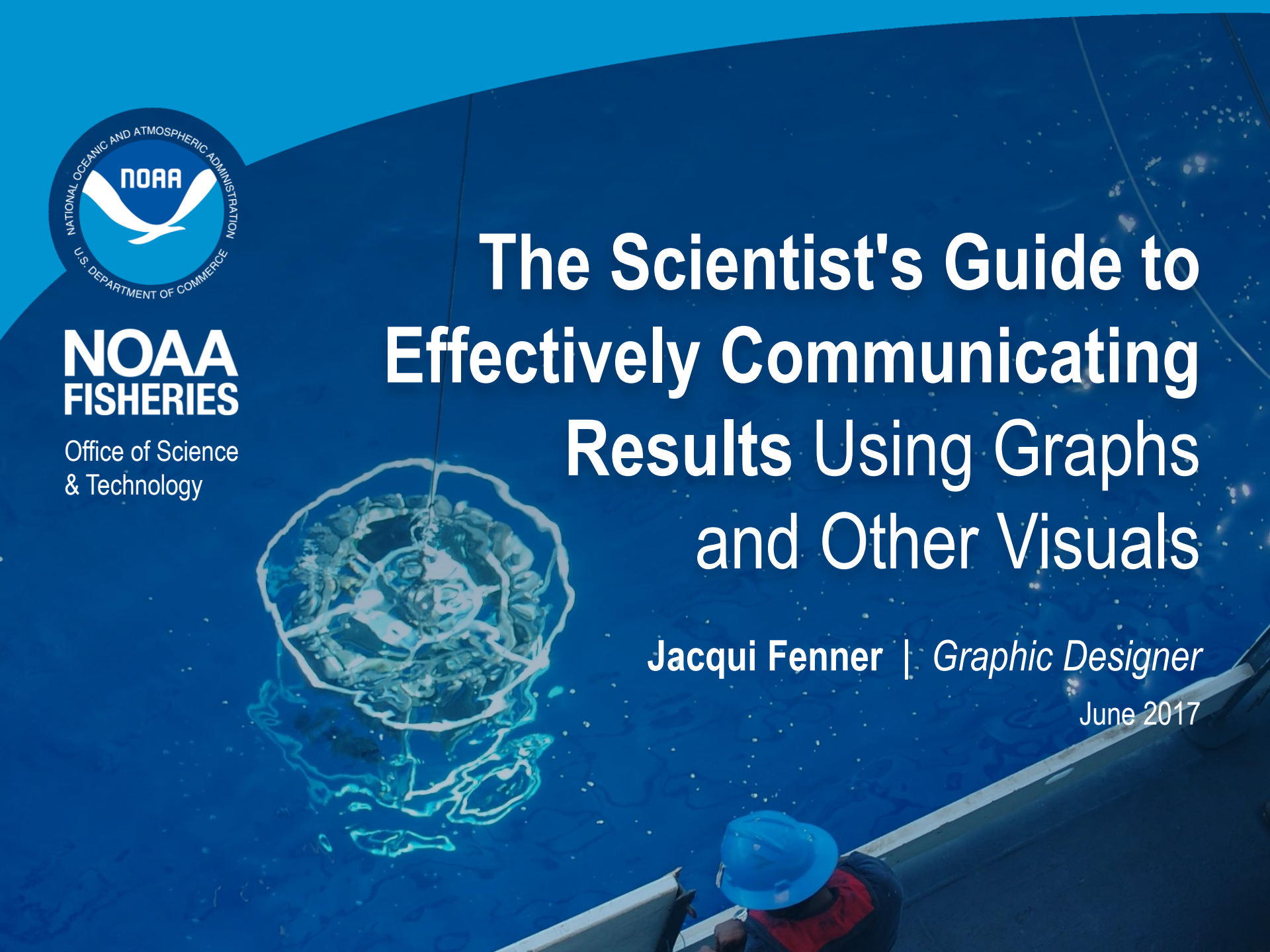


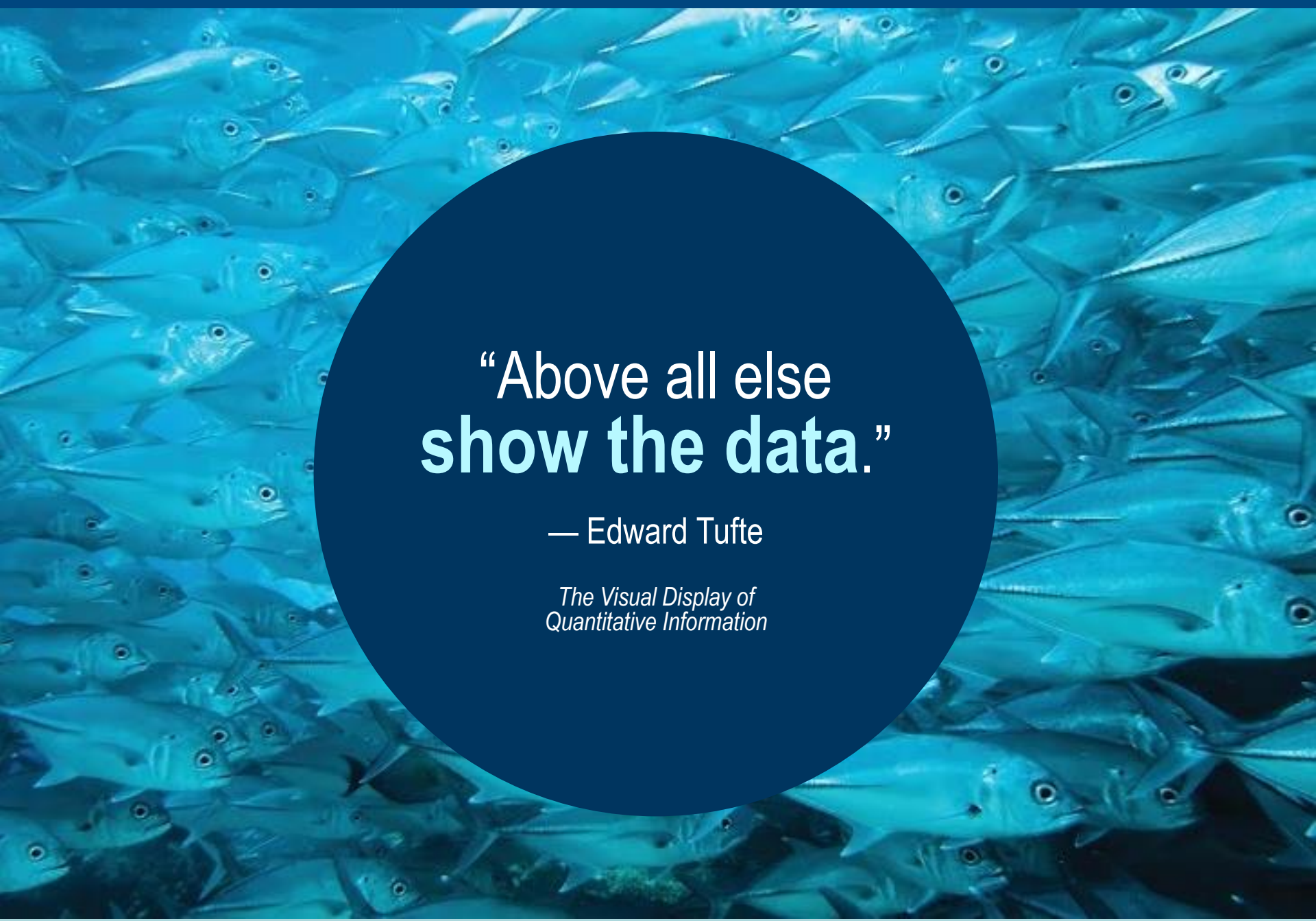
NOAA FISHERIES

Office of Science & Technology

The Scientist's Guide to Effectively Communicating **Results** Using Graphs and Other Visuals

Jacqui Fenner | *Graphic Designer*

June 2017


“Above all else
show the data.”
— Edward Tufte
The Visual Display of
Quantitative Information

Talk Overview

Getting Started

- Why are Visuals Important?
- Where to Begin?
- Types of Communications Materials

Visual Best Practices

- Match the Visual to the Message
- Highlight Key Information
- Declutter to Simplify
- Summary Example

Summary

- Programs + Workflow
- Resources
- Q+A

Why are Visuals Important?

Not just “dressing up” data

Where to Begin?

Craft Written Content First

- Know your key messages (1-3 main)

Use Existing Resources

- Brand Guide
- Templates
- Color palettes

Build Time into Process

- Plan up front
- 1+ week at end
- Iterative

Keep in mind…

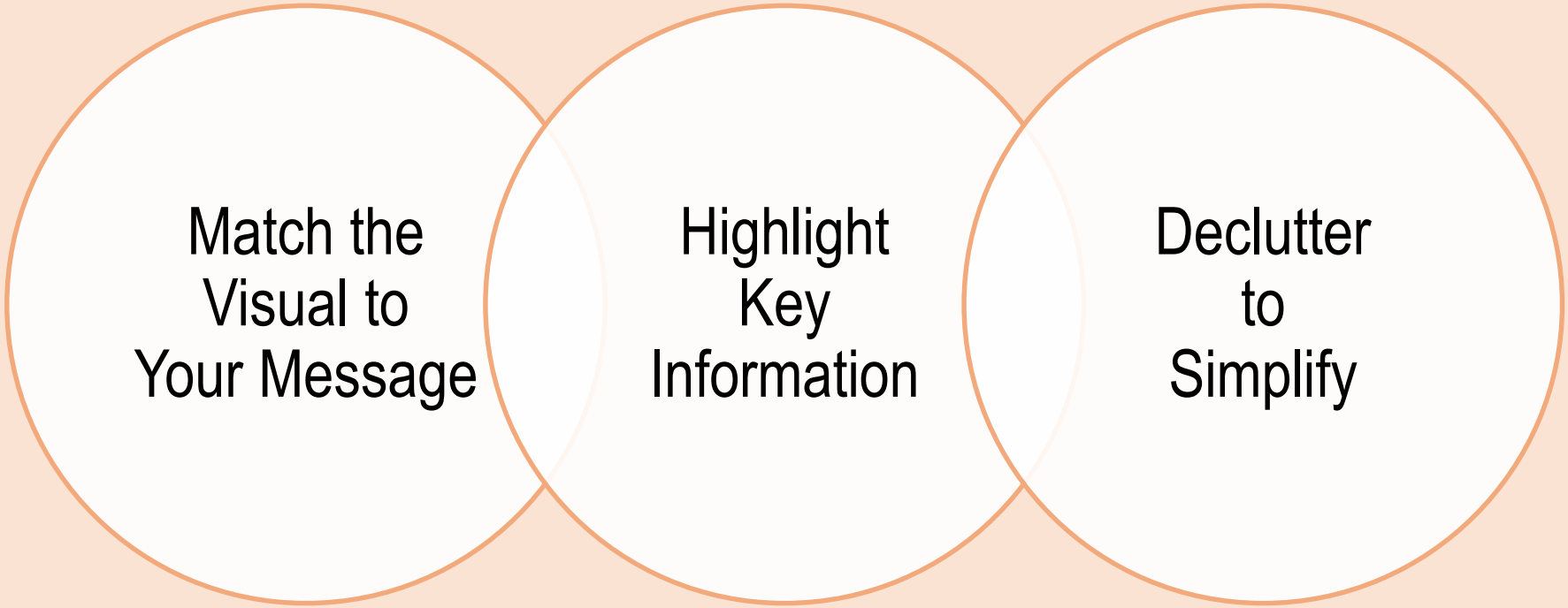
- Only covering a few topics
- Modified examples
- Rules are not rigid

