

Acceptance Test Plan

for

WAVED

Version 3.0

Prepared By:

Sean Bluestein, Kristian Calhoun, Keith Horrocks, Steven Nguyen, Hannah Pinkos

Advisor:

Kurt Schmidt

Stakeholder:

Climate Central

Table of Contents

1. Document History	4
2. Introduction	5
2.1 Purpose	5
2.2 References	5
2.2.1 Software Requirements Specification.....	5
2.2.2 Issue Tracking.....	5
2.3 Definitions	6
3. Test Approach and Constraints.....	7
3.1 Test Objectives.....	7
3.2 Test Structures	7
3.3 Test Constraints	7
4. Test Assumptions and Exclusions.....	8
4.1 Test Assumptions	8
4.2 Test Exclusions	8
5. Entry and Exit Criteria	9
5.1 Entry Criteria	9
5.2 Exit Criteria.....	9
6. Testing Participants.....	10
6.1 Roles and Responsibilities.....	10
6.2 Training Requirements.....	10
6.3 Problem Reporting	10
6.4 Progress Reporting.....	10
7. Test Cases.....	11
7.1 Introduction	11
7.2 Test Cases.....	11
7.2.1 Creating a Project.....	11
7.2.2 Saving a Project.....	12
7.2.3 Loading a project.....	13
7.2.4 Deleting a Project.....	14
7.2.5 Modifying a Project.....	15

7.2.6 Exporting a Visualization.....	16
7.2.7 Project Revision History.....	17
7.2.8 Adding Widgets.....	18
7.2.9 Removing Widgets.....	19
7.2.10 Widget Properties.....	20
7.2.11 Data.....	23
7.2.12 Actions.....	27
7.2.13 Events.....	31
7.2.14 Google Analytics.....	33
7.2.15 Project Tree.....	34
8. Traceability Matrix.....	36

1. Document History

Name	Date	Reason	Version
Kristian Calhoun, Sean Bluestein, Hannah Pinkos, Steve Nguyen, Keith Horrocks	January 7, 2014	Initial Draft	1.0
Kristian Calhoun, Sean Bluestein, Hannah Pinkos, Steve Nguyen, Keith Horrocks	February 4, 2014	Update for changes made to SRS	2.0
Kristian Calhoun, Sean Bluestein, Hannah Pinkos, Steve Nguyen, Keith Horrocks	April 29, 2014	Update for changes made to SRS	3.0

2. Introduction

2.1 Purpose

This document provides the plan for completing the acceptance test of Web App for Visualizing Environmental Data (WAVED). The included test cases were derived from the *Software Requirement Specifications for WAVED* (2.2.1), which details the system's functionality.

2.2 References

2.2.1 Software Requirements Specification

This document references the requirements in the [Software Requirements Specification for WAVED](#) document. Requirement numbers from this document are listed for every test to indicate the requirements the test exercises.

2.2.2 Issue Tracking

The issue tracking system used to track any test failures, bugs, concerns, and backlog items can be found at <https://github.com/KSHSK/WAVED/issues>.

2.3 Definitions

Action - The process of changing the properties of a widget or data set via an event

Data Binding - Making an explicit association between a data source or data subset and a widget, property, or event

Data Set - A data source or data subset

Data Source - A collection of data, such as that found in an uploaded CSV or JSON file

Data Subset - The resulting portion of a data source that meets some specified criteria.

Event - A user interaction (click, hover, etc.) that triggers an action

Glyph - A marker indicated by some shape or icon

Project - The context in which a user works to create a single visualization using the WAVED application.

Property - Defines a value used for a widget attribute, such as width, height, color, name, etc

Software Requirements Specification (SRS) - A document containing the complete description of the behavior of a system

Stakeholder - The group investing in the development of the product (in this case, Climate Central)

Test Case - A test case is an atomic test description including preconditions that must be satisfied before the test is performed, the actions a tester takes when performing the test, and the expected postconditions that ensure the system has completed the expected behavior.

Test Team Leader - The individual responsible for overseeing the execution of all test cases.

Unit Tests - Unit tests are a collection of small code snippets that each test a single atomic module of the source code to ensure its proper functioning.

Widget - A top level component that has properties and bound data

Workspace - The interactive area of the WAVED user interface that displays the visualization as it is assembled from widgets.

3. Test Approach and Constraints

This section describes the objectives, structure and constraints for the software acceptance test plan for WAVED.

