

# Shiny optimization of climate benefits from a statewide agricultural grant program



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<https://wsda.shinyapps.io/WaCSE/>





# Washington's Sustainable Farms & Fields Program incentivizes climate-smart practices.

\$1.8 million in FY23

\$1.5 million in FY24

Photo: San Juan Island Conservation District

<https://wsda.shinyapps.io/WaCSE/>





# Benefits from climate-smart practices vary widely.



Photo: Molly McIlquham

We needed a decision-support tool to identify projects with the greatest climate benefits.

<https://wsda.shinyapps.io/WaCSE/>

# Models and tools for on-farm carbon and GHG accounting already exist.

**COMET  
Farm**



United States Department of Agriculture  
Natural Resources Conservation Service



Whole Farm and Ranch  
Carbon and Greenhouse Gas  
Accounting System.

Too hard to use!

**COMET-Planner**



Natural Resources Conservation Service  
U.S. DEPARTMENT OF AGRICULTURE




**COLORADO STATE  
UNIVERSITY**

Too limited!

<https://wsda.shinyapps.io/WaCSE/>



# Our wishlist

 User-friendly for grant applicants and the public

 Interactively compare conservation practices

 Convert CO<sub>2</sub>eq estimates into familiar terms

 Downloadable spreadsheets and reports



Washington Climate Smart Estimator

<https://wsda.shinyapps.io/WaCSE/>

# Demo



WaCSE 3-min demo, no audio

Jadey Ryan

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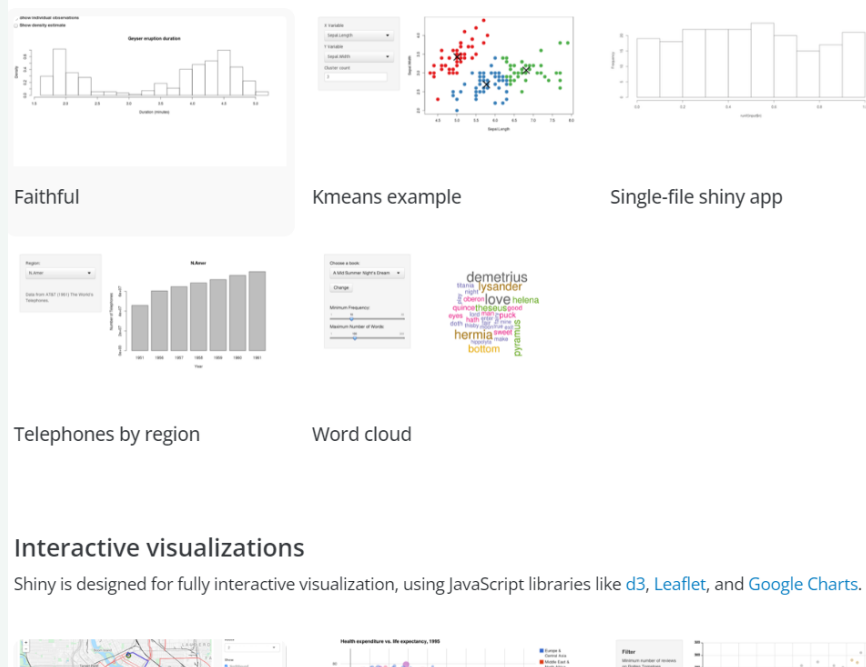


# Study Shiny 🤪 📖

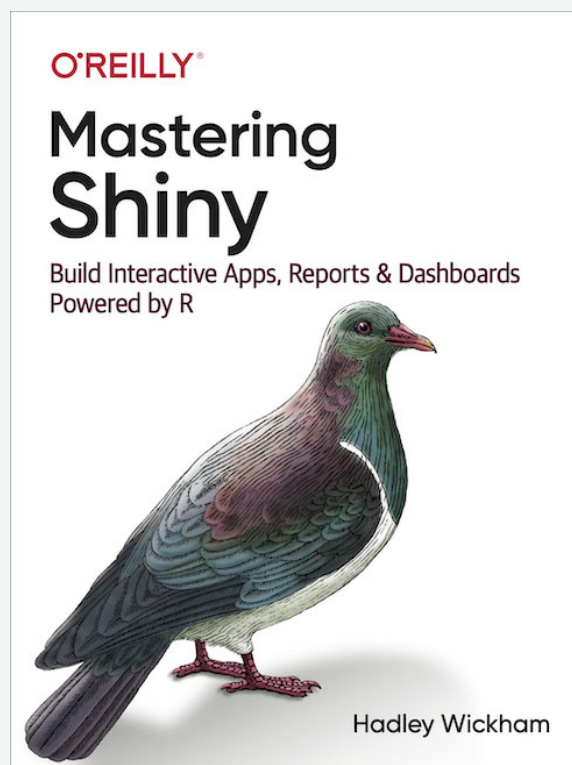
Start with examples and big picture workflows.

