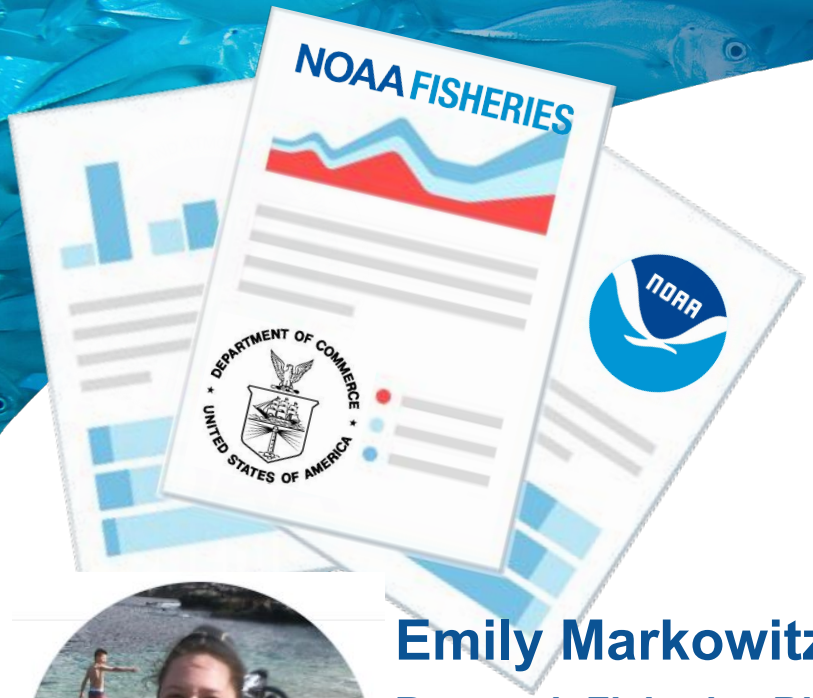
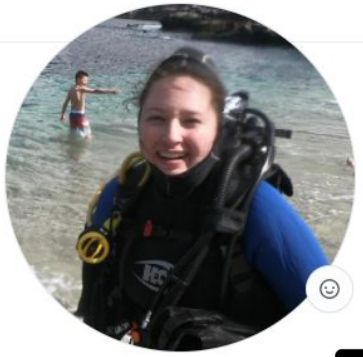


NMFSReports

Easily write NOAA reports and tech memos in R Markdown!



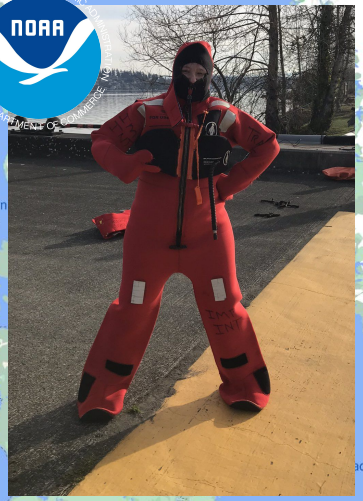
Emily Markowitz

Research Fisheries Biologist
NOAA Fisheries
Alaska Fisheries Science Center
Emily.Markowitz@noaa.gov

June 05, 2021
2021 R Cascadia Conference

Emily Markowitz
EmilyMarkowitz-NOAA

@emilyhmarkowitz
https://emilymarkowitz-noaa.github.io/NMFSReports/



Resource Assessment and Conservation Engineering Division

A Division of the Alaska Fisheries Science Center

Office of Science and Technology

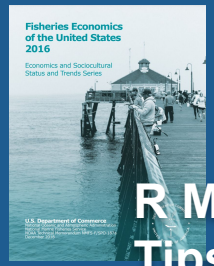
Providing the science behind how we manage sustainable fisheries, protected species and healthy ecosystems.

Inspiration

While re-writing the annual high-level *Fisheries Economics of the US report,* into R Markdown, I picked up a few tips and tricks.
(Talk at DC satRdays 2020)

...so I started building a package of my favorite functions to make future report writing easier and more efficient.

…then realized that this could be useful to others!