3.1 Test Objectives

Following the prescribed Acceptance Test Plan process verifies WAVED fulfills all of the functional requirements specified in the Software Requirements Specification. WAVED is ready for deployment if and only if it passes all of the test cases contained in the Acceptance Test Plan.

3.2 Test Structures

Atomic test cases were derived from the SRS. Each test case has a unique identifier, a name, a high-level description of the functionality it tests and references to its related requirements in the SRS.

Additionally, each test case contains preconditions, actions and postconditions. Preconditions describe the required state of the system before the test is performed. The actions include an itemized list of steps the tester takes when performing the test. The postconditions describe the state the system is expected to be in after the actions are performed. If the postcondition(s) are met, then the software passes the test case.

3.3 Test Constraints

The Acceptance Test Plan only tests the functionality of WAVED as described in the SRS. The test cases described in the Acceptance Test Plan are not concerned with specific design and implementation details of the system. The test cases focus on ensuring the correct system behavior is achieved for the complete set of functions available to users of the system.

4. Test Assumptions and Exclusions

This section provides greater details about which functions and features of WAVED are and are not covered by the Acceptance Test Plan process.

4.1 Test Assumptions

The test cases covered in the Acceptance Test Plan are written under the assumption that the related issues are also addressed by unit tests, integration tests and system tests for WAVED.

The Acceptance Test Plan covers:

- The functional requirements listed in the Software Requirements Specification.
- The consistency of the user-related system documentation.
- The usability of the system.

4.2 Test Exclusions

It is assumed that unit tests, integration tests, and system tests for WAVED exercise areas of the system not covered by the Acceptance Test Plan.

The Acceptance Test Plan does not cover:

- The non-functional requirements of the system listed in the Software Requirements Specification.
- Functionality beyond what is described in the Software Requirements Specification
- The structural integrity of the source code.

5. Entry and Exit Criteria

This section lists the criteria that must be satisfied in order for the Acceptance Test Plan to commence, as well as the criteria that must be satisfied in order to conclude the acceptance testing.

5.1 Entry Criteria

Acceptance testing begins after the following preconditions are met:

- All Priority 1 requirements are considered to be implemented by the WAVED development team.
- Unit, integration and system testing for WAVED are completed successfully.
- A proper testing environment meeting the hardware and software constraints specified in 4.3 of the Software Requirements Specification is available.
- The Test Team Leader and the Stakeholder received the most recent revision of the Software Requirements Specification.
- Consent is obtained from the Test Team Leader.
- Consent is obtained from the Stakeholder.

5.2 Exit Criteria

The Acceptance Test Plan can end after any of the following conditions are met:

- All Priority 1 requirements were tested and resulted in expected behavior (Success).
- At least one Priority 1 requirement failed to meet the documented specification (Failure).
- All parties mutually agree to postpone testing until a later date (Failure).

6. Testing Participants

This section describes the roles and responsibilities of the parties involved in the Acceptance Test Plan, as well as the procedure for reporting the test results and any subsequent issues.

6.1 Roles and Responsibilities

For the Acceptance Test Plan, the following individuals fill the roles listed below:

- Test Team Leader: Steven Nguyen
- Testers: Sean Bluestein, Kristian Calhoun, Keith Horrocks, Hannah Pinkos
- Stakeholder: Scott Kulp (Climate Central)

6.2 Training Requirements

All parties involved in the Acceptance Test Plan should be comfortable with standard web application interfaces. Additionally, all parties should be familiar with the WAVED user interface, the type of visualizations WAVED is expected to produce, and the WAVED Software Requirements Specification.

6.3 Problem Reporting

Any problem found by either a Tester or the Stakeholder must be documented and reported to the Test Team Leader via the project's issue tracking system. Any reported problems are to be reviewed by the Test Team Leader and development team during a mandatory post testing review meeting and subsequently assigned to at least one person on the development team to resolve.

6.4 Progress Reporting

The Acceptance Test Plan Report is to be compiled by the Test Team Leader after the testing process was concluded and has satisfied any one of the conditions listed in 5.2. The WAVED development team is to review the Acceptance Test Plan Report during the mandatory post testing review meeting.

