

# CAP LTER Data Exploration

## Seasonal Birds



### Objective(s):

Students will analyze patterns of seasonal bird observations.

### Author

Ecology Explorers Education Team

### Time:

15-30 minutes

### Grade Level:

9-12

### Standards:

#### AZ Science Strands:

S1C3, S1C4, S3C1, S4C3, S4C4, S4C5

#### NGSS - Core Ideas:

ESS3.A: Natural resources; LS1.D: Information Processing; LS2.C: Ecosystem dynamics LS4.C: Adaptation

**Practices:** Analyzing and interpreting data; Engaging in argument from evidence; Obtaining, evaluating, and communicating information

#### Crosscutting Concepts:

Patterns; Cause and effect; Scale, proportion and quantity

**ELA:** RST7: Integrate content from diverse formats; WHS2: Write to convey ideas and information

**Math Domains:** Number and Quantity; Measurement and Data; Statistics and Probability

### Background:

The Phoenix urban core is composed of several contiguous cities and is situated within the Sonoran Desert. This area is being studied by scientists as part of the long-term ecological research network (LTER) funded by the National Science Foundation. Our project, the Central Arizona-Phoenix LTER (CAP LTER) is focusing on researching the effects of urbanization on the surrounding desert ecosystem and vice versa. The Phoenix area is growing rapidly with a population with 300,000 people in 1950 and 3 million+ in 2005. The area receives annual precipitation of 180 mm (6 inches) and can experience summer temperatures as high as 48 C (115 F). The rain comes twice a year (winter & summer), which contributes to the high species diversity of the Sonoran Desert as compared to the North American deserts. Urbanization of this area has led to decreased agricultural development (formerly focused to the west, south, and southeast of the urban core) and increased water control via dams, reservoirs, and canals. The data presented here were collected weekly by volunteer birders at the Desert Botanical Garden from the mid-1980s until 2004 and analyzed by CAP LTER Post-doctoral associate [William Cook in 2005](#).

### Advanced Preparation:

Students should have been introduced to basic information about population and community ecology

### Materials:

Seasonal Bird Observation Graphs

Student Worksheets

### Evaluation:

Observation during the activity and participation in discussion

Student responses to reflection questions

### Extensions:

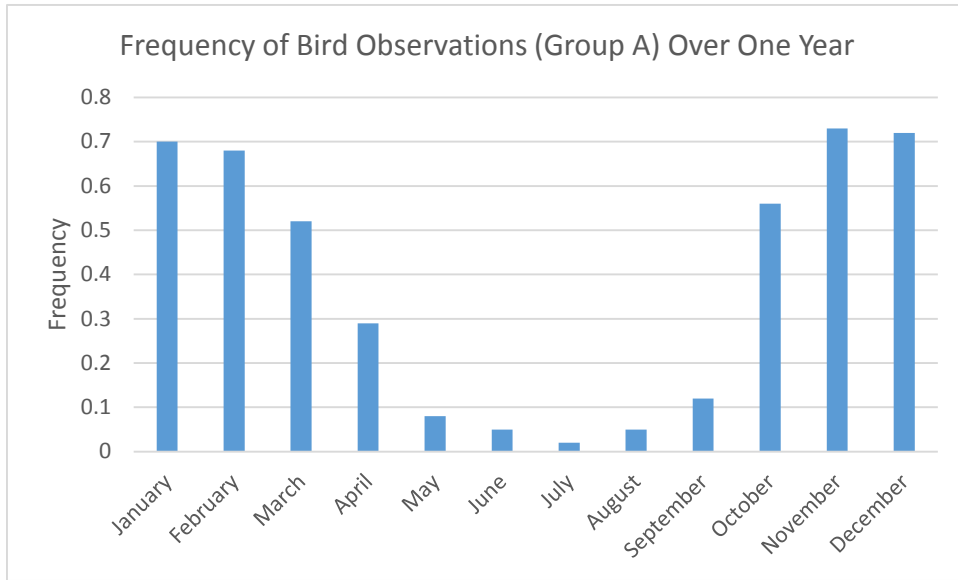
Have students conduct their own observations of birds on campus or at home following the [Ecology Explorers Bird Protocol](#)

# Student Worksheet

## Seasonal Birds (page 1)

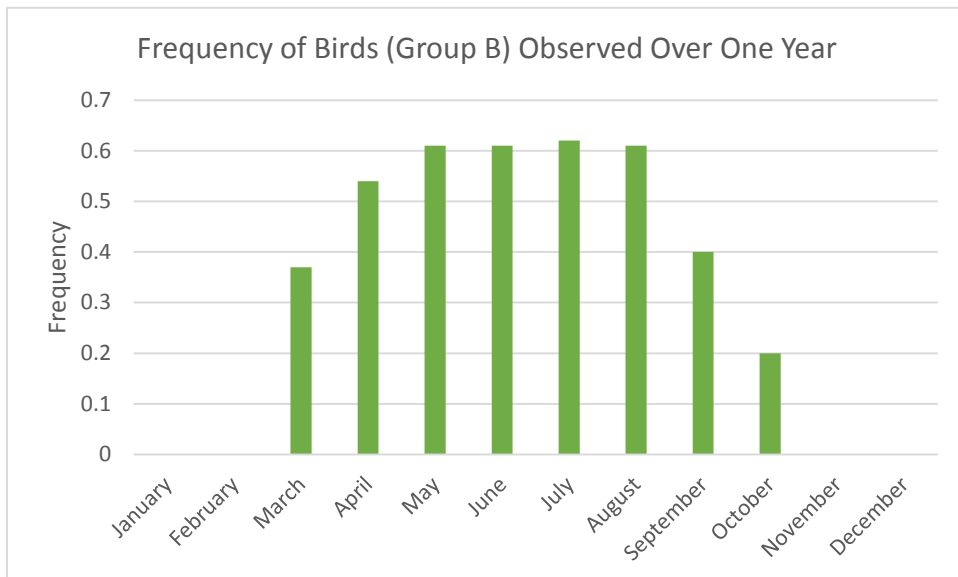


These data were collected on weekly bird walks from 1987-2004 in the same location. The observers recorded the absence or presence of a particular bird species, so a frequency of 0.7 means that the observers had a 70% chance of seeing those bird species on any given bird walk during that month.



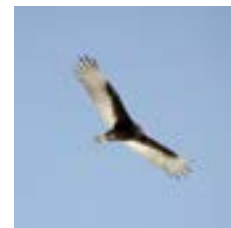
### Group A:

- Cooper's Hawk
- Costa's Hummingbird
- Ruby-crowned Kinglet
- Yellow-rumped Warbler
- White-crowned Sparrow



### Group B:

- White-winged Dove
- Brown-crested Flycatcher
- Ash-throated Flycatcher
- Turkey Vulture
- Black-chinned Hummingbird



# Student Worksheet

## Seasonal Birds (page 2)



The data presented in the graphs are a small subset of the entire data collected. The scientist spent time looking at all the data and noticed some interesting patterns. He decided to group the birds based on these patterns.

1) What does Graph #1 tell you about the abundance of the Group A birds over the year?

2) What does Graph #2 tell you about the abundance of Group B birds over the year?

3) List any environmental components of the desert southwest and/or adaptations that you think might contribute to some birds being “winter residents” or “summer residents”.