R Markdown + Tips & Tricks

{EmFavFuncts}

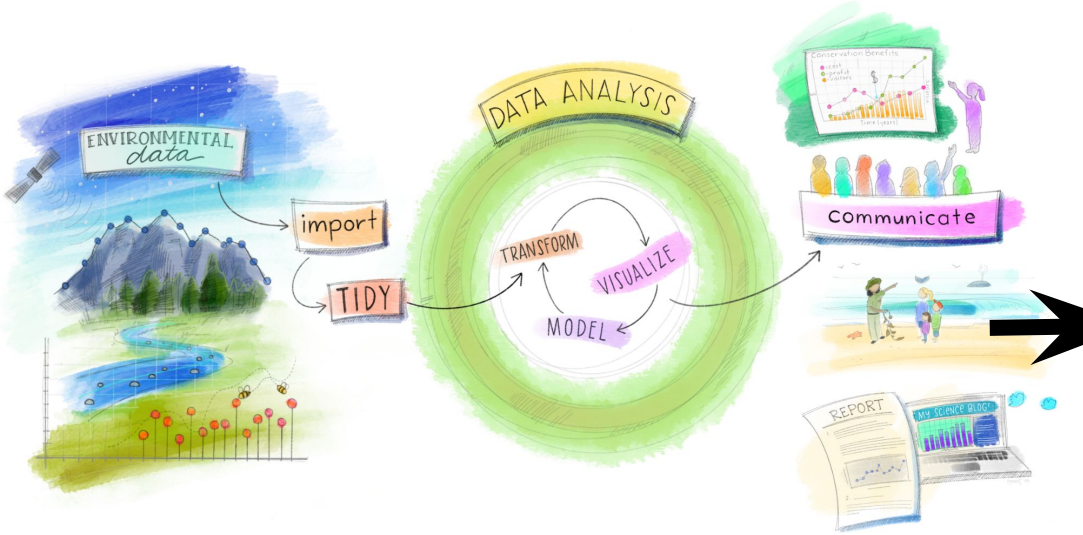
{NMFSReports}

Previously...


Collect Data
SMEs Determine Data Caveats
Report Editor Prepares Report
Collating and preparing the report from all the provided (or not provided) pieces.
SMEs Review Report Content
Design Report, Infographics, and Fact Sheets
Designer makes Report 508 Compliant
Series Editor Signs Off on Report
Leadership Reviews and Approves Report
Report is "Rolled Out" for Public Release

knockknockk

Now, with NMFSReports...



Cover or support these parts of the report creation process.

Series Editor Signs Off on Report → Leadership Reviews and Approves Report → Report is "Rolled Out" for Public Release

"Artwork from @juliesquid for @openscapes (illustrated by @allison_horst)."

NMFSReports

To automatically and easily create reports in RMarkdown!

(Report writing, but make it science!)

https://emilymarkowitz-noaa.github.io/NMFSReports


```
library(devtools)
devtools::install_github("EmilyMarkowitz-NOAA/NMFSReports")
library(NMFSReports)
```

What we need to automate a large report:

Data Download Automation

Streamline Report Creation

Consistent Grammar Structure

Built-in 508 Accessibility

Version Control

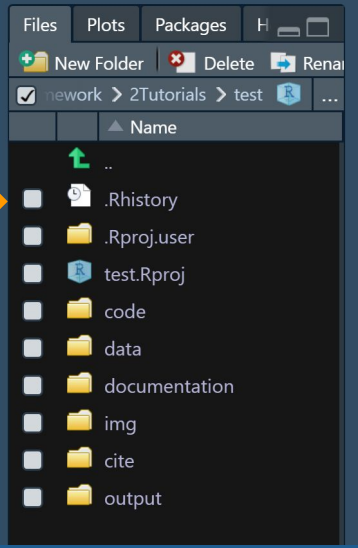
Output Flexibility

Build a Report Outline in 3 Easy Steps


```
# 1. Load the NMFSReports Library
library(devtools)
devtools::install_github("EmilyMarkowitz-NOAA/NMFSReports", force = TRUE)
library(NMFSReports)

# 2. Build your report
NMFSReports::buildReport(
  sections = c("abstract", "introduction", "history",
               "methods", "results", "results_spp",
               "results_discussion", "endmatter", "presentation"),
  report_authors = "Me, Myself, and I",
  report_title = "Data Report: All of NOAA's Coolest Data Ever!",
  styles_reference_pptx = "refppt_nmfs",
  styles_reference_docx = "refdoc_noaa_tech_memo",
  bibliography.bib = "bib_example",
  csl = "bulletin-of-marine-science"
)

# 3. Run your run.R file
source("./code/run.R")
```