Help Your Data Go Farther

Communications Materials

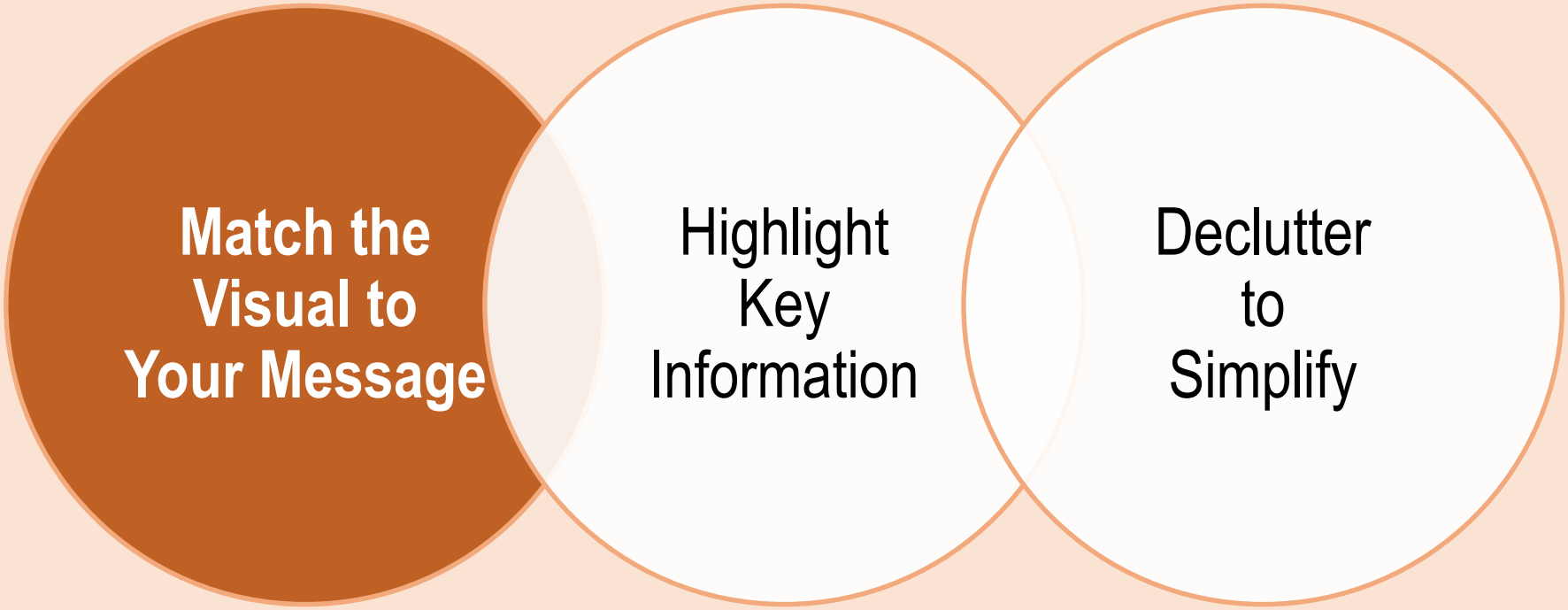
Websites / Web tools	Infographics / Maps / Graphs	Reports / Tech Memos
Fact Sheets / Brochures / Flyers	Posters	Presentations

Visual Best Practices



Summary Example

Visual Best Practices



Match the Visual to Your Message

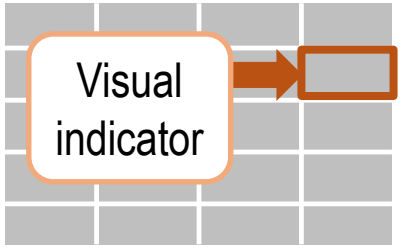
Consider **Context**

- Audience
- Key messages
- Product type
- Web or print

Consider **Options**

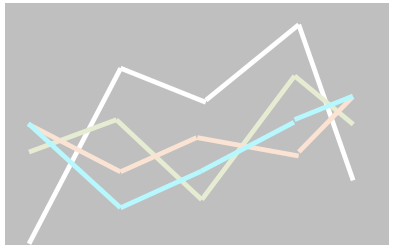
- Graph / table
- Infographic
- Photo + text
- Callout box

Types of Graphs to Consider



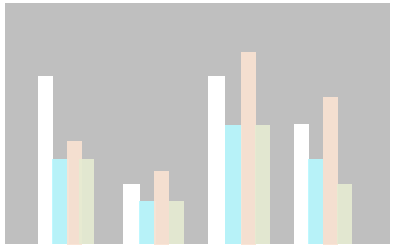
Tables

- **PRO**
  Can fit a lot of info, often already done
- **CON**
  Makes viewer work harder



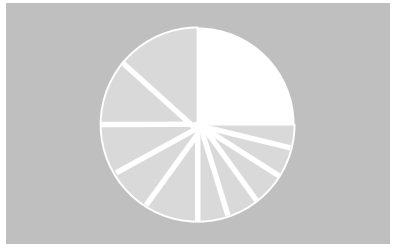
Line graphs

- **PRO**
  Good for trends, comparison, multi series (**sm changes**)
- **CON**
  Less effective **w/in category**



Bar graphs

- **PRO**
  Good for trends, comparison, multi series (**lg changes**)
- **CON**
  Less effective **across series**

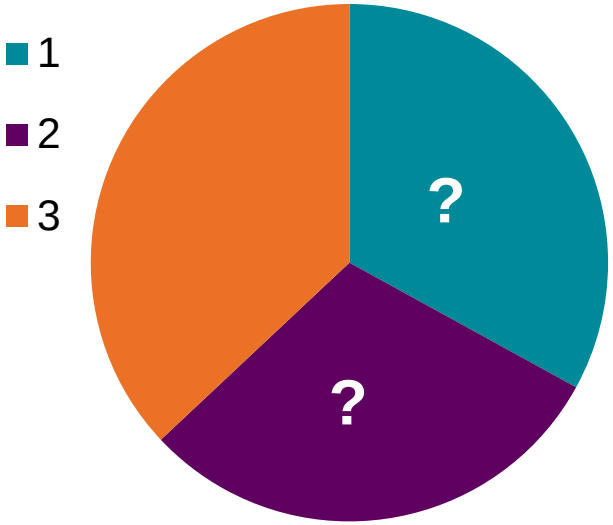


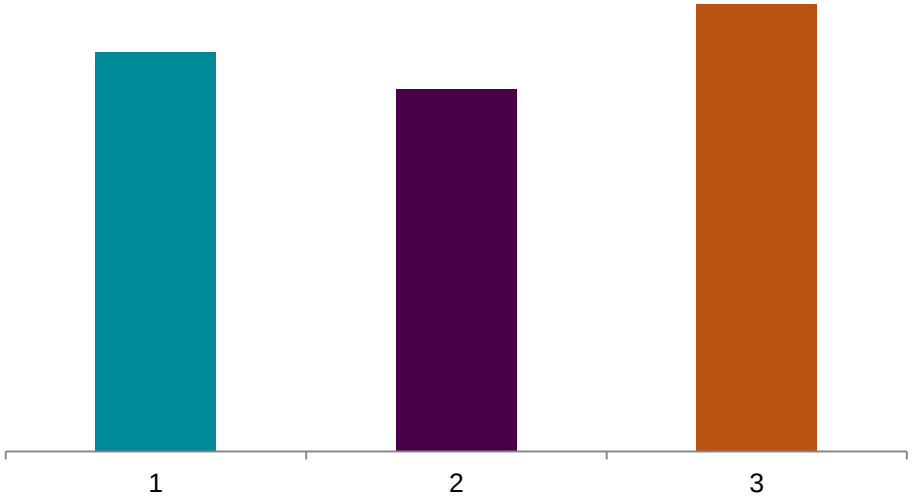
Circle graphs

- **PRO**
  Good for parts of a whole
- **CON**
  Less effective w/ many groups, multi series, similar values

Avoid Data Distortion

It Can Muddy Up Your Message





Does a Photo + Text Work Just as Well?

