

How to Determine if Observed Precipitation is “Normal” for a WSDOT Delineation Report

NOTE:

Explanatory text is available by hovering over the upper left corner of some pages.

WSDOT and Hydrology Indicators

WSDOT typically follows the Corps of Engineers guidance for difficult situations when determining wetland hydrology, especially when indicators may naturally be missing during summer or fall field work.

Using this guidance allows the author and reviewers to evaluate field observations in the context of recent and historical precipitation data from the best climate station.

Purpose

- This tutorial describes steps to determine weather precipitation conditions prior to a site visit are either:
 - drier than normal
 - normal
 - wetter than normal
- In WSDOT reports the description is supported in an appendix:
 - comparing historical to recent precipitation, to determine if normal precipitation occurred in the 3 months preceding field work.
 - documenting precipitation conditions in the 10 days prior to field work.

Background

- This tutorial is based on guidance for Difficult Wetland Situations in the Regional Supplements to the Corps Delineation Manual:
 - Western Mountains, Valleys and Coast Version 2.0, page 118, paragraph b
 - Arid West Version 2.0, page 104, paragraph b
- For general instructions, see pages 19-24 to 19-27, Procedure 2 of the NRCS [Engineering Field Handbook Chapter 19](#).
- The following pages are adapted specifically to Washington State, and information available in 2015.

Assumptions

- We assume:
 - Historical precipitation data provides the best available estimate of “normal” precipitation.
 - In the WETS tables, the interval between the lower 30% value and the upper 30% value is the range of normal precipitation.
 - Data from the chosen observation station represents similar precipitation conditions occurring at the site.

Contents

- table template
- how to find long-term precipitation data
- how to find current precipitation data
- example table documenting if conditions are normal, or wetter or drier than normal
- how to find precipitation data for the 10 days preceding field work
- example report text

Template for Precipitation Data

Appendix B — Precipitation Data

Appendix B-1. Comparison of Observed and Normal Precipitation (NRCS 1997)

Monthly precipitation data for **City**, Washington.

| Month | Long-term rainfall records ^a | | | Rain fall ^a | Condition dry, wet, normal ^b | Condition Value | Month weight value | Product of previous two columns |
|-----------------------------|---|---------|------------------------|------------------------|---|-----------------|--------------------|---------------------------------|
| | 3 yrs. in 10 less than | Average | 3 yrs. in 10 more than | | | | | |
| 1 st prior month | | | | | | | 3 | |
| 2 nd prior month | | | | | | | 2 | |
| 3 rd prior month | | | | | | | 1 | |
| Sum | | | | | | | | |

^aNRCS 2014

^b Conditions are considered normal if they fall within the low and high range around the average.

Note: If sum is

6 - 9 then prior period has been drier than normal
 10 - 14 then period has been normal
 15 - 18 then period has been wetter than normal

Condition value:

Dry (D) =1
 Normal (N) =2
 Wet (W) =3

Conclusions: **Normal**, **drier than normal**, or **wetter than normal** precipitation conditions were present prior to the field visit.

Natural Resources Conservation Service Field Office Technical Guide (FOTG) website

Use the [NRCS FOTG website](#) to obtain:

1. Long term rainfall records (6 steps)
2. Current precipitation data (1 step)

In the following slides, the Anacortes WETS station is used to illustrate the process for an early May 2014 field visit.

First: WETS Table Info

Appendix B — Precipitation Data

Appendix B-1. Comparison of Observed and Normal Precipitation (NRCS 1997)

Monthly precipitation data for **City**, Washington.

| Month | Long-term rainfall records ^a | | | Rain fall ^a | Condition dry, wet, normal ^b | Condition Value | Month weight value | Product of previous two columns |
|-----------------------------|---|---------|------------------------|------------------------|---|-----------------|--------------------|---------------------------------|
| | 3 yrs. in 10 less than | Average | 3 yrs. in 10 more than | | | | | |
| 1 st prior month | | | | | | | 3 | |
| 2 nd prior month | | | | | | | 2 | |
| 3 rd prior month | | | | | | | 1 | |
| | | | | | | | Sum | |

^aNRCS 2014

^b Conditions are considered normal if they fall within the low and high range around the average.

Note: If sum is
 6 - 9 then prior period has been drier than normal
 10 - 14 then period has been normal
 15 - 18 then period has been wetter than normal

Condition value:
 Dry (D) =1
 Normal (N) =2
 Wet (W) =3

Conclusions: **Normal, drier than normal, or wetter than normal** precipitation conditions were present prior to the field visit.

