

Data Stories

Using Effective Data Visualization and PowerPoints to Tell Your
Research Story

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University of Manitoba Libraries

A Research Story



FOREST CREATURES & ACTIVITY

RECREATIONAL OPPORTUNITIES FOR WOODLAND CREATURES IN CITY PARKS

THE PROJECT

Recreation and recreation activities within the city of Winnipeg is just as important to woodland creatures as it is to humans. And, the time of year makes a big difference on they types of activity in which squirrels, raccoons, deer, mice, and skunks can partake. Our study aims to look at each of these populations, the types of activities in which they participate, and the levels of participation based on the time of year. From this study we hope to develop a strategy to reach out these different populations and encourage them to seek recreational activities in the months where, historically not been as active.

STUDY PARTICIPANTS

Included Animals

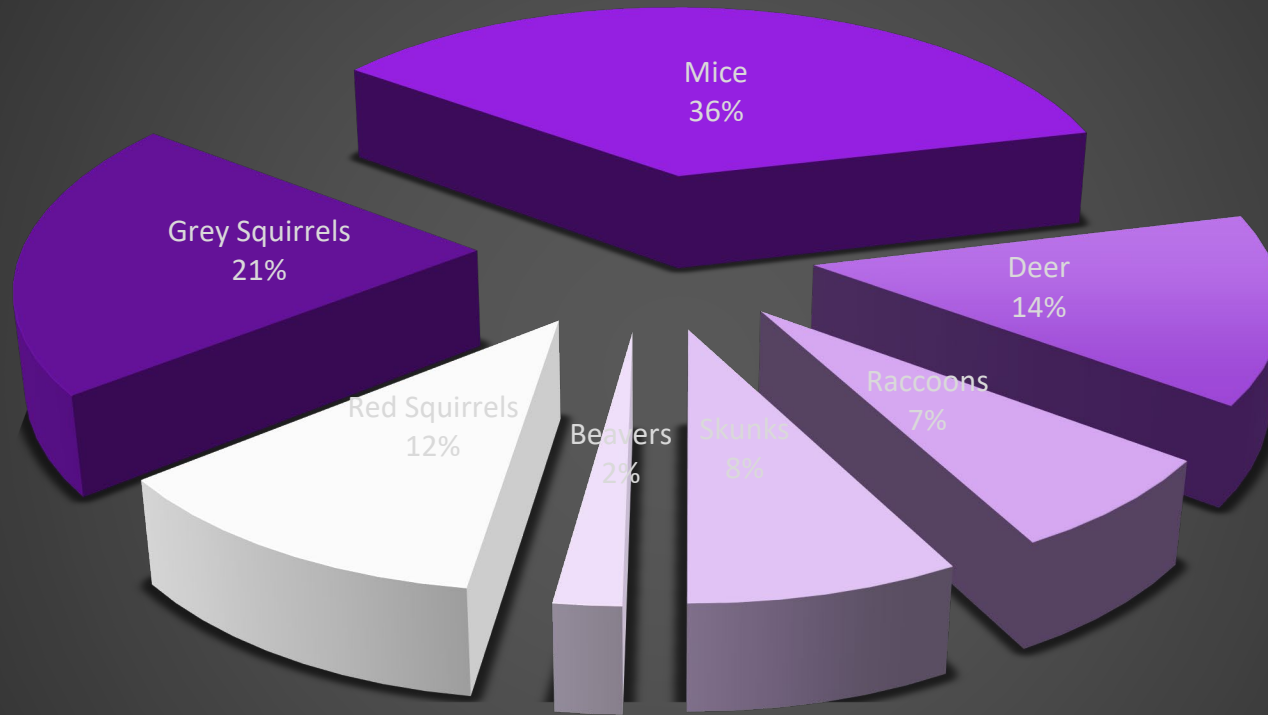
- Red and Grey Squirrels
- Mice, but not rats
- Deer
- Raccoons
- Skunks
- Beavers

Excluded Animals

- Feral cats
- Domesticated dogs and cats

WOODLAND CREATURE POPULATIONS

Percentages of Woodland Creatures



■ Red Squirrels ■ Grey Squirrels ■ Mice ■ Deer ■ Raccoons ■ Skunks ■ Beavers

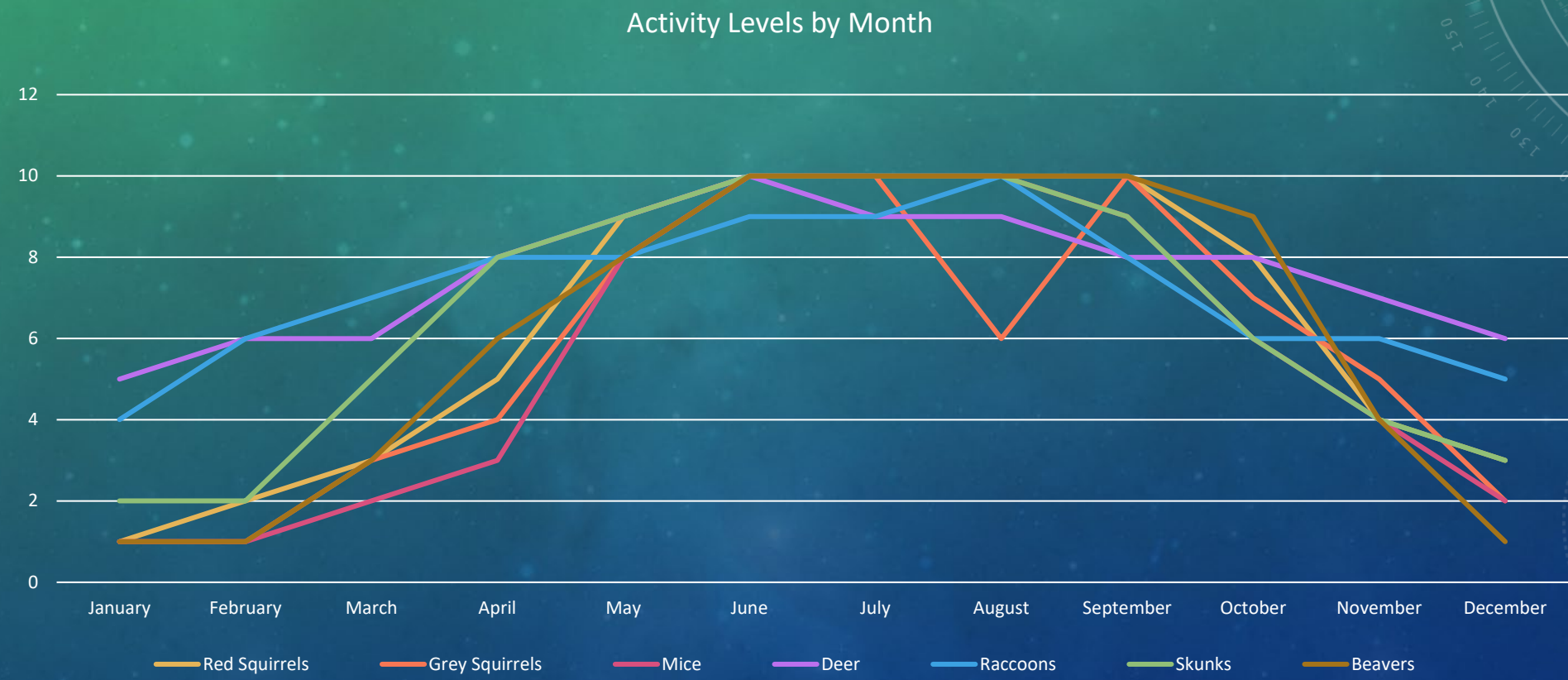
RECREATIONAL ACTIVITIES

- Chilling – this is where woodland creatures just stand around, and like, mind their own business
- Chasing – primarily a squirrel activity, can be either territorial behaviour or having fun
- Running or Leaping – not to be confused with being chased by another species

