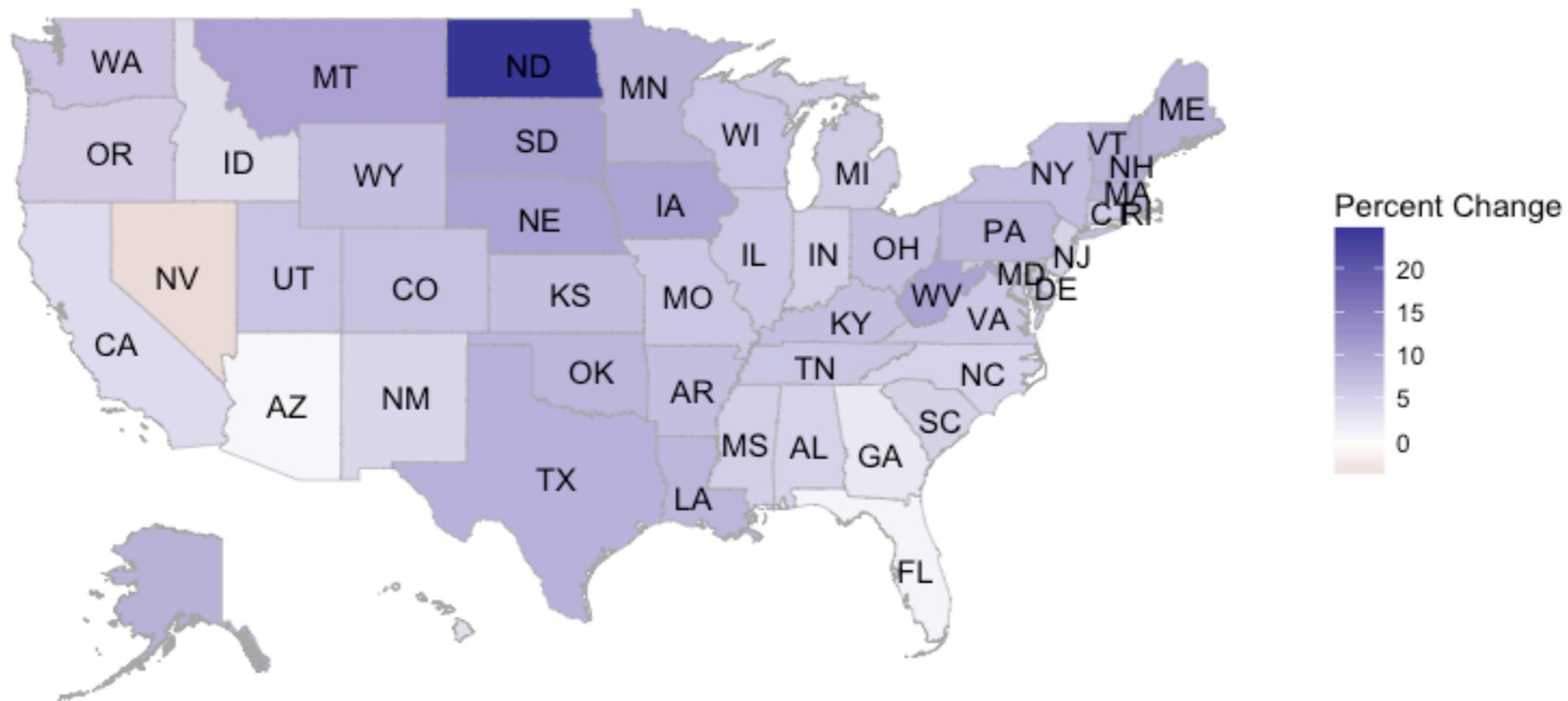
