

# 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-minute demo, no audio



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



# 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.



Faithful

Kmeans example

Single-file shiny app



Telephones by region

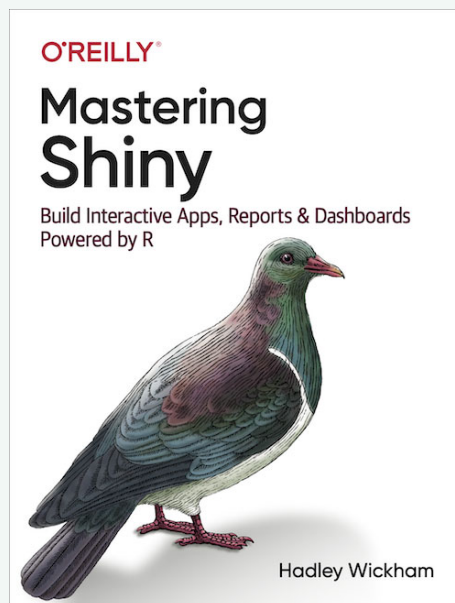
Word cloud

## Interactive visualizations

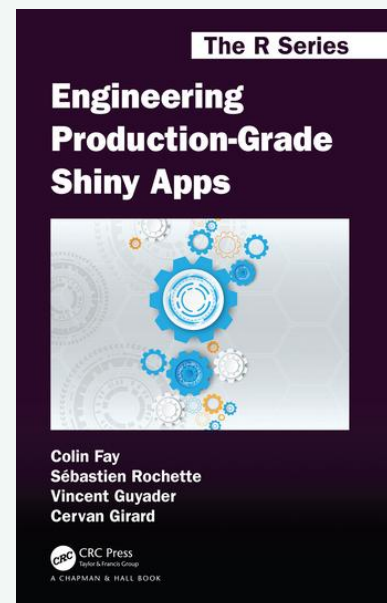
Shiny is designed for fully interactive visualization, using JavaScript libraries like [d3](#), [Leaflet](#), and [Google Charts](#).



Posit Shiny Gallery



Mastering Shiny



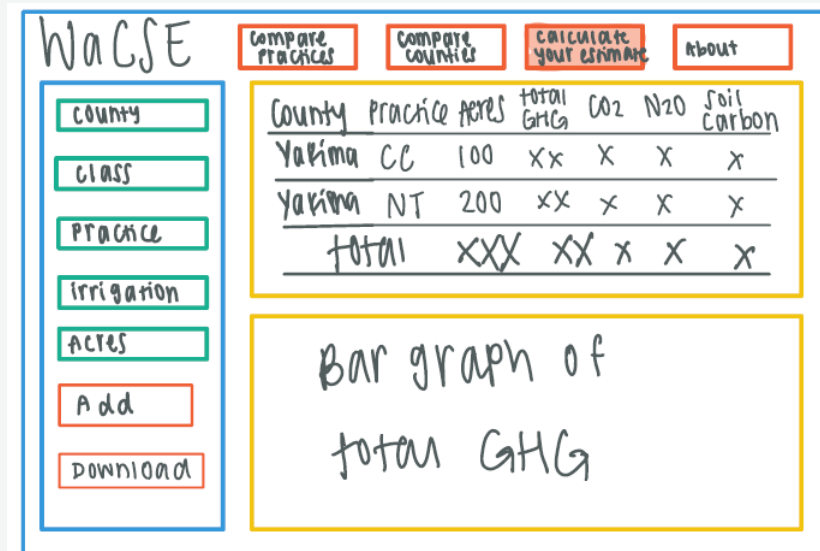
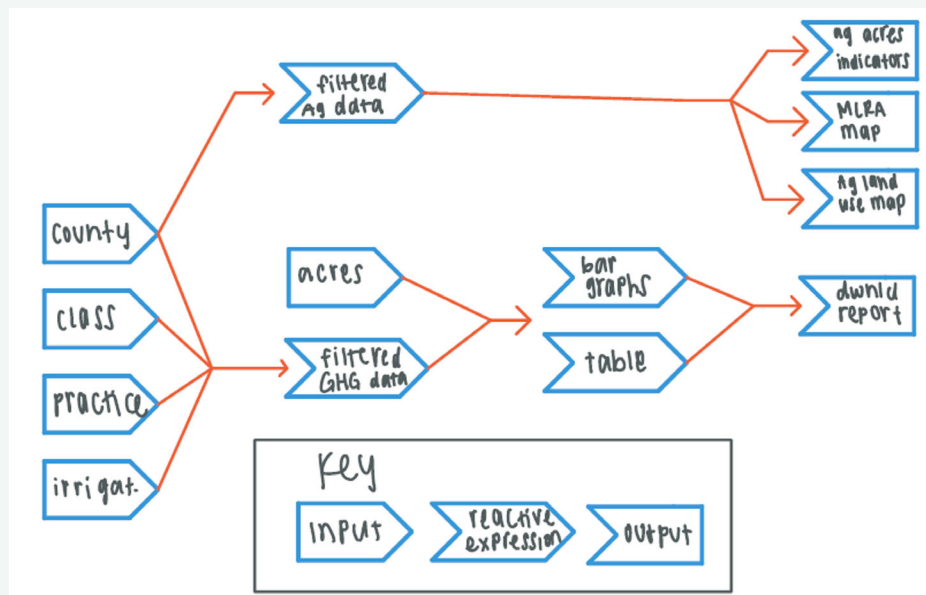
Engineering Production-Grade Shiny Apps

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



# Wireframe Wishes

Before coding, sketch data flows and app design.



