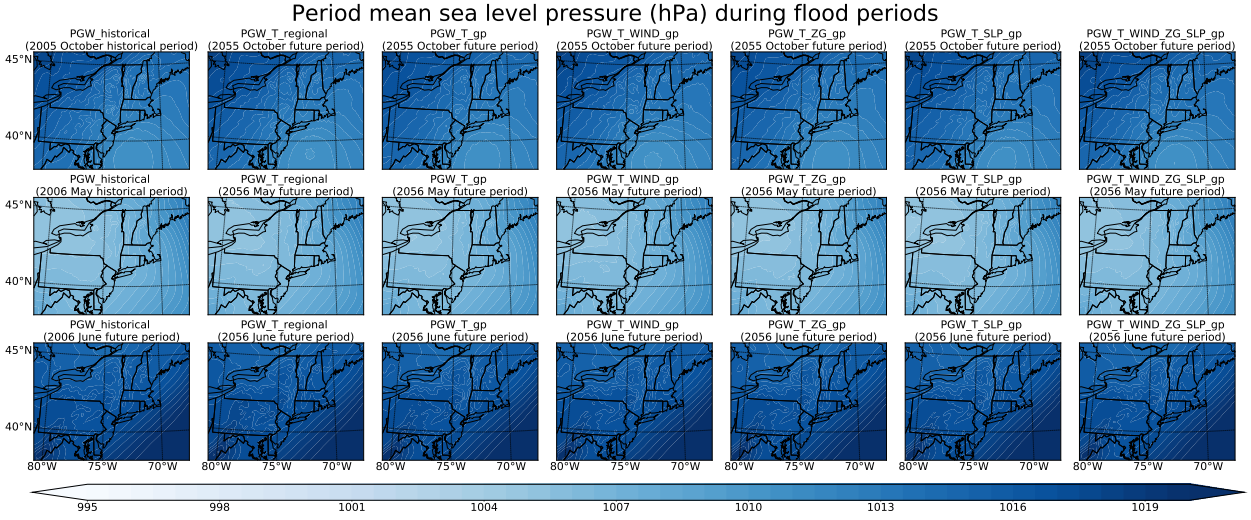


Fig. S3. Period mean sea level pressure (hPa) over the inner domain from all PGW simulations during flood periods.

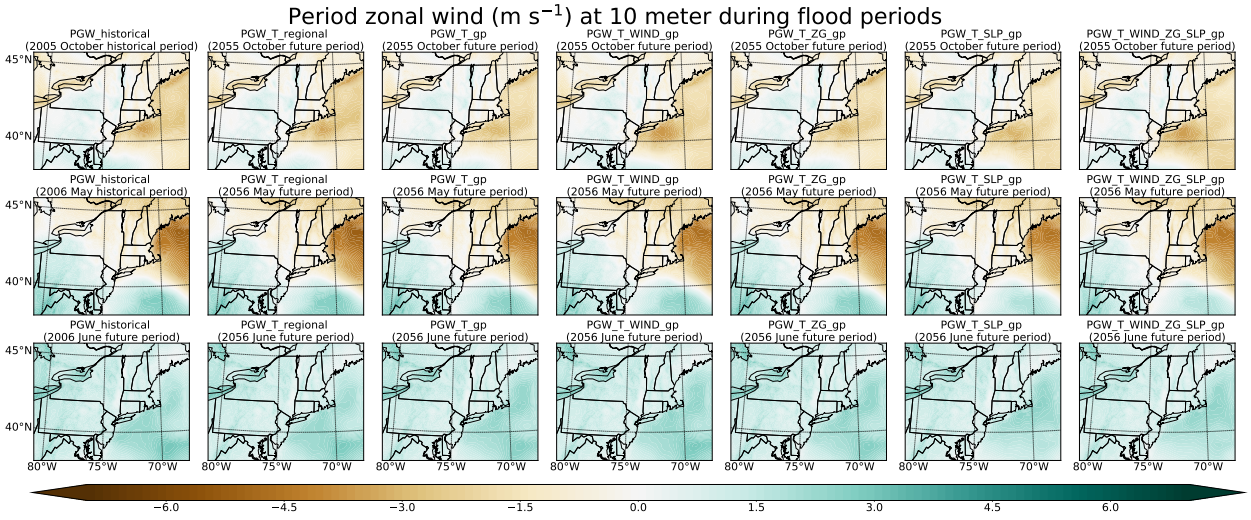


Fig. S4. Period mean zonal wind (m s^{-1}) over the inner domain from all PGW simulations during flood periods.