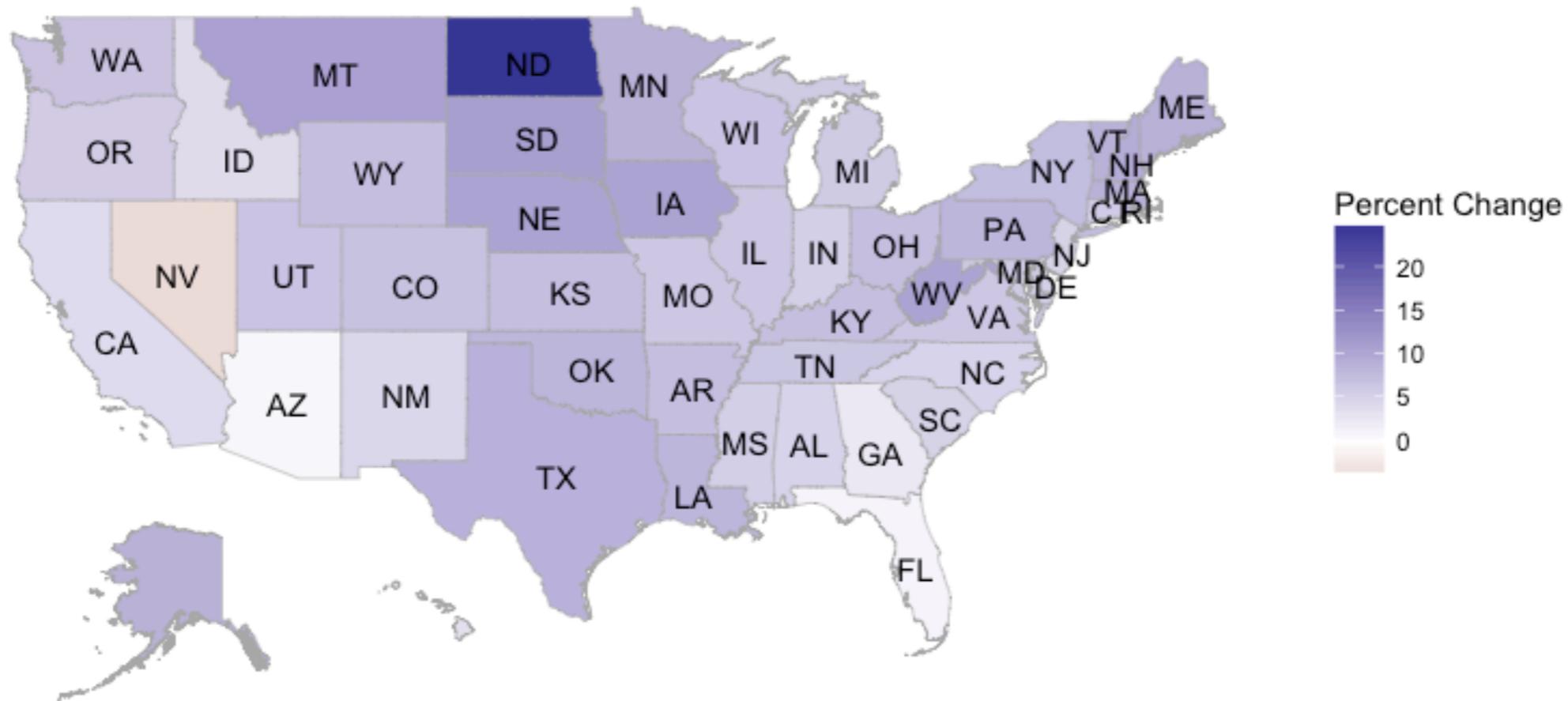