MOST POPULAR LOCATIONS

Quadrant	Name	Address	Popularity
South	Assiniboine Forest	950 Shaftesbury Blvd.	27
South	Assiniboine Park	6 Locomotive Dr.	20
East	Buhler Recreation Park	135 Murdock Rd.	3
South	Crescent Drive Park *	781 Crescent Dr.	10
North	John Blumberg Park	4540 Portage Ave. Headingley, MB	6
East	Kilcona Park *	1229 Springfield Rd.	8
North	Kildonan Park *	2015 Main St.	15
South	King's Park *	198 King's Drive	3
South	La Barriere Park *	4403 Waverley St. (south of the Perimeter Hwy.)	14
North	Little Mountain Park *	64093 Klimpke Rd. RM of Rosser	10
East	Maple Grove Park	100 Frobisher Road	9
East	St. Vital Park *	190 River Road	6

PARK USE BY MONTH



SQUIRRELS

- Obligate hibernators are animals that spontaneously, and annually, enter hibernation regardless of ambient temperature and access to food. Obligate hibernators include many species of ground squirrels, other rodents, mouse lemurs, European hedgehogs and other insectivores, monotremes, and marsupials. These species undergo what has been traditionally called "hibernation": a physiological state wherein the body temperature drops to near ambient temperature, and heart and respiration rates slow drastically. (Hibernation, n.d.)

Hibernation. (n.d.) In *Wikipedia*. Retrieved March 6, 2020
from <https://en.wikipedia.org/wiki/Hibernation>

Data Visualization

Telling a Better Story with Better Graphics



Data Visualization

Telling our Story with Better Graphics

click for slides: bit.ly/uml_viz

The background of the slide features a series of thin, curved lines in a light beige color, sweeping across the top and bottom corners. On the left side, there is a dark olive-green rectangular area that serves as a container for the title. This area is composed of two stacked rectangles, with the bottom one being larger and having a small triangular notch at its bottom center.

Objectives:

- Outline basic types of visualizations and when to use each;
- Discuss best practices: colour selection, cognitive load, etc.

The background of the slide features a series of thin, curved lines in a light brown or beige color, sweeping across the top and bottom corners. On the left side, there is a dark olive green rectangular area that serves as a container for the title text.

Scope:

- Information Visualization vs. Scientific Visualization

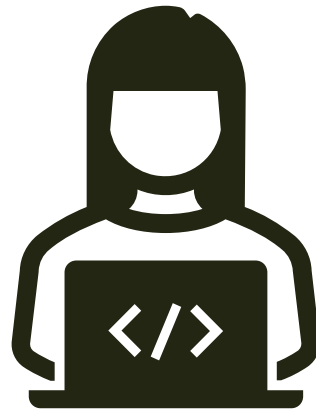
The background of the slide features several thin, curved lines in a light brown or tan color, sweeping across the top and bottom corners. On the left side, there is a dark olive green rectangular area with a small triangular pointer at the bottom center, resembling a speech bubble. Inside this green area, the text "Know your data:" is written in a white, sans-serif font.

Know your
data:

What are you trying to show?

<https://libguides.lib.umanitoba.ca/viz>

Know your
audience:



Example: Discovery + Access

City of Winnipeg

Open Data Portal: Active Transportation Network

<https://data.winnipeg.ca/Transportation-Planning-Traffic-Management/Active-Transportation-Network/wm39-dswz>

The background of the slide features several thin, curved lines in a light beige or tan color, sweeping across the top and bottom corners. A solid olive-green rectangular box is positioned on the left side, containing the text 'Best Practices:'.

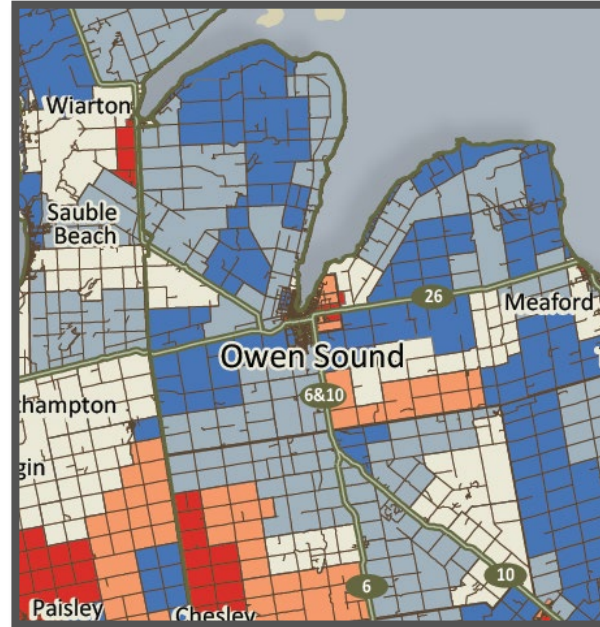
Best Practices:

Things to consider:

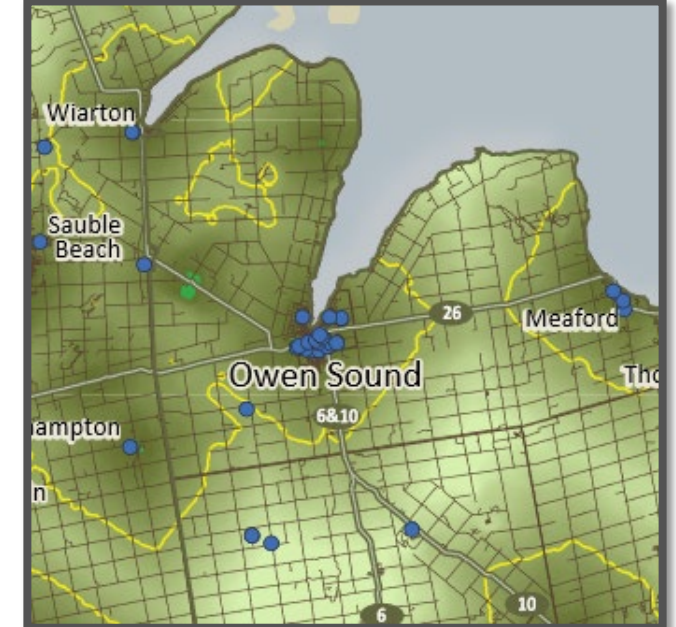
- Colour
- Cognitive load
- Reproducibility

Best Practices: Colour

Data Classification:



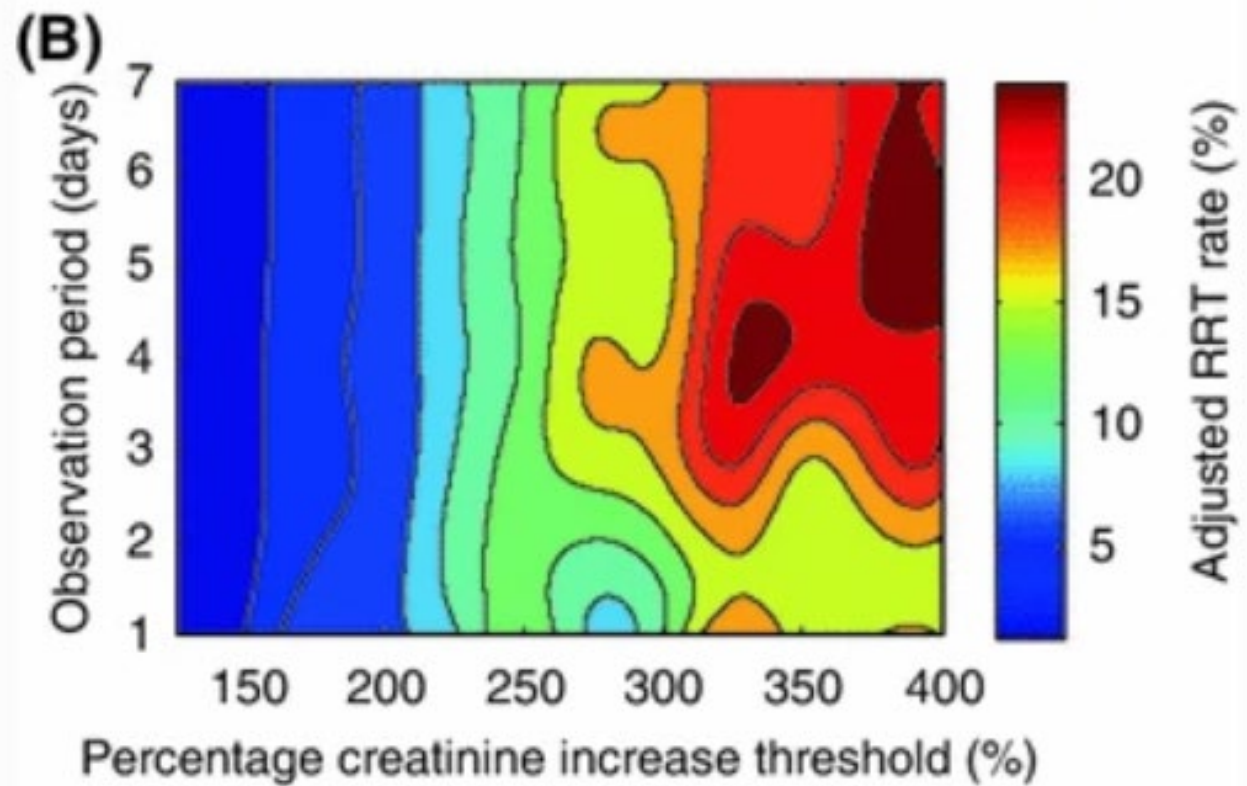
Discrete Classification



Continuous Classification

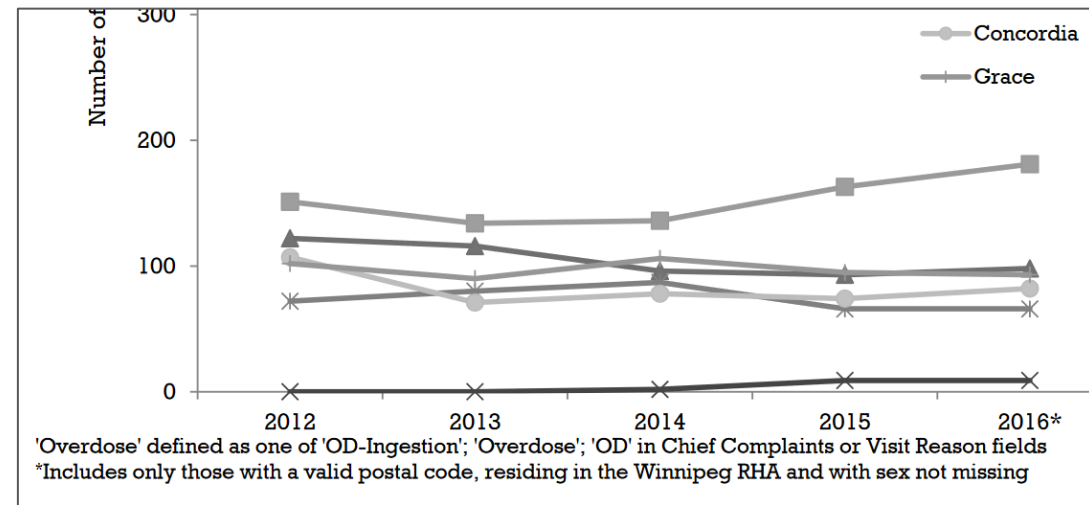
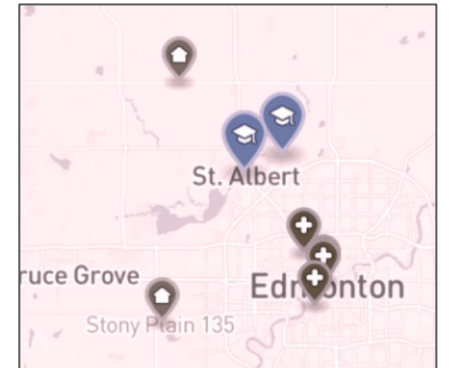
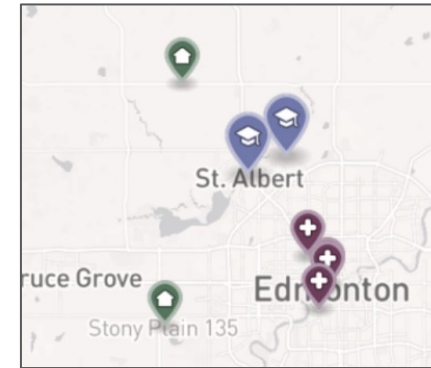
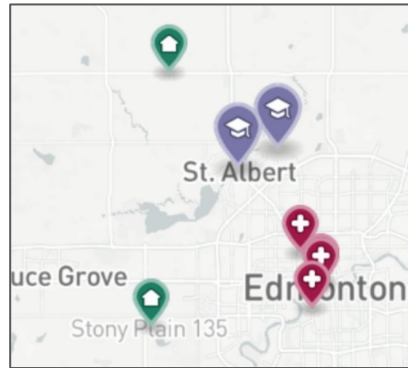
Best Practices: Colour

Unconscious Perception



Best Practices: Colour

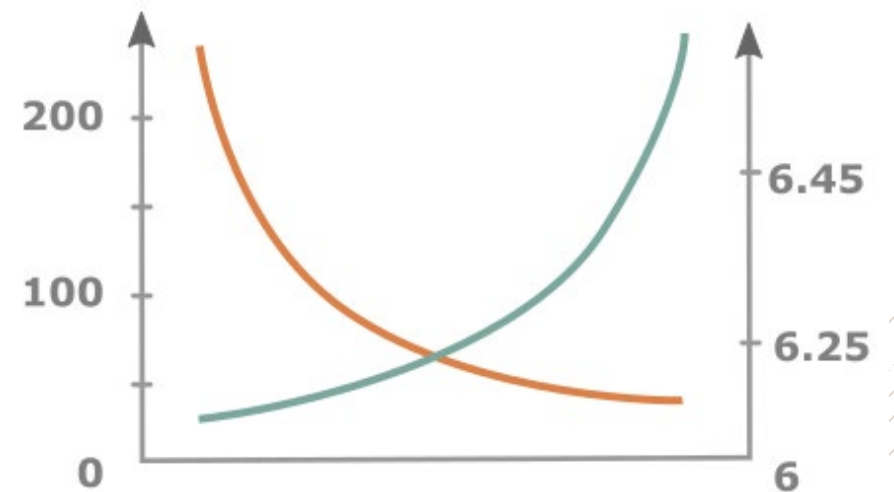
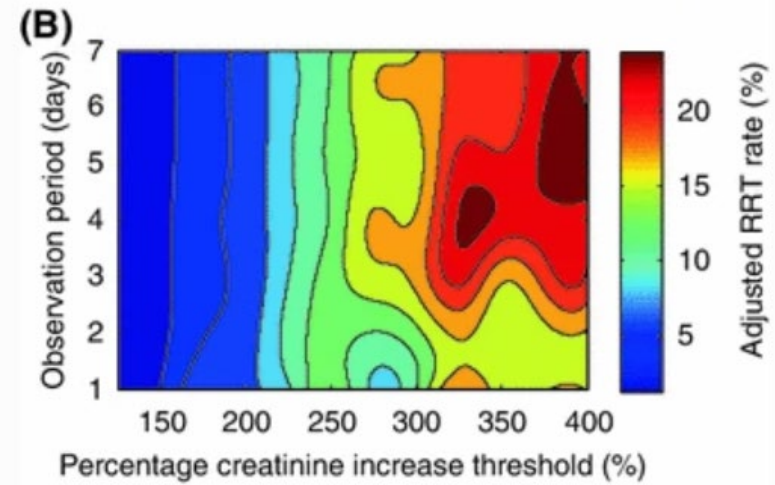
Accessibility