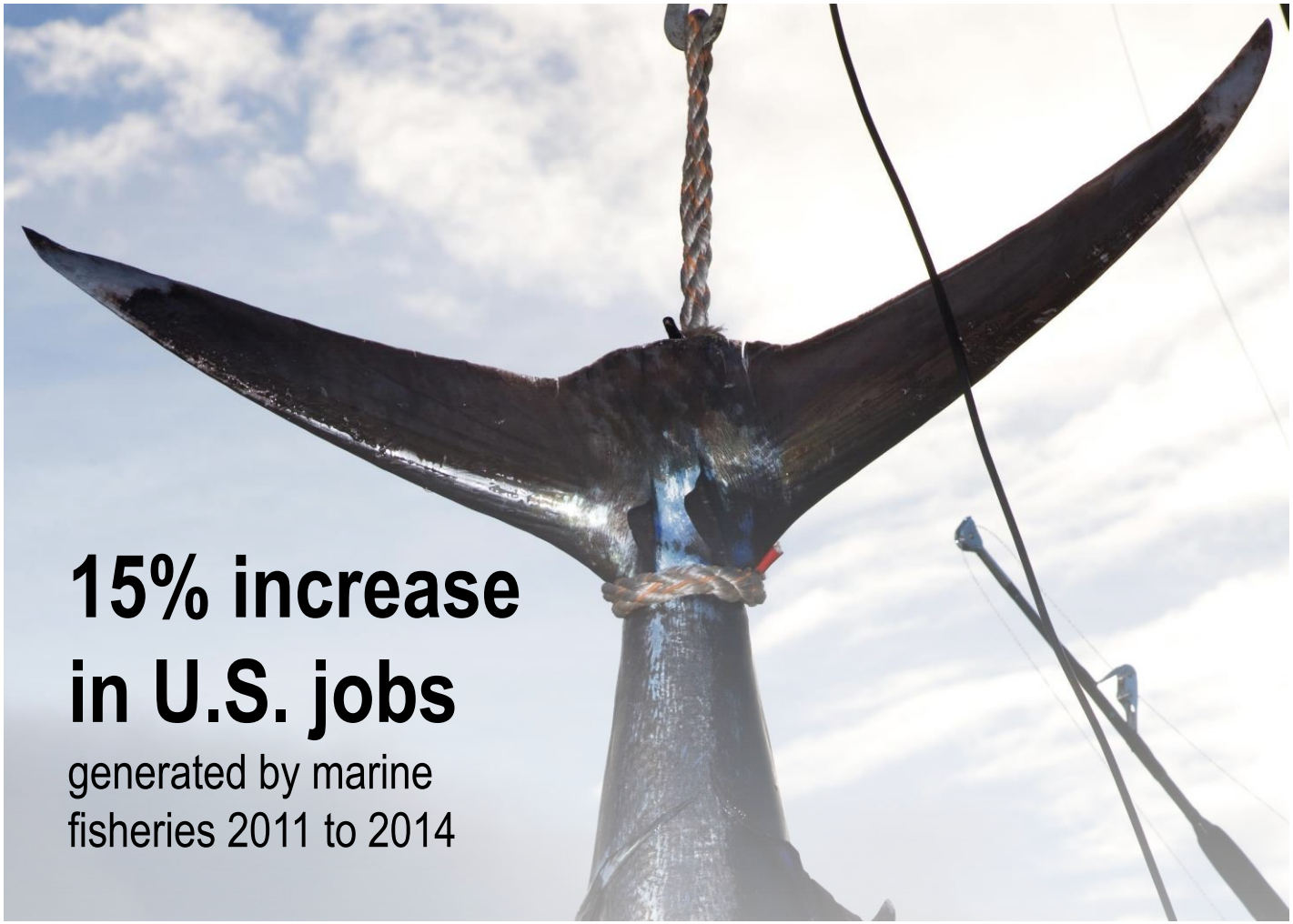


Photo Tips

1-3 photos – high-quality, well chosen, relevant

Consider photo direction

Avoid cheesy photos + clipart

Background photo = text must be readable

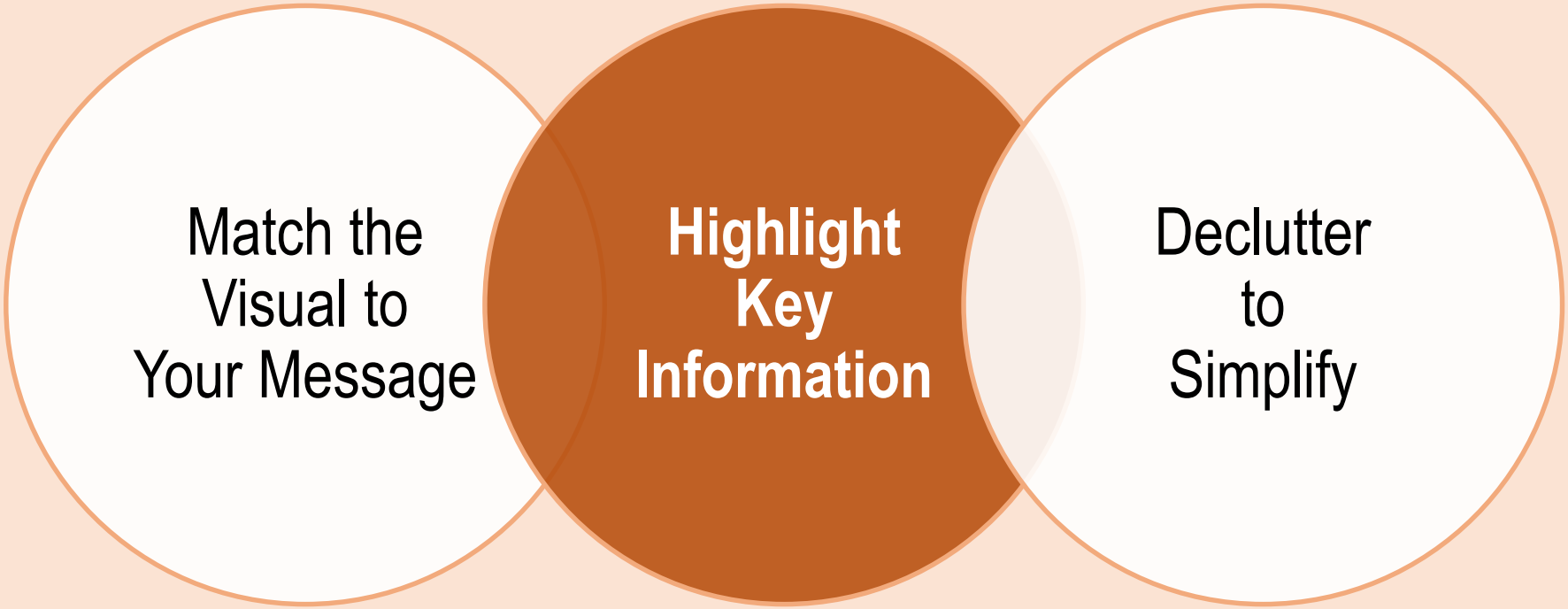
Credit properly + complete file metadata as needed

Make Sure **Content Can Breathe**

Consider Photo Direction

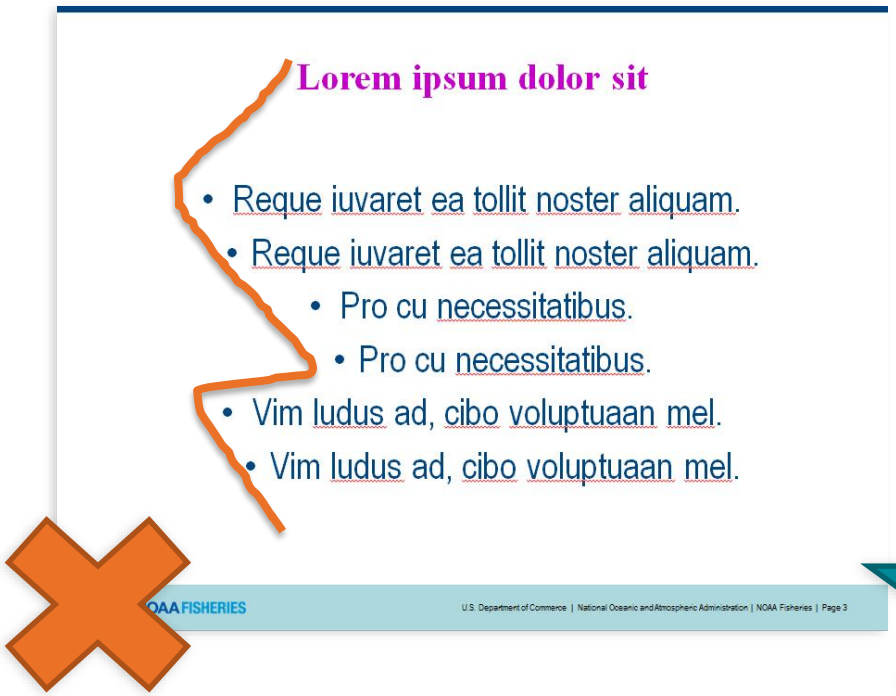
- Photos should face content.
- Flipping photos? Avoid distortion of words / other.

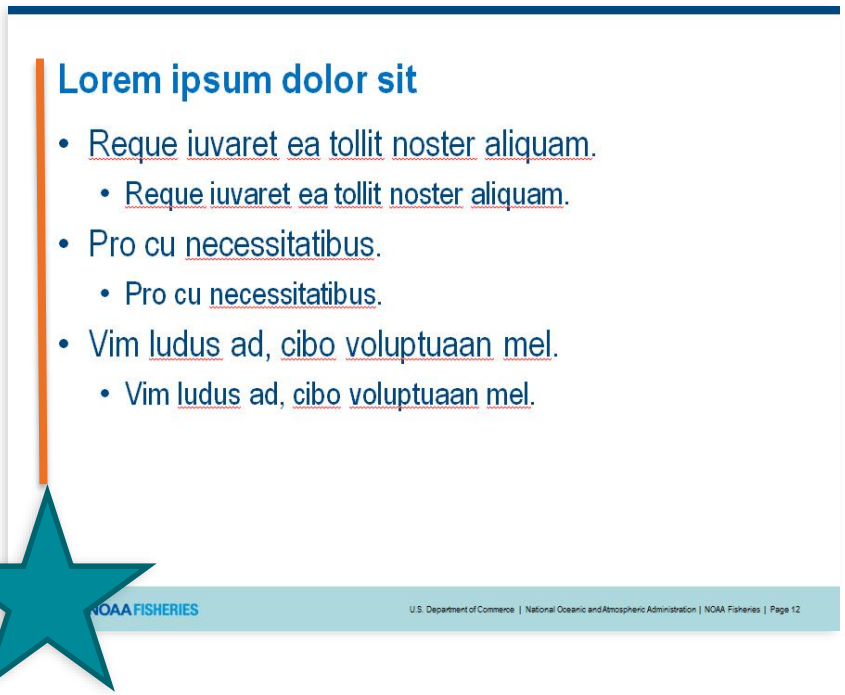
Visual Best Practices



Before You Begin, **Make things Consistent**

1. What are the defaults? Make everything consistent (layout, fonts, colors)
2. Add visual interest with meaning to highlight key information





Tip: Left-justify text as default to simplify line of sight

Give Focal Points using Visual Indicators

15% increase in U.S. jobs
generated by marine fisheries from 2011-2014

Table 5. U.S. Seafood Industry Economic Impacts Trends

	2011	2012	2013	2014
Jobs	1,233,204	1,270,141	1,350,627	1,394,833

Table 12. Recreational Economic Impacts Trends for the United States

	2011	2012	2013	2014
Jobs	363,932	425,321	420,191	438,590

1.8M jobs

Color is a Powerful Tool

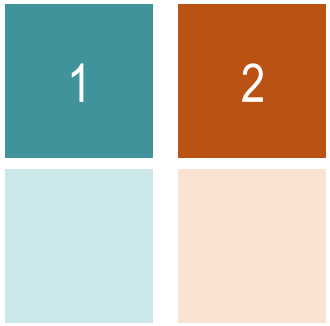
- Start with premade palette (Your org brand? Online?)
- Choose 2-3 main colors (1 neutral and/or 1 cool, 1 warm/accent color)
- Use saturation levels of same color for variety
- Use primary colors sparingly