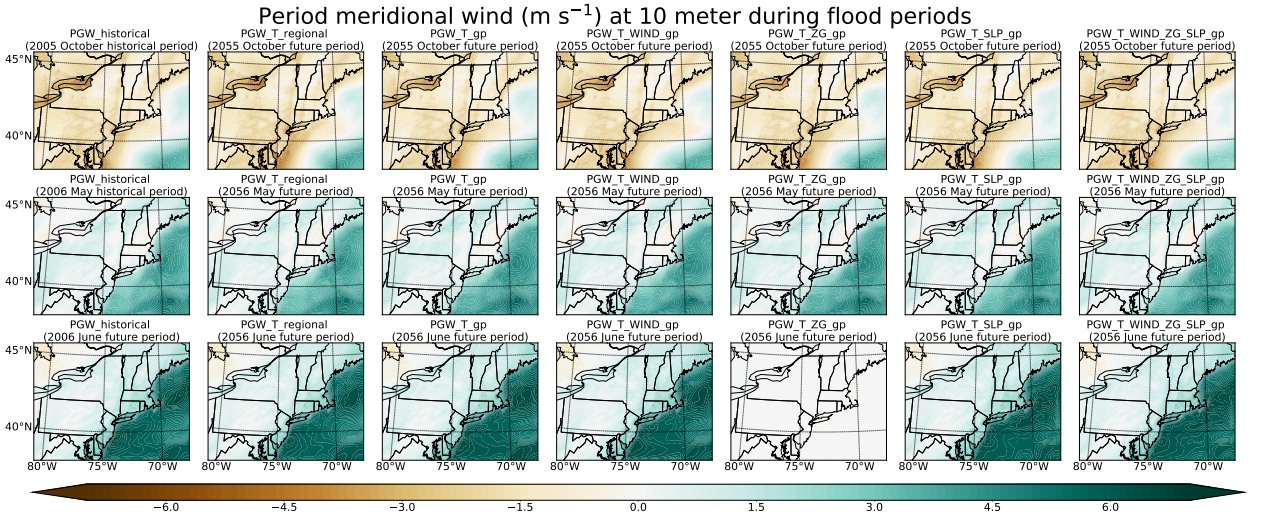


Fig. S5. Period mean meridional wind (m s^{-1}) over the inner domain from all PGW simulations during flood periods.

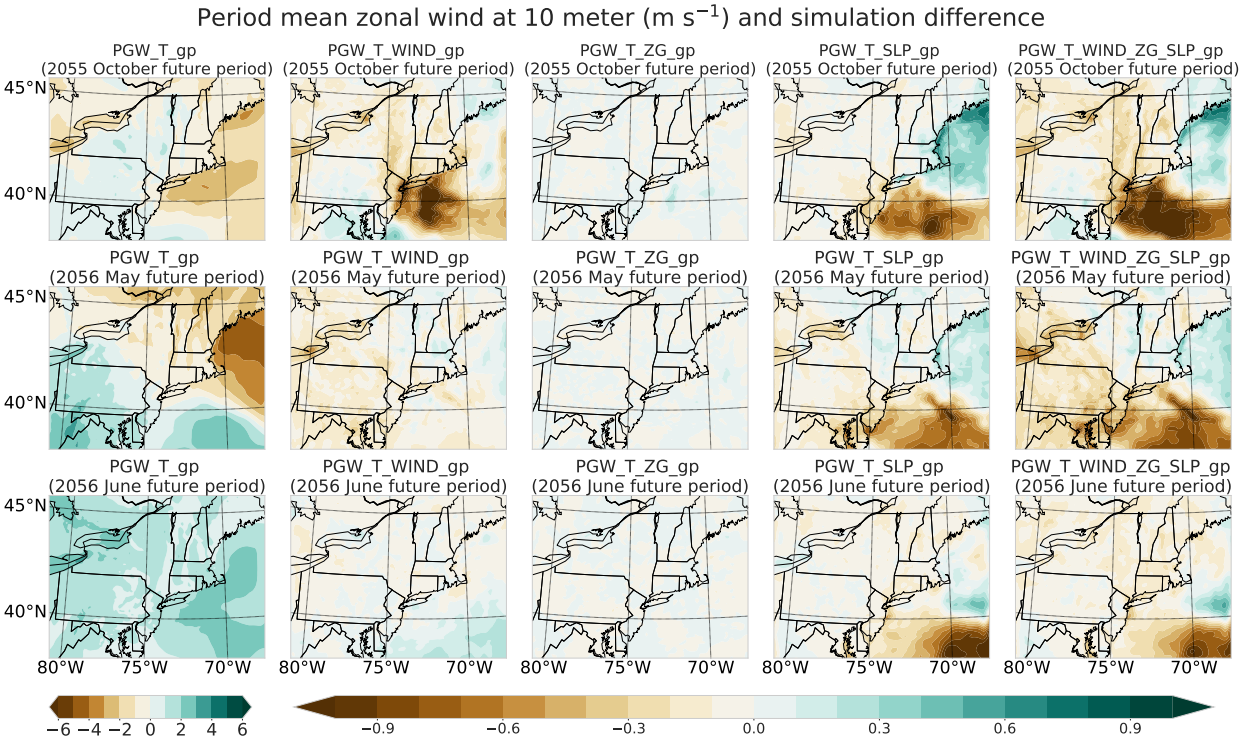
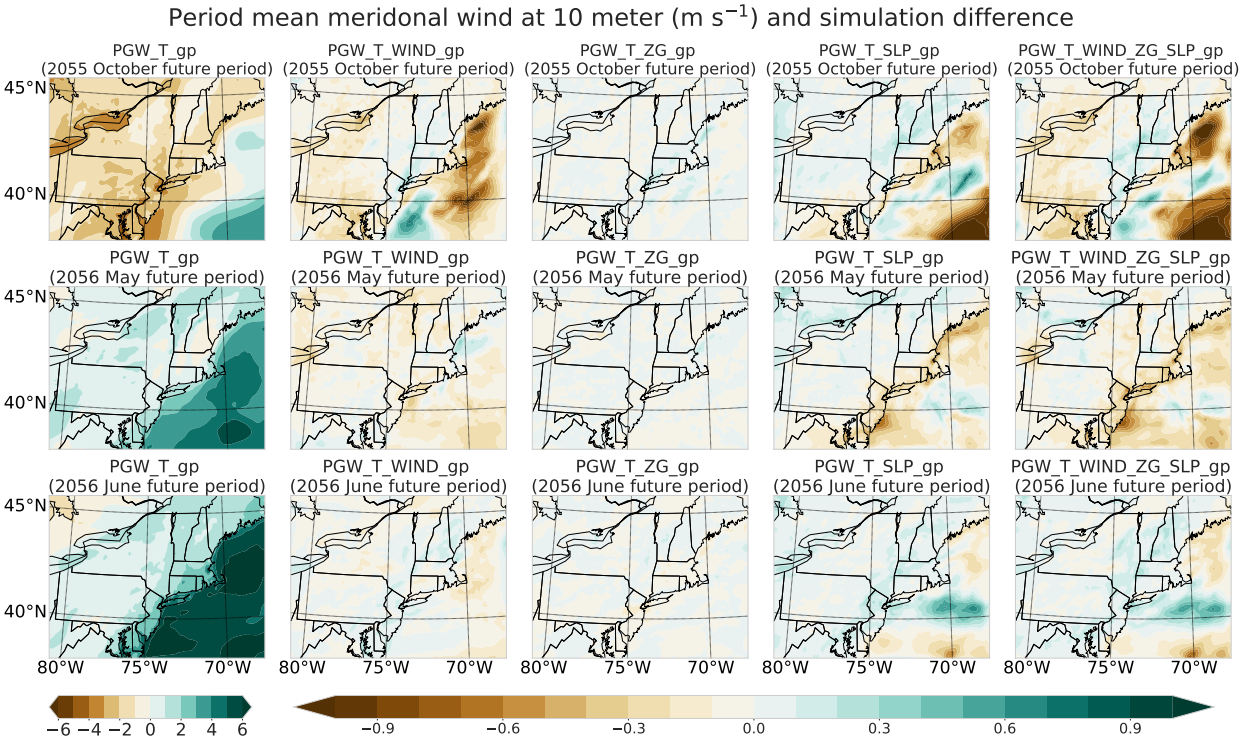


