Do the areas with insects contain more toads?

By: Sam Quick, Owen Goettner, and Jared Battat

PURPOSE

- Goal: to find correlations between population of toads and population of insects
- Since toads feed on aerial insects, do toads gravitate towards areas with more of these insects?

HYPOTHESIS

The areas that contain more aerial insects will contain more toads. There will be more insects and toads near water, as opposed to the dry areas with little vegetation.

NULL HYPOTHESIS

There is no correlation between the population of aerial insects and toads. Dry versus wet areas will not have an effect on toad and insect populations.

MATERIALS

- Sticky Insect Traps
- Metal Stakes
- Bucket
- Observation Tray
- Pencil
- Notebook

METHODS

1. Collect materials.
2. Go to Van Norden Meadow.
3. Connect the sticky insect traps with the metal stakes.
4. Chose sticky insect trap locations based on areas with toads and water, areas with water and no toads, and areas with no toads and no water.
5. Place the sticky insect traps in the locations previously determined.
6. Note the time that the traps are put out.
7. Attempt to catch toads at each location for twenty minutes.
8. Record the data of the amount of toads collected.
9. After 1 hour of the sticky insect traps being out, count the number of insects.
10. Record this data.
11. Repeat steps 3-10 at every location two more times for sufficient data.

AREA DESCRIPTION

Area 1

•Shallow pond, rocky bank, surrounded with vegetation on one side

Area 2

•Deep stream, high vertical bank surrounded with high vegetation (grasses)

