### JOURNAL PUBLICATION CITATION:

### Carter, Alice M, Michael J. Vlah, Emily S. Bernhardt. 2021. The energetics of New Hope Creek fifty years after the first attempt to measure river metabolism. *Ecological Monographs.*

### Data S5

### Analyze and plot data for manuscript

### Authors:

Alice M Carter

Duke University

Durham, NC 27708

alice.carter@duke.edu

Michael J. Vlah

Duke University

Durham, NC 27708  
vlahm13@gmail.com

### File list

analyze\_data:

bootstrap\_metabolism\_comparison\_streamMetabolizer.R

calculate\_Q10\_SM\_plot.R

calculate\_hall\_Q.R

nhc\_temp\_Q\_k\_depth\_comparison.R

nhc\_temp\_Q\_comparison.R

summarize\_physical\_met\_drivers.R

munge\_nutrient\_concentrations.R

plot\_data:  
plot\_met\_with\_Q.R

plot\_direct\_calc\_met\_results.R

plot\_met\_summary\_dat.R

multi\_panel\_watershed\_change\_fig.R

**Description**

These files require that the steps in DataS2, DataS3, and DataS4 have been executed and they reference the NHCsite\_metadata.csv file. Comparisons to historical data rely on data from Hall 1970 and 1972, which has been compiled and included in DataS1 for user convenience.

bootstrap\_metabolism\_comparison\_streamMetabolizer.R – Calculates bootstrapped 95% confidence intervals for seasonally weighted data from this study and from Hall 1972. Plots seasonal distribution of sample dates, seasonal mean rates, and bootstrapped means.

calculate\_Q10\_SM\_plot.R – Calculates relationships between metabolic rates and drivers in the modern dataset. Plots figures 3, 4 and generates statistics for results section.

calculate\_hall\_Q.R – uses digitized data from figures in Hall 1970 to reconstruct daily discharge and temperature from 1969.

nhc\_temp\_Q\_k\_depth\_comparison.R – Compares distributions of measured depth, discharge and estimated K600 from this study and from Hall 1970, 1972. Plots supplementary figure 2.

nhc\_temp\_Q\_comparison.R – Compares daily records of temperature and discharge at NHC from 1969 and 2019. Generates figure 6.

summarize\_physical\_met\_drivers.R – Compiles and summarizes drivers of metabolic patterns in the modern dataset.

munge\_nutrient\_concentrations.R - Compares nutrients from Hall 1970, 1972 to today’s measured concentrations. Calculates regressions for DOC and nitrate as drivers of metabolism.

plot\_met\_with\_Q.R – Plots daily metabolism with discharge for all site years in the modern dataset. Generates figure 2

plot\_direct\_calc\_met\_results.R – plots monthly averaged metabolism data for the modern and Hall datasets as well as comparisons of metabolic patterns across sites and years. Generates figure 8.

plot\_met\_summary\_dat.R - Compares geomorphic driver variables with metabolism estimates. Calculates statistics for manuscript and plots regressions.

multi\_panel\_watershed\_change\_fig.R – plots data for watershed and climate change. Generates figure 5.