Fig. S6. Period mean zonal wind and simulation delta (m s^{-1}) over the inner domain from all PGW simulations during flood periods.



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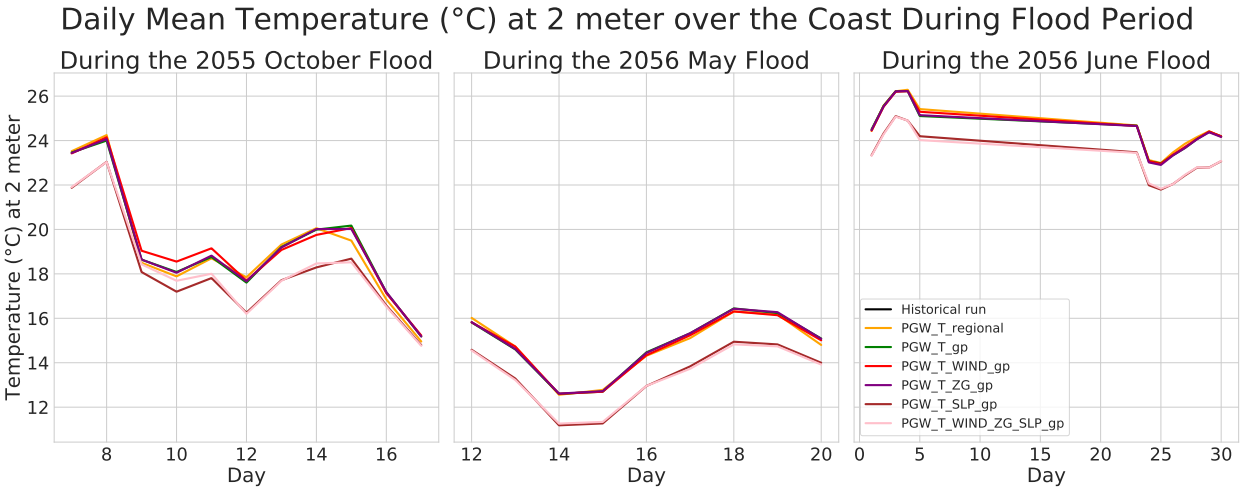