Warm colors
- Come forward

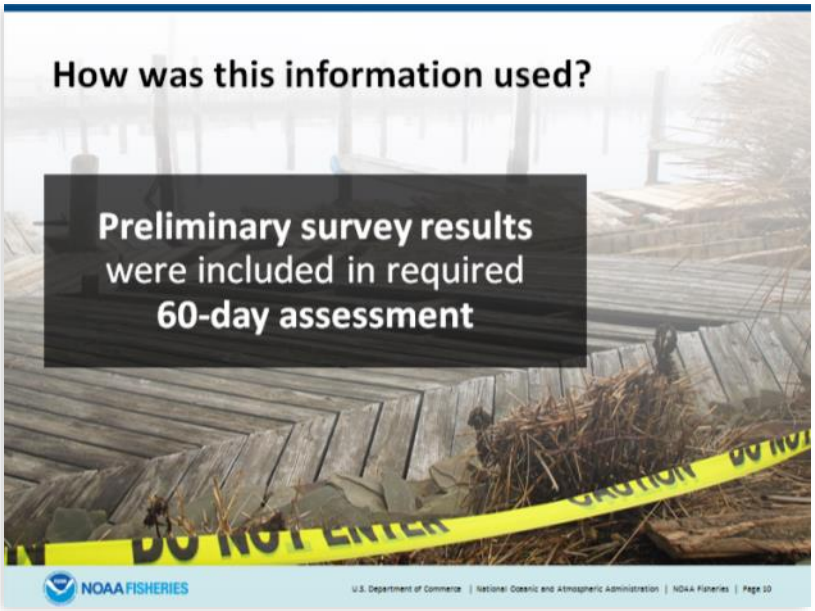
Cool colors
- Fall back

Template Colors

Main Colors



Color Sets the Mood



Color + emotion: Can improve viewer's memory of key information

Brand Palettes are a Great Place to Start

NOAA Fisheries brand palette

NOAA Logo Colors

- NOAA Logo Dk. blue
- NOAA Logo Lt. blue

Acceptable Swoosh + Type Color

- Type Dk. blue

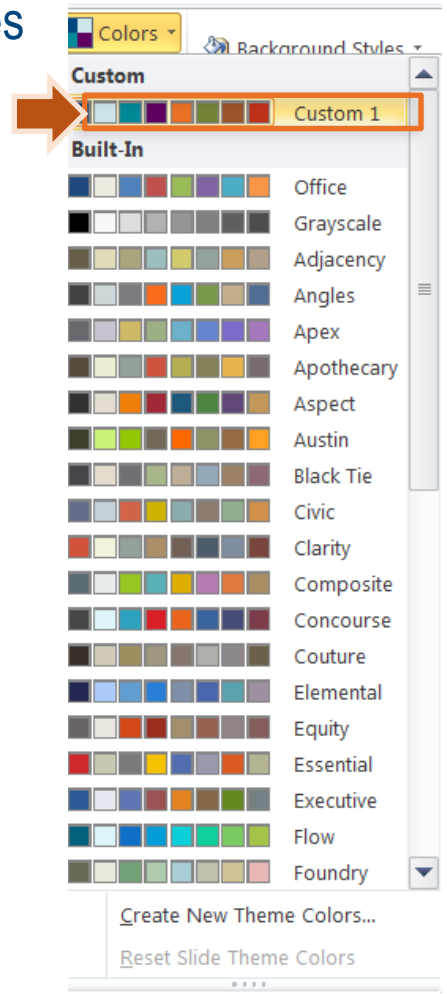
Base Accent Colors

- Gold
- Sea green
- Orange
- Olive green
- Brown
- Red
- Purple

Supplemental Accent Colors

- Sky blue
- Light sky blue
- Dk. cream
- Lt. cream

Premade palettes embedded in templates



Let Color Theory Basics **Inform Your Choices**

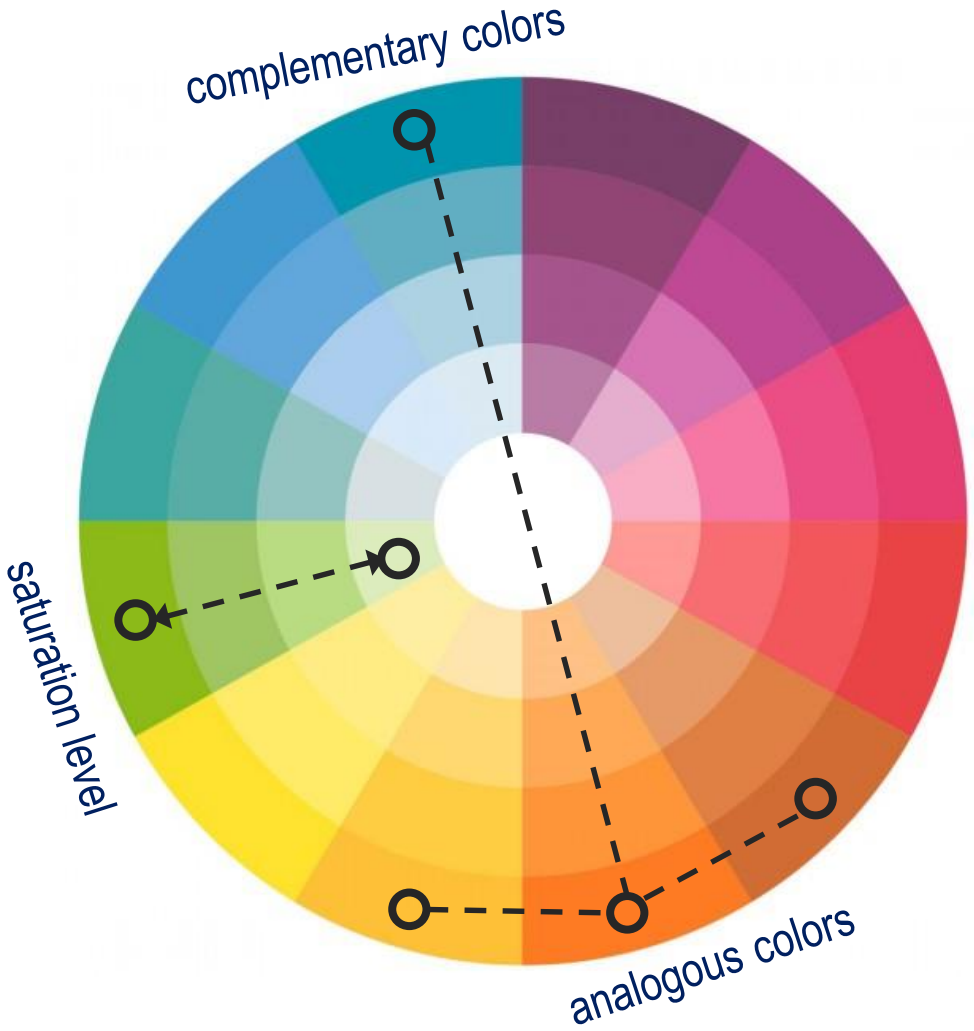
Terms to know:

- Color = hue
- Saturation level = value

How to achieve more contrast:

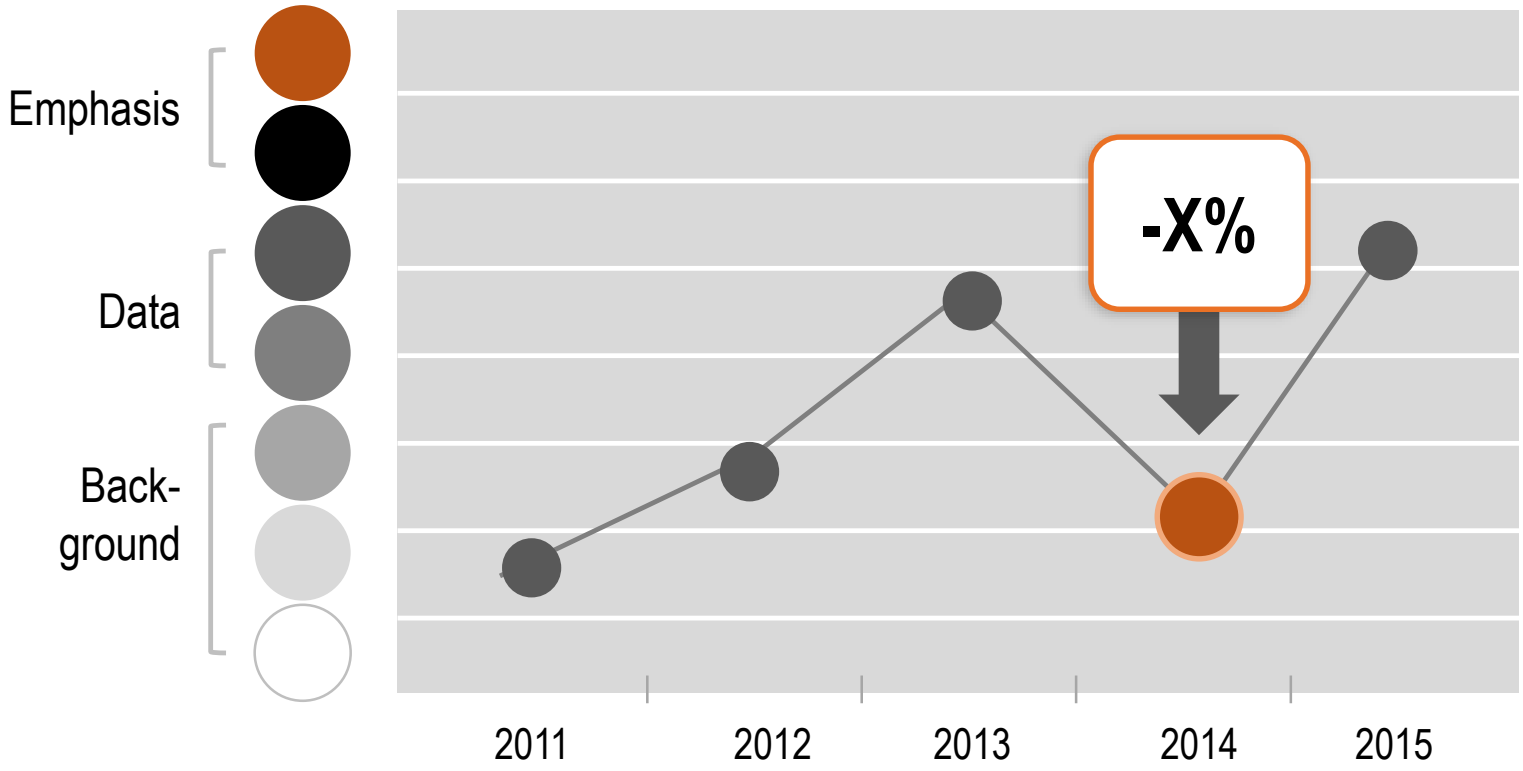
- Use complimentary colors
- Use colors with greater saturation level differences

Greater contrast
can make things stand out, highlighting key messages.

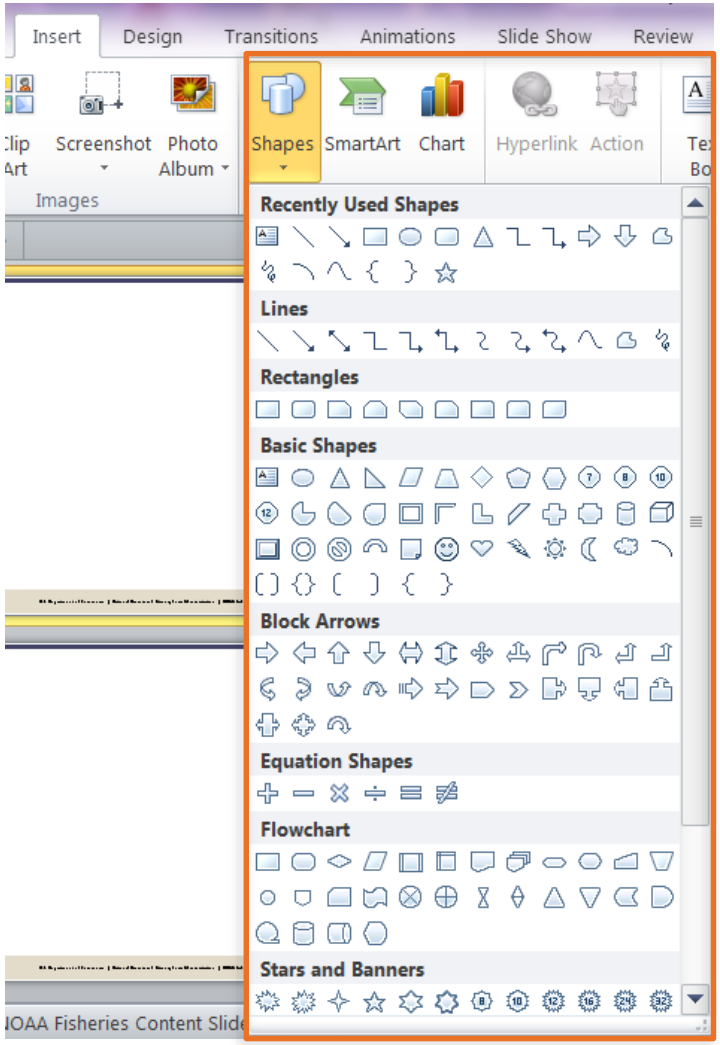


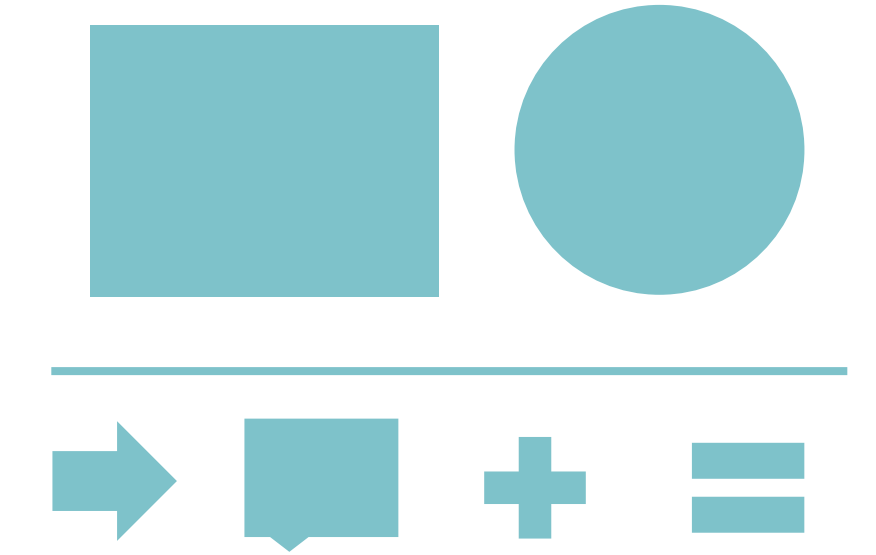
Highlight Key Information in a Graph

using Color, Saturation, and Visual Indicators



Insert PPT Shapes to Highlight Information

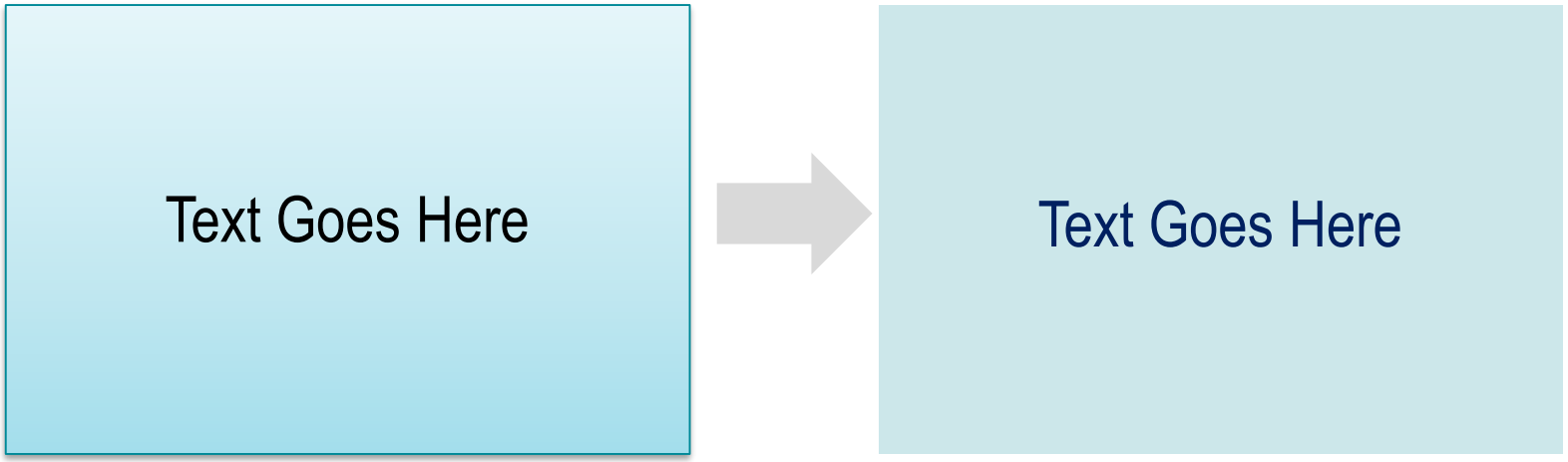




Can be used for:

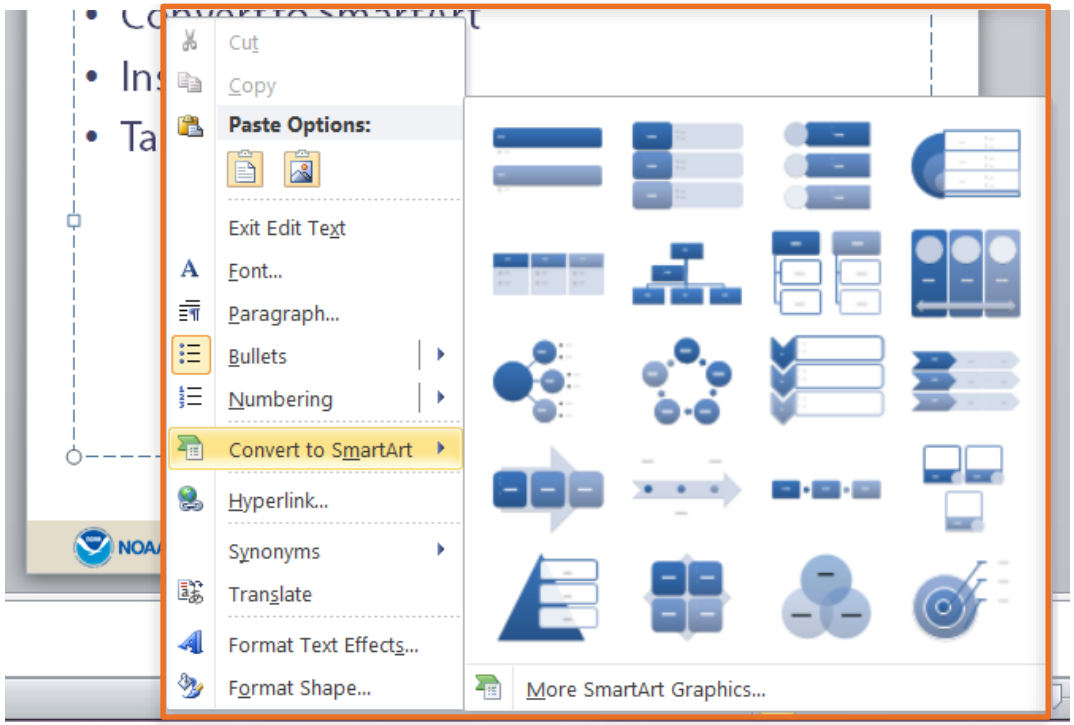
- Call out boxes
- Backgrounds
- Simple infographics
- Visual indicators

Remove Default Formatting on Shapes
for a Cleaner Look



- Copy + paste shapes
- Use *Format Painter*

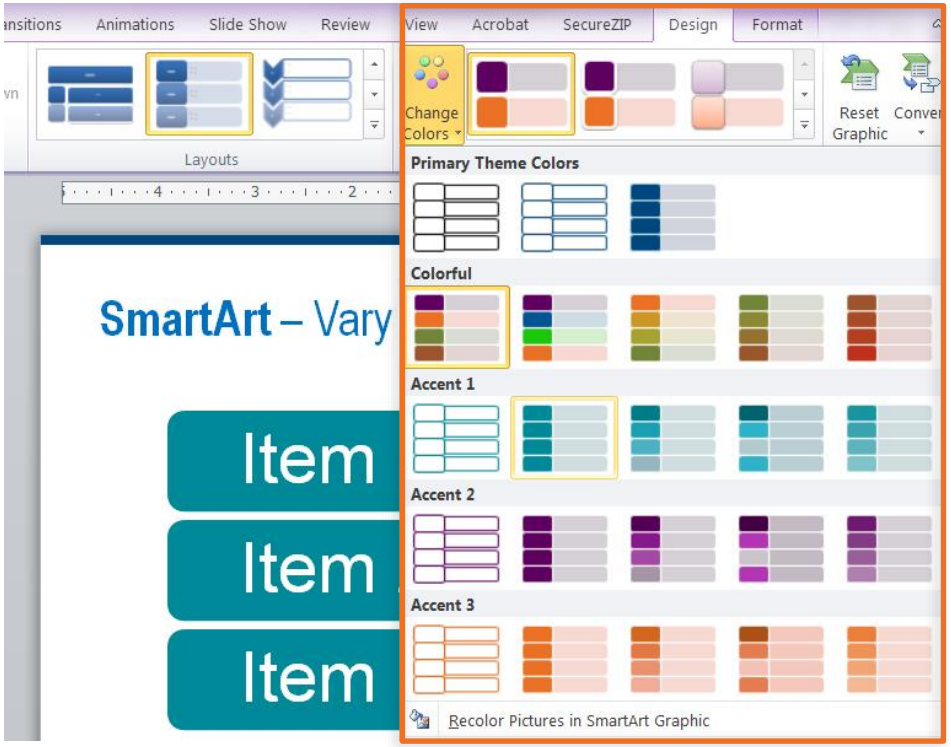
Create Simple Infographics (PPT SmartArt)

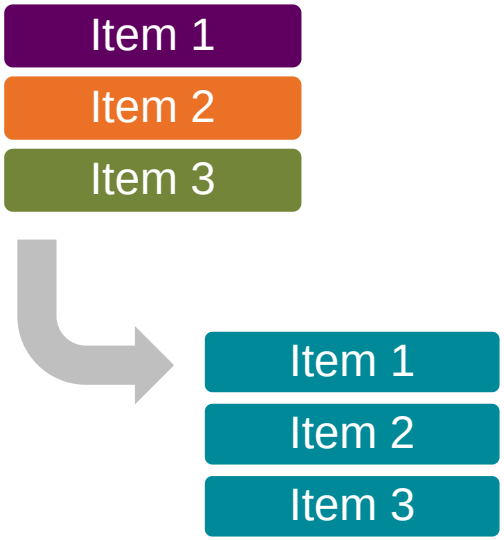


- Item 1
- Item 2
- Item 3

Right-click on bulleted list **> Convert to SmartArt** > More SmartArt Graphics…

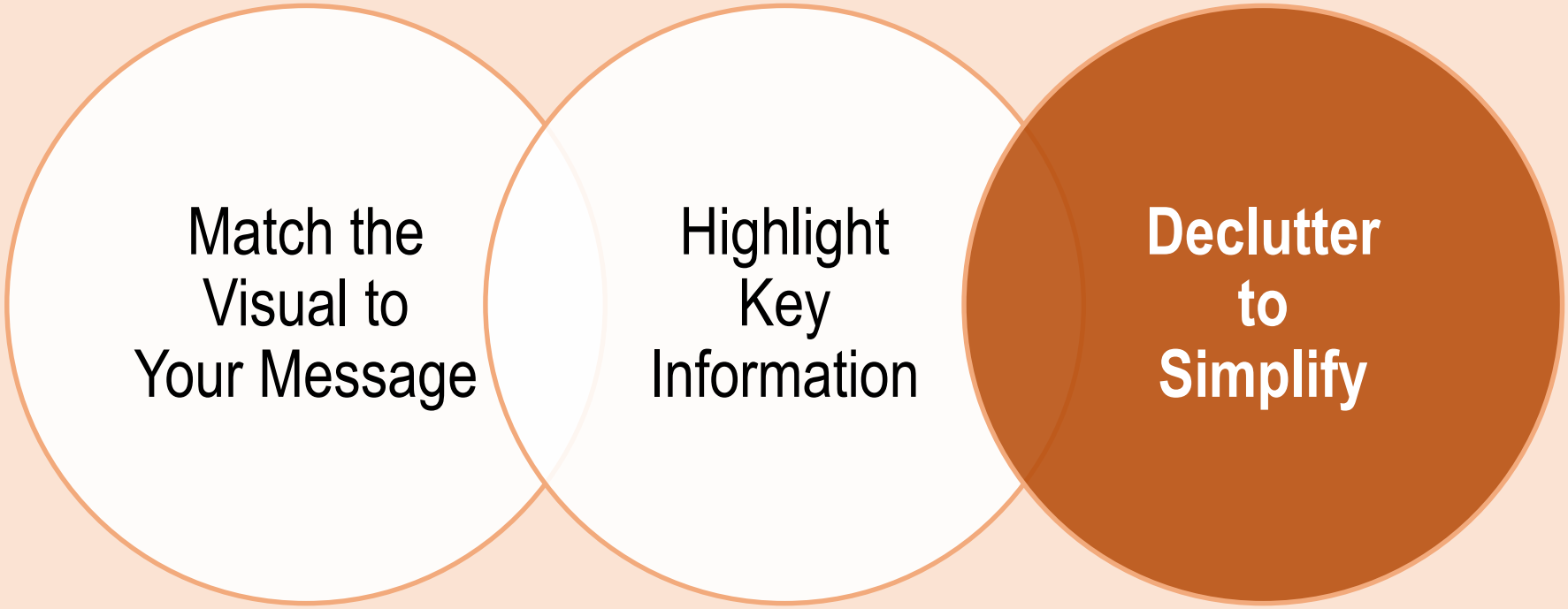
Adjust Styling to Refine the Effect





Double-click on SmartArt graphic **> Change Colors** (etc.) on 'Design' tab
(or right-click on SmartArt, convert to shapes, adjust properties for individual elements)

Visual Best Practices



Why Declutter?

To remove / lessen excess information

Benefits

- Creates **white space**
- **Highlights** key messages
- Frees up **viewer's attention**

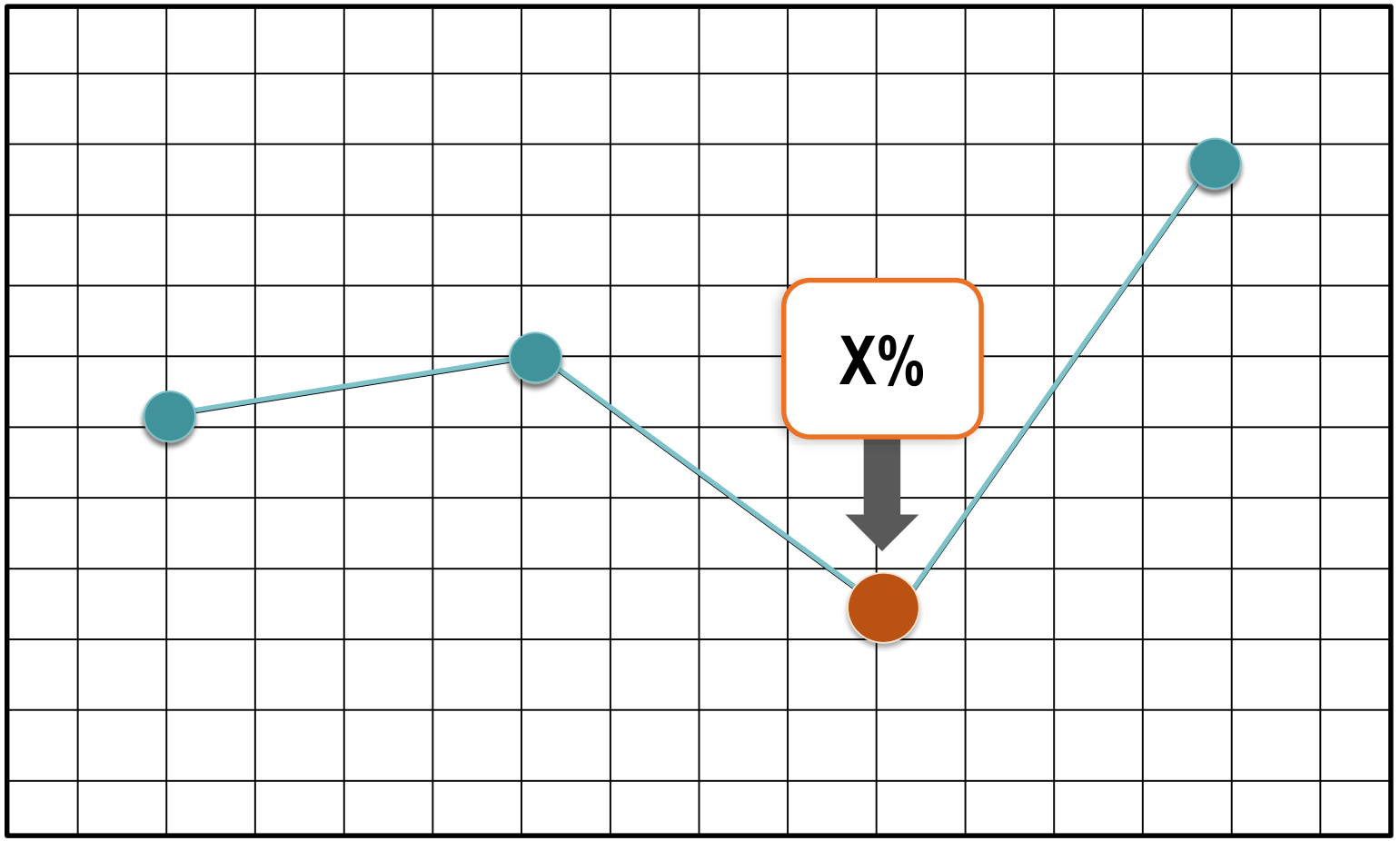
Make Sure **Content Can Breathe**

Tips: Avoid moving written content into the margins (leave a buffer).