7. Test Cases

7.1 Introduction

The test cases below cover all functionality required by the Software Requirements Specification document. Each of the test cases includes the following information:

- ID - An identification code for the test case
- Name - A descriptive name of the test
- Requirement(s) - The requirement number(s) from the Software Requirements Specification document
- Description - A brief overview of the test purpose
- Precondition(s) - The expected state of the software before the actions are executed
- Action(s) - The step(s) to be completed by the tester
- Postcondition(s) - The expected state of the software after the actions are executed

7.2 Test Cases

7.2.1 Creating a Project

ID	T7.2.1.1
Name	Creating a new project at launch
Requirement(s)	R3.1.1.1, R3.1.2.1, R3.1.2.2, R3.1.3
Description	The user opens the WAVED application and creates a new project.
Precondition(s)	None
Action(s)	<ol style="list-style-type: none"> 1. The user opens a web browser and navigates to the hosted location of the WAVED application. 2. The user clicks the new project button on the dialog 3. The user enters a valid name for the project 4. The user clicks the okay button to create the project
Postcondition(s)	<ul style="list-style-type: none"> • The user is presented with a blank project • The project name the user entered appears on the menu

ID	T7.2.1.2
Name	Creating a new project after making changes to the current project
Requirement(s)	R3.1.2.2, R3.1.2.3, R3.1.3
Description	The user abandons changes to the current project, and overwrites the current project with a new project.

Precondition(s)	<ul style="list-style-type: none"> • The user created a project • The user made at least 1 change to the project
Action(s)	<ol style="list-style-type: none"> 1. The user clicks the new button in the main menu 2. The user clicks the okay button on a prompt asking to confirm the decision to lose any unsaved changes 3. The user enters the same name for the new project as the existing project 4. The user clicks the okay button to create the project 5. The user clicks the okay button to overwrite the existing project
Postcondition(s)	<ul style="list-style-type: none"> • The workspace area is empty • There are no widgets seen in the project tree • The user cannot use the undo button to recover changes from the abandoned project

7.2.2 Saving a Project

ID	T7.2.2.1
Name	Saving a project
Requirement(s)	R3.10.1.1, R3.10.1.3
Description	The user saves the current project.
Precondition(s)	<ul style="list-style-type: none"> • The user created a project
Action(s)	<ol style="list-style-type: none"> 1. The user opens the Widgets Panel 2. The user adds a U.S. map widget to the project 3. The user clicks the save button
Postcondition(s)	<ul style="list-style-type: none"> • The user is not prompted to save • The U.S. map was added to the saved state of the project • If the user reloads the created project, the U.S. map widget is visible.

ID	T7.2.2.2
Name	Saving a copy of the project
Requirement(s)	R3.10.1.2
Description	The user saves a copy of a previously saved project under a new name.
Precondition(s)	<ul style="list-style-type: none"> • The user created and saved a project • The user made at least one change to the project after saving
Action(s)	<ol style="list-style-type: none"> 1. The user clicks the Save As button

	<ol style="list-style-type: none"> 2. The user enters a new name for the project 3. The user clicks the save button on the popup dialog
Postcondition(s)	<ul style="list-style-type: none"> • An entry for the project is created in the database under the new name • The new project name is displayed on the menu bar • An entry for the old project name still exists in the database • Changes saved to the copy were not saved to the original project

7.2.3 Loading a project

ID	T7.2.3.1
Name	Loading a project
Requirement(s)	R3.1.4.1, R3.1.4.2, R3.1.4.3
Description	The user opens a previously saved project.
Precondition(s)	<ul style="list-style-type: none"> • The user saved a project • The user is at the WAVED welcome screen
Action(s)	<ol style="list-style-type: none"> 1. The user clicks the load button from the welcome dialog 2. The user selects the name of the previously saved project from the list on the popup dialog 3. The user clicks the load button on the popup dialog
Postcondition(s)	<ul style="list-style-type: none"> • The name of the loaded project appears on the screen • The workspace area is populated with the widgets that are part of the saved project • The project tree lists all widgets that are part of the saved project • The properties for each widget are populated • Events on the workspace area can be triggered • Any actions applied by default in the original project are in effect.