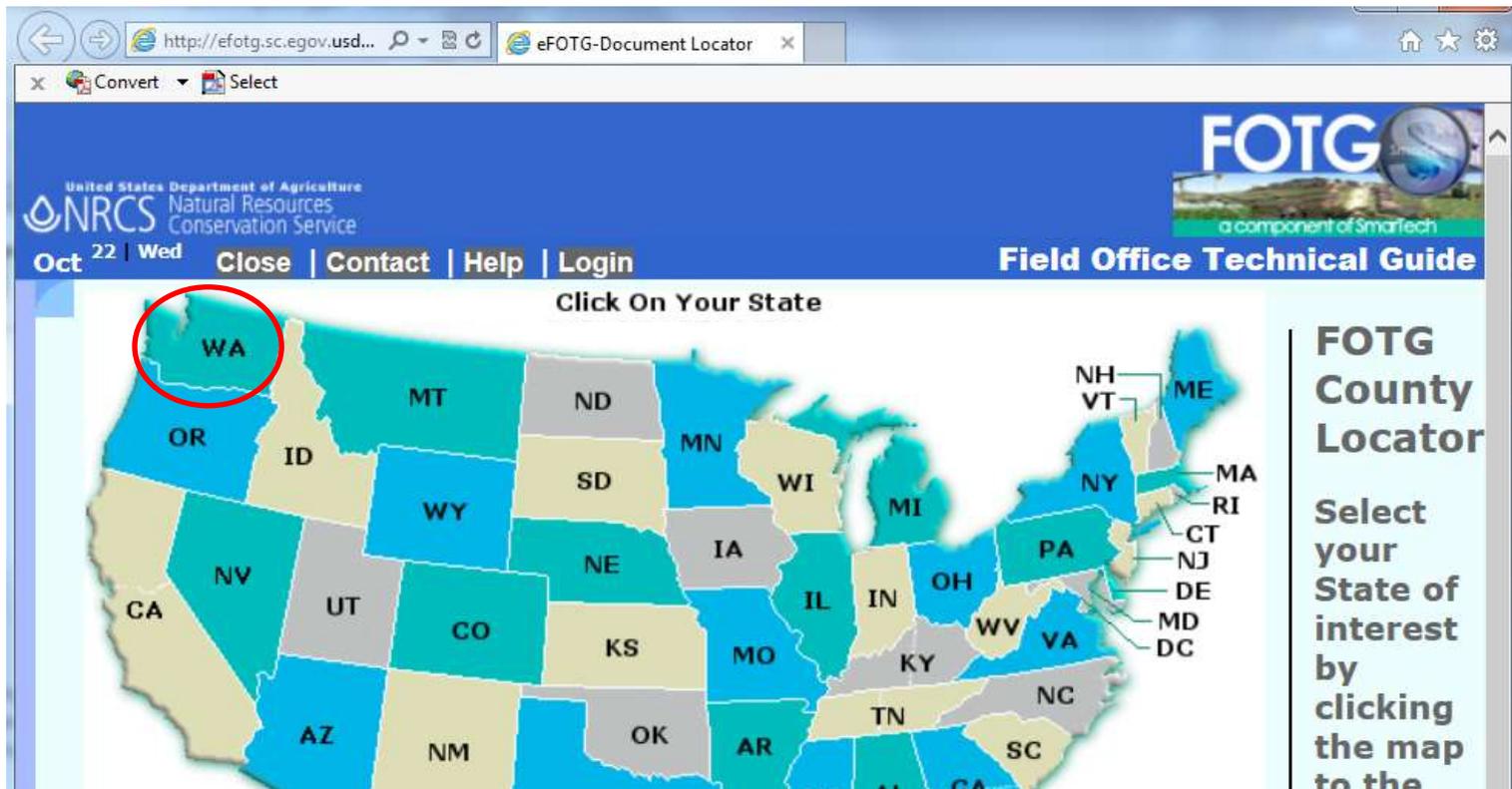
To fill out the “Long-term rainfall records” section of the table use WETS table info.

Remember: closest WETS station to your site may be in an adjacent county.

WETS Tables can be found here: [WETS Tables](#)

Find the WETS Tables

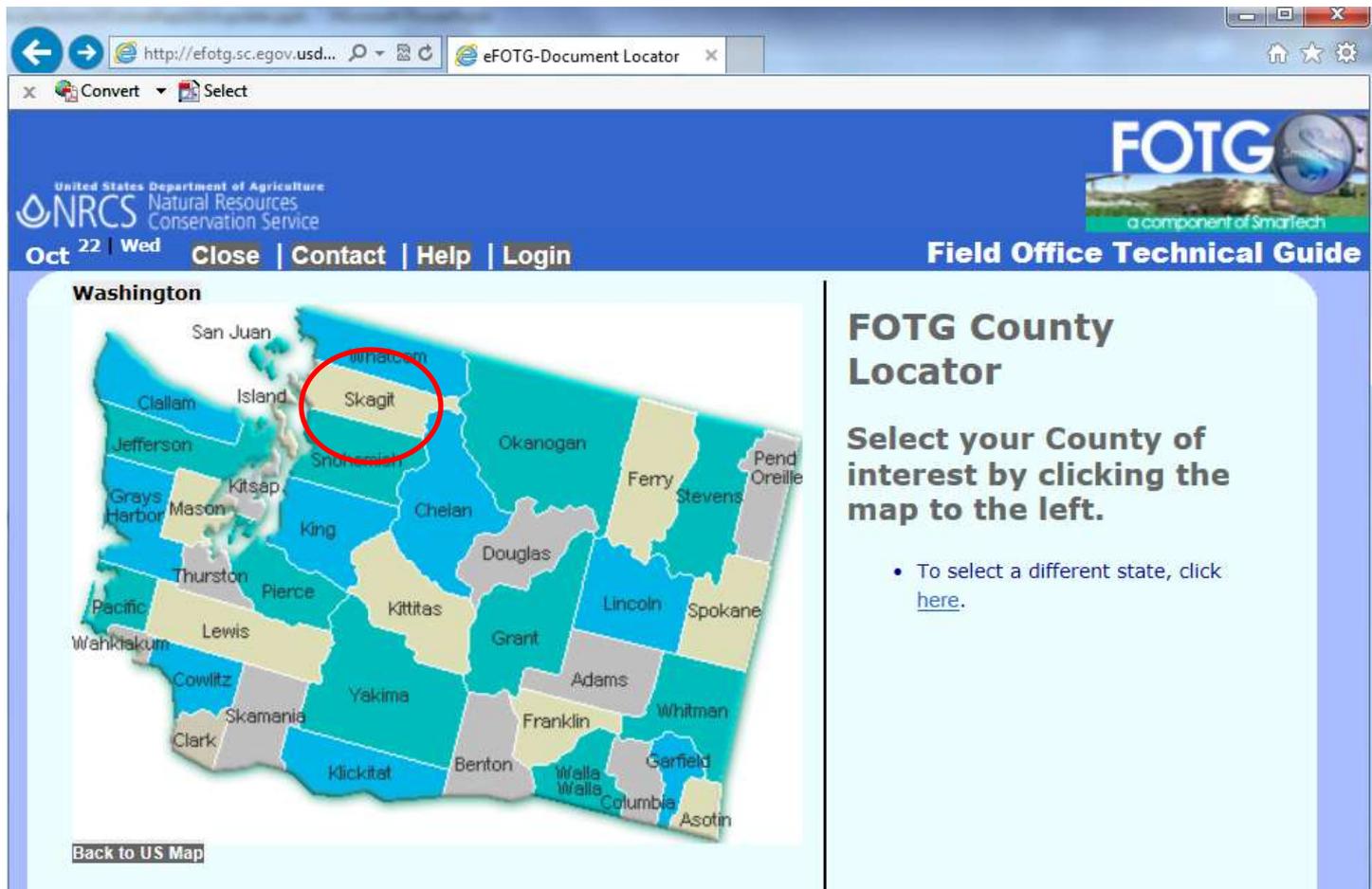
Step 1: Go to [NRCS FOTG website](http://efotg.sc.egov.usda.gov),
Click on Washington state