- Font, Symbology, Classification

Best Practices: Cognitive Load

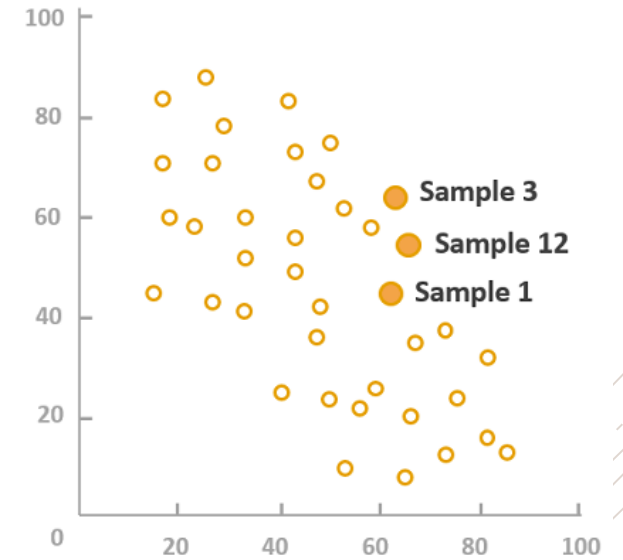
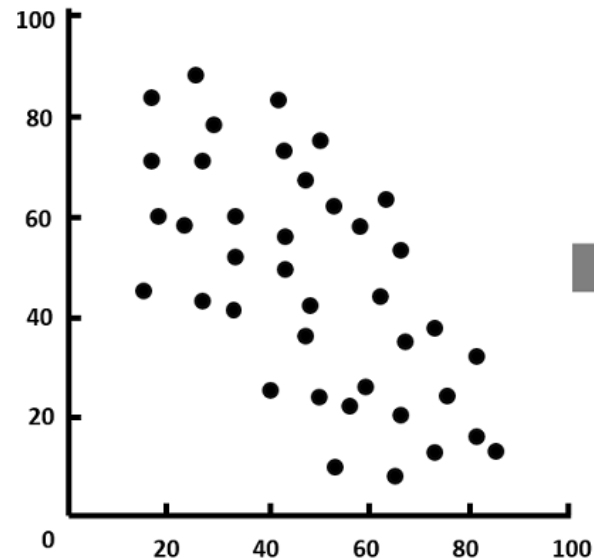
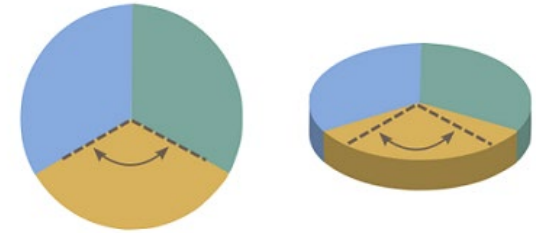
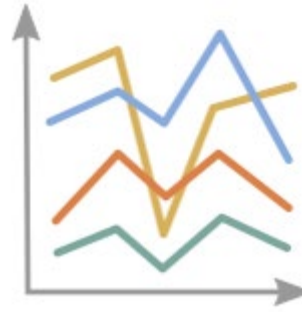
Consistency



- Busy graphics, adequate labels

Best Practices: Cognitive Load

Clarity



Example: Clarity

Institute for Health Metrics and Evaluation:
Exploratory Dashboard

<https://vizhub.healthdata.org/gbd-compare/#>

Best Practices: Reproducibility

Software & Hardware



- Ease of updating & open science

Best Practices: Reproducibility

Human



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Know what's
available:

10. How do you do what you want to do?

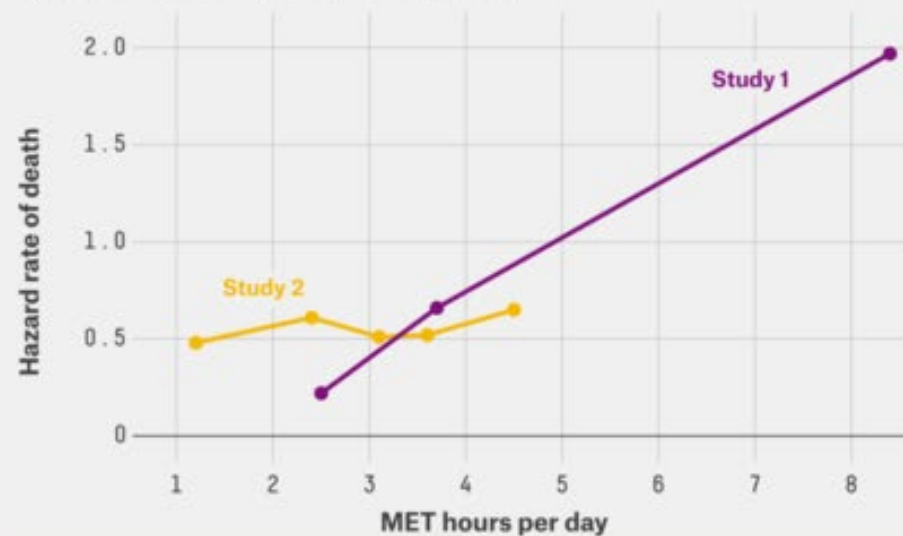
- [Tools for visualizing](#)
- Find examples
- Ask for help

Emulate an Example

Inspiration

The Harder You Exercise, The Better?

Hazard rates of death based on two studies of runners' metabolic equivalent of task (MET) hours per day



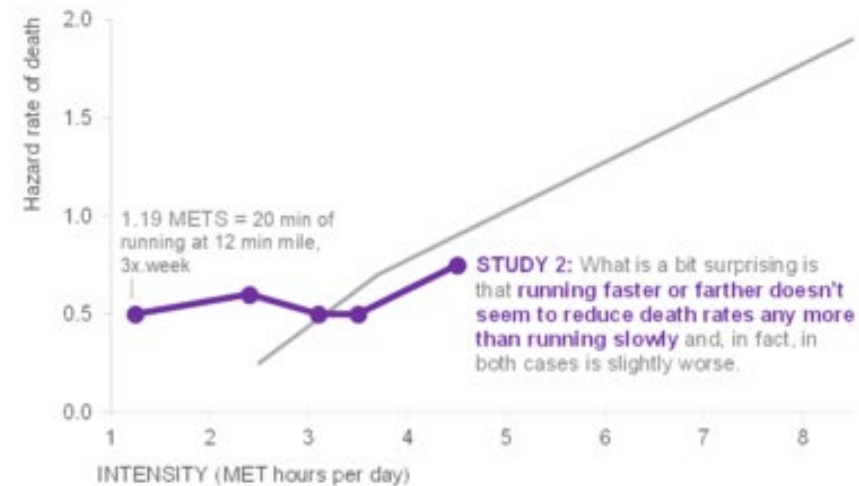
FIVETHIRTYEIGHT

SOURCE: IOWA STATE UNIVERSITY DEPARTMENT OF KINESIOLOGY

My honorable copy

The Harder You Exercise, The Better?