ID	T7.2.3.2
Name	Loading a project
Requirement(s)	R3.1.4
Description	The user abandons changes when opens a previously saved project.
Precondition(s)	<ul style="list-style-type: none"> • The user saved a project • The user has a different project open
Action(s)	<ol style="list-style-type: none"> 1. The user clicks the load button in the menu bar 2. The user is prompted to abandon changes and click okay

	<ol style="list-style-type: none"> 3. The user selects the name of the previously saved project from the list on the popup dialog 4. The user clicks the load button on the popup dialog
Postcondition(s)	<ul style="list-style-type: none"> • The name of the loaded project appears on the screen • The workspace area is populated with the widgets that are part of the saved project • The project tree lists all widgets that are part of the saved project • The properties for each widget are populated • Events on the workspace area can be triggered • Any actions applied by default in the original project are in effect.

7.2.4 Deleting a Project

ID	T7.2.4.1
Name	Deleting a saved project
Requirement(s)	R3.10.2.1, R3.10.2.3, R3.10.2.4, R3.10.2.5
Description	The user deletes a project from the list of saved project.
Precondition(s)	<ul style="list-style-type: none"> • The user created and saved a project • The user is at the WAVED welcome screen.
Action(s)	<ol style="list-style-type: none"> 1. The user clicks the load button on the welcome dialog 2. The user selects the saved project from the list of saved projects 3. The user clicks the delete button 4. The user clicks okay when prompted to delete the project
Postcondition(s)	<ul style="list-style-type: none"> • The deleted project no longer appears in the list of projects to load • The entry for the deleted project no longer appears in the database • Files associated with the deleted project were removed from the server

ID	T7.2.4.2
Name	Deleting the currently opened project
Requirement(s)	R3.10.2
Description	The user deletes the currently opened project.
Precondition(s)	<ul style="list-style-type: none"> • The user created and opened a project.
Action(s)	<ol style="list-style-type: none"> 1. The user opens the Project Tree Panel 2. The user selects the top level project folder from the project tree hierarchy 3. The user clicks the delete button

	4. The user clicks okay when prompted to confirm deletion of the project
Postcondition(s)	<ul style="list-style-type: none"> • The deleted project is no longer open • The user is presented with the WAVED welcome screen. • The entry for the deleted project no longer appears in the database • Files associated with the deleted project were removed from the server

7.2.5 Modifying a Project

ID	T7.2.5.1
Name	Changing the workspace size
Requirement(s)	R3.2.1, R3.5.2
Description	The user resizes the workspace
Precondition(s)	<ul style="list-style-type: none"> • The user created a project • The user added a widget to the project
Action(s)	<ol style="list-style-type: none"> 1. The user opens the Project Tree Panel 2. The user selects the workspace on the project tree 3. The user opens the Properties Panel 4. The user changes the height from 600 to 400 pixels 5. The user changes the width from 750 to 600 pixels 6. The user changes the color from white to blue
Postcondition(s)	<ul style="list-style-type: none"> • The workspace updated to the size the user entered • The workspace has the same relative appearance • The workspace background is blue

ID	T7.2.5.2
Name	Resetting the workspace
Requirement(s)	R3.2.2, R3.2.3
Description	The user triggers an action in the workspace and then resets the workspace to its initial state.
Precondition(s)	<ul style="list-style-type: none"> • The user created a project • The user added a widget to the project • The user created an action targeting the widget with the apply by default option left unchecked. • The user created a click event using the created action with the widget as the trigger.

Action(s)	<ol style="list-style-type: none"> 1. The user clicks on the widget to trigger the action 2. The user clicks the refresh button
Postcondition(s)	<ul style="list-style-type: none"> • The workspace reverted to the state it was in before the user triggered the click event

ID	T7.2.5.3
Name	Changing widget properties
Requirement(s)	R3.2.1, R3.5.1.1, R3.5.1.2
Description	The user changes the properties of a widget.
Precondition(s)	<ul style="list-style-type: none"> • The user created a project • The user added a widget to the project • The widget is selected
Action(s)	<ol style="list-style-type: none"> 1. The user opens the Properties Panel 2. The user changes the value of one of the properties of the widget
Postcondition(s)	<ul style="list-style-type: none"> • The widget visualization in the workspace was updated to reflect the changed property value

7.2.6 Exporting a Visualization

ID	T7.2.6.1
Name	Exporting a visualization
Requirement(s)	T3.10.3
Description	The user exports a project to his or her local machine.
Precondition(s)	<ul style="list-style-type: none"> • The user created a project and made at least one change to the project
Action(s)	<ol style="list-style-type: none"> 1. The user clicks the export button 2. The user browses to a directory on the local machine 3. The user enters a name for the exported file 4. The user clicks the export button on the popup dialog
Postcondition(s)	<ul style="list-style-type: none"> • A zip file was created in the specified directory with the specified name • The zip file contains the files specified in R3.10.3.1.2

