

Tableau Skills Part 3: Biomass as a calculated field

Calculating average biomass

Situation:

- We want to find the average biomass of a transect at a site. In the CRM_Fish data set, there are multiple transects at different depths for each site, so we have to clearly specify what to average over in our calculated field.

Solution:

- Divide the total biomass in each site-year at each depth by the total number of transects
- Requires that you first create a calculated field for the number of transects
- How you create the calculated field for number of transects depends on your data and how you recorded transects
 - In the simplest case, you have the same number of transects at each sampling event. Then you can set the number of transects to be a constant number within the average biomass calculated field. See example on the next slide.

Average biomass - constant number of transects

Average biomass

`SUM([Biomass g])/5`

The calculation is valid.

Apply OK

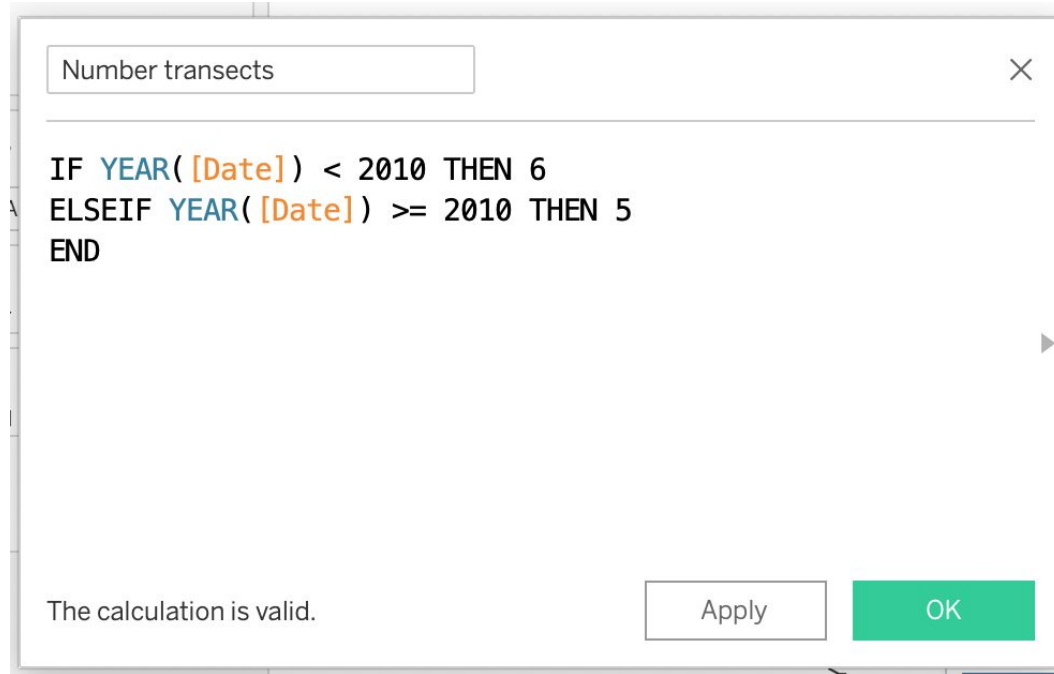
Detailed description: This is a screenshot of a software dialog box. At the top, there is a title bar with the text 'Average biomass' and a close button (X) on the right. Below the title bar is a large text area containing the formula 'SUM([Biomass g])/5'. The formula is color-coded: 'SUM' is blue, '[Biomass g]' is orange, and '/5' is black. At the bottom left of the dialog, the text 'The calculation is valid.' is displayed. At the bottom right, there are two buttons: 'Apply' and 'OK'. The 'OK' button is highlighted in green.

If you have 5 transects at each depth and site in each year, you can use that directly in your average biomass calculation.

What if the number of transects varies?

If the number of transects varies, you have to take an extra step and first create a calculated field for the number of transects. How you create the calculated field for the number of transects depends on your data and how you recorded transects.

- If the number of transects changed at a certain time, you can set that in your calculated field for number of transects. Here is an example for a data set where there were 6 transects done before 2010 and 5 transects after.



Number transects

```
IF YEAR( [Date] ) < 2010 THEN 6  
ELSEIF YEAR( [Date] ) >= 2010 THEN 5  
END
```


The calculation is valid.

Apply OK

What if the number of transects varies?

If the number of transects varies by year and site and depth, first create a calculated field for each year-site-depth combination (“Reef_year_depth”), then use the COUNTD function within Tableau to count the number of transects for each year-site-depth combination.

The first step to accomplish this, is to create a new calculated field that identifies the unique combination of sites, years, and depths.