## Start Simple

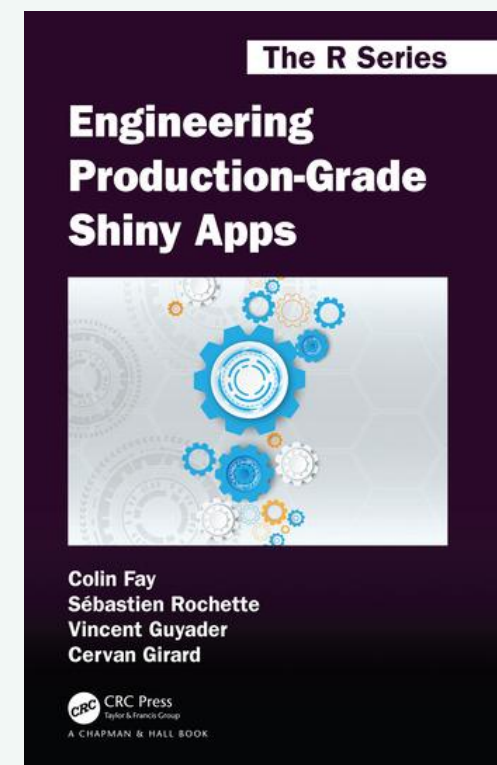
If you're new to Shiny, these simple but complete applications are designed for you to learn from.