ID	T7.2.6.2
-----------	----------

Name	Embedding a visualization
Requirement(s)	R3.10.3
Description	The user embeds the exported application in another web page.
Precondition(s)	<ul style="list-style-type: none"> • The user exported the visualization • The user extracted the contents of the exported zip folder
Action(s)	<ol style="list-style-type: none"> 1. The user creates a new HTML file and adds the exported HTML file in an iframe tag 2. The user opens the newly created HTML file in a web browser
Postcondition(s)	<ul style="list-style-type: none"> • The visualization appears on the web page • The visualization in the web page has the same functionality as the visualization seen on the workspace area of WAVED

7.2.7 Project Revision History

ID	T7.2.7.1
Name	Undoing changes to a project
Requirement(s)	R3.10.4.1
Description	The user reverts a change made to the current project.
Precondition(s)	<ul style="list-style-type: none"> • The user created a project
Action(s)	<ol style="list-style-type: none"> 1. The user makes a change to the project 2. The user clicks the undo button
Postcondition(s)	<ul style="list-style-type: none"> • The undo button is now disabled • The most recent change was reverted

ID	T7.2.7.2
Name	Redoing changes to a project
Requirement(s)	R3.10.4.2.1, R3.10.4.2.2
Description	The user restores a change that was previously undone to the current project.
Precondition(s)	<ul style="list-style-type: none"> • The user created a project • The user made a change • The user undid this change

Action(s)	1. The user clicks the redo button
Postcondition(s)	<ul style="list-style-type: none"> • The redo button is disabled • The undo button is enabled • The reverted change was restored

ID	T7.2.7.3
Name	Overwriting undone changes
Requirement(s)	R3.10.4.2
Description	The user undoes a change, then makes a new change to the current project.
Precondition(s)	<ul style="list-style-type: none"> • The user created a project • The user made two changes to the project • The user reverted one change
Action(s)	1. The user makes a change to the project
Postcondition(s)	<ul style="list-style-type: none"> • The redo button is disabled

7.2.8 Adding Widgets

ID	T7.2.8.1
Name	Available widgets
Requirement(s)	R3.4
Description	The user adds a widget to the current project.
Precondition(s)	<ul style="list-style-type: none"> • The user created a project
Action(s)	1. The user opens the Widgets Panel
Postcondition(s)	<ul style="list-style-type: none"> • All widgets listed in R3.4.2 are available on the widget panel

ID	T7.2.8.2
Name	Adding a widget
Requirement(s)	T3.4.1
Description	The user adds a widget to the current project.
Precondition(s)	<ul style="list-style-type: none"> • The user created a project

Action(s)	<ol style="list-style-type: none"> 2. The user opens the Widgets Panel 3. The user clicks to add a widget to the project
Postcondition(s)	<ul style="list-style-type: none"> • The widget is visible in the workspace • The widget is selected • The widget was added to the project tree • The widget's properties are seen in the Properties Panel

7.2.9 Removing Widgets

ID	T7.2.9.1
Name	Removing a widget
Requirement(s)	R3.9.2.1, R3.9.2.2
Description	The user selects a widget with no dependents and deletes it from the current project.
Precondition(s)	<ul style="list-style-type: none"> • The user created a project • The user added a widget to the project
Action(s)	<ol style="list-style-type: none"> 1. The user opens the Project Tree Panel 2. The user selects the widget to remove 3. The user clicks the delete button
Postcondition(s)	<ul style="list-style-type: none"> • The widget is no longer seen in the workspace area • The widget is no longer listed in the project tree • The widget is no longer selectable from the select combobox in the main menu

ID	T7.2.9.2
Name	Removing a widget with events and actions
Requirement(s)	R3.9.2
Description	The user deletes a widget with events and actions referring to it.
Precondition(s)	<ul style="list-style-type: none"> • The user created a project • The user added a widget • The user created a default action that targets the widget • The user created an event that is triggered by the widget
Action(s)	<ol style="list-style-type: none"> 1. The user opens the Project Tree Panel 2. The user selects the widget to remove from the project tree 3. The user clicks the delete button