The screenshot shows a web browser window displaying the NRCS FOTG website. The browser's address bar shows the URL <http://efotg.sc.egov.usda.gov>. The website header includes the NRCS logo (United States Department of Agriculture, Natural Resources Conservation Service), the date "Oct 22 | Wed", and navigation links for "Close", "Contact", "Help", and "Login". The main content area features a map of the United States with the text "Click On Your State" above it. The state of Washington (WA) is highlighted in a darker blue and circled with a red line. To the right of the map is a sidebar titled "FOTG County Locator" with the instruction "Select your State of interest by clicking the map to the".

Find the WETS Tables

Step 2: Click on the site county



The screenshot shows a web browser window with the URL <http://efotg.sc.egov.usd...> and a tab titled "eFOTG-Document Locator". The page header includes the NRCS logo (United States Department of Agriculture, Natural Resources Conservation Service), the date "Oct 22 | Wed", and navigation links: "Close", "Contact", "Help", and "Login". On the right, there is a "FOTG" logo with the tagline "a component of SmartTech" and the text "Field Office Technical Guide".

The main content area is titled "Washington" and features a map of the state's counties. The county of Skagit is highlighted with a red circle. Other counties shown include San Juan, Clallam, Island, Jefferson, Kitsap, Mason, Grays Harbor, Thurston, Pierce, Pacific, Wahkiakum, Lewis, Cowlitz, Skamania, Clark, Klickitat, Benton, Walla Walla, Columbia, Asotin, Whitman, Gerfield, Adams, Grant, Douglas, Chelan, Snohomish, Okanogan, Ferry, Stevens, Pend Oreille, Lincoln, Spokane, Kittitas, King, and Whitman.

Below the map is a link: [Back to US Map](#)