It may seem obvious that the harder you exercise, the better. However, nothing in the data suggests that running more — farther, or faster — will do more to lower your risk of death.



STUDY 1: While it looks like running very intensely (faster than an eight-minute mile, more than four hours a week) increases your risk of death relative to not running at all. But a closer look at the data suggests that this is probably just a statistical artifact: This intense running group contains only 36 people and two deaths, versus hundreds of people in the more casual running groups.

STUDY 2: What is a bit surprising is that running faster or farther doesn't seem to reduce death rates any more than running slowly and, in fact, in both cases is slightly worse.

Hazard rates of death based on two studies of runners' metabolic equivalent of task (MET) hours per day
Source: FiveThirtyEight | Iowa State University Department of Kinesiology

The background of the slide features a series of thin, curved lines in a light beige color, creating a sense of motion and depth. These lines are more prominent on the left side and fade towards the right.

Services/ Support

Ask Meg about:

- Finding supporting data for research;
- Preparing and cleaning data;
- Selecting appropriate analysis or visualization tools;
- Standards and best practices

<https://libguides.lib.umanitoba.ca/viz>

PowerPoint Presentations

Don't Lose Your Audience, Keep Your Audience

How to Avoid Death By PowerPoint

David JP Phillips

No offence...

Have you gotten out of a big deal? 79 Yes 125 No

Are you planning on getting out of a big deal? 92 Yes 107 No

If you have gotten out of a big deal or are planning to, what was/is your reasoning?

104 Budget 10 Principle 1 Mandate 32 Other

If decision on principle, where did you reinvest the funds?

3 APCs 3 Open initiatives 9 On demand resources
20 Subscriptions to other resources 76 We have not gotten out of a deal

If you had the funds to renegotiate your journal packages with a publisher, would you re-enter a big deal?

20 Yes 86 Maybe 30 No 62 Have not gotten out of a deal

The Search Process

This presentation examines the search process which is defined in the following 8 steps:

1. Understanding how information is organized
2. Understanding your question
3. Identifying your foreground question
4. Identifying background questions
5. Searching resources to answer your background question
6. Planning your foreground question search
7. Searching resources to answer your foreground question
8. Organizing the information you have retrieved

How to Avoid Death By PowerPoint

David JP Phillips

One Message per Slide

Contrast

Avoid Sentences

Dark Backgrounds

If You Can

Six Objects

SELECTING A JOURNAL

Wide Readership in Your Field

Wide readership in your field

- What are the journals you read? Your supervisor and peers?
- Where is the research you are citing published?
- In which databases is your journal of interest indexed?

Exercise

- Find a website of a journal you would like to publish, explore the publishing information

SELECTING A JOURNAL

WIDE READERSHIP IN YOUR FIELD

Wide Readership in Your Field

Wide Readership in Your Field

- **Journals read**

Wide Readership in Your Field

- Journals read
- **Research cited**

Wide Readership in Your Field

- Journals read
- Research cited
- **Databases indexed**

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Find a website of a journal you would like to publish, explore the publishing information

Selecting a Journal

Wide Readership in Your Field

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Wide readership in your field

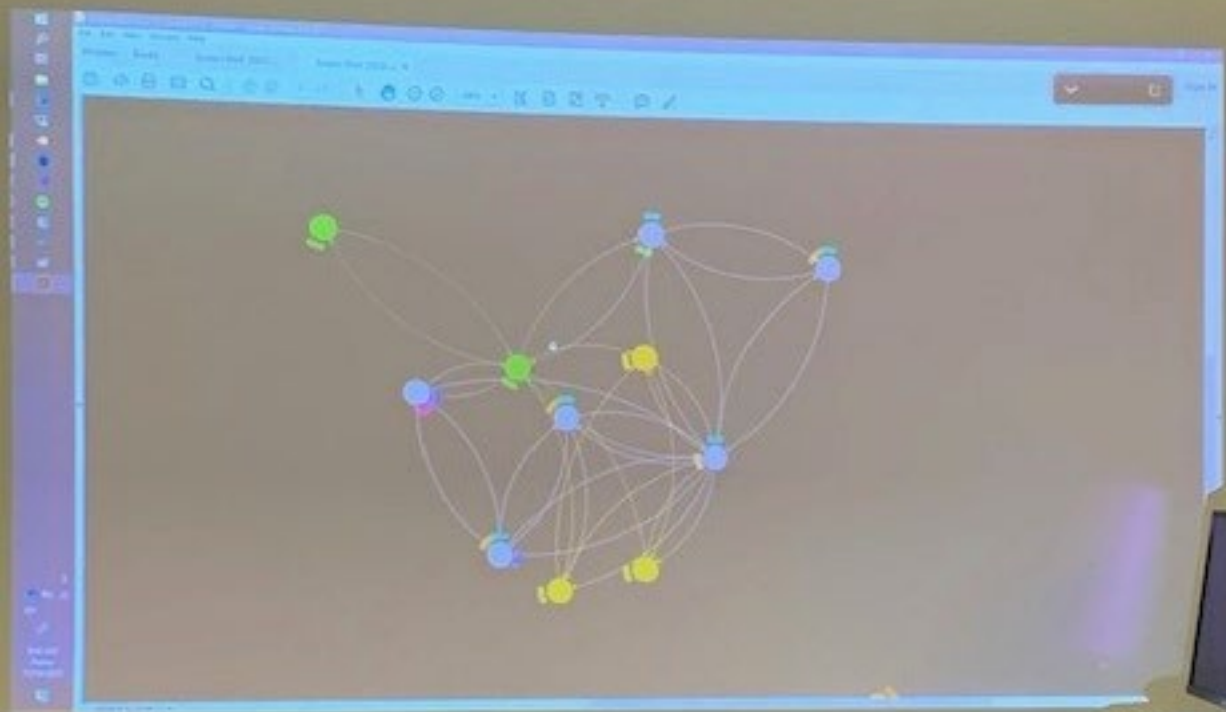
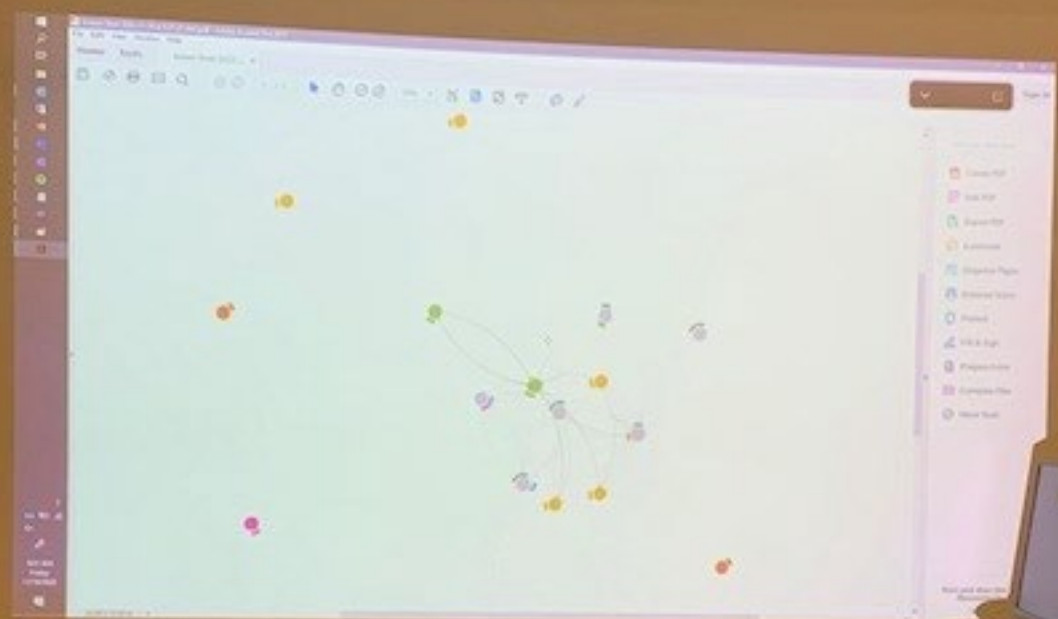
- What are the journals you read? Your supervisor and peers?
- **Where is the research you are citing published?**