	<ol style="list-style-type: none"> 4. The user clicks the okay button on the dialog alerting him or her that the widget cannot be deleted until actions and events are changed 5. The user deletes the event that is triggered by the widget 6. The user modifies the action so it does not target the widget 7. The user opens the Project Tree Panel 8. The user selects the widget 9. The user clicks the delete button
Postcondition(s)	<ul style="list-style-type: none"> • The widget is no longer seen in the workspace area • The widget is no longer listed in the project tree • The widget is no longer selectable from the select combobox in the main menu

7.2.10 Widget Properties

ID	T7.2.10.1
Name	Adding a U.S. map widget
Requirement(s)	R3.5.3, R3.5.4
Description	The user adds a U.S. map widget to the project.
Precondition(s)	<ul style="list-style-type: none"> • The user created a project
Action(s)	<ol style="list-style-type: none"> 1. The user opens the Widgets Panel 2. The user adds a U.S. Map widget
Postcondition(s)	<ul style="list-style-type: none"> • The Properties Panel is open • The map with all 50 states is visible in the workspace • All properties listed in requirements R3.5.3 and R3.5.4.1 are accessible from the Properties Panel

ID	T7.2.10.2
Name	Adding glyphs to the U.S. map
Requirement(s)	R3.5.4.2
Description	The user adds a glyph and a tooltip to the U.S. Map widget.
Precondition(s)	<ul style="list-style-type: none"> • The user created a project • The user added a U.S. Map widget • The U.S. map widget is selected
Action(s)	<ol style="list-style-type: none"> 1. The user opens the Properties Panel 2. The user selects to add a glyph and clicks okay

	<ol style="list-style-type: none"> 3. The user sets required glyph properties 4. The user selects the U.S. Map widget 5. The user opens the Properties Panel
Postcondition(s)	<ul style="list-style-type: none"> • The glyphs were added to the project tree • The glyphs appear on the map

ID	T7.2.10.3
Name	Adding a Line Graph widget
Requirement(s)	R3.5.3, R3.5.5
Description	The user adds a line graph to the current project.
Precondition(s)	<ul style="list-style-type: none"> • The user created a project • The user added a data source to the project
Action(s)	<ol style="list-style-type: none"> 1. The user opens the Widgets Panel 2. The user clicks to add a Line Graph widget 3. The user opens the Properties Panel 4. The user binds the data source to the project 5. The user sets the x-axis and y-axis data properties
Postcondition(s)	<ul style="list-style-type: none"> • The Line Graph widget appears on the workspace area • The graph has circles for each data point • The graph displays lines connecting the data point circles • All properties listed in requirements R3.5.3 and R3.5.5 are accessible from the Properties Panel

ID	T7.2.10.4
Name	Adding a button
Requirement(s)	R3.5.3, R3.5.6
Description	The user adds a button widget to the current project.
Precondition(s)	<ul style="list-style-type: none"> • The user created a project
Action(s)	<ol style="list-style-type: none"> 1. The user opens the Widgets Panel 2. The user clicks to add a Button widget to the project
Postcondition(s)	<ul style="list-style-type: none"> • A Button widget is visible in the workspace area. • All properties listed in R3.5.3 and R3.5.6 are accessible from the Properties Panel

ID	T7.2.10.5
Name	Adding a text block
Requirement(s)	R3.5.3, R3.5.8
Description	The user adds a text block widget to the current project.
Precondition(s)	<ul style="list-style-type: none"> • The user created a project
Action(s)	<ol style="list-style-type: none"> 1. The user opens the Widget Panel 2. The user adds the Text Block widget
Postcondition(s)	<ul style="list-style-type: none"> • A rectangular text block is visible in the workspace area • All properties listed in R3.5.3 and R3.5.8 are accessible from the Properties Panel

ID	T7.2.10.6
Name	Adding constant size glyphs
Requirement(s)	R3.5.4.2.7.1.1
Description	The user adds constant sized glyphs to a U.S. map widget.
Precondition(s)	<ul style="list-style-type: none"> • The user created a project • The user created a U.S. map widget • The user selected the U.S. map widget • The user opened the Properties Panel
Action(s)	<ol style="list-style-type: none"> 1. The user clicks the add glyph button in the Properties Panel 2. The user selects glyphs from the resulting popup and clicks the okay button 3. The user sets a data set 4. The user supplies a number for the size of the glyphs 5. The user selects a field from the selected data set for the latitude 6. The user selects a field from the selected data set for the longitude
Postcondition(s)	<ul style="list-style-type: none"> • Glyphs are visible on the U.S. map. • Glyphs are a constant size

ID	T7.2.10.7
Name	Adding scaled size glyphs
Requirement(s)	R3.5.4.2.7.1.2
Description	The user adds glyphs scaled in size to a U.S. map widget.