Images can bleed fully to the edge if desired, but avoid no-man's land (as pictured on left).

Remove Visual Clutter from Graphs

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et. consectetur adipiscing elit, sed



Remove Visual Clutter from Graphs

Use Color, Saturation, and Visual Indicators Meaningfully

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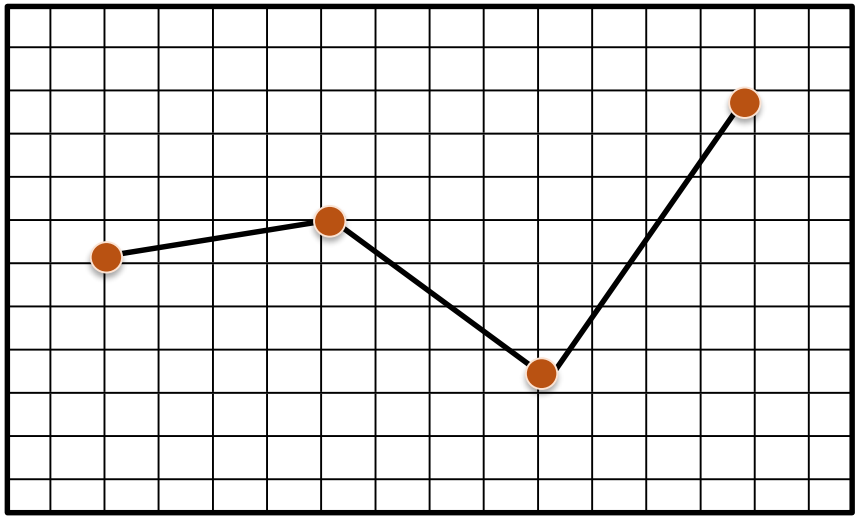
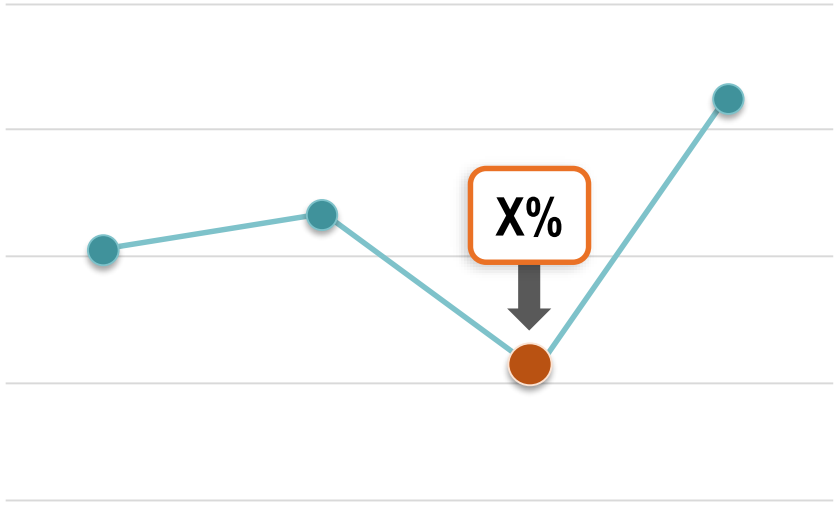


Lorem ipsum dolor sit amet, consectetur adipiscing elit



Reduce Amount of Text on PPT Slides

- **People can read or listen**, not both at same time.

6x7 rule

max **6 lines**

max **7 words** per line

6x7 Rule in Action

- **Lorem ipsum dolor sit amet, ante elit.**
- **Orci in scelerisque sollicitudin nonummy, turpis sapien.**
- Feugiat nisl dictum quam, ullamcor nec amet, gravida.
- Aliquet ut hendrerit duis, vivamus nam vel.
- Ligula ac adipiscing. Vestibulum turpis fusce, justo.
- Ultricies, fusce dolor wisi adipiscing, est amet.

- OK to break this rule
- Alternate text-heavy / text-light slides

Example: **Reducing PPT Text**

greater than

- Intentional overfishing~~; i.e.~~ setting a target ~~that is beyond the best estimate of~~ the overfishing limit. ~~In principal, the~~ US has ended this type of overfishing.

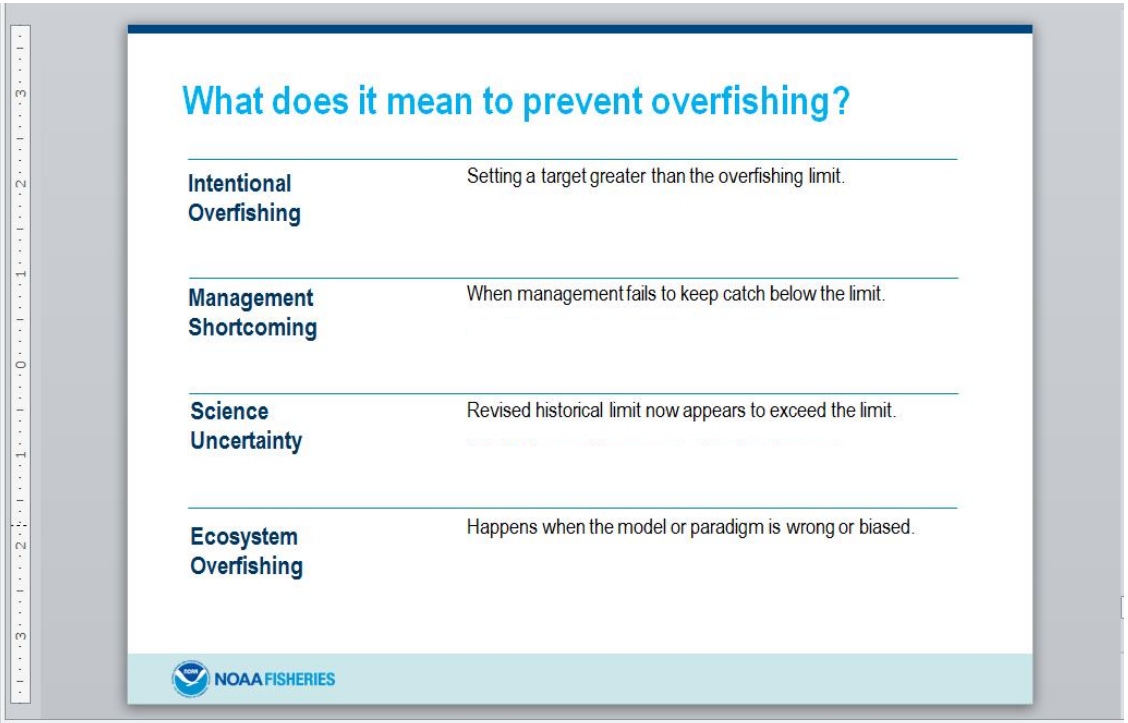
Intentional Overfishing	Setting a target greater than the overfishing limit.

Example: **Reducing PPT Text**

Detailed info:

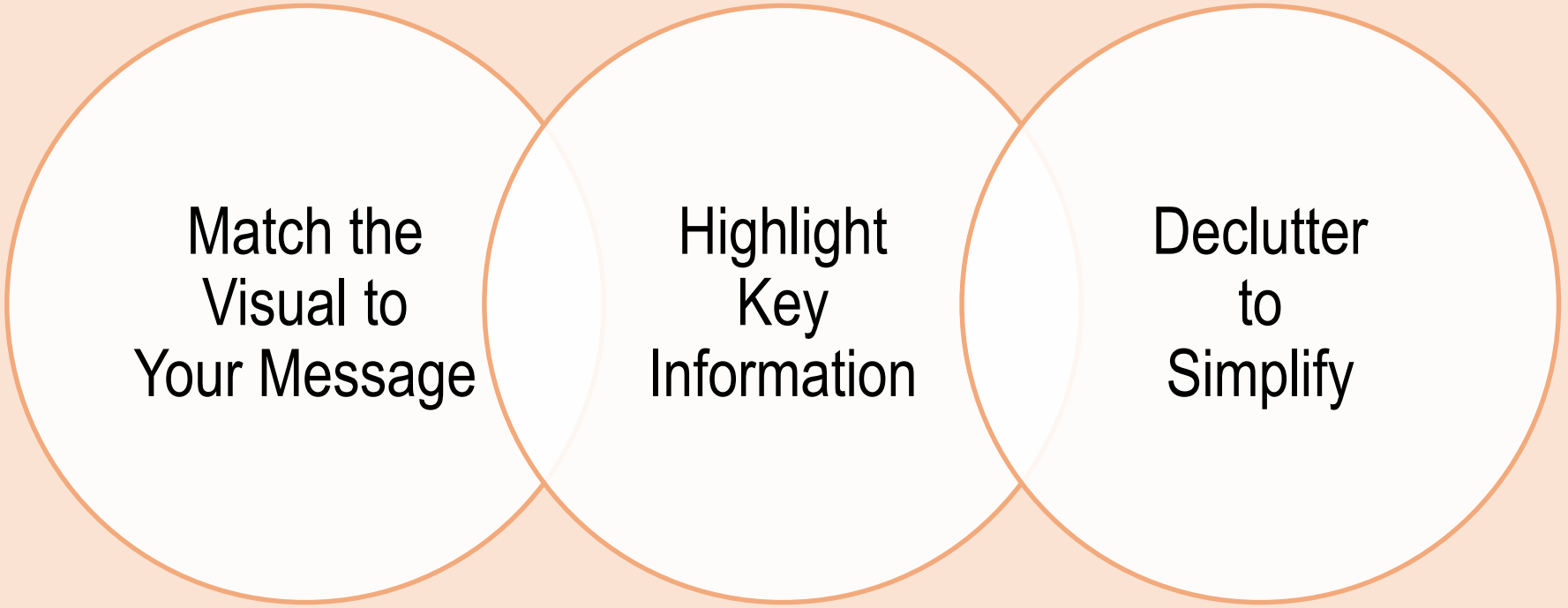
- Say out loud
- Move to…

  1) PowerPoint notes
  2) Appendix slides
  3) Reference docs



Intentional overfishing - i.e. setting a target that is beyond the best estimate of the overfishing limit. In principal, the US has ended this type of overfishing.
Management shortcoming - this occurs when fishery management procedures fail to keep the catch below the overfishing limit. This could be accidental (procedures were in place but they didn't work), or structural (no credible accountability measures were in place to keep catch under control within the fishing season).
Science uncertainty - this leads to retrospective revision of calculated historical abundance and fishing mortality such that the revised historical level now appears to have exceeded the limit, even though the catch was not over the ACL. This may happen every few years as major updates of assessments occur.
Ecosystem overfishing - this occurs when the model/paradigm under which the tactical estimates of overfishing limits are calculated is wrong/biased/inadequate. We may not find out about this until decades later.