Percent Change in Estimated Per-Capita Income, 2010-2015



**Mapping State ACS Data in R with
Choropleth**
Ari Lamstein

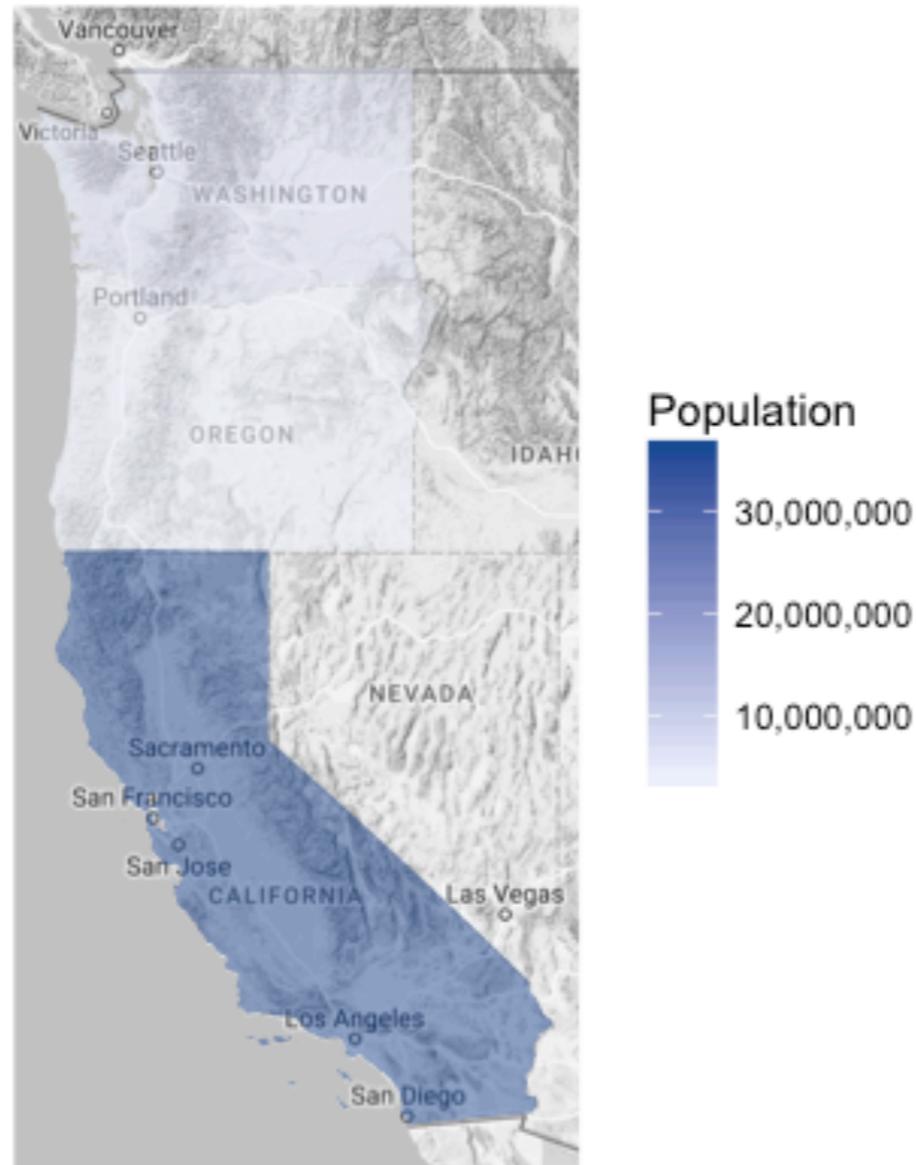
Percent Change in Estimated Per-Capita Income, 2010-2015