Precondition(s)	<ul style="list-style-type: none"> • The user created a project • The user added a U.S. map widget • The user selected the U.S. map widget • The user opened the Properties Panel
Action(s)	<ol style="list-style-type: none"> 1. The user clicks the add glyph button in the Properties Panel 2. The user selects the glyphs option from the resulting popup and clicks the okay button 3. The user sets a data set 4. The user selects a data field for the size of the glyphs 5. The user selects a field from the selected data set for the latitude 6. The user selects a field from the selected data set for the longitude
Postcondition(s)	<ul style="list-style-type: none"> • Glyphs are visible on the U.S. map. • The glyphs are scaled by the values in the specified data field

ID	T7.2.10.6
Name	Adding a tooltip
Requirement(s)	R3.5.3, R3.5.12
Description	The user adds a tooltip widget to the current project.
Precondition(s)	<ul style="list-style-type: none"> • The user created a project
Action(s)	<ol style="list-style-type: none"> 1. The user opens the Widget Panel 2. The user adds the tooltip widget
Postcondition(s)	<ul style="list-style-type: none"> • A rectangular text block is visible in the workspace area • All properties listed in R3.5.3 and R3.5.8 are accessible from the Properties Panel

7.2.11 Data

ID	T7.2.11.1
Name	Adding data sources to the project
Requirement(s)	R3.3.1.1, R3.3.2, R3.3.2.3
Description	The user uploads data sources from his or her local machine to the project.
Precondition(s)	<ul style="list-style-type: none"> • The user created a project
Action(s)	<ol style="list-style-type: none"> 1. The user opens the Data Panel 2. The user clicks the add data source button

	<ol style="list-style-type: none"> 3. The user selects a CSV file from his local machine 4. The user enters a name for the data source 5. The user clicks the load button 6. The user clicks the add data source button 7. The user selects a text file from his local machine 8. The user clicks the load button
Postcondition(s)	<ul style="list-style-type: none"> • An error message is visible saying the text file is an invalid data type • The filename of the added CSV data source is visible in the Data Source list of the Data Panel • The data source are available as an option when binding data to widgets

ID	T7.2.11.2
Name	Viewing added data
Requirement(s)	R3.3.3
Description	The user views the data fields for an added data source.
Precondition(s)	<ul style="list-style-type: none"> • The user created a project • The user added a data set to the project
Action(s)	<ol style="list-style-type: none"> 1. The user opens the Data Panel 2. The user selects a data set from the list 3. The user clicks the view button
Postcondition(s)	<ul style="list-style-type: none"> • A dialog containing a table is displayed • The table contains the data field names • The table contains the data values for the first 10 rows

ID	T7.2.11.3
Name	Removing a data source
Requirement(s)	R3.3.5.1, R3.3.5.4
Description	The user removes a data source from the current project.
Precondition(s)	<ul style="list-style-type: none"> • The user created a project • The user added a data source to the project
Action(s)	<ol style="list-style-type: none"> 1. The user opens the Data Panel 2. The user selects a data source from the list 3. The user clicks the delete button
Postcondition(s)	<ul style="list-style-type: none"> • The data source is removed from the list of available data in the Data Panel

	<ul style="list-style-type: none"> • The deleted data source is no longer available as an option when binding data to a widget • The corresponding data file is deleted from the server
--	---

ID	T7.2.11.4
Name	Removing bound data
Requirement(s)	R3.3.5.5, R3.3.5.6
Description	The user removes a bound data source from the current project.
Precondition(s)	<ul style="list-style-type: none"> • The user created a project • The user added a data source to the project • The user added a widget to the project • The widget is selected • The user bound the data source to the widget
Action(s)	<ol style="list-style-type: none"> 1. The user opens the Data Panel 2. The user selects the data source to delete 3. The user clicks the delete button 4. The user clicks the okay button on the dialog instructing him or her to unbind the data 5. The user opens the Properties Panel 6. The user removes the data source from the bound data section 7. Repeat steps 2-3
Postcondition(s)	<ul style="list-style-type: none"> • The data source is no longer visible in the list of data sources in the Data Panel • The data source can no longer be bound to the widget • The data source is no longer available to the project

