Water Quality in Marathon County

1. Generate Github repo w/following files
   1. Marathon\_WQ 2009-2020 (pre-cleaned)
   2. HUC10 watershed data (either pre-clipped or clip in python)
   3. Municipal boundary for Marthon County
   4. Farmland preservation zoning (FPP) Data
   5. PRISM Data
   6. Crop Data Layer
   7. README file

Part 1 Graphing WQ Data

1. Marathon\_WQ data
   1. Extract data for just Phosphorus readings
   2. Bin phosphorus readings every 2 years
      1. 2009-2010
      2. 2011-2012
      3. 2013-2014
      4. 2015-2016
      5. 2017-2018
      6. 2019-2020
   3. Generate geographic point data using cords?
2. HUC10 Watershed Data
   1. Clip HUC10 watershed shape file to municipal boundaries
3. FPP Data
   1. Calculate the intersection of FPP types with HUC10 watersheds
      1. No need to delineate between zone, AEA or both
      2. Identify the % of land HUC10 watersheds under nutrient management
4. Append FPP data/% of land under nutrient management to zonal stats table
   1. Spatial Join & group by huc10
5. Create a dual yaxis linear graph
   1. Yaxis 1 = mean WQ reading in watershed
   2. Yaxis 2 = %of land under nutrient management
   3. Xaxis = binned time periods
      1. Should have data points for the following
         1. 2010
         2. 2012
         3. 2014
         4. 2016
         5. 2018
         6. 2020
   4. Replicate this graph for each HUC10
      1. 21 graphs

Part II Crop Data Layer Info for each watershed

1. Locate Crop Data Layer for Marathon County Wisconsin
2. Create a dictionary with pixel identification
3. Clip by watershed inside marathon
4. Create Summary stats of top 10 crops in marathon county
5. Intersect crop data layer with Farm Land Preservation Zone
   1. Show top 10 crops under NMP

Part III Zonal Stats for PRISM data

1. Load PRISM data for Marathon County
2. Calculate Zonal Stats for Marathon County
3. Create an animated graph for PRISM data with time as the variable
   1. Should be a slider, so you can demonstrate mean precipitation overtime
4. Create a list of rainfall spike events in marathon county/correlate with P reading spikes?

Spatial join, group by huc10 average instead of zonal stats

Readin daily rainfall data, PRISM

CDL Identify cropped area in watersheds too