Introduction

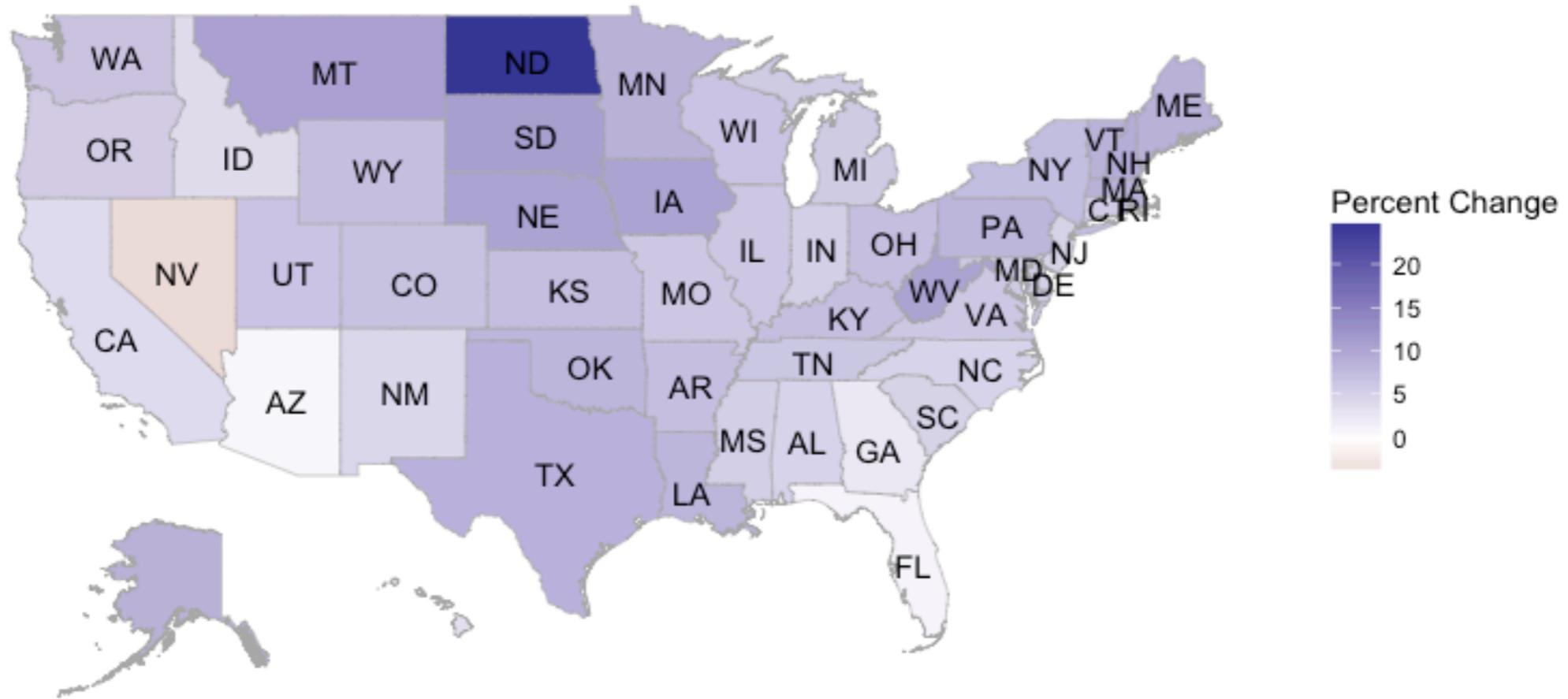
- What you'll learn
- Installing R
- Installing RStudio
- Installing Choroplethr

2012 State Population Estimates



Module 2: Choropleth Basics

Percent Change in Estimated Per-Capita Income, 2010-2015



Module 3: **Variables** and **Vintages**

Percent Change



THE American Community Survey

U.S. DEPARTMENT OF COMMERCE
Economics and Statistics Administration
U.S. CENSUS BUREAU

This booklet shows the content of the American Community Survey questionnaire.

Start Here

Respond online today at:
<https://respond.census.gov/acs>

OR

Complete this form and mail it back as soon as possible.

This form asks for information about the people who are living or staying at the address on the mailing label and about the house, apartment, or mobile home located at the address on the mailing label.



If you need help or have questions about completing this form, please call 1-800-354-7271. The telephone call is free.

Telephone Device for the Deaf (TDD):
Call 1-800-582-8330. The telephone call is free.

¿NECESITA AYUDA? Si usted habla español y necesita ayuda para completar su cuestionario, llame sin cargo alguno al 1-877-833-5625. Usted también puede completar su entrevista por teléfono con un entrevistador que habla español. O puede responder por Internet en: <https://respond.census.gov/acs>

For more information about the American Community Survey, visit our web site at: <http://www.census.gov/acs>

➔ Please print today's date.

Month Day Year

➔ Please print the name and telephone number of the person who is filling out this form. We will only contact you if needed for official Census Bureau business.

Last Name

First Name

MI

Area Code + Number

➔ How many people are living or staying at this address?

- **INCLUDE** everyone who is living or staying here for more than 2 months.
- **INCLUDE** yourself if you are living here for more than 2 months.
- **INCLUDE** anyone else staying here who does not have another place to stay, even if they are here for 2 months or less.
- **DO NOT INCLUDE** anyone who is living somewhere else for more than 2 months, such as a college student living away or someone in the Armed Forces on deployment.