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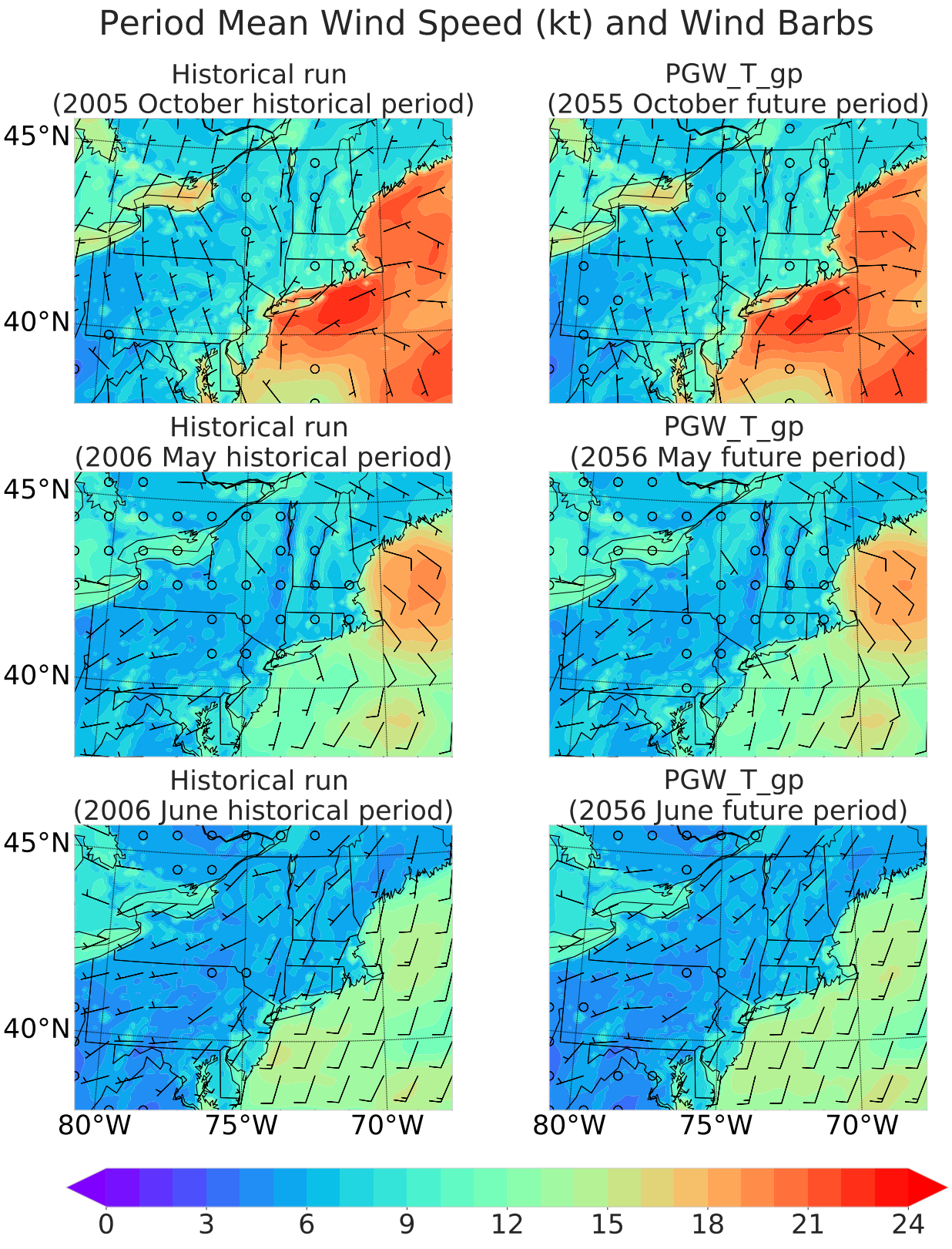