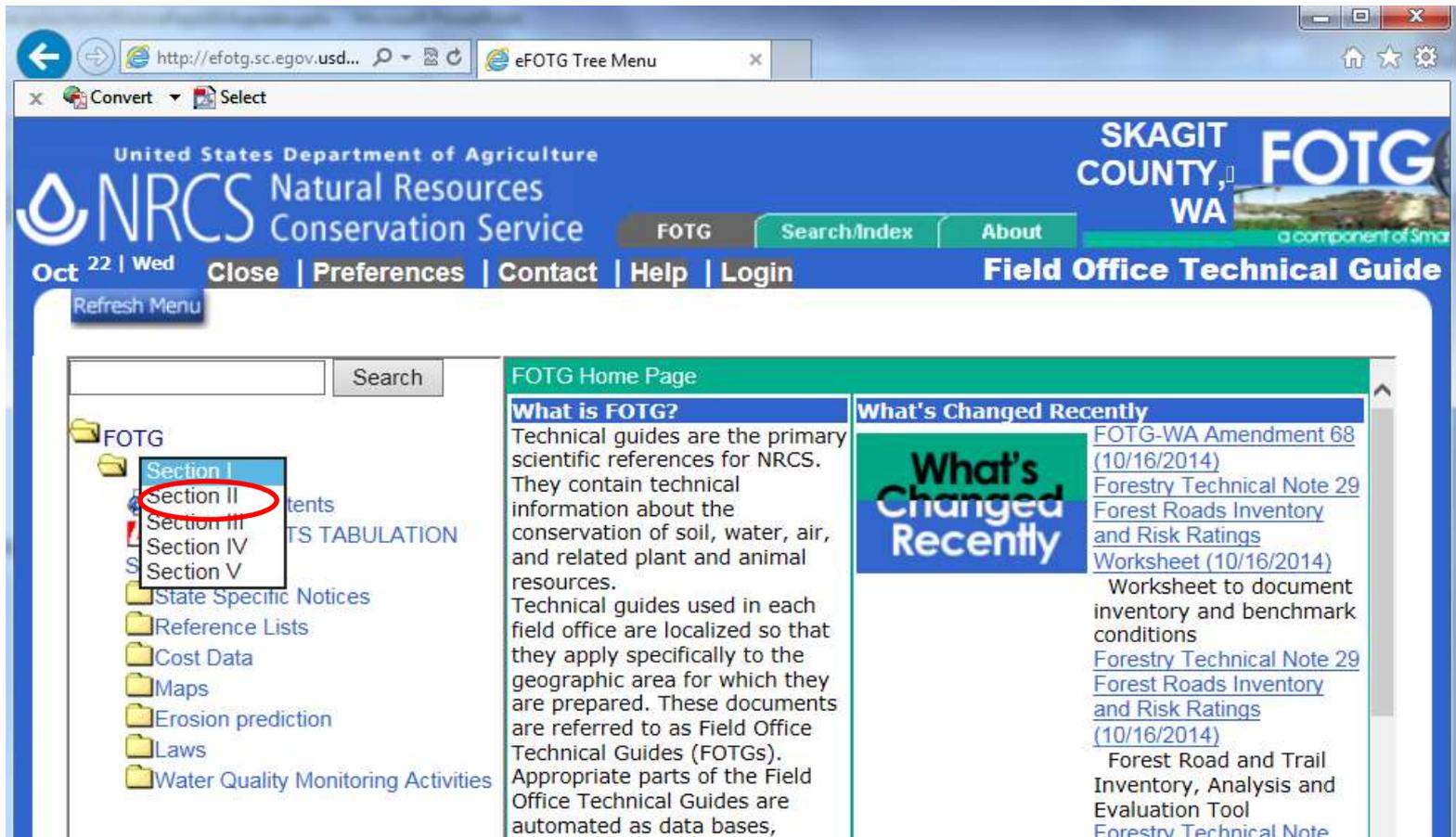
FOTG County Locator

Select your County of interest by clicking the map to the left.

- To select a different state, click [here](#).

Find the WETS Tables

Step 3: Select “Section II” in the drop down menu



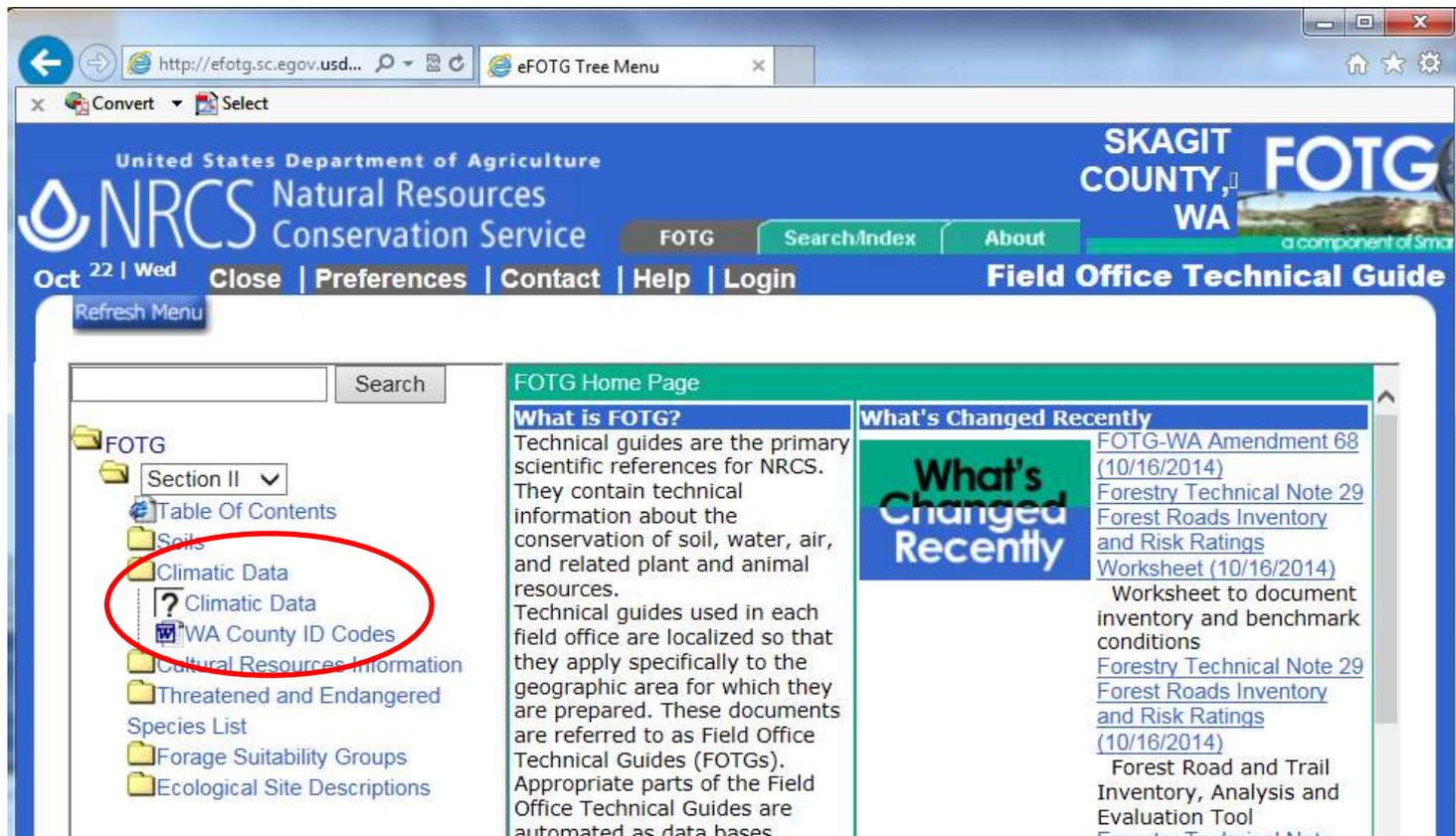
The screenshot shows a web browser window displaying the eFOTG Tree Menu. The browser's address bar shows the URL <http://efotg.sc.egov.usd...>. The page header includes the United States Department of Agriculture logo, NRCS Natural Resources Conservation Service, and SKAGIT COUNTY, WA FOTG. The navigation bar contains links for FOTG, Search/Index, and About. Below the navigation bar, there is a date indicator (Oct 22 | Wed) and a menu with options: Close, Preferences, Contact, Help, and Login. The main content area is titled "Field Office Technical Guide" and features a "Refresh Menu" button. On the left side, there is a search bar and a tree menu. The tree menu is expanded to show the following items: FOTG, Section I, Section II (highlighted with a red circle), Section III, Section IV, Section V, State Specific Notices, Reference Lists, Cost Data, Maps, Erosion prediction, Laws, and Water Quality Monitoring Activities. The main content area is divided into two columns. The left column is titled "FOTG Home Page" and contains a section "What is FOTG?" with text explaining that technical guides are primary scientific references for NRCS, containing information about soil, water, air, and related plant and animal resources. The right column is titled "What's Changed Recently" and contains a section "What's Changed Recently" with a list of recent updates, including "FOTG-WA Amendment 68 (10/16/2014)", "Forestry Technical Note 29 Forest Roads Inventory and Risk Ratings Worksheet (10/16/2014)", and "Forest Road and Trail Inventory, Analysis and Evaluation Tool Forestry Technical Note".