Streamline Report Creation

Video Demo

Example of how to use this R Markdown document

Here is the report content:

Systematic writing of content

My example dataset has 100 rows in it and three columns in it.[1]

This sentance examplifies how to systematically calculate a percent change: a 97% decrease[2].

Here are several types of vessels: NOAAS Vessel, F/V Fishing Boat, R/V University Vessel, and Private Charter.

Equations

Here is some equation you'll need to have in this report, of which produces the variable X.

Equation 1. Pythagorean theorem.[3]

$$c^2 = b^2 + a^2$$

Alternative text: The Pythagoras theorem is a mathematical law that states that the sum of squares of the lengths of the two short sides of the right triangle is equal to the square of the length of the hypotenuse.

[Text blah blah]

Equation 2. Newton's Universal Law of Gravitation.

$$F = G\frac{m_1 m_2}{d^2}$$

[1] Wow, this project is so cool!

[2] Here's another, free-written footnote!

[3] footnote about how cool the pythagorean theorem is.

Remember the pythagorean theorem from before? That was Equation #1 and it had a footnote that said "footnote about how cool the pythagorean theorem is."

Citations

There are a lot of ways to cite within your report, so here is an example of two: (Try 1957) and Arrhenius (1889). Checkout https://github.com/cboettig/knitcitations for more info!

Note that references will appear at the bottom of this document (and any document that you put references in) but when you combine this document with all of the other documents that you create, it will shift to the bottom of the report.

Example Figure (Plot)

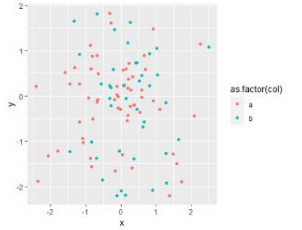


Figure 1. Here is a figure![4,5]

[4] A footnote for this figure!

[5] A second footnote for this figure!

Alternative text: This is a scatter plot of random data

Here in plot 1, we see that....

Example Figure (Reference Image)

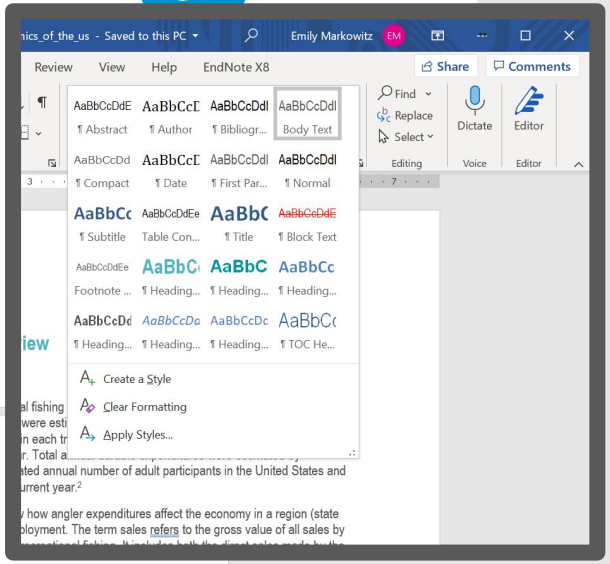
Example Table (Basic)

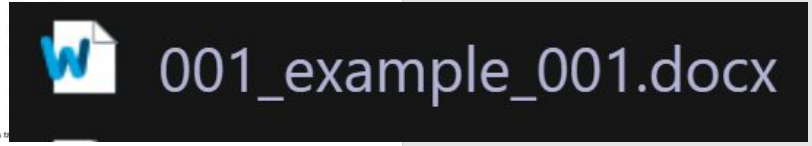
Table 1. Here is a table![7]

col	x	y
A	0.19	0.14
B	0.76	0.52
C	0.62	1
D	-0.83	-1.3
E	-1.1	0.75
F	0.021	2.2
G	0.23	-0.079
H	-0.29	-0.92

col	x	y
B	1.6[10,11]	-0.87
C[12]	0.36[13]	-2.2
D[14,15]	-1.1	-0.42
E		
F		
G		
H		
I		
J		