Posit Shiny Gallery



Mastering Shiny

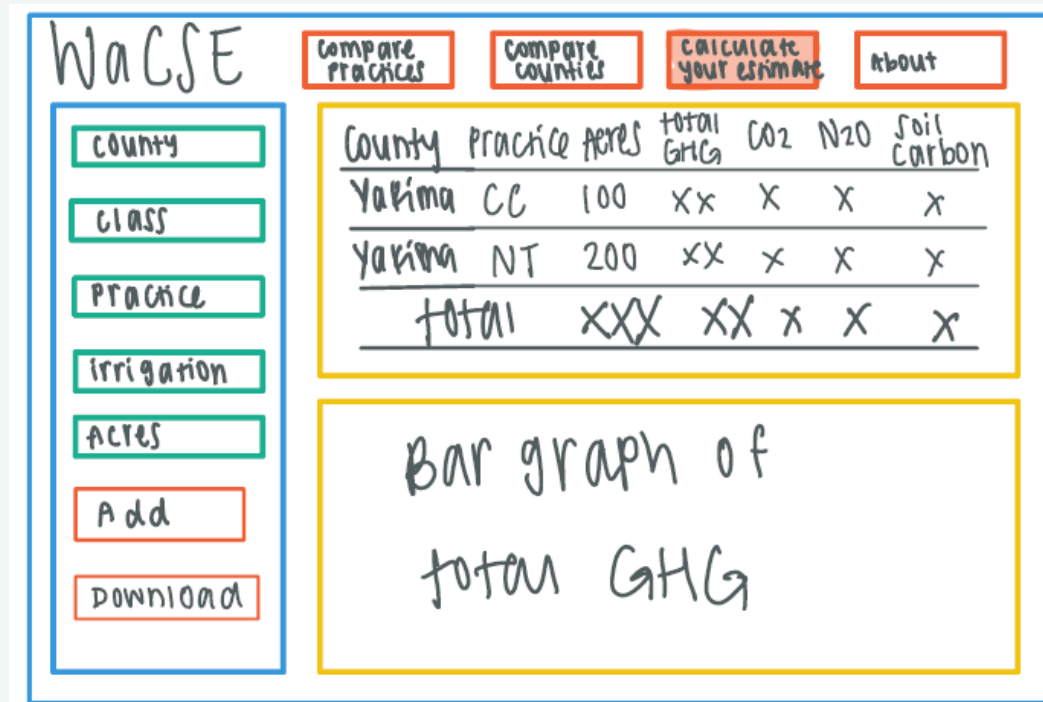
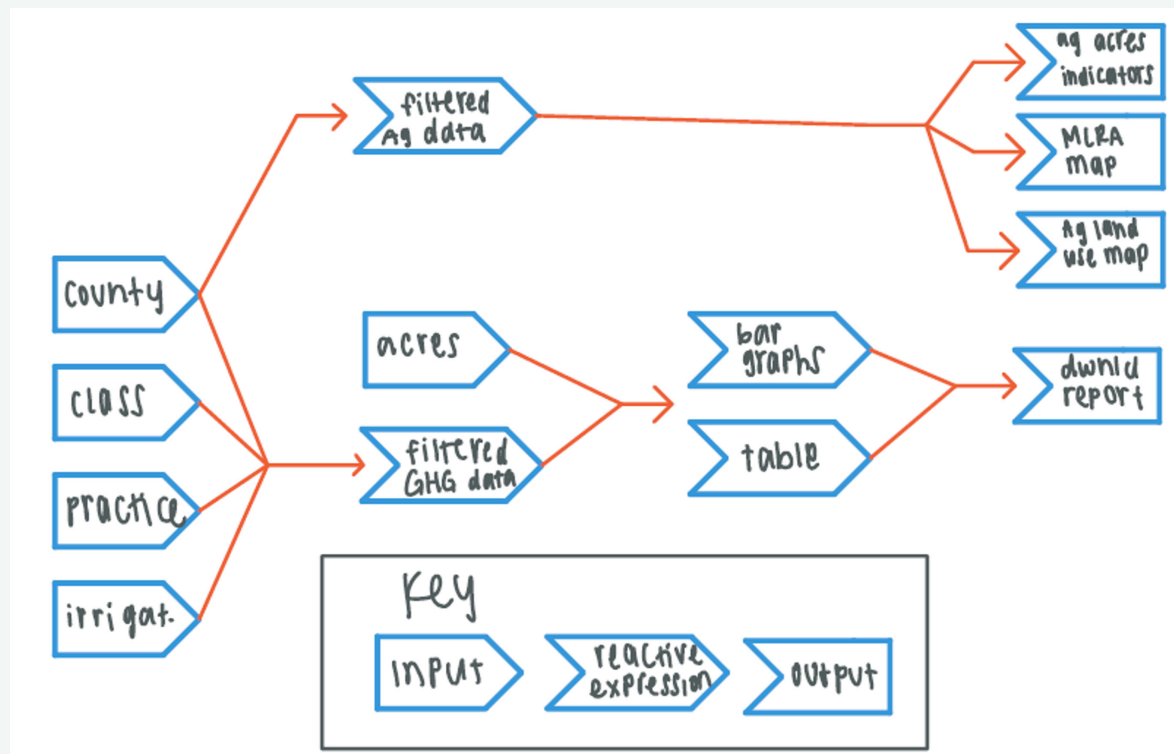


Engineering Production-Grade Shiny Apps

<https://wsda.shinyapps.io/WaCSE/>

# Wireframe Wishes

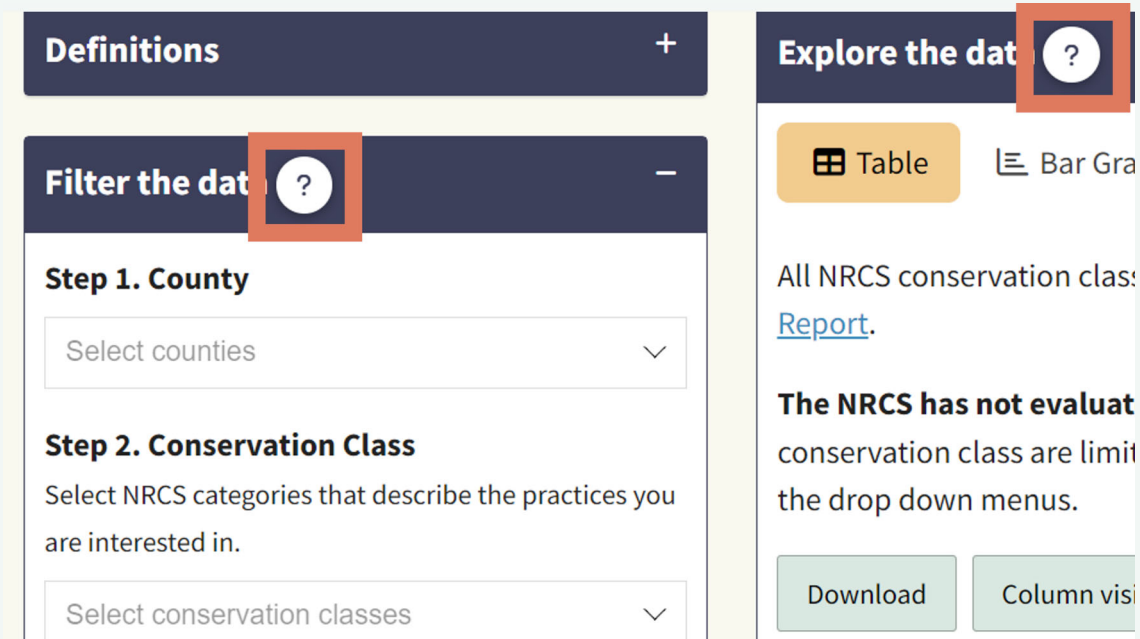
Before coding, sketch data flows and app design.