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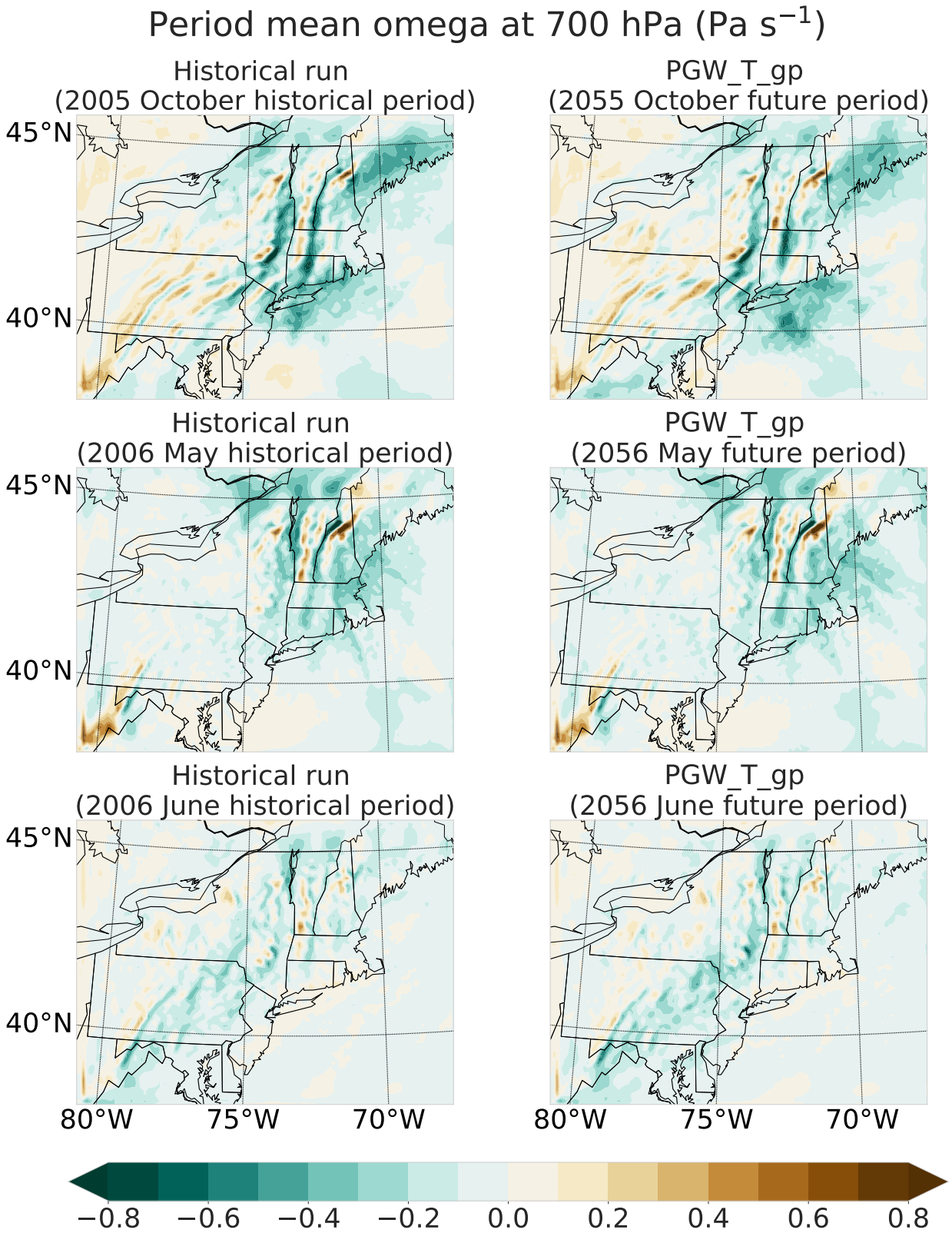

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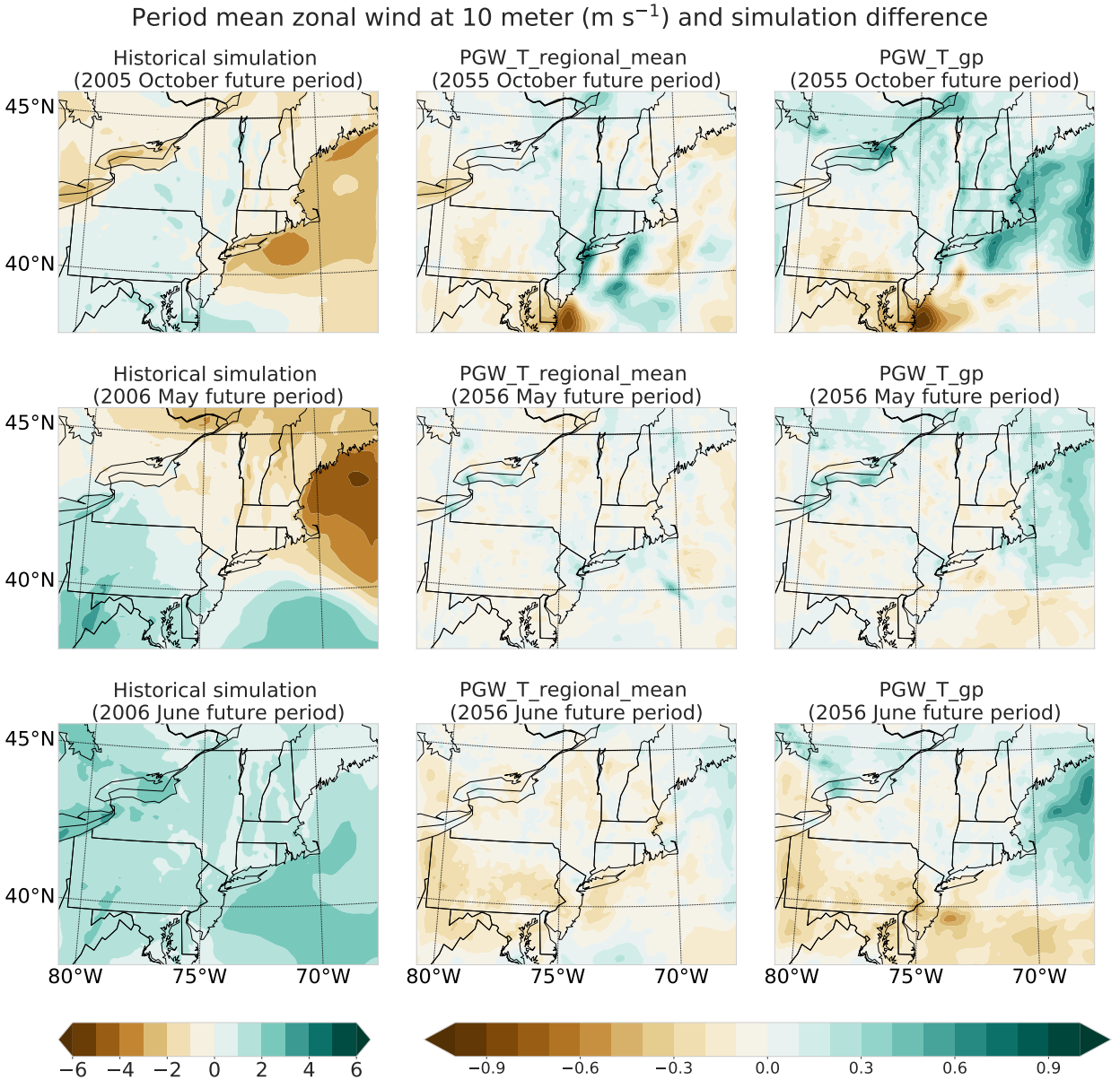

