**Little Miami River N – IWI Comparisons**

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There are 5 types of N metrics (total-N, total ammonium, total nitrate/nitrite, dissolved inorganic-N, and fraction of total-N as dissolved inorganic-N) and 2 types of summary (annual mean and annual range)

# Method

Raw data comes from the file ‘USEPA-OhEPA\_EFWSChemistryData\_ForZacharyJohnson\_12082016.xlsx’ sent from Chris Nietch to Zach Johnson. Data begins on March 14, 2005 and ends on December 29, 2015 and was collected by the US EPA (\*\*NEEDS CHRIS’ INPUT REGARDING COLLECTION AND ANALYSIS METHODS\*\*).

Data were organized by site (‘id’ attribute) and analysis type (i.e., total-N, total ammonium, etc.) and multiple site-analysis measurements within a day were averaged. Total-N values greater than dissolved inorganic-N values were removed from the analysis. Data were then organized by month between 2005-2015 and monthly average values were calculated for each site-analysis pairing, following Jiajia’s example for the Calapooia (See her Eq. 1). However, the number of years of data varied for each Little Miami site. Monthly averages for site-analysis pairings with less than 3 observations for a given month were left blank. Annual averages were calculated by averaging the 12 monthly average values for each site-analysis pairing. Annual averages for site-analysis pairings with less than 10 monthly average values were left blank. Sites with data for less than 10 separate months were removed from further analysis. This left 44 sites with IWI/ICI values for further analysis.

Annual range values were calculated using the monthly summaries, following Jiajia’s example for the Calapooia (See her Eq. 2). Annual mean values were also calculated in a similar fashion:

Annual range and mean values were then log10 transformed, following Jiajia’s example for the Calapooia. The annual range and mean values were then plotted against IWI/ICI values and their 6 components. Pearson correlation coefficient (r) and linear regression R2 and p values were calculated for each site-IWI/ICI metric pairing.

# Results

All significant correlations between the annual summaries and IWI/ICI metrics were negative. Overall, the annual mean values correlated slightly stronger with the IWI/ICI metrics than the annual range values (see ‘USEPA\_LtlMiamiN\_IWI\_ICI.pdf’). The annual mean values were also more strongly correlated with total-N and total ammonium than the annual range values. However, the annual range values were more strongly correlated with total nitrate/nitrite and dissolved inorganic-N than the annual mean values. Interestingly, watershed metrics (i.e., IWI+6 components) correlated more strongly with total-N, nitrate/nitrite, and dissolved inorganic-N, whereas catchment metrics (i.e., ICI+6 components) correlated more strongly with ammonium. This may reflect local sources of ammonium and ammonium cycling (\*\*CHRIS AND JANA’S INPUT?\*\*).

# Example graphs

See ‘USEPA\_LtlMiamiN\_IWI\_ICI.pdf’ for more.

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