Here in th





ata Report: MAXYR Eastern Bering Sea continental shelf Bottom Trawl Survey of Groundfish and Invertebrate Fauna

L. Britt, E. J. Dawson, R. Haehn and E. H. Markowitz

NOAA FISHERIES

1

Example of how to use this R Markdown document

NOAA FISHERIES

2

Figure 1. Here is a figure!

Table 1. Here is a table!

col	x	y
A	0.19	0.14
B	0.76	0.52
C	0.62	1
D	-0.83	-1.3
E	-1.1	0.75
F	0.021	2.2
G	0.23	-0.079
H	-0.29	-0.92
I	-1.3	-0.014
J	0.2	-0.49

NOAA FISHERIES

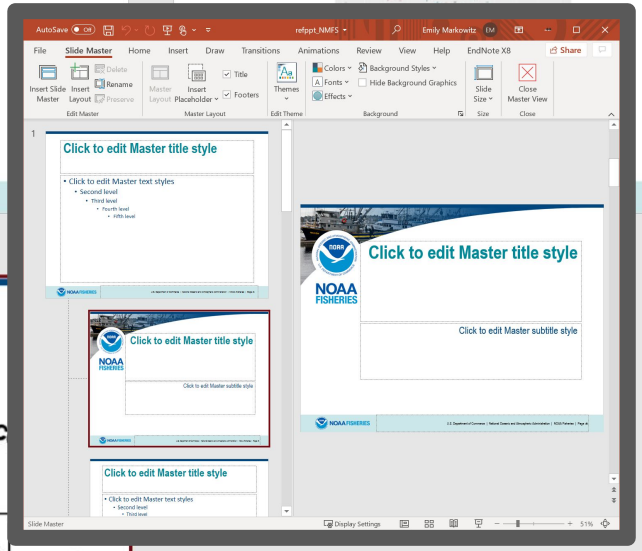
4

Slide X

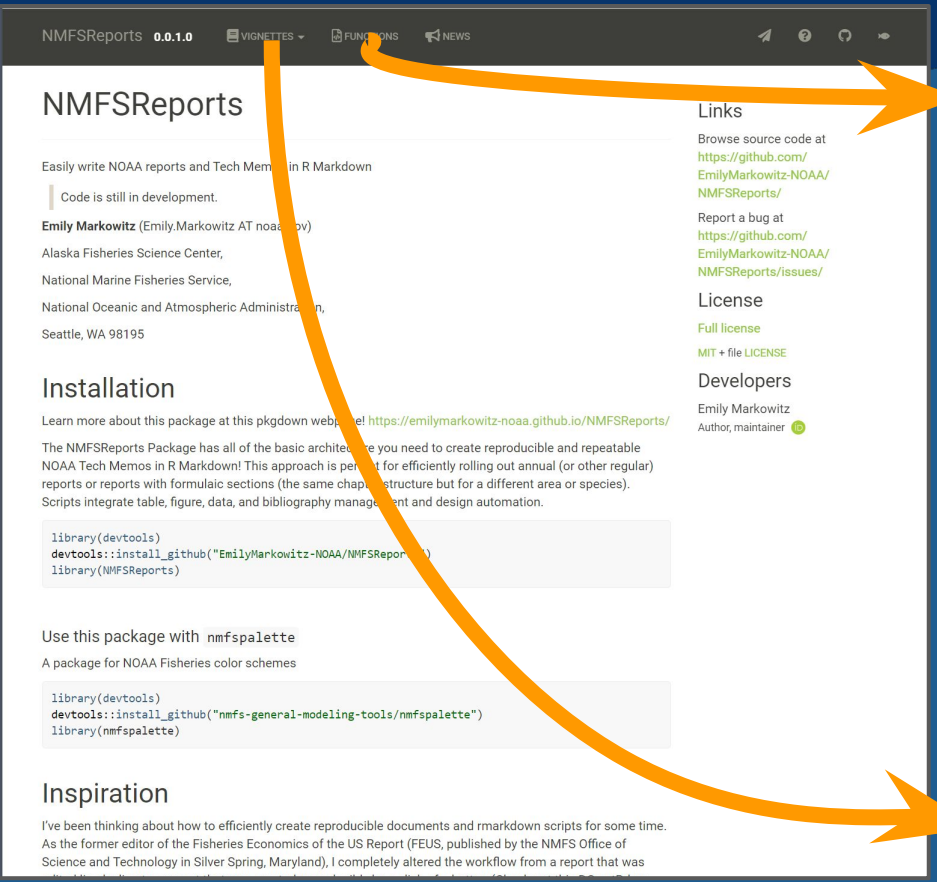
- Text 1.
- Text 2.