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# Construct Code

Prototype then refactor with custom functions.

Definitions +

Filter the data ? -

**Step 1. County**

Select counties

**Step 2. Conservation Class**

Select NRCS categories that describe the practices you are interested in.

Select conservation classes

Explore the data ?

Table Bar Gra

All NRCS conservation class

[Report.](#)

**The NRCS has not evaluat**

conservation class are limit

the drop down menus.

Download Column visi

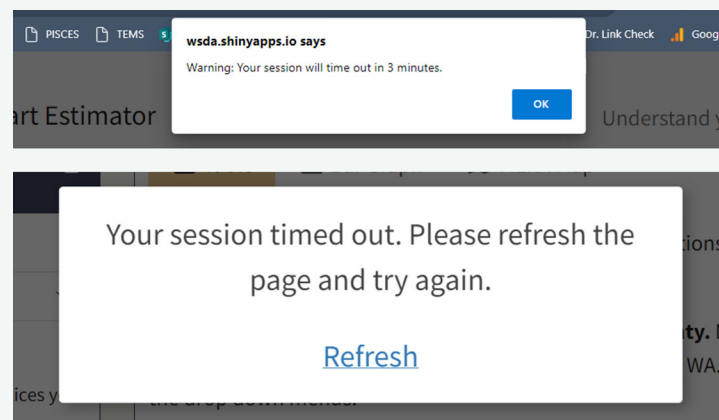
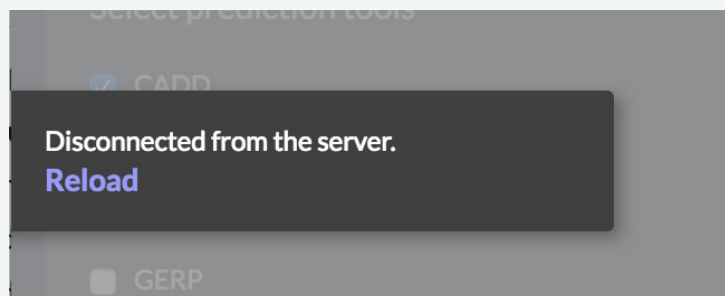
```

1 fct_helpBtn <- function(id) {
2   shinyWidgets::actionBttn(
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")
```

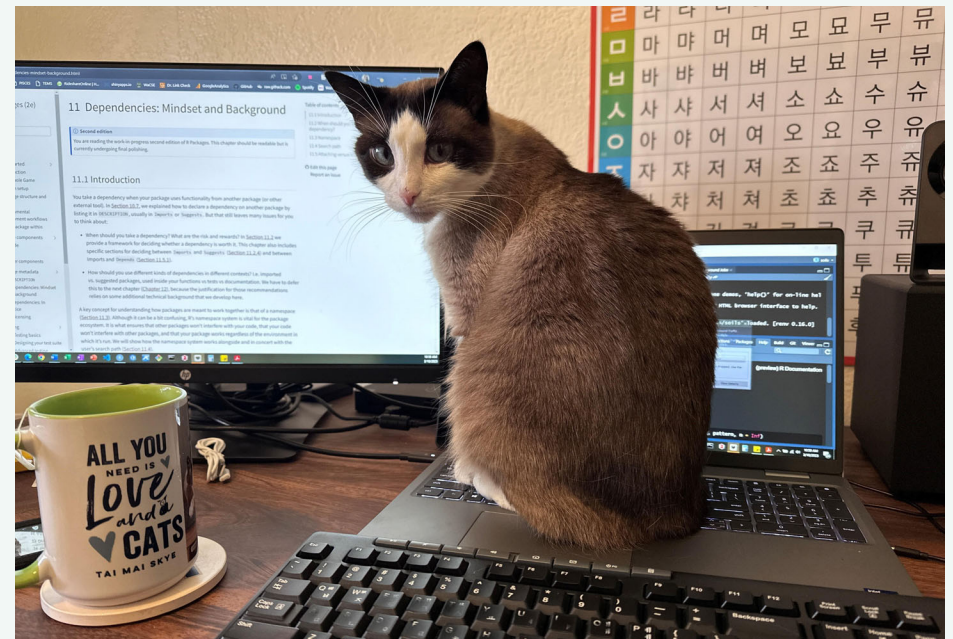


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# Try using R to solve a problem, even if you don't have a CS background!

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



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

# 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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