Wide readership in your field

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Exercise

Find a website of a journal you would like to publish, explore the publishing information



A New Research Story

Forest Creatures and Activity

Recreational Opportunities for Woodland Creatures in City Parks

The Project

The project

Woodland creatures like recreation too.

Study Participants

Study Participants

Inclusion Criteria

Study Participants – Inclusion Criteria

- Red and Grey Squirrels

Study Participants – Inclusion Criteria

- Red and Grey Squirrels
- **Mice**

Study Participants – Inclusion Criteria

- Red and Grey Squirrels
- Mice, but not rats
- **Deer**

Study Participants – Inclusion Criteria

- Red and Grey Squirrels
- Mice, but not rats
- Deer
- **Raccoons**

Study Participants – Inclusion Criteria

- Red and Grey Squirrels
- Mice, but not rats
- Deer
- Raccoons
- **Skunks**

Study Participants – Inclusion Criteria

- Red and Grey Squirrels
- Mice, but not rats
- Deer
- Raccoons
- Skunks
- **Beavers**

Study Participants

Exclusion Criteria

Study Participants – Exclusion Criteria

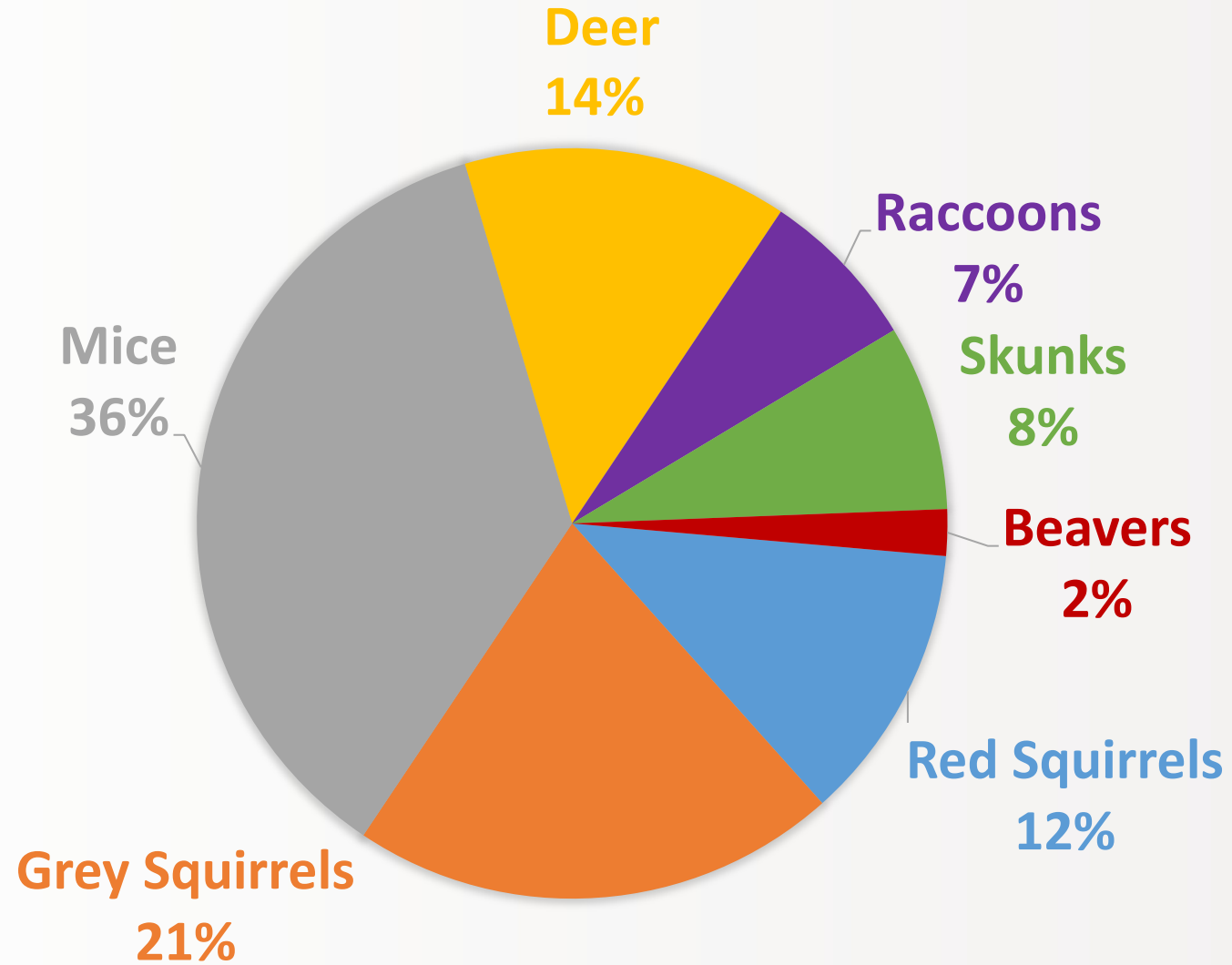
- Feral Cats

Study Participants – Exclusion Criteria

- Feral Cats
- **Domesticated Dogs and Cats**

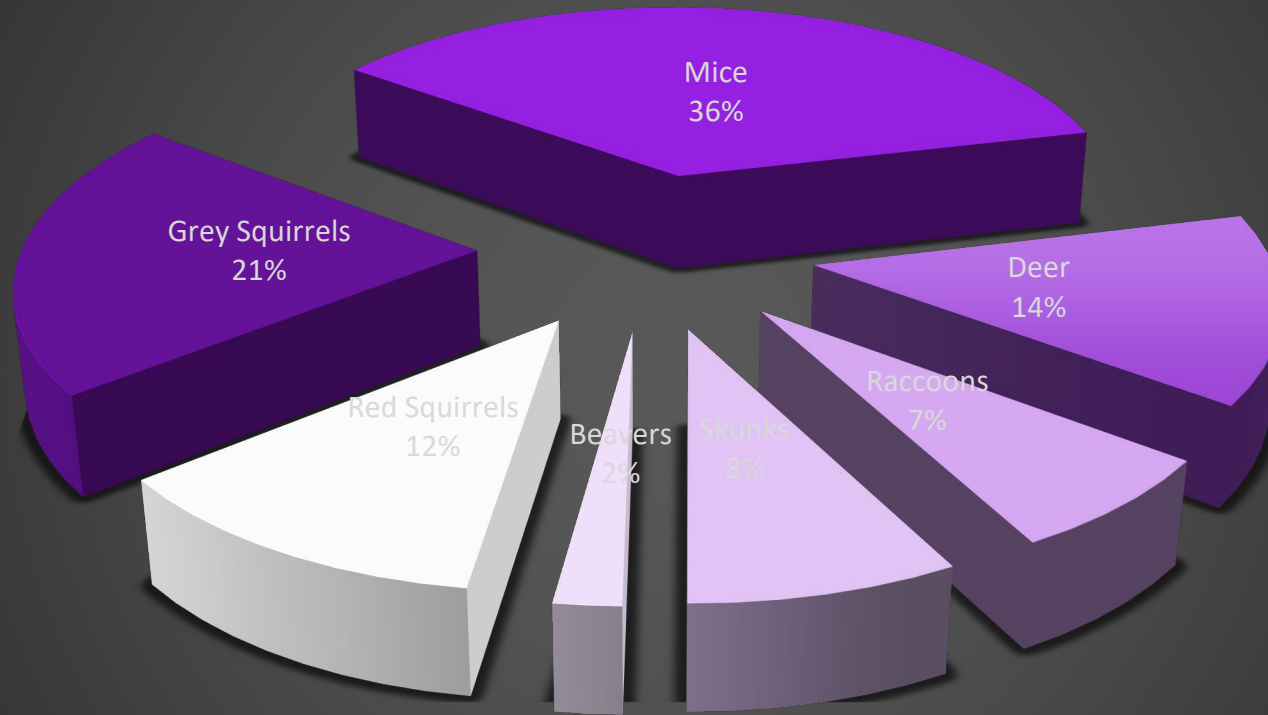
Woodland Creature Populations

Study Population



WOODLAND CREATURE POPULATIONS

Percentages of Woodland Creatures



■ Red Squirrels ■ Grey Squirrels ■ Mice ■ Deer ■ Raccoons ■ Skunks ■ Beavers

Recreational Activities



Chilling



(1)

Chasing



(2)

Recreational Activities

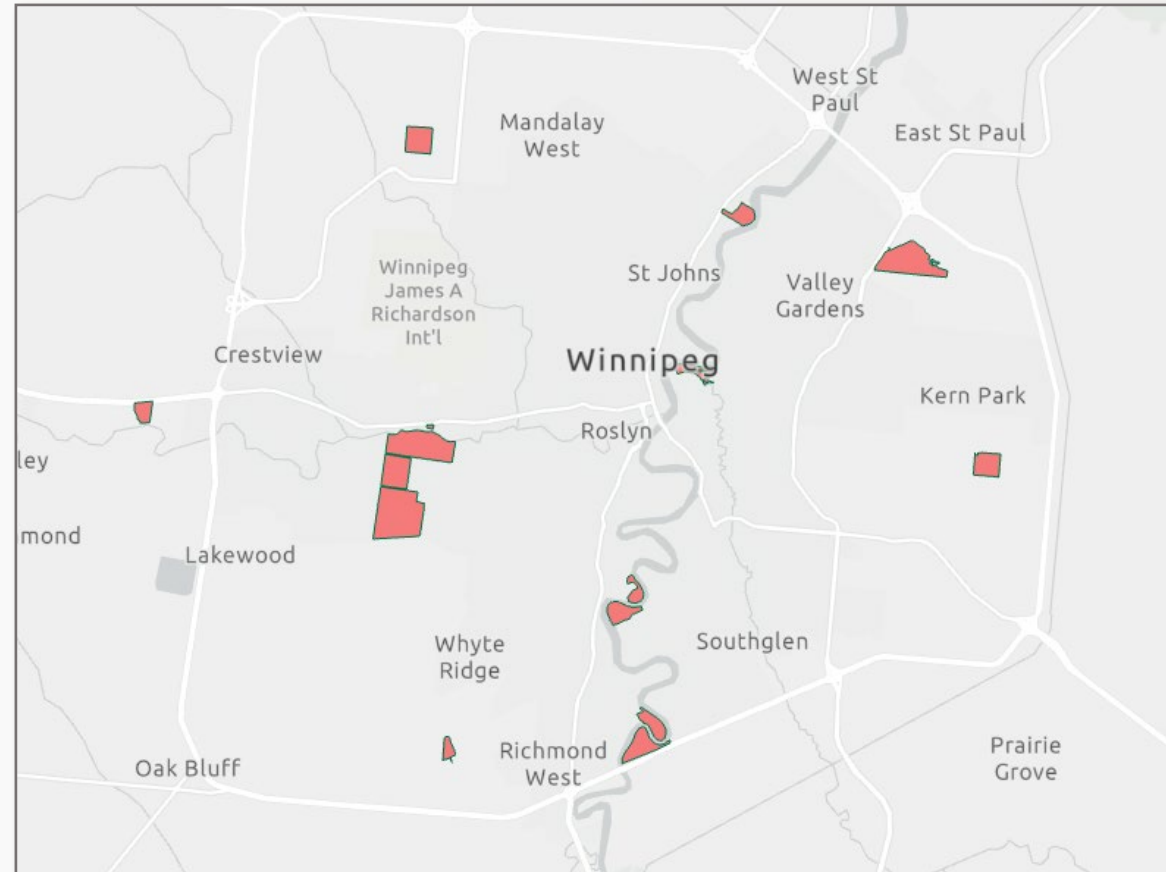
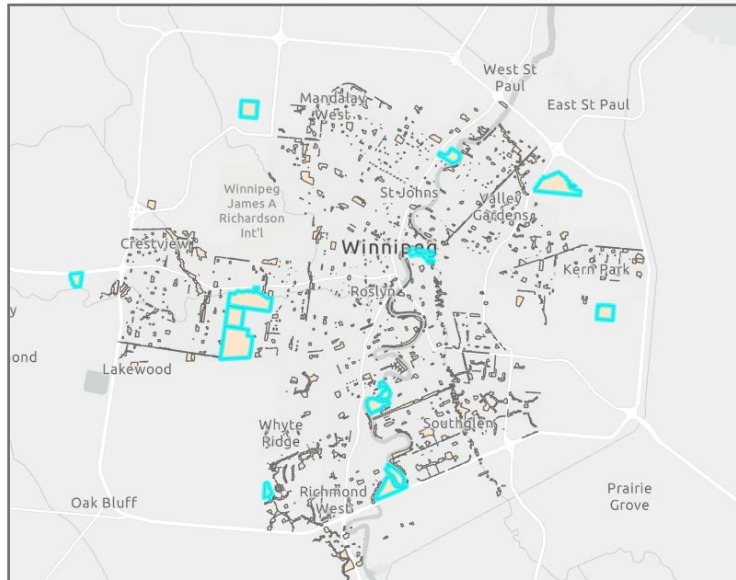
Leaping



(3)