# Construct Code

Prototype then refactor with custom functions.



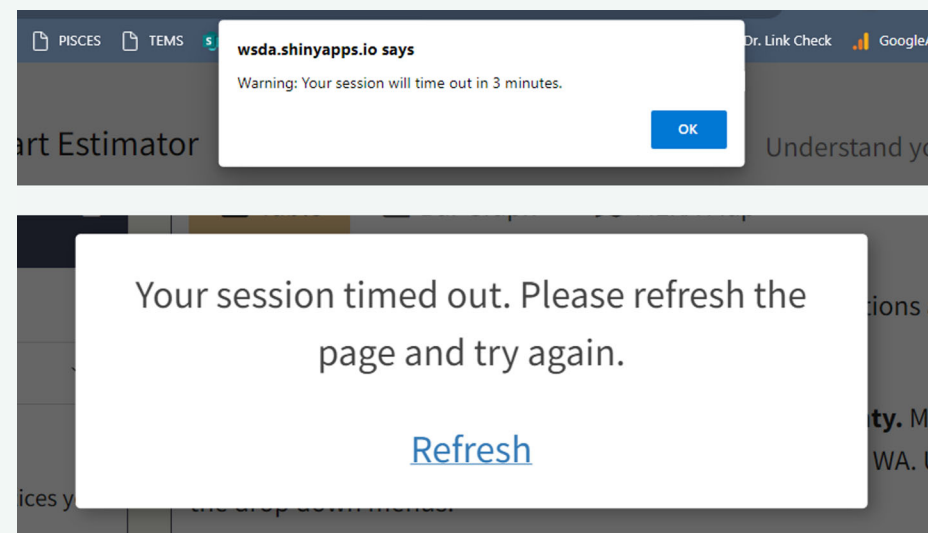
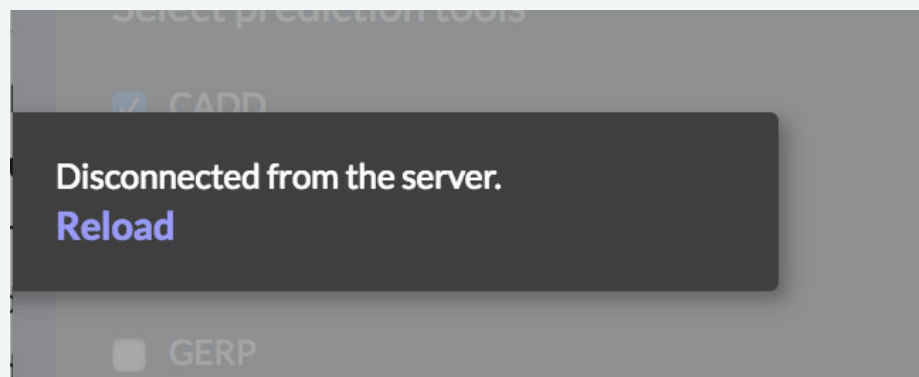
The screenshot shows a Shiny application interface. On the left, there is a sidebar titled 'Filter the data' with a question mark icon in a red box. It contains two steps: 'Step 1. County' with a dropdown menu labeled 'Select counties', and 'Step 2. Conservation Class' with a dropdown menu labeled 'Select conservation classes'. On the right, there is a panel titled 'Explore the data' with a question mark icon in a red box. It shows a table view of NRCS conservation classes and a message: 'The NRCS has not evaluated conservation class are limited in the drop down menus.' There are buttons for 'Download' and 'Column visibility'.

```
1 fct_helpBtn <- function(id) {
2   shinyWidgets::actionBtn(
3     inputId = id,
4     label = NULL,
5     icon = icon("question"),
6     style = "material-circle",
7     size = "xs",
8   )
9 }
```

# Elevate Experience

Incorporate HTML, CSS, JavaScript to improve user experience.