Find the WETS Tables

Step 4: Click the “Climatic Data” folder

1st choice is the data

2nd choice shows the county code needed for the next step



The screenshot shows a web browser window displaying the FOTG (Field Office Technical Guide) website. The browser's address bar shows the URL <http://efotg.sc.egov.usd...>. The website header includes the United States Department of Agriculture logo, NRCS Natural Resources Conservation Service, and SKAGIT COUNTY, WA FOTG. The navigation menu includes links for FOTG, Search/Index, About, and a date indicator for Oct 22 | Wed. A search bar is located at the top left of the main content area. The left sidebar contains a tree view of the website's structure, with the 'Climatic Data' folder highlighted by a red circle. The main content area is divided into two columns: 'FOTG Home Page' and 'What's Changed Recently'. The 'FOTG Home Page' section includes a 'What is FOTG?' heading and text explaining that technical guides are primary scientific references for NRCS, containing information about soil, water, air, and related plant and animal resources. The 'What's Changed Recently' section lists several documents, including 'FOTG-WA Amendment 68 (10/16/2014)', 'Forestry Technical Note 29 Forest Roads Inventory and Risk Ratings Worksheet (10/16/2014)', and 'Forest Road and Trail Inventory, Analysis and Evaluation Tool'.

[WA County Codes](#)

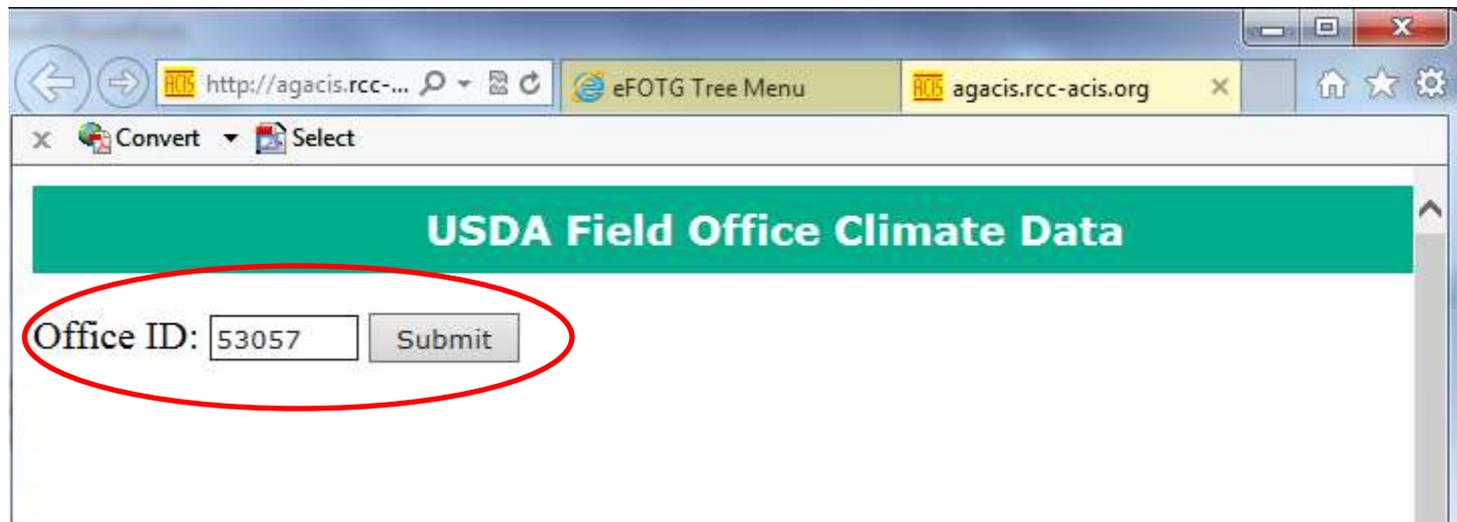
Washington County Codes

For climatic data: Enter County ID and SUBMIT

| | | | |
|-------|--------------|-------|--------------|
| 53001 | Adams | 53041 | Lewis |
| 53003 | Asotin | 53043 | Lincoln |
| 53005 | Benton | 53045 | Mason |
| 53007 | Chelan | 53047 | Okanogan |
| 53009 | Clallam | 53049 | Pacific |
| 53011 | Clark | 53051 | Pend Oreille |
| 53013 | Columbia | 53053 | Pierce |
| 53015 | Cowlitz | 53055 | San Juan |
| 53017 | Douglas | 53057 | Skagit |
| 53019 | Ferry | 53059 | Skamania |
| 53021 | Franklin | 53061 | Snohomish |
| 53023 | Garfield | 53063 | Spokane |
| 53025 | Grant | 53065 | Stevens |
| 53027 | Grays Harbor | 53067 | Thurston |
| 53029 | Island | 53069 | Wahkiakum |
| 53031 | Jefferson | 53071 | Walla Walla |
| 53033 | King | 53073 | Whatcom |
| 53035 | Kitsap | 53075 | Whitman |
| 53037 | Kittitas | 53077 | Yakima |
| 53039 | Klickitat | | |