Number of people

➔ Fill out pages 2, 3, and 4 for everyone, including yourself, who is living or staying at this address for more than 2 months. Then complete the rest of the form.

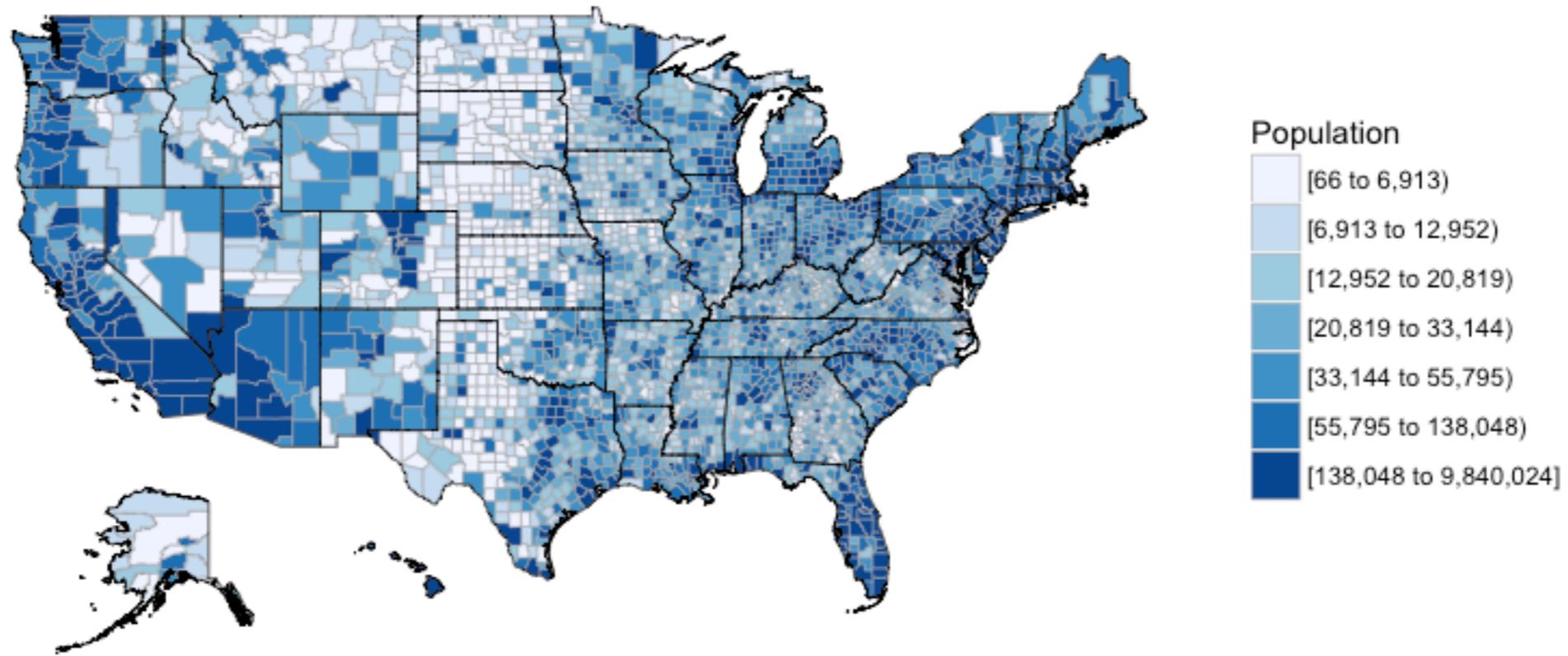
FORM ACS-1(INFO)(2017)
(03-14-2016)

OMB No. 0607-0810
OMB No. 0607-0936



Module 4: Data Details

2012 County Population Estimates



Module 5: Learning More

Module 1: Introduction

- Introduction
- **Installing R**
- Installing RStudio
- Installing Choroplethr

Installing R

- Visit <https://www.r-project.org>
- Visit <https://cloud.r-project.org/>

Module 1: Introduction

- Introduction
- Installing R
- **Installing RStudio**
- Installing Choroplethr

Installing RStudio

- Visit <https://www.rstudio.com/>

Module 1: Introduction

- Introduction
- Installing R
- Installing RStudio
- Installing Choroplethr

If you already know R ...