Area 3

•Shallow stream, rocky bank, surrounded with vegetation

Area 4

•Pond surrounded with rocks and vegetation, by a drainage pipe

Area 5

•Deep stream, high bank with vegetation

•Shallow pond, rocky bank, surrounded with high grasses

Area 7

•Away from stream, dry land, some vegetation

Area 8

•Away from stream, dry land, some vegetation

Area 9

•Away from stream, dry land, some vegetation

Area 10

•Shallow pond, rocky bank, some vegetation, under bridge

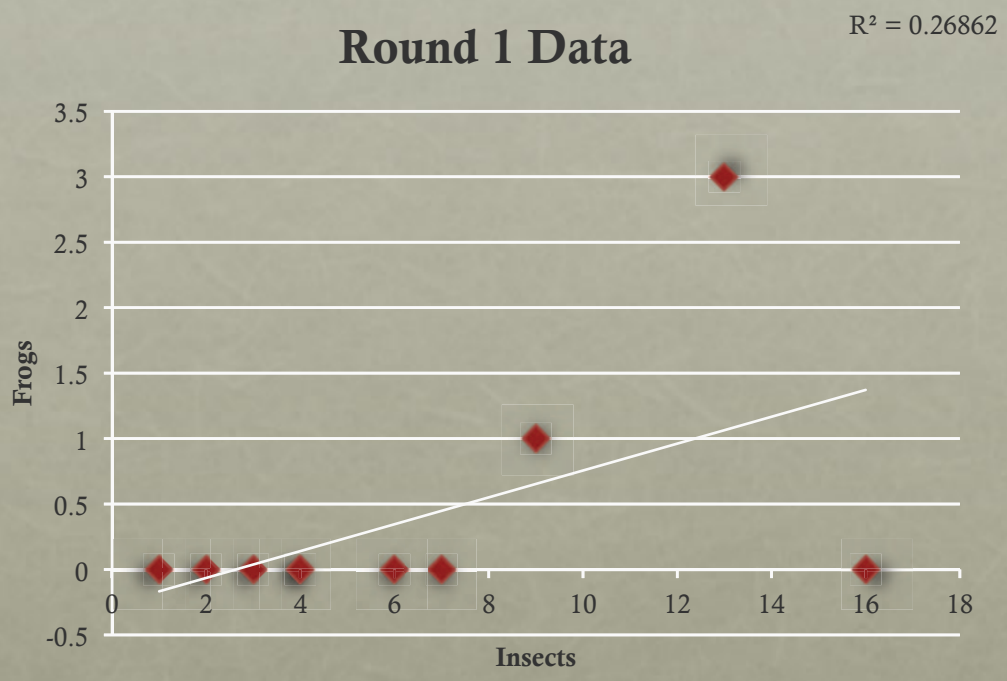
PICTURES OF AREAS

Water with Toads

Water without Toads

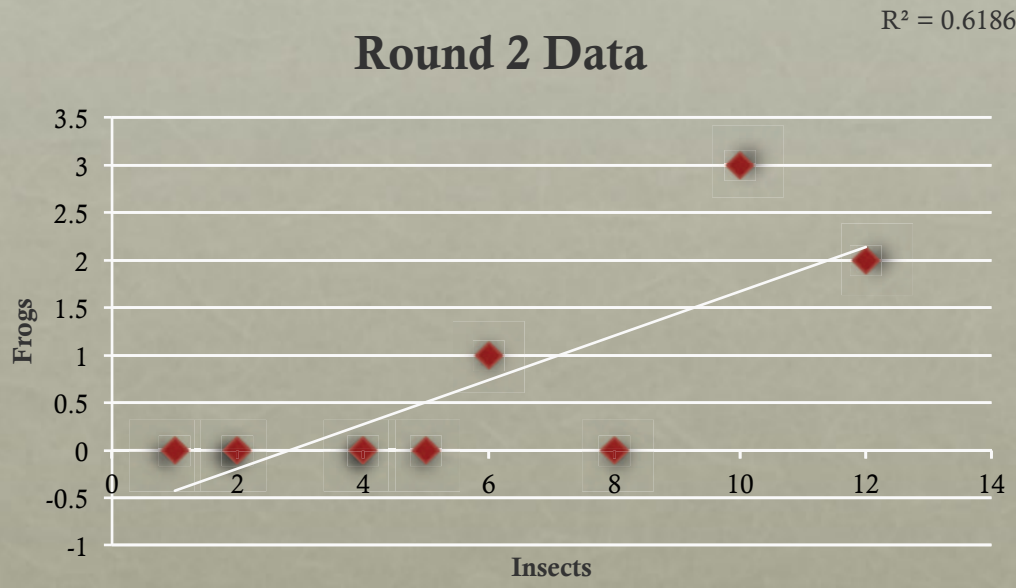
No Water No Toads

ROUND 1 DATA



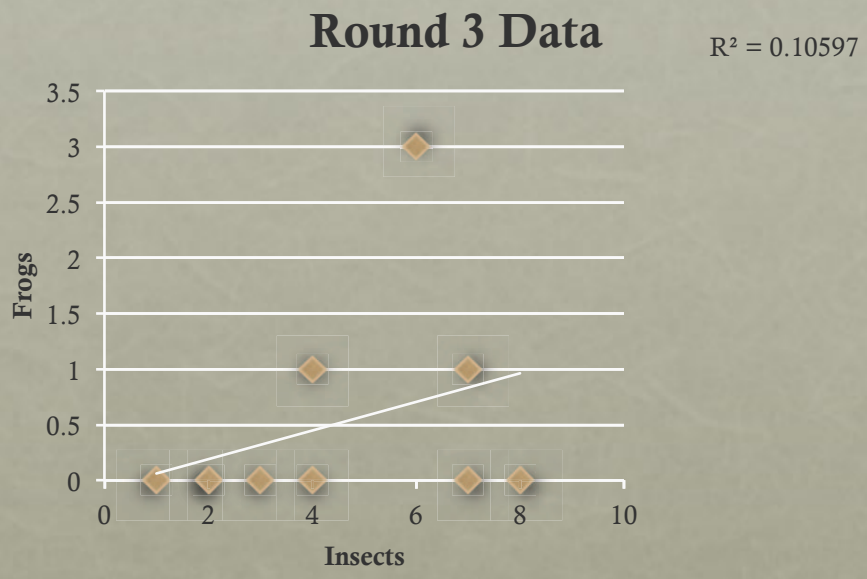
- Graph shows an upward slope
- Outlier 2 Explained
- Fairly low R^2
- Measurements taken all before noon
- Insects are cold blooded → not out this early

ROUND 2 DATA



- High upward slope
- Better R^2 number
- Measurements taken around early afternoon
- Temperature at its highest
- Frogs/Insects more active
- Outliers 2 explained

ROUND 3 DATA



- Gradual upward slope
- Very low R^2 number
- Earliest measurements of all rounds
- Coldest temperature of all rounds
- Frogs/Insects less active
- Outliers 6 and 7 explained

DISCUSSION/ CONCLUSION

- Conclusion 1: Round 2 affirms hypothesis
  - More accurate correlation between toads and insects and high R^2 number

  But…
  - Warmer temperatures
  - Later in the day
- Conclusion 2: Rounds 1 and 3 show that the null hypothesis is partially correct
  - Little correlation between toads and insects and low R^2 number

  But…
  - Colder Temperatures
  - Earlier in the day

CONCLUSIONS

- Warm temps → more toads present in areas with more aerial insects
- This trend supports the hypothesis
- However, with cold temps → no clear relationship between toads and insect
- This trend does not support the hypothesis

IMPROVEMENTS/ NEXT STEP

- Possible improvements:
  - More Data
  - Consistent air temperatures
  - Better knowledge of toad ecosystems
  - Recording the air temperature
- What's Next?
  - Other factors influencing toad and insect population?
  - How do turbidity, nutrient levels, outside temperature, and water temperature play in?
  - What factors influence where insects live?
  - Could Chytrid fungus affect the toads living in this area?

THANKS FOR LISTENING!

Questions?