Find the WETS Tables

Step 5: Submit the County Code



The screenshot shows a web browser window with the following elements:

- Address bar: <http://agacis.rcc-...>
- Page title: eFOTG Tree Menu
- Page URL: agacis.rcc-acis.org
- Page content: A green header bar with the text "USDA Field Office Climate Data".
- Form: A form with the label "Office ID:" followed by a text input field containing "53057" and a "Submit" button. This entire form area is circled in red.

Find the WETS Tables

Step 6: Select “WETS”, the best observation station,
& “Go”

Climate Data for Skagit County, Washington

1. Product

- Daily data for a month
- Daily almanac
- Monthly avgs/totals
- Monthly occurrences
- Monthly extremes
- Daily extremes
- Daily/monthly normals
- Record extremes
- Frost/freeze dates
- TAPS
- FROST
- GROWTH
- WETS**
- DAYS

2. Location

ANACORTES

DARRINGTON 21 NNE
CONCRETE PPL FISH ST
SEDRO WOOLLEY

3. Thresholds

| |
|----|
| 24 |
| 28 |
| 32 |

4. View

Go

Choose the Best Observation Station

- Research elevations and landscape position of the available stations in the vicinity compared to your site.
- If the site is near a county line, look at WETS stations in both counties. The best station may be in an adjacent county.
- Choose a nearby station that is likely to have the most similar precipitation pattern as your site. The best station may not be the nearest one.

Fill in the Appendix Table

In Appendix B, month rows are in reverse order, and columns are in a different order than the WETS Tables.

Appendix B Precipitation Data

Appendix B-1 Comparison of Observed and Normal Precipitation (NRCS 1997)

Monthly precipitation data for Anacortes, Washington

| | Long-term rainfall records ^a | | | Rain fall ^a | Condition: Dry, Wet, Normal ^c | Condition Value | Month weight value | Product of previous two columns |
|-----------------------------|---|---------|------------------------|------------------------|--|-----------------|--------------------|---------------------------------|
| | 3 yrs. in 10 less than | Average | 3 yrs. in 10 more than | | | | | |
| 1 st prior month | Apr | 1.49 | 1.86 | 2.12 | | | 3 | |
| 2 nd prior month | Mar | 1.67 | 2.21 | 2.58 | | | 2 | |
| 3 rd prior month | Feb | 1.75 | 2.49 | 2.95 | | | 1 | |
| | | | | | | | Sum | x |

^a NRCS 2014a

^c Conditions are considered normal if they fall within the low and high range around the average.

Second: Compare Historical (WETS) Data to Current Precipitation Data

Use the Climate Data Page for the specific county found in [Section II, Climactic Data](#) to obtain recent “Rainfall” data.

Appendix B — Precipitation Data

Appendix B-1. Comparison of Observed and Normal Precipitation (NRCS 1997)

Monthly precipitation data for **City**, Washington.

| Month | Long-term rainfall records ^a | | | Rain fall ^a | Condition dry, wet, normal ^b | Condition Value | Month weight value | Product of previous two columns |
|-----------------------------|---|---------|------------------------|------------------------|---|-----------------|--------------------|---------------------------------|
| | 3 yrs. in 10 less than | Average | 3 yrs. in 10 more than | | | | | |
| 1 st prior month | | | | | | | 3 | |
| 2 nd prior month | | | | | | | 2 | |
| 3 rd prior month | | | | | | | 1 | |
| | | | | | | | Sum | |

^aNRCS 2014

^b Conditions are considered normal if they fall within the low and high range around the average.

Current Precipitation Data

Step 1: Return to the County Tab, Click “Monthly avgs/totals”, “Precipitation”, “This year,” & Go