- Type:
 - `install.packages("choroplethr")`
 - `install.packages("choroplethrMaps")`

The screenshot shows the RStudio interface. The console window at the bottom left is highlighted with a red border and contains the following text:

```
~/Lamstein Consulting/census-consulting-project/course draft/course draft code/
> install.packages("choroplethr")
trying URL 'https://cran.rstudio.com/bin/macosx/el-capitan/contrib/3.4/choroplethr_3.6.1.tgz'
Content type 'application/x-gzip' length 215126 bytes (210 KB)
=====
downloaded 210 KB

The downloaded binary packages are in
  /var/folders/m7/ztk511fj6v14m6bw7vh47nk40000gn/T//RtmpGc0071/downloaded_packages
> |
```

The right-hand side of the interface shows the 'Packages' pane with a list of installed and available packages:

Name	Description	Version
System Library		
<input type="checkbox"/> acepack	ACE and AVAS for Selecting Multiple Regression Transformations	1.4.1
<input type="checkbox"/> acs	Download, Manipulate, and Present American Community Survey and Decennial Data from the US Census	2.1.2
<input type="checkbox"/> assertthat	Easy Pre and Post Assertions	0.2.0
<input type="checkbox"/> backports	Reimplementations of Functions Introduced Since R-3.0.0	1.1.2
<input type="checkbox"/> base64enc	Tools for base64 encoding	0.1-3
<input type="checkbox"/> BH	Boost C++ Header Files	1.65.0-1
<input type="checkbox"/> bindr	Parametrized Active Bindings	0.1
<input type="checkbox"/> bindrcpp	An 'Rcpp' Interface to Active Bindings	0.2
<input type="checkbox"/> bitops	Bitwise Operations	1.0-6
<input type="checkbox"/> boot	Bootstrap Functions (Originally by Angelo Canty for S)	1.3-20
<input type="checkbox"/> caTools	Tools: moving window statistics, GIF, Base64, ROC AUC, etc.	1.17.1
<input type="checkbox"/> checkmate	Fast and Versatile Argument Checks	1.8.5
<input type="checkbox"/> choroplethr	Simplify the Creation of Choropleth Maps in R	3.6.1
<input type="checkbox"/> choroplethrZip	Shapefile, Metadata and Visualization Functions for US Zip Code Tabulated Areas (ZCTAs)	1.5.0
<input type="checkbox"/> class	Functions for Classification	7.3-14
<input type="checkbox"/> classInt	Choose Univariate Class Intervals	0.1-24

Where to type it

install.packages("choroplethr")

The screenshot displays the RStudio interface. The main editor window shows a file named 'installing-choroplethr.R'. The console window, highlighted with a red border, shows the following output:

```
> install.packages("choroplethrMaps")
trying URL 'https://cran.rstudio.com/bin/macosx/el-capitan/contrib/3.4/choroplethrMaps_1.0.1.tgz'
Content type 'application/x-gzip' length 2176437 bytes (2.1 MB)
=====
downloaded 2.1 MB

The downloaded binary packages are in
  /var/folders/m7/ztk511fj6v14m6bw7vh47nk40000gn/T//RtmpGc0071/downloaded_packages
>
```

The right-hand side of the interface shows the 'Packages' pane, which lists various R packages. The 'System Library' section includes:

Name	Description	Version
<input type="checkbox"/> acepack	ACE and AVAS for Selecting Multiple Regression Transformations	1.4.1
<input type="checkbox"/> acs	Download, Manipulate, and Present American Community Survey and Decennial Data from the US Census	2.1.2
<input type="checkbox"/> assertthat	Easy Pre and Post Assertions	0.2.0
<input type="checkbox"/> backports	Reimplementations of Functions Introduced Since R-3.0.0	1.1.2
<input type="checkbox"/> base64enc	Tools for base64 encoding	0.1-3
<input type="checkbox"/> BH	Boost C++ Header Files	1.65.0-1
<input type="checkbox"/> bindr	Parametrized Active Bindings	0.1
<input type="checkbox"/> bindrcpp	An 'Rcpp' Interface to Active Bindings	0.2
<input type="checkbox"/> bitops	Bitwise Operations	1.0-6
<input type="checkbox"/> boot	Bootstrap Functions (Originally by Angelo Canty for S)	1.3-20
<input type="checkbox"/> caTools	Tools: moving window statistics, GIF, Base64, ROC AUC, etc.	1.17.1
<input type="checkbox"/> checkmate	Fast and Versatile Argument Checks	1.8.5
<input type="checkbox"/> choroplethr	Simplify the Creation of Choropleth Maps in R	3.6.1
<input type="checkbox"/> choroplethrMaps	Contains Maps Used by the 'choroplethr' Package	1.0.1
<input type="checkbox"/> choroplethrZip	Shapefile, Metadata and Visualization Functions for US Zip Code Tabulated Areas (ZCTAs)	1.5.0
<input type="checkbox"/> class	Functions for Classification	7.3-14

Where to type it

`install.packages("choroplethrMaps")`

The screenshot shows the RStudio interface with the following components:

- Source Editor:** A script named 'installing-choroplethr.R' with a single line of code: `1`.
- Environment:** Shows 'Global Environment' and 'Environment is empty'.
- Console:** Displays the execution of `install.packages("choroplethrMaps")`. The output shows the URL `https://cran.rstudio.com/bin/macosx/el-capitan/contrib/3.4/choroplethrMaps_1.0.1.tgz` and a successful download of 2.1 MB. The path to the downloaded packages is `/var/folders/m7/ztk511fj6v14m6bw7vh47nk40000gn/T//RtmpGc0071/downloaded_packages`.
- Packages Pane:** A table of installed packages is shown, with 'choroplethr' highlighted. The table is as follows:

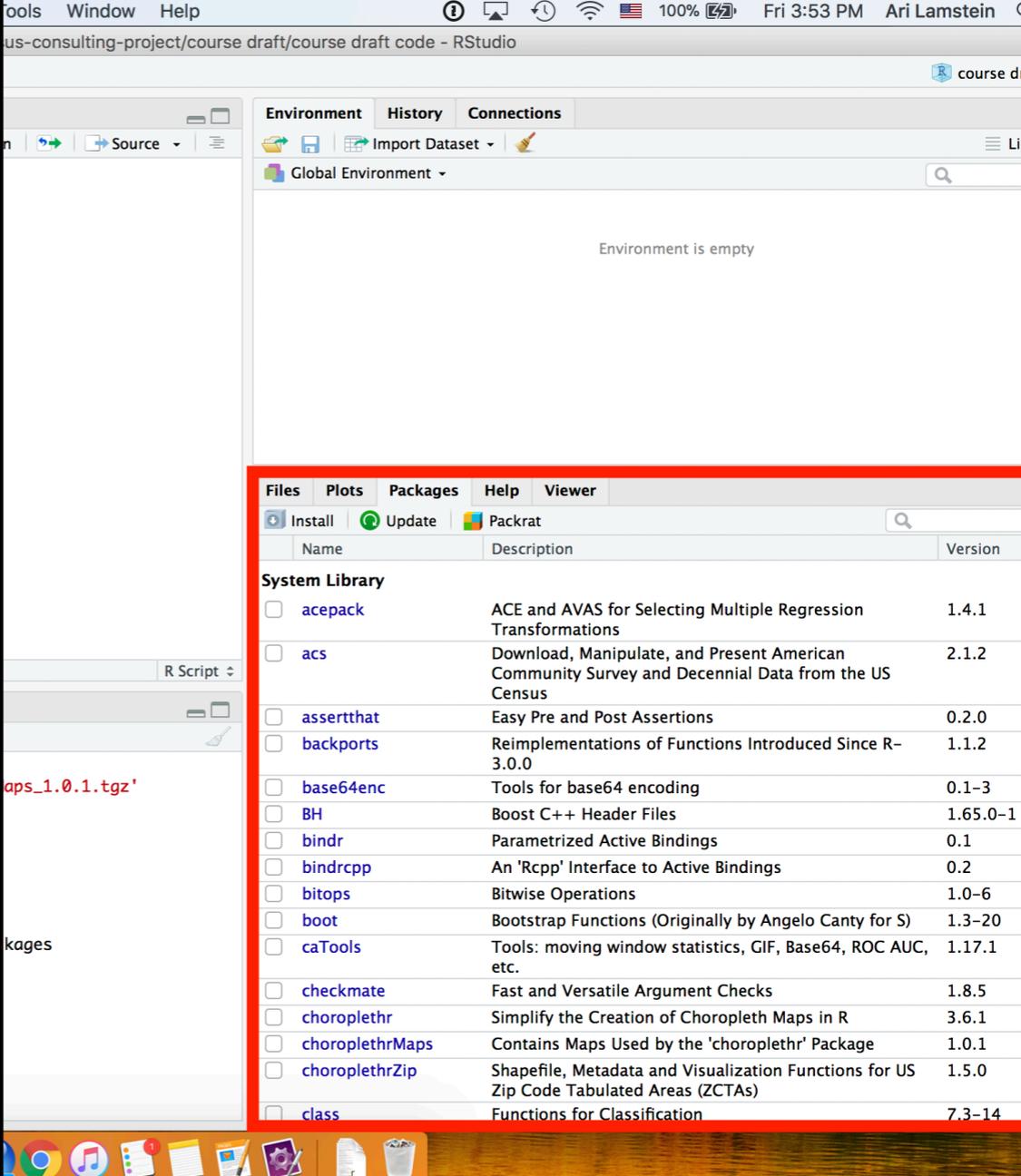
Name	Description	Version
System Library		
<input type="checkbox"/> acepack	ACE and AVAS for Selecting Multiple Regression Transformations	1.4.1
<input type="checkbox"/> acs	Download, Manipulate, and Present American Community Survey and Decennial Data from the US Census	2.1.2
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<input type="checkbox"/> backports	Reimplementations of Functions Introduced Since R-3.0.0	1.1.2
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<input type="checkbox"/> choroplethrZip	Shapefile, Metadata and Visualization Functions for US Zip Code Tabulated Areas (ZCTAs)	1.5.0
<input type="checkbox"/> class	Functions for Classification	7.3-14

Verify that it works

Find “choroplethr” in the Packages pane

Comparing Versions

- I'm using:
 - R 3.4.3
 - choroplethr 3.6.1
 - choroplethrMaps 1.0.1
- Type `R.Version()`



The screenshot shows the RStudio interface. The top menu bar includes 'Tools', 'Window', and 'Help'. The main workspace area is empty, displaying 'Environment is empty'. The 'Environment' pane is active, showing 'Global Environment'. The 'Packages' pane is open, displaying a list of installed and available packages. The 'Files' pane shows a file named 'aps_1.0.1.tgz'.

Name	Description	Version
System Library		
<input type="checkbox"/> acepack	ACE and AVAS for Selecting Multiple Regression Transformations	1.4.1
<input type="checkbox"/> acs	Download, Manipulate, and Present American Community Survey and Decennial Data from the US Census	2.1.2
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<input type="checkbox"/> backports	Reimplementations of Functions Introduced Since R-3.0.0	1.1.2
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<input type="checkbox"/> checkmate	Fast and Versatile Argument Checks	1.8.5
<input type="checkbox"/> choroplethr	Simplify the Creation of Choropleth Maps in R	3.6.1
<input type="checkbox"/> choroplethrMaps	Contains Maps Used by the 'choroplethr' Package	1.0.1
<input type="checkbox"/> choroplethrZip	Shapefile, Metadata and Visualization Functions for US Zip Code Tabulated Areas (ZCTAs)	1.5.0
<input type="checkbox"/> class	Functions for Classification	7.3-14

Module 1: Introduction

- What you'll learn
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- Installing Choroplethr