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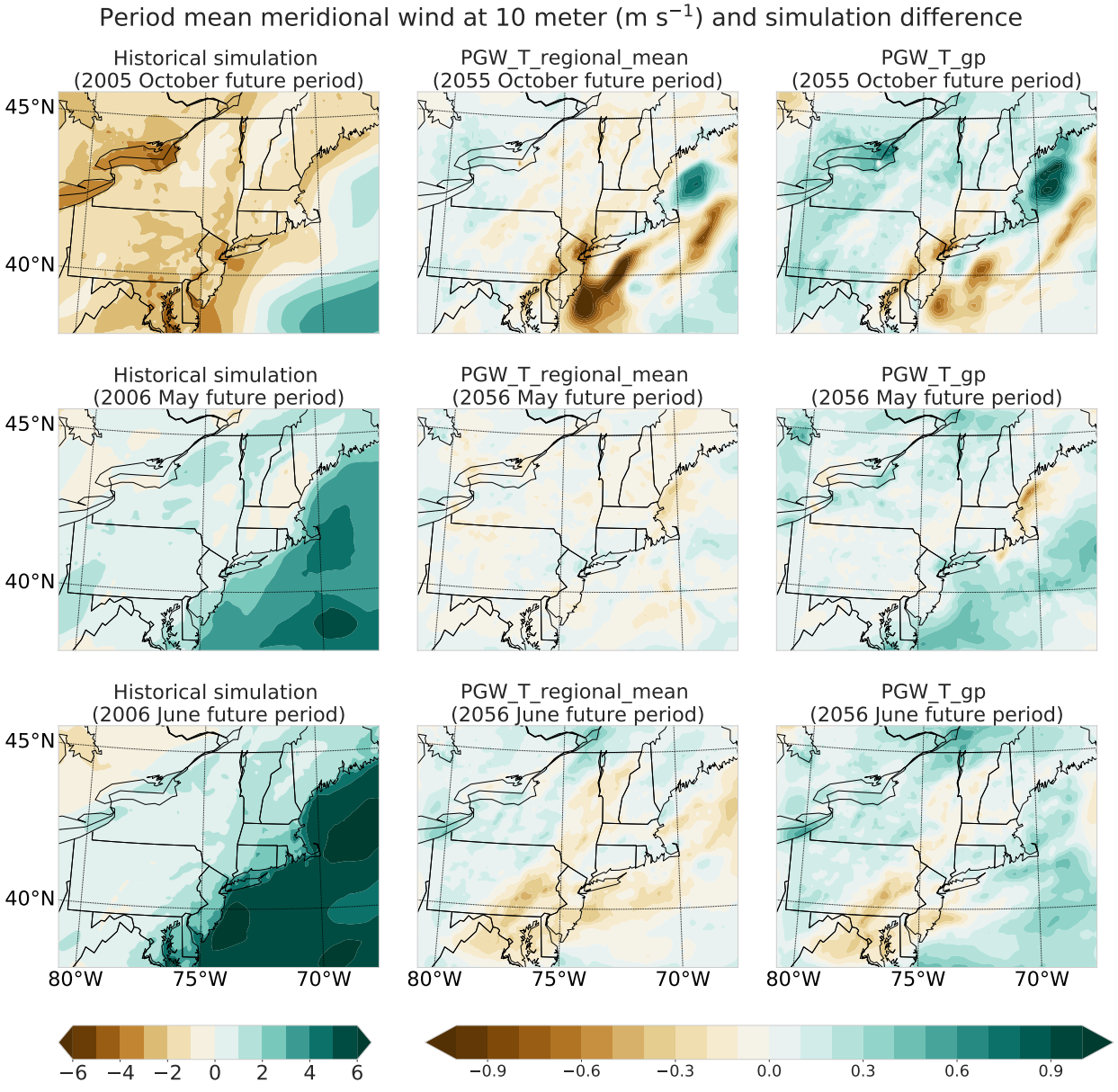