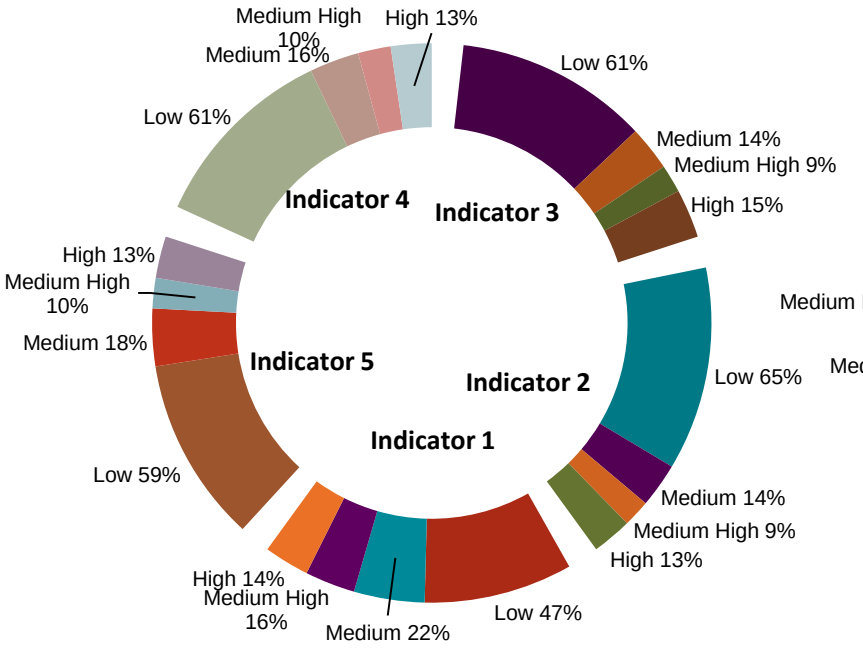
Summary Example



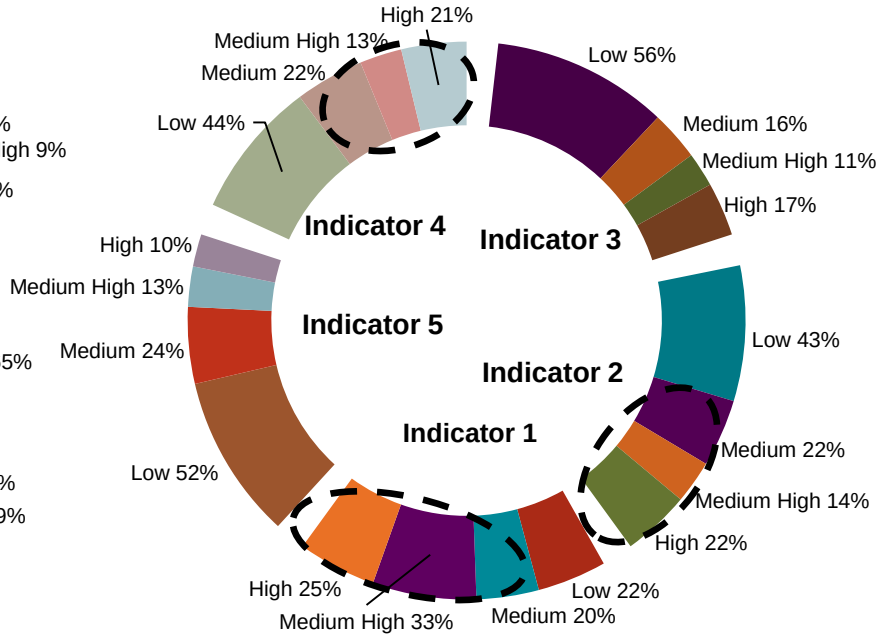
Example: Original (modified)

Graph Title Goes Here

G1 (Group 1)

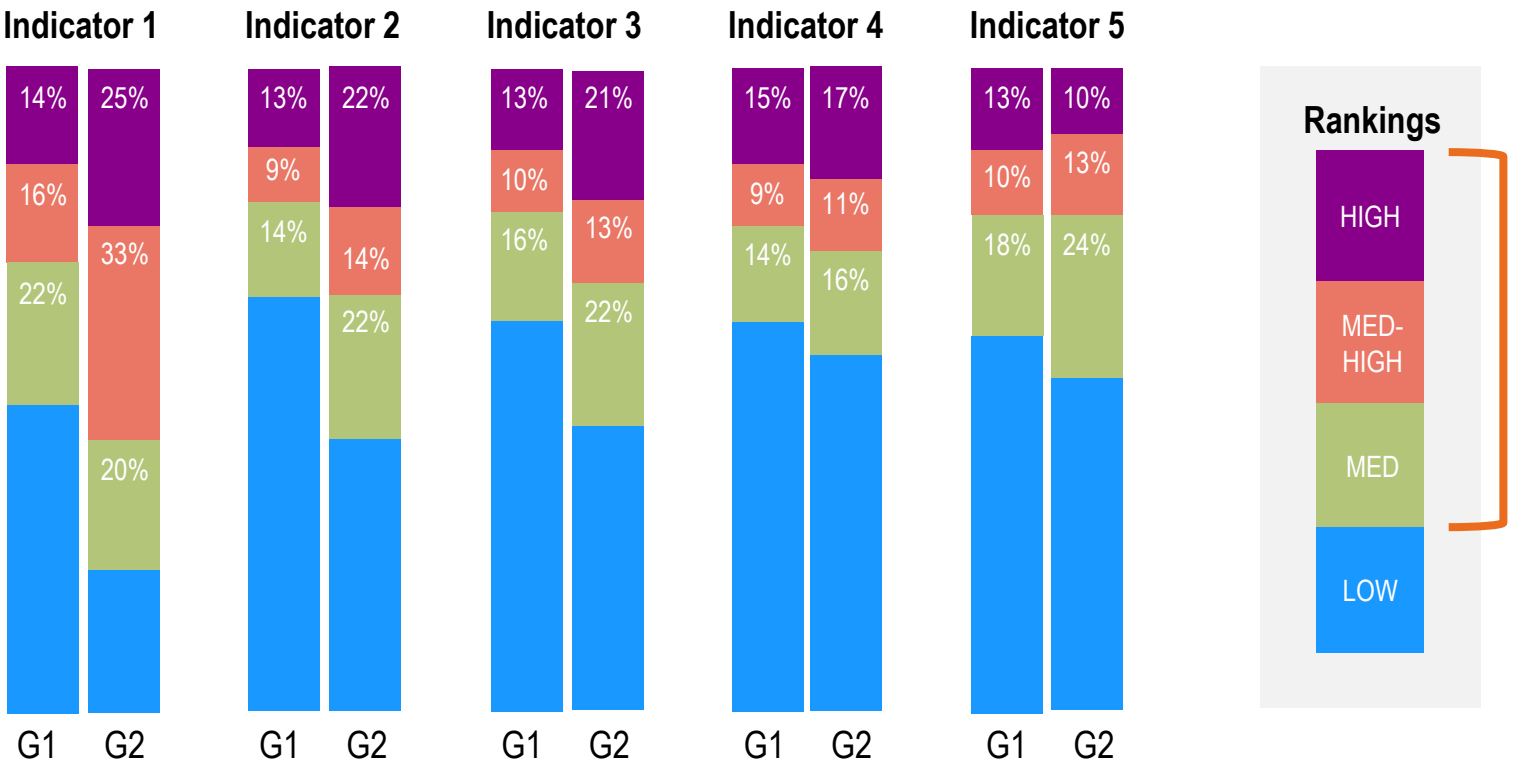


G2 (Group 2)

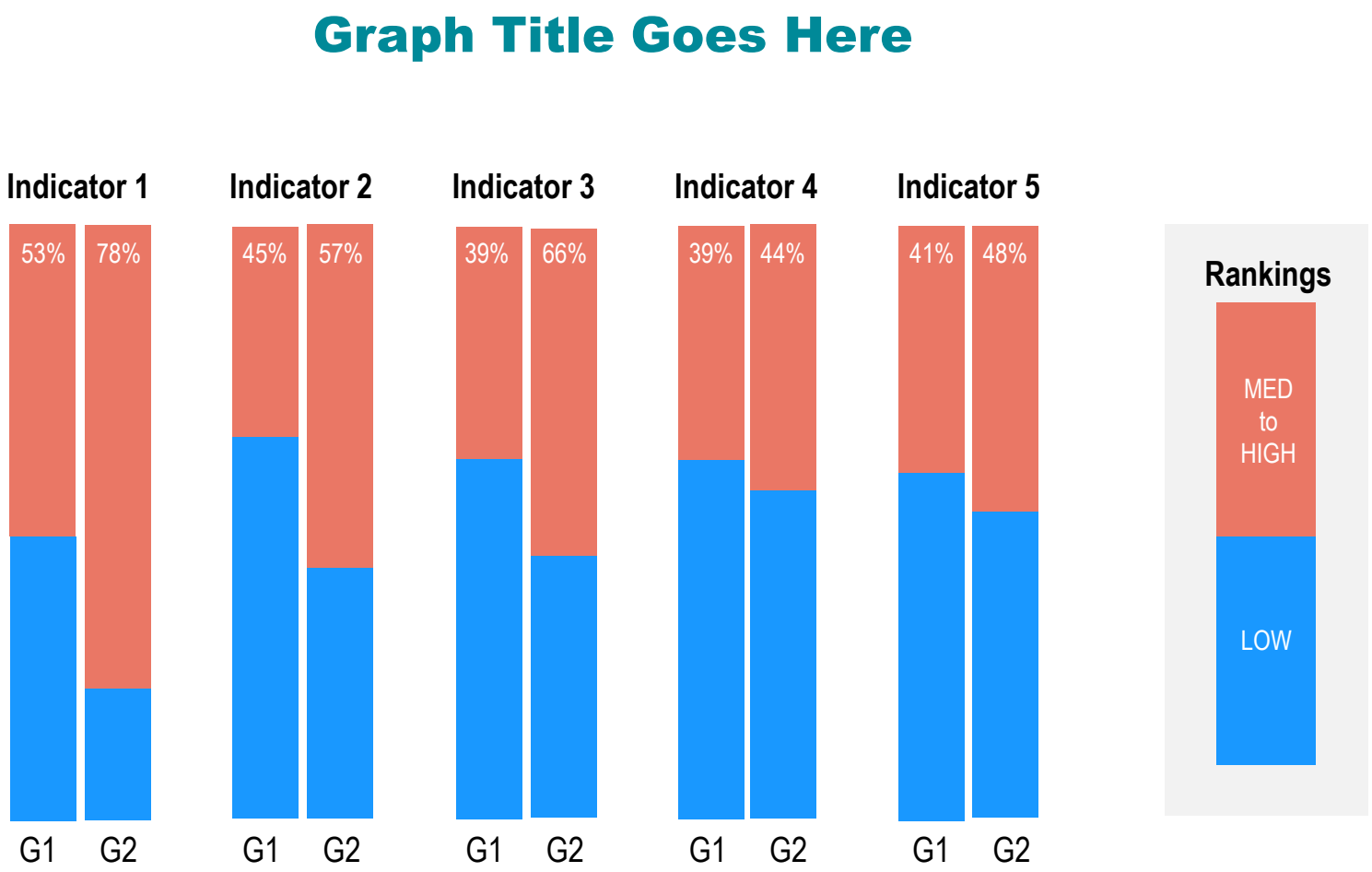


Example: **Draft 1** (modified)