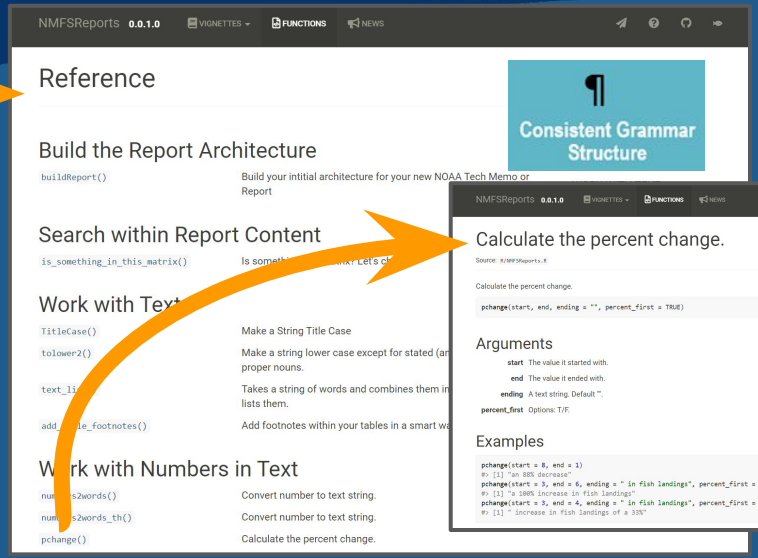
NOAA FISHERIES

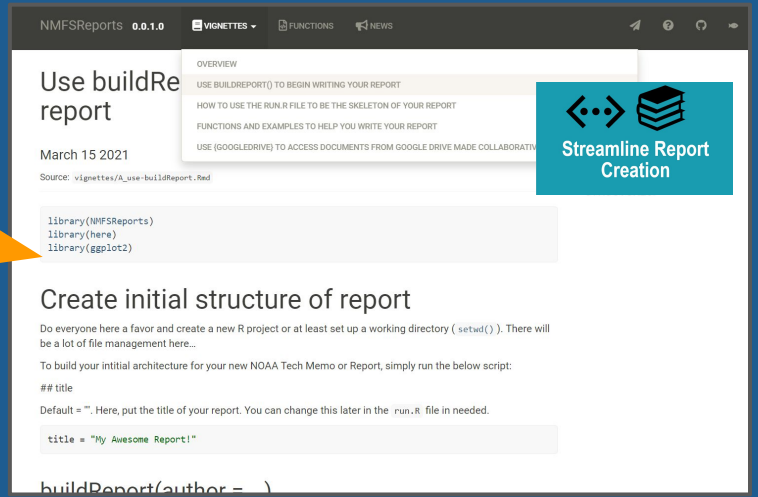
5



010_presentation_001.pptx







Function

Vignettes

Pgkdown page: https://emilymarkowitz-noaa.github.io/NMFSReports/

Untitled1* | 0_example.Rmd

Knit

```yaml
---
output:
  word_document:
    pandoc_args: ["--metadata-file=header.yaml"]
    reference_docx: styles_reference.docx
    df_print: kable
csl: "../cite/citestyle.csl"
bibliography: "../cite/bibliography.bib"
---
```

Streamline Report Creation

Citation Style

Bibliography

docx or pptx Style

```
## Citations

There are a lot of ways to cite within your report, so here is an example of two: [@RN686] and
@RN621. Checkout https://github.com/cboettig/knitcitations for more info!
```

Citations

There are a lot of ways to cite within your report, so here is an example of two: (Fry 1957) and Arrhenius (1889). Checkout https://github.com/cboettig/knitcitations for more info!