Most Popular Recreational Locations

Most popular recreational locations

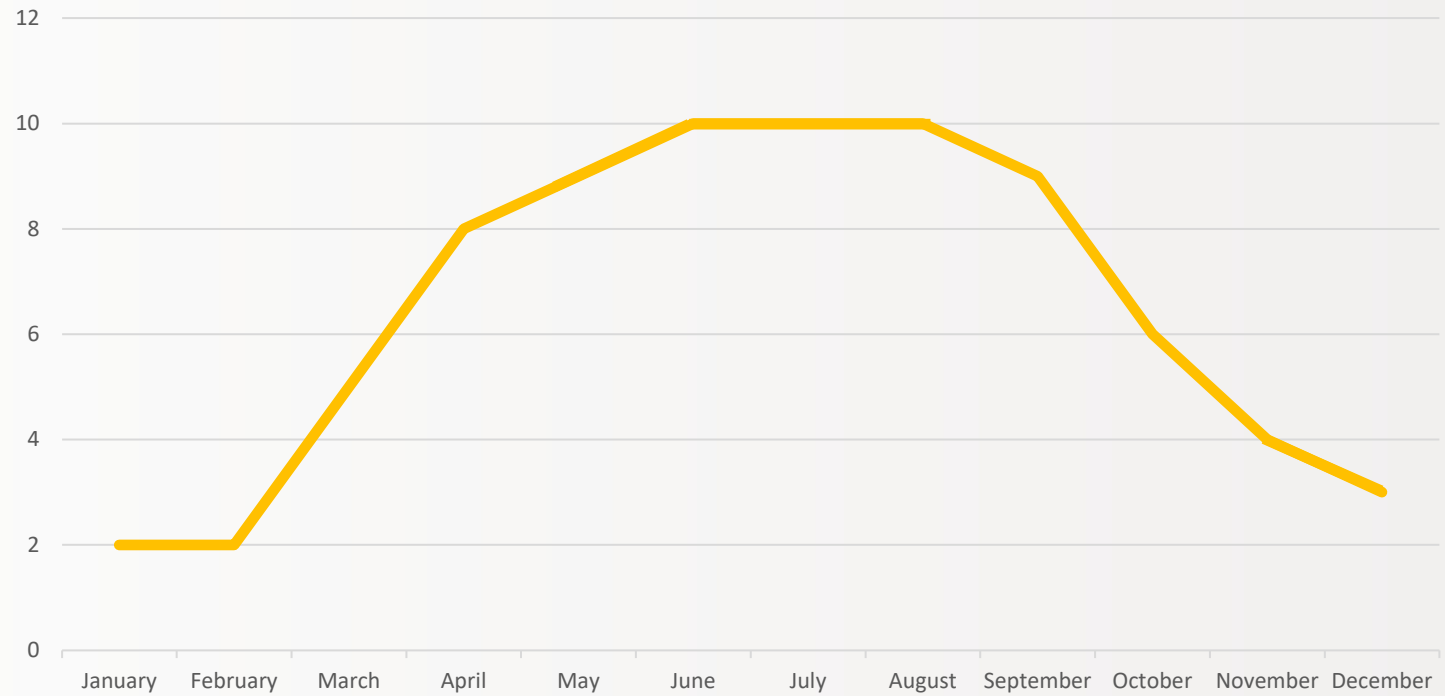
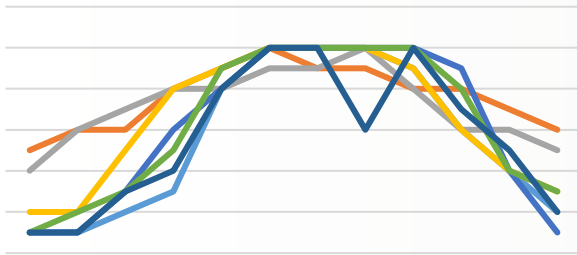


MOST POPULAR LOCATIONS

Quadrant	Name	Address	Popularity
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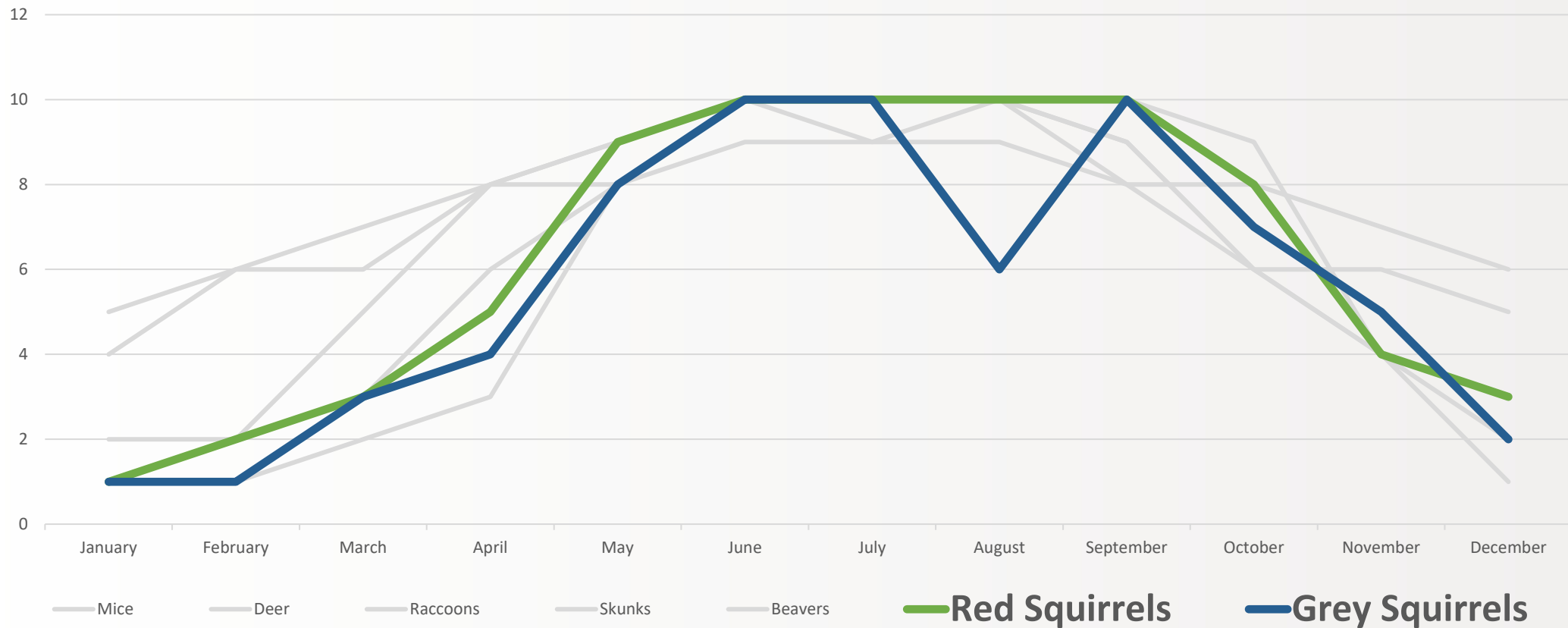
Activity Levels by Month

Activity Levels by Month- Skunks



— Skunks

Activity Levels by Month- Squirrels



Squirrels – Obligate Hibernators

Squirrels – Obligate Hibernators

- Spontaneously, and annually, enter hibernation

Squirrels – Obligate Hibernators

- Spontaneously, and annually, enter hibernation
- **Regardless of temperature and access to food**

Squirrels – Obligate Hibernators

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- Regardless of temperature and access to food
- **A physiological state**

Squirrels – Obligate Hibernators

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- **Body temperature drops**

Squirrels – Obligate Hibernators

- Spontaneously, and annually, enter hibernation
- Regardless of temperature and access to food
- A physiological state
- Body temperature drops
- **Heart and respiration rates slow**

(4)

References

1. By Michael Hunter, CC-BY-SA-4.0, https://commons.wikimedia.org/wiki/File:A_Pair_of_Raccoon%27s_Sleeping_Red_Hill_Valley.JPG
2. Squirrels Chasing. (n.d.). Squirrels chasing each other. [Photograph]. Retrieved August 14, 2013 from <http://media.nj.com/jersey-journal/photo/2012/08/11474342-essay.jpg>
3. By Dwight Burdette, CC BY 3.0, <https://commons.wikimedia.org/w/index.php?curid=55128607>
4. Hibernation. (n.d.) In *Wikipedia*. Retrieved March 6, 2020 from <https://en.wikipedia.org/wiki/Hibernation>

Main Points:

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Don't blind people with science!

Main Points:

Don't worry about the number of slides.

Main Points:

Remember, you own your slides, they don't own you!

Questions?

Questions?