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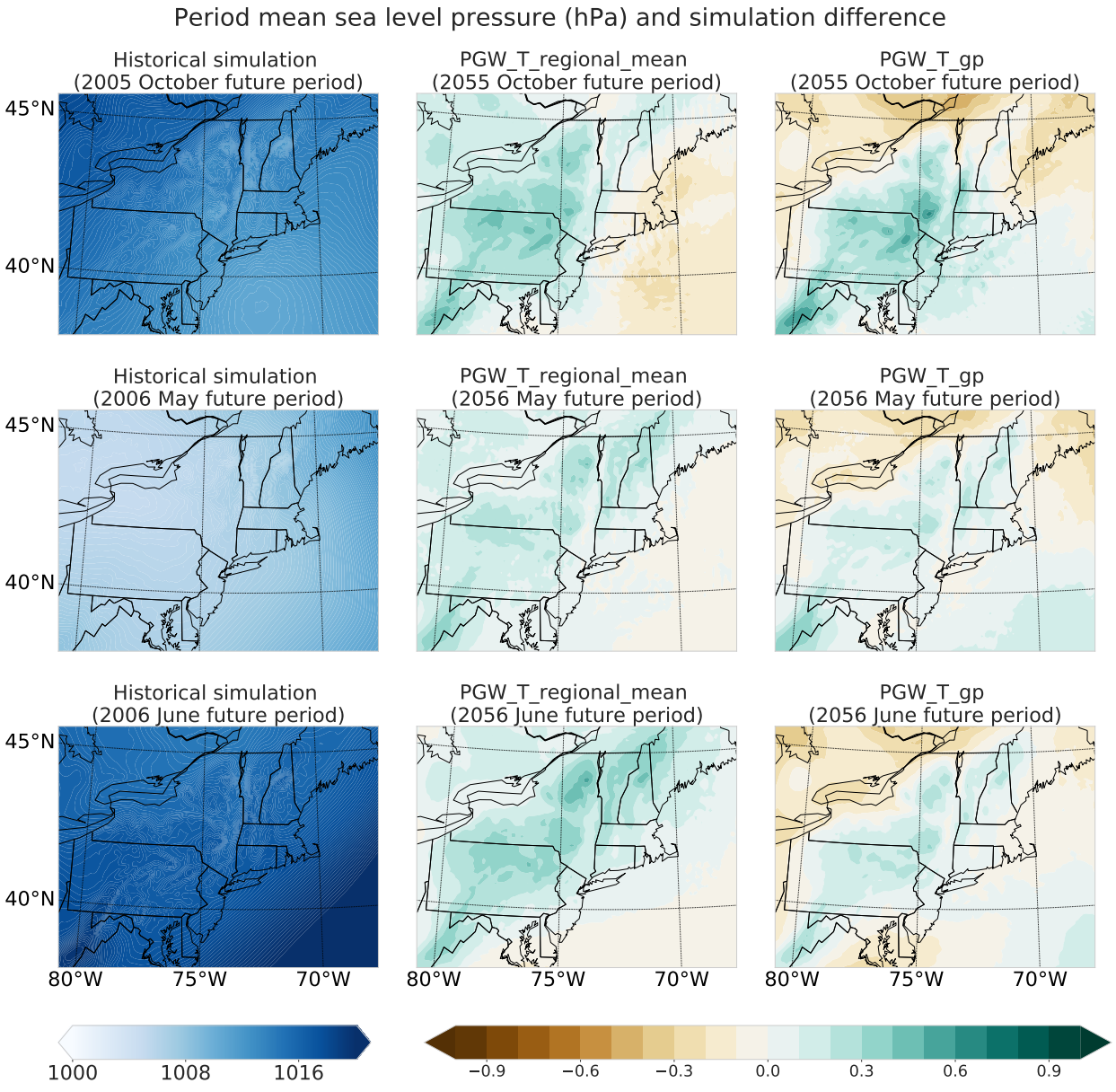
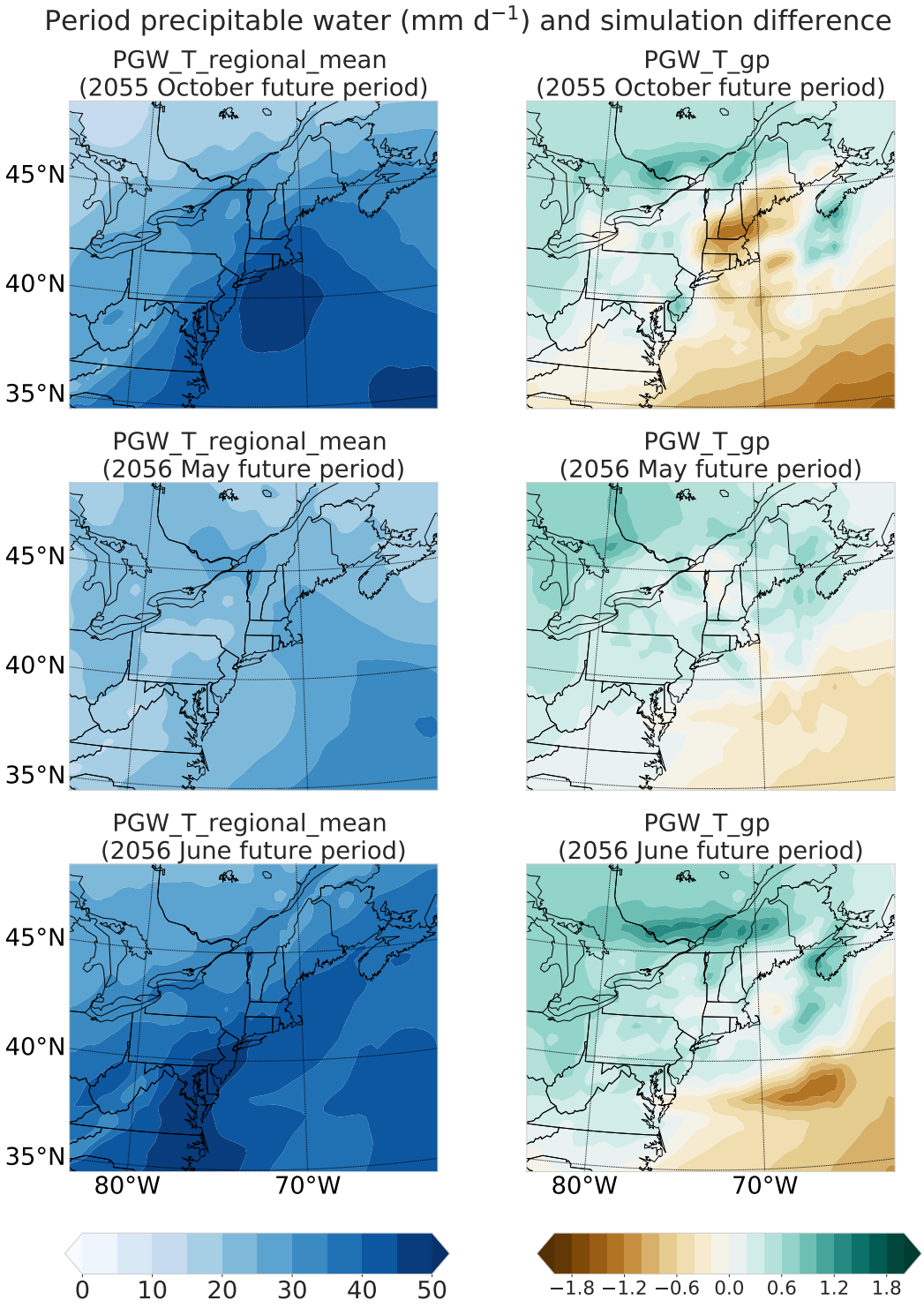