References

Arrhenius S. 1889. Über die reaktionsgeschwindigkeit bei der inversion von rohrzucker durch säuren. Zeitschrift für physikalische Chemie 4: 226–248.

Fry FEJ. 1957. The physiology of fishes. London: Academic Press.

(We're not at html-based or code-to-pdf reports yet - this is what editors expect to receive.)

Built-in 508 Accessibility

Accessible colors and fonts using MS styles.

```
---
title: ""
author: ""
date: ""
output:
   word_document:
      df_print: kable
      reference_docx: word-styles-reference.docx
---
```

Formatting styles to tag sections (H1, H2, H3) that are inherited into screen reader tags.

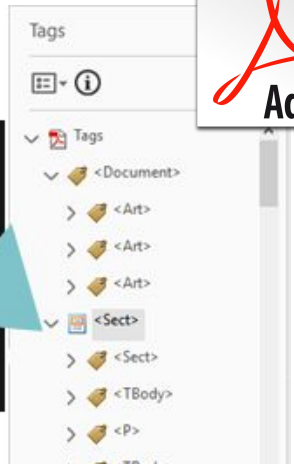
H2 (Header 2)

P (Paragraph)

Footnote

```
## Economic Impacts

The premise behind economic impact modeling is that every
spent in a regional economy (direct impact) is either saved
re-spent on additional goods or services. If those dollars are
re-spent on other goods and services in the regional economy,
this spending generates additional economic activity in the
region.`r paste0("^[", Footnotes.list$ft_FEUStool,"]")`
```



Output Flexibility

The same code can be used to reproducibly produce other products: *(For example)*

Saltwater Recreational Fisheries Snap Shots

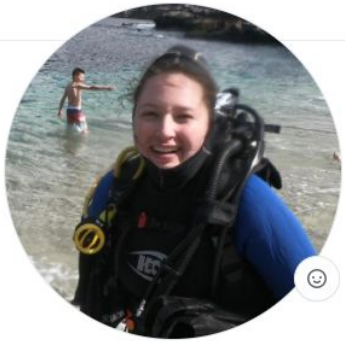
Fact Sheets and Infographics

Online Webtool

… and is now being applied to many products and reports at AFSC!

Thanks!

Be sure to check out these other great talks!



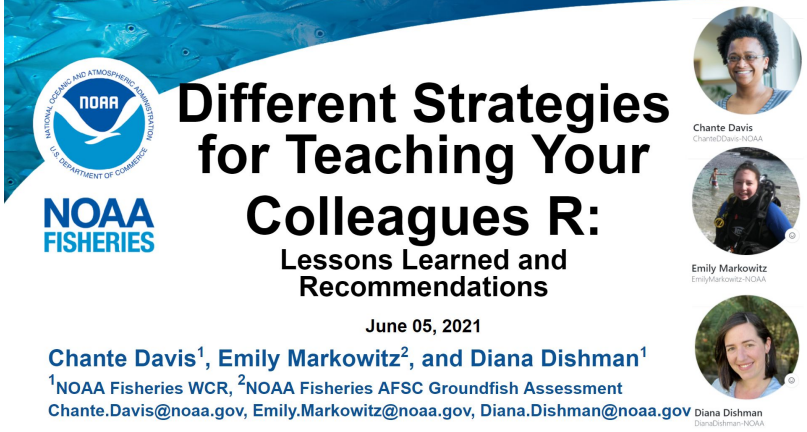
Emily Markowitz
EmilyMarkowitz-NOAA

https://emilymarkowitz-noaa.github.io/NMFSReports/

Emily.Markowitz@noaa.gov

@EmilyMarkowitz-NOAA

@EmilyHMarkowitz



What is R Markdown?

R Markdown provides a single medium for writing code and generating reports.

1. Use an R Markdown file to load data, run code, connect to databases, servers, spark clusters, and more.

2. Publish the results as a html, pdf, or Word file, or as a slide show, book, handout, dashboard, website, or interactive app.