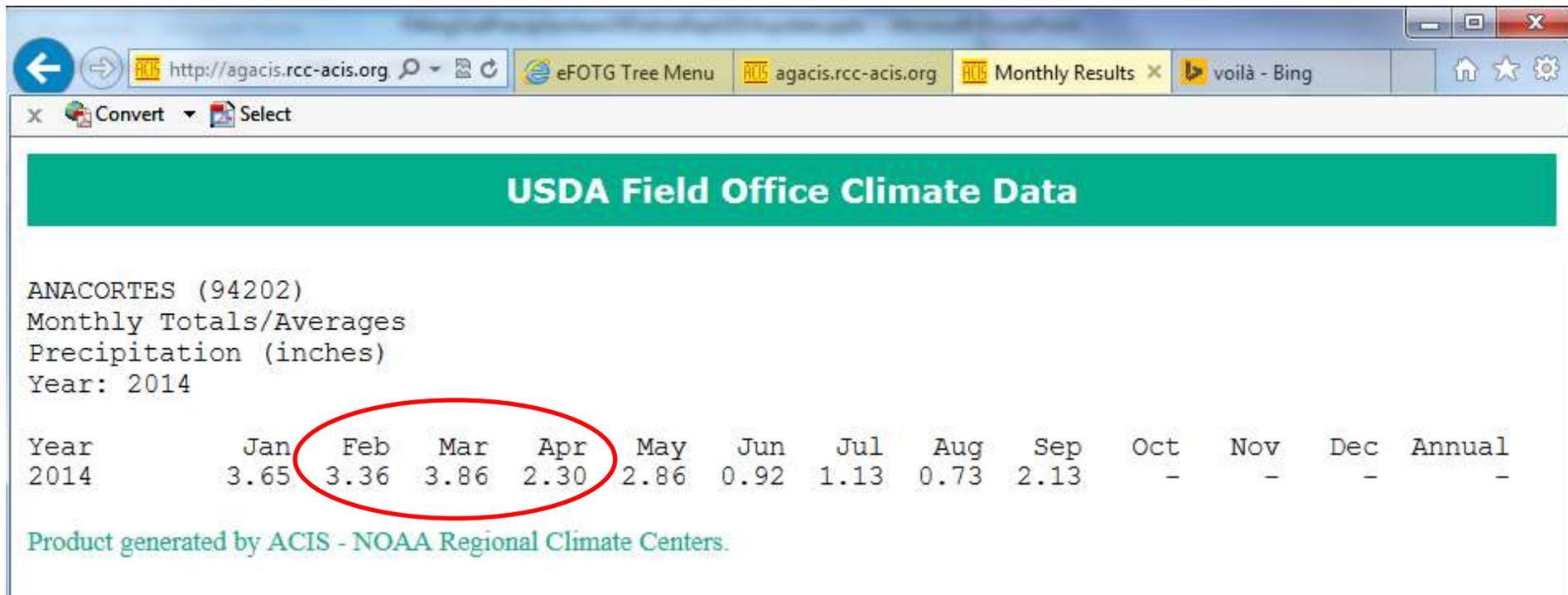
Climate Data for Skagit County, Washington

| 1. Product | 2. Location | 3. Variable | 4. Year | 5. View |
|--|----------------------|--|--|-----------------------------------|
| <input type="radio"/> Daily data for a month | ANACORTES | <input type="radio"/> Max Temperature | <input checked="" type="radio"/> This year | <input type="button" value="Go"/> |
| <input type="radio"/> Daily almanac | DARRINGTON 21 NNE | <input type="radio"/> Min Temperature | <input type="radio"/> Last year | |
| <input checked="" type="radio"/> Monthly avgs/totals | CONCRETE PPL FISH ST | <input type="radio"/> Avg Temperature | <input type="radio"/> 1971-2000 | |
| <input type="radio"/> Monthly occurrences | SEDRO WOOLLEY | <input checked="" type="radio"/> Precipitation | <input type="radio"/> 1981-2010 | |
| <input type="radio"/> Monthly extremes | | <input type="radio"/> Snowfall | <input type="radio"/> Select year: | |
| <input type="radio"/> Daily extremes | | <input type="radio"/> Snow Depth | 2014 | |
| <input type="radio"/> Daily/monthly normals | | <input type="radio"/> GDD (Base 50) | | |
| <input type="radio"/> Record extremes | | | | |
| <input type="radio"/> Frost/freeze dates | | | | |
| <input type="radio"/> TAPS | | | | |
| <input type="radio"/> FROST | | | | |
| <input type="radio"/> GROWTH | | | | |
| <input type="radio"/> WETS | | | | |
| <input type="radio"/> DAYS | | | | |

Use the [NRCS FOTG website](#)

Current Precipitation Results

Step 2: Transfer the precipitation totals for the three months before the field work to the “Rainfall” column



Fill in the Appendix Table

Appendix B Precipitation Data

Appendix B-1 Comparison of Observed and Normal Precipitation (NRCS 1997)

Monthly precipitation data for Anacortes, Washington

| | | Long-term rainfall records ^a | | | Rain fall ^a | Condition: Dry, Wet, Normal ^c | Condition Value | Month weight value | Product of previous two columns |
|-----------------------------|-----|---|---------|------------------------------|------------------------|--|--------------------|--------------------------|---------------------------------------|
| Month | | 3 yrs. in 10 less than | Average | 3 yrs. in 10 more than | | | | | |
| 1 st prior month | Apr | 1.49 | 1.86 | 2.12 | 2.30 | | 3 | | |
| 2 nd prior month | Mar | 1.67 | 2.21 | 2.58 | 3.86 | | 2 | | |
| 3 rd prior month | Feb | 1.75 | 2.49 | 2.95 | 3.36 | | 1 | | |
| Sum | | | | | | | | | x |

^a NRCS 2014a

^c Conditions are considered normal if they fall within the low and high range around the average.

For this example, the field work was in early May 2014. To accurately interpret field observations, you want to know how wet it was in April (1st prior month). How wet it was in March and February would be less influential on site conditions, but would still be important. This is reflected in the “Month weight value” column.

Fill out the rest of the table

- For each row, if recently observed rainfall is:
 - Greater than the upper 30% value, it has been wetter than normal. The condition is **W** and the condition value is **3**.
 - Contained within the upper and lower 30% values, precipitation has been normal. The condition is **N** and the condition value is **2**.
 - Less than the lower 30% value, it has been drier than normal. The condition is **D** and the condition value is **1**.
- Multiply the condition value times the month weight value and enter the product in the right column.
- Add the 3 values in the right column and compare the total to the ranges in the lower left part of the template to determine precipitation conditions at the site for the 3 months prior to the visit.