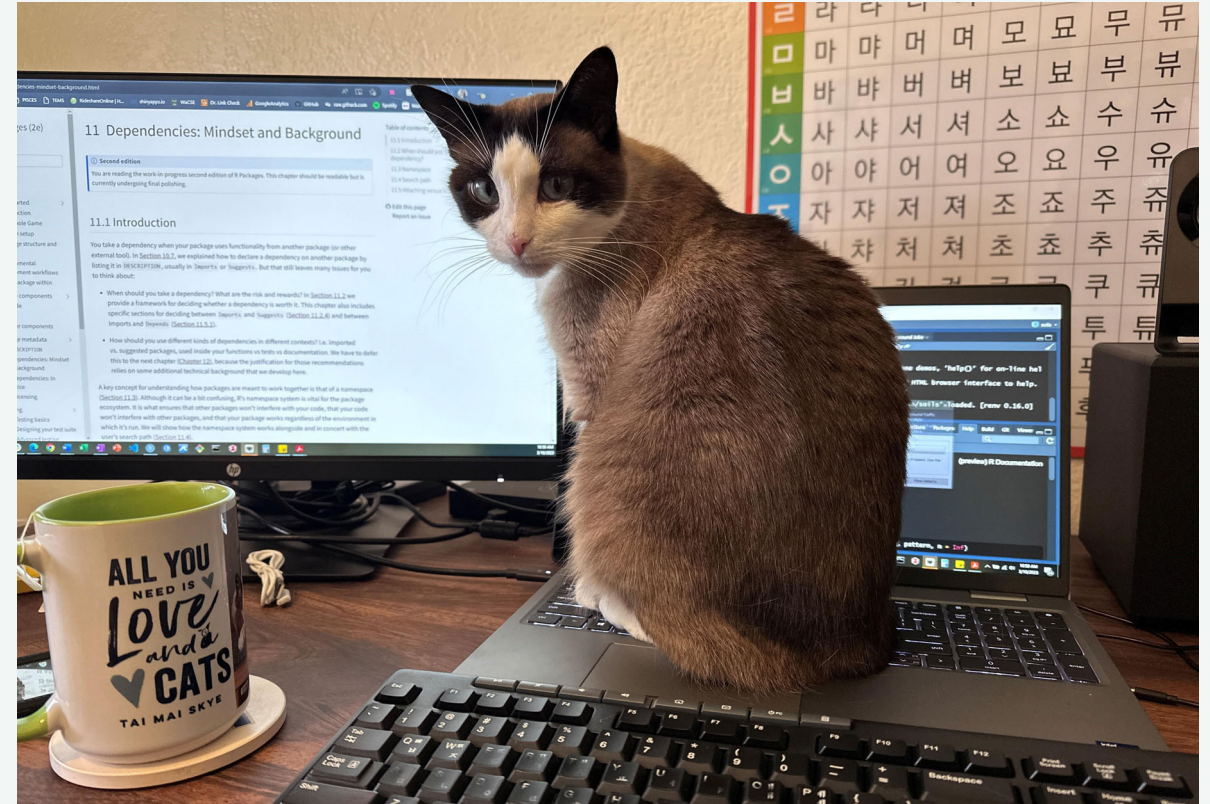
```
1 shinyjs::runjs(  
2   "function onTimeout() {  
3     alert('Warning: Your session will time out in 3 minutes.');"br/>4   } ...")  
5  
6 shinydisconnect::disconnectMessage(  
7   text = "Your session timed out. Please refresh the page and try again.",  
8   refresh = "Refresh")
```



<https://wsda.shinyapps.io/WaCSE/>

# Try a new R package or workflow to solve a problem!

There are many amazing R resources, and the **community** is incredibly supportive!





# I'd love to connect with you!

 Slides

 WaCSE GitHub Repo

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 @jadeynryan

 WA Dept. of Agriculture Webpage



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