The screenshot shows the 'Create Calculated Field' dialog box in Tableau. The title bar at the top reads 'Reef_year_depth'. The main text area contains the formula: `STR([Year])+STR([Site])+STR([Depth m])`. At the bottom left, it says 'The calculation is valid.' and '3 Dependencies'. On the bottom right, there are two buttons: 'Apply' and 'OK'.

Reef_year_depth

`STR([Year])+STR([Site])+STR([Depth m])`

The calculation is valid. 3 Dependencies ▼

Apply OK

What if the number of transects varies?

Next, you want to count the number of transects for each Reef_year_depth

A screenshot of a software dialog box titled "Count transects". The dialog box has a title bar with a close button (X) in the top right corner. Below the title bar is a text input field containing the text "Count transects". Below the input field is a large text area containing the following code: `{FIXED [Reef_year_depth] : COUNTD([Transect]) }`. The code is color-coded: `{FIXED` is blue, `[Reef_year_depth]` is orange, `:` is blue, `COUNTD` is blue, `([Transect])` is orange, and `}` is blue. Below the text area is a small right-pointing arrow. At the bottom of the dialog box, there is a status bar that says "The calculation is valid." and two buttons: "Apply" and "OK". The "OK" button is green, and the "Apply" button is white with a grey border.

Count transects

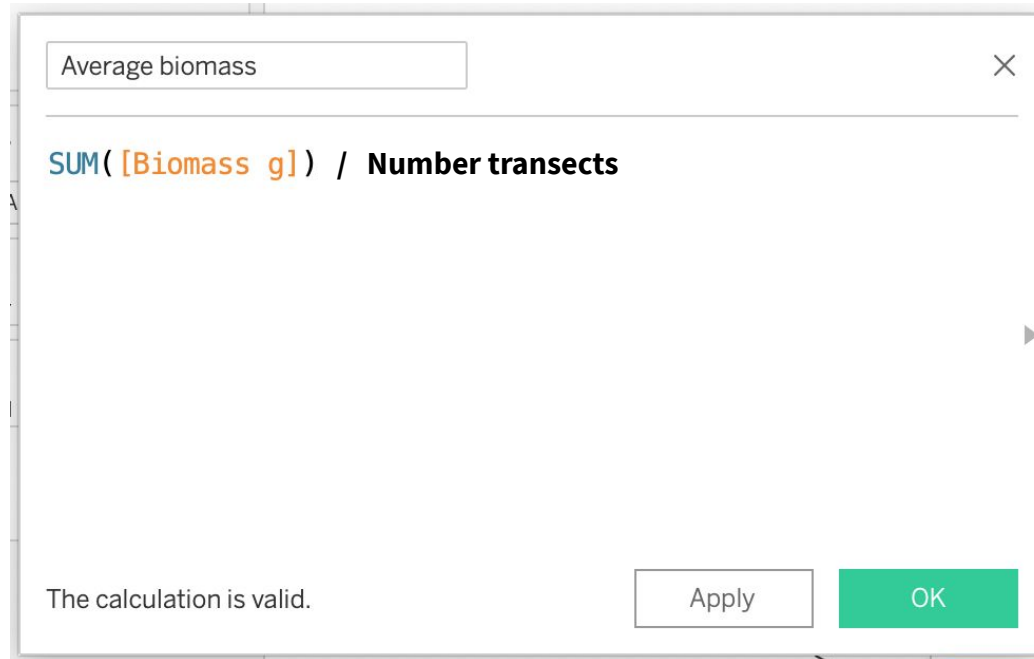
`{FIXED [Reef_year_depth] : COUNTD([Transect]) }`

The calculation is valid.

Apply OK

What if the number of transects varies?

Finally, you divide the total biomass by the number of transects



Average biomass

`SUM([Biomass g]) / Number transects`

The calculation is valid.

Apply OK

This is a screenshot of a software dialog box. At the top, there is a text input field containing the label 'Average biomass'. Below this field is a horizontal line. Under the line, the formula 'SUM([Biomass g]) / Number transects' is displayed in a monospaced font. At the bottom left of the dialog, the text 'The calculation is valid.' is shown. At the bottom right, there are two buttons: 'Apply' and 'OK'. The 'OK' button is highlighted in green.

Final notes

- By constructing your calculated field carefully - and sometimes creating a series of calculated fields! - you can average samples to show what you want, whether that's average biomass per transect at each depth at each site in each year, average biomass at a site across years, or average biomass each year across sites. If you want biomass by area, you could divide by area as well.
- Averaging correctly can also be an issue if you have multiple size classes. Sometimes Tableau divides by the number of size classes, if they are represented in your data set as rows, rather than the number of transects.
- Always check your calculated field carefully to make sure you are averaging over what you expect!