Example of
completed
report
appendix
table

Appendix B — Precipitation Data

Appendix B-1. Comparison of Observed and Normal Precipitation (NRCS 1997)

Monthly precipitation data for Anacortes, Washington.

| | | Long-term rainfall records ^a | | | Rain fall ^e | Condition dry, wet, normal ^b | Condition Value | Month weight value | Product of previous two columns |
|-----------------------------|------------------------|---|------------------------|------|------------------------|---|-----------------|--------------------|---------------------------------|
| Month | 3 yrs. in 10 less than | Average | 3 yrs. in 10 more than | | | | | | |
| 1 st prior month | Apr | 1.49 | 1.86 | 2.12 | 2.30 | W | 3 | 3 | 9 |
| 2 nd prior month | Mar | 1.67 | 2.21 | 2.58 | 3.86 | W | 3 | 2 | 6 |
| 3 rd prior month | Feb | 1.75 | 2.49 | 2.95 | 3.36 | W | 3 | 1 | 3 |
| | | | | | | | | Sum | 18 |

^aNRCS 2014

^b Conditions are considered normal if they fall within the low and high range around the average.

Note: If sum is
 6 - 9 then prior period has been
 drier than normal
 10 - 14 then period has been
 normal
 15 - 18 then period has been
 wetter than normal

Condition value:
 Dry (D) =1
 Normal (N) =2
 Wet (W) =3

Conclusions: Wetter than normal precipitation conditions were present prior to the field visit on May 5, 2014.

Third: Document Precipitation Occurring in the 10 Days Prior to Field Work

Use the Climate Data Page for the specific county found in [Section II, Climactic Data](#) to obtain “daily data for a month”.

Appendix B-2. Daily Precipitation 10 days preceding field work occurring on May 11, 2014, Anacortes, Washington

| Date (2014) | Daily Precipitation (inches) ^a |
|-------------|---|
| May 10 | 0.00 |
| May 9 | 0.76 |
| May 8 | 0.00 |
| May 7 | 0.00 |
| May 6 | 0.07 |
| May 5 | 0.32 |
| May 4 | 0.50 |
| May 3 | 0.45 |
| May 2 | 0.00 |
| May 1 | 0.00 |

^aNRCS 2015

Document Precipitation Occurring in the 10 Days Prior to Field Work

Step 1: Return to the County Tab, Click “Daily data for a month”, select location and appropriate month(s) & Go

The screenshot shows a web browser window with the URL agacis.rcc-acis.org/53057/obsmn. The page title is "Climate Data for Skagit County, Washington". The interface is divided into four columns:

- 1. Product:** A list of data types with radio buttons. "Daily data for a month" is selected and circled in red.
- 2. Location:** A dropdown menu with "ANACORTES" selected and circled in red. Other options include DARRINGTON 21 INNE, CONCRETE PPL FISH ST, and SEDRO WOOLLEY.
- 3. Month:** A section with radio buttons for "Current month" and "Last month", and a "Select month/year:" section. "May" and "2014" are selected in dropdown menus and circled in red.
- 4. View:** A yellow "Go" button circled in red.

Document Precipitation Occurring in the 10 Days Prior to Field Work

Step 2: Transfer the daily precipitation records for the appropriate days to the report appendix

| Day | Max Temp | Min Temp | Avg Temp | GDD B50 | GDD Total B40 | Precip | New Snow | Snow Depth |
|-----|----------|----------|----------|---------|---------------|--------|----------|------------|
| 1 | 75 | 51 | 63.0 | 13 | 23 | 0.00 | | |
| 2 | 77 | 53 | 65.0 | 15 | 25 | 0.00 | | |
| 3 | 68 | 49 | 58.5 | 9 | 11 | 0.45 | | |
| 4 | 62 | 50 | 56.0 | 6 | 15 | 0.50 | | |
| 5 | 60 | 49 | 54.5 | 5 | 15 | 0.32 | | |
| 6 | 62 | 50 | 56.0 | 6 | 15 | 0.07 | | |
| 7 | 64 | 47 | 55.5 | 6 | 15 | 0.00 | | |
| 8 | 65 | 47 | 56.0 | 6 | 14 | 0.00 | | |
| 9 | 62 | 48 | 55.0 | 5 | 15 | 0.76 | | |
| 10 | 58 | 47 | 52.5 | 3 | 13 | 0.00 | | |
| 11 | 63 | 46 | 54.5 | 5 | 15 | 0.00 | | |
| 12 | 66 | 48 | 57.0 | 7 | 17 | 0.00 | | |
| 13 | 78 | 56 | 67.0 | 17 | 27 | 0.00 | | |
| 14 | 78 | 53 | 65.5 | 16 | 26 | 0.00 | | |
| 15 | 78 | 57 | 67.5 | 18 | 28 | 0.00 | | |
| 16 | 76 | 54 | 65.0 | 15 | 25 | 0.00 | | |
| 17 | 70 | 54 | 62.0 | 12 | 22 | 0.00 | | |
| 18 | 65 | 51 | 58.0 | 8 | 18 | 0.00 | | |

Appendix B-2. Daily Precipitation 10 days preceding field work occurring on May 11, 2014, Anacortes, Washington

| Date (2014) | Daily Precipitation (inches) ^a |
|-------------|---|
| May 10 | 0.00 |
| May 9 | 0.76 |
| May 8 | 0.00 |
| May 7 | 0.00 |
| May 6 | 0.07 |
| May 5 | 0.32 |
| May 4 | 0.50 |
| May 3 | 0.45 |
| May 2 | 0.00 |
| May 1 | 0.00 |

^a NRCS 2015

Example Report Text

4.3.5 Wetland Hydrology and Recent Weather:

Normal, drier than normal, or wetter than normal conditions were present for three months before the field visit based on rainfall data from the XX station (NRCS 201Xa) (Appendix B-1). Precipitation observed at the XX station was **light, moderate, heavy** in the 10 days prior to the field work (NRCS 201Xa) (Appendix B-2). These data indicate that hydrology indicators observed during the time of the delineation **were/were not** reliable and informative indicators.