# OPIHI Data Analysis Requirements

## Water Quality Data Analysis Requirements

- Discuss findings with class
- Compare findings to predictions
- Make hypotheses about findings
- Share any interesting findings at final Teacher PD blackboard follow-up

## Biological Data Analysis Requirements

- Must use data for analysis in some form
  - Must look at abundance (relative %) in some way
  - Must look at richness (#) in some way
- MUST graph overall abundance
  - 2 graphs to share: algae and invert
- OPTIONAL: look at difference in richness/abundance between
  - quadrats verses transect
    (looking at how additional data points affect conclusions)
  - low, mid, high intertidal (looking for zonation)

## Data Entry

- **Teacher meta data:** http://tinyurl.com/OPIHITeacherMetadata2016
  - Anyone with this link can edit and view.
- **Student data**: *We have invited you to your class' data sheet so that only you have access and can edit. Please let us know if you cannot access!*
  - *If you want other teachers' data sets, please ask us and we can share you a copy that is anonymous and that your class can edit/graph.*
  - Tab 1. sample QUADRAT
  - Tab 2. sample TRANSECT
  - Enter your data on your number/name for quadrat/transect (#'d in order of field trip date; see meta data google doc)
- **Add in algae/invert** (or verts!) names as appropriate (in other:_____)
- You may delete rows for algae/inverts to make simpler for your students
- You may enable "freeze" rows and columns to help your students easily enter
  - I have done this for you, but you may wish to alter
  - Use View → freeze
- **Note that there is a number line in column A**
  - ***Do not alter this line.***
  - It is just a count, but it will allow you/us to re-order the spreadsheet if things get messed up somehow. To reorder by number, select all the data by clicking in the far blank left had cell, which is the corner between the Column A and the Row 1) and sort by column A.
- **Values auto sum**
  - **For each quadrat, the sum of the organism points is calculated in row 121**
    - For column E, the formula for this is = sum(E2:E120)

        - This formula is copied along each column for row 121, so for column E row 121, the formula is sum(F2:F120)
        - If you add in extra rows or subtract rows, check to make sure the formula adjusts
    - **The total number of points with an organism are summed in D121**
        - The formula is =SUM(E121:ACL121)
        - This value is used as the overall total
    - **The relative abundance is calculated as the proportion of each organism divided by the overall total**
        - For *Acanthophora spicifera* in C2, the formula is =D2/$D$121
        - This formula is copied for each organism, so for *Ahnfeltiopsis* in C3, the formula is C2/$D$121
        - Note that the $ keep D121 being used for each organism, which is what we want since that is the sum total of all organism points
        - The values are a proportion.
        - The values are displayed as percent (format→ number→ percent)
    - **The total relative abundance should add to 1 (displayed as 100%)**
        - The formula for this is =SUM(C2:C120)
        - This is shown in C121 and can be used as a check of proportions.
- **Note that sand/bare rock is at end**
    - (not calc into your % organism cover, but still important!)
    - **We added a line to sum all points in each quadrat (should sum to 25 for the quadrats; the number for transect point intercept will vary).**
        - The formula for this line is: =E121+E122+E123
        - = sum organism (row 121) + bare rock (row 122) + sand (row 123)

**Make 2 graphs: one for algae and one for inverts (and verts if you find them!)**

- **Sort Data**
    - Select algae, e.g. rows #2-#71 (or inverts, rows #72-#120)
    - Data —> sort range —> column (%) —> Z-A
- **Select species** (column B) and % (column C) for all algae that are > 0%
- **Click graph icon** —> column graph
- **Color algae bars green** (color blue for inverts/verts)
- **Set Y-axis scale from 0-50%**
    - Click on the y-axis and enter 0 for minimum and .5 for max (remember the abundance values are displayed in % but really calculated as a propotion)
- **Clear legend**
- **Title**: Algae (or Invert/Verts) abundance (%) + Location + Date + Teacher
- **Save graph**
    - —> click chart —> drop down —> save image —> name same as title
- **Save graph image to google chart folder** for sharing with other teachers
    - **http://tinyurl.com/OahuOPIHIgraphs**
        - Anyone with this link should be able to view and edit.
- **Repeat for inverts (combine in any verts)!**
- **Compare your graphs** to others' in the google folder to compare across researchers, sites, and islands