Fig. S13. Historical period mean sea level pressure and simulation delta (hPa) over the inner domain from PGW simulations during flood periods.



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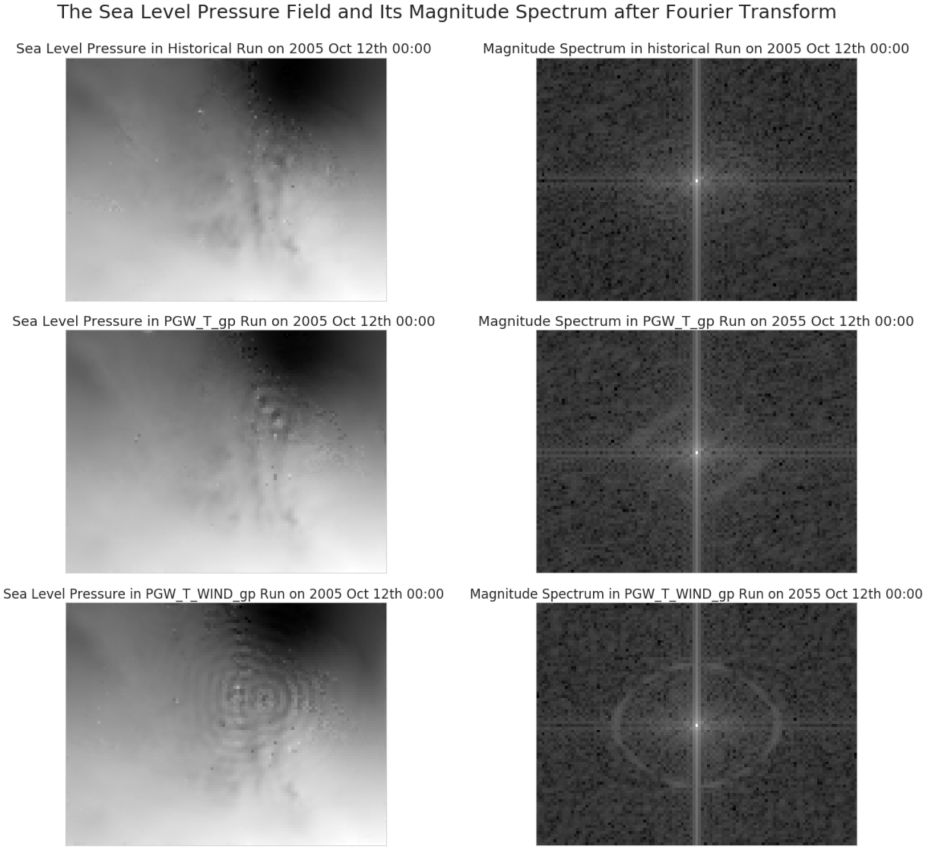

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