

- precipitation.
- by water resource managers.



Future Work

- 1. Finish validating current recharge rates
- Contiguous U.S.
- 3. Evaluate predicted recharge rates and long-term trends in recharge that could be useful for water resource managers

Estimating groundwater recharge rates over the Contiguous **United States** Kendra Devereux¹ and Chris Russoniello² ¹The College of Wooster Department of Earth Sciences, Wooster, OH, ²West Virginia University Department of Geology and Geography, Morgantown, WV Effective precipitation (P) was calculated as precipitation (P_0) plus groundwater-sourced irrigation (Ir) for agriculture and golf courses: $P = P_0 + Ir$ Effective Mean Annual Precipitation (m/yr) (m/yr) ≤ 0.22 • Precipitation - 800m CONUS grids from the PRISM Climate Group at Oregon State University ≤ 0.293 ≤ 0.366 ≤ 0.439 ≤ 0.537 ≤ 0.635 ≤ 0.757 ≤ 0.854 ≤ 0.976 ≤ 1.1 ≤ 1.17 ≤ 1.24 Quick Flow (QF) Quick flow was calculated using the regression equation developed by • Temperature - the PRISM Climate Group at Oregon State University Reitz et al., 2017: $R_{ m g} = C_1 { m g}igg(rac{P}{\overline{P}} igg)^{a_{ m g}}igg(rac{K}{\overline{\overline{K}}} igg)^{b_{ m g}} + C_2 { m g}$ Datasets: Precipitation - effective precipitation • Saturated hydraulic conductivity - STATSGO database compiled by the U.S. Department of Agriculture • Surficial geology – USGS Where C_1g , a_1 , b_q , and C_2g appear, fitting coefficients unique for each of 16 surficial geology types are used: Surficial Geology of the Contiguous U.S.

2. Predict future recharge rates using CMIP 5 climate projects of temperature and precipitation across the



0 250 500 1,00 Water Lacustrine fine-grained Glacial till thin Alluvial coastal Eolian Sedimentary rocks Colluvium Residual bedrock Igneous and metamorphic Glacial till sand Carbonates

References

Reitz, M., Sanford, W. E., Senay, G. B., Cazenas, J., 2017, Annual estimates of recharge, quick-flow, runoff, and evapotranspiration for the Contiguous U.S. using empirical regression equations, JAWRA, *53(4)*, 961-983.









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