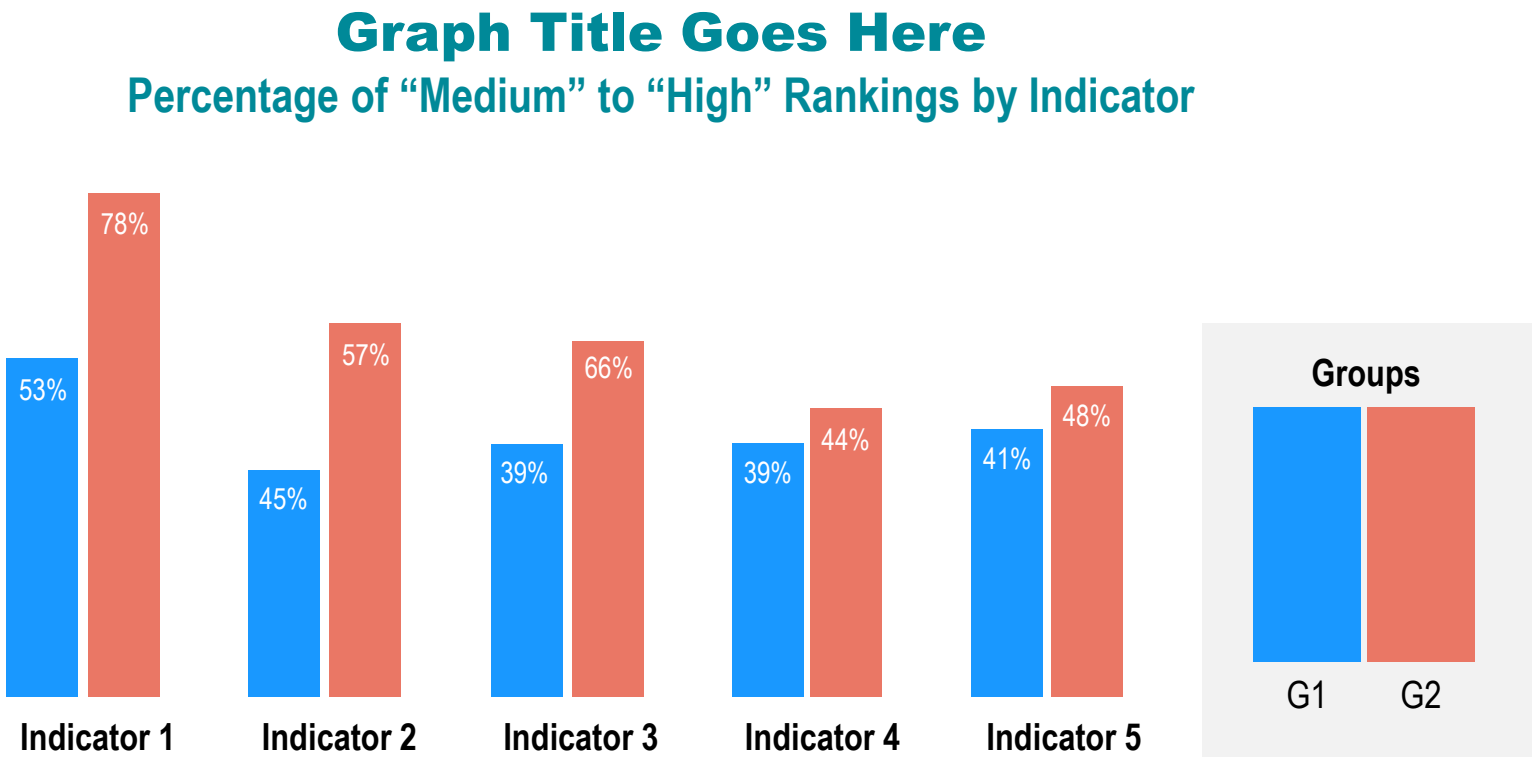
Graph Title Goes Here



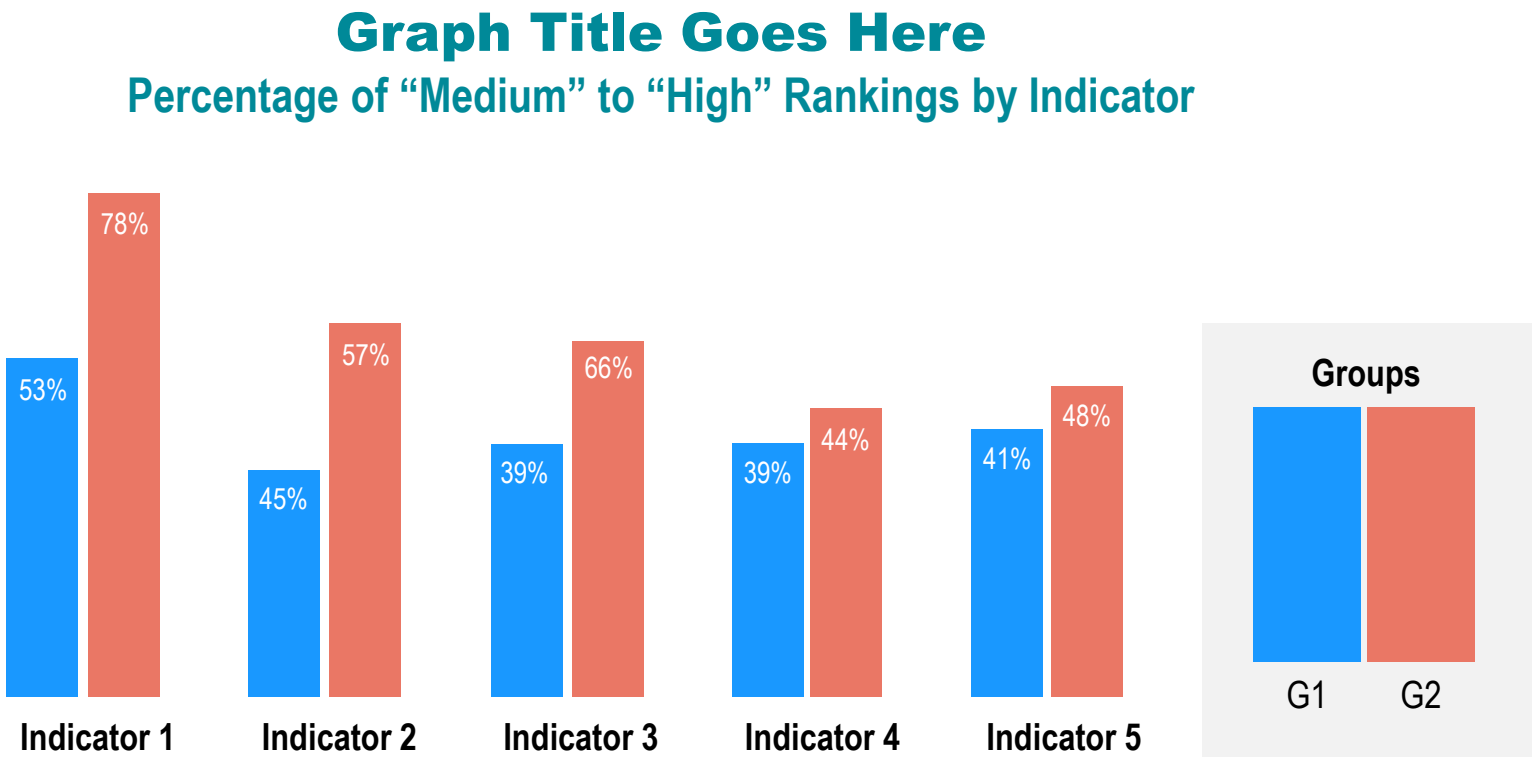
Example: **Draft 2** (modified)



Example: **Final** (modified)



Example: **Before + After**



Programs + Workflow

Common Programs

- **Not only one workflow.** Find one to suit your needs.
- If graph produced in analysis software, **consider styling elsewhere**.
- Don't have strong visual skills? **Consider training 1-2 visual point people** in your office in basic visuals skills/programs.

Resources

NOAA Fisheries Resources

- Intranet Brand Guide + Templates
- Plain Language Guidance
- NOAA Photos on Flickr

Reading Materials

- Slideology by Nancy Duarte
- Resonat by Nancy Duarte
- The Visual Display of Quantitative Information by Edward Tufte

Web + PowerPoint Resources

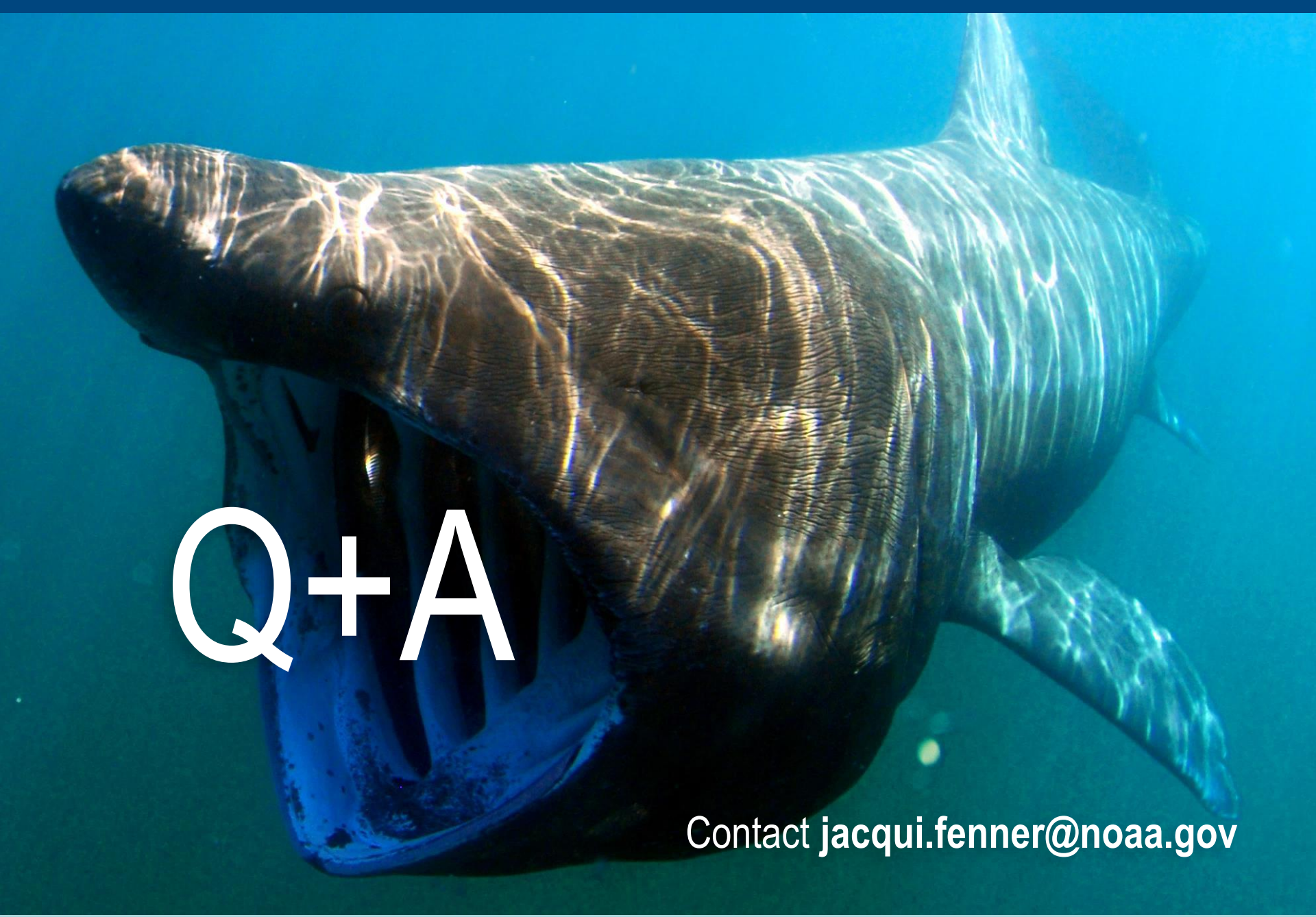
- Lynda.com (paid) or YouTube (free)
- PowerPoint:
  - SmartArt graphics
  - Add or Format shapes
  - Change order of objects
  - Edit or Crop images
- Shorten links

Acknowledgements

ECS People • Values • Purpose

NOAA FISHERIES

- **Communications Office**
- **Office of Science and Technology (ST)**
  - **ST Communications Team**
    esp. Avi Litwack, Laura Oremland, Cara Mayo
    Rita Curtis, John Thibodeau
  - **ST Staff** who provided examples


Q+A
Contact jacqui.fenner@noaa.gov