ID	T7.2.11.5
Name	Removing a data source with a data subset
Requirement(s)	R3.3.5.2, R3.3.5.3
Description	The user deletes a data source after a data subset was created from that data source.
Precondition(s)	<ul style="list-style-type: none"> • The user created a project • The user added a data source • The user created a data subset from a data source
Action(s)	<ol style="list-style-type: none"> 1. The user opens the Data Panel 2. The user selects a data source from which a data subset was created

	3. The user clicks the okay button on the dialog asking to confirm deletion of the data source
Postcondition(s)	<ul style="list-style-type: none"> • The deleted data source is no longer listed in the list of data sources in the Data Panel • Any data subsets created from the deleted data source are no longer listed in the Data Panel • Neither the deleted data set nor any of its data subsets are available as options when binding data to widgets

ID	T7.2.11.6
Name	Adding a data subset
Requirement(s)	R3.3.4
Description	The user creates a data subset from a loaded data source.
Precondition(s)	<ul style="list-style-type: none"> • The user created a project • The user added a data source to the project
Action(s)	<ol style="list-style-type: none"> 1. The user opens the Data Panel 2. The user selects the option to add a data subset 3. The user selects a data set 4. The user supplies a name for the data subset 5. The user selects a data field of the selected data set 6. The user selects a comparison operator 7. The user specifies a comparison value 8. The user selects the AND operator 9. The user repeats steps 5-7 10. The user selects the OR operator 11. The user repeats steps 5-7 12. The user clicks the okay button
Postcondition(s)	<ul style="list-style-type: none"> • The provided name for the data subset appears in the list of data subsets in the Data Panel • The data subset is available as an option when binding data to widgets

ID	T7.2.11.7
Name	Binding data to a widget
Requirement(s)	R3.5.13.1
Description	The user binds a loaded data source to the U.S. map with glyphs.
Precondition(s)	<ul style="list-style-type: none"> • The user created a project

	<ul style="list-style-type: none"> • The user added a data set to the project • The user added a U.S. map widget to the project
Action(s)	<ol style="list-style-type: none"> 1. The user selects the widget to which data should be bound 2. The user opens the Properties Panel 3. The user clicks the button to bind data to the widget 4. The user checks the boxes on the dialog next to the data sets that should be bound to the widget 5. The user clicks the okay button to close the dialog
Postcondition(s)	<ul style="list-style-type: none"> • The name of the data set appears in the list of data sources in Properties Panel when the U.S. Map to which it was bound is selected • The name of the bound data set is available as an option when creating an action or adding glyphs to the U.S. map

ID	T7.2.11.8
Name	Unbinding data from a widget
Requirement(s)	R3.5.14
Description	The user removes bound data from a widget.
Precondition(s)	<ul style="list-style-type: none"> • The user added a data set to the project • The user added a widget to the project • The user bound a data set to a widget
Action(s)	<ol style="list-style-type: none"> 1. The user selects the widget from which bound data should be removed 2. The user selects the name of the data set to be removed from the list of data sets bound to the widget 3. The user clicks the button to remove the data
Postcondition(s)	<ul style="list-style-type: none"> • The name of the unbound data set no longer appears in the list of data sources bound to the widget in the Properties Panel

7.2.12 Actions

ID	T7.2.12.1
Name	Adding a change property action
Requirement(s)	R3.6.1, R3.6.2.1.1
Description	The user adds a default action to change a property of a widget.
Precondition(s)	<ul style="list-style-type: none"> • The user created a project • The user added a widget to the project

Action(s)	<ol style="list-style-type: none"> 1. The user opens the Actions Panel 2. The user clicks the add button 3. The user selects property as the action type 4. The user selects the widget to target 5. The user enters a new value for one of the widget's properties in the options section of the dialog 6. The user checks the "apply automatically" checkbox. 7. The user clicks the okay button to close the dialog and apply the action
Postcondition(s)	<ul style="list-style-type: none"> • The affected target property of the widget is updated in the workspace view

ID	T7.2.12.2
Name	Adding a change query action
Requirement(s)	R3.6.1, R3.6.2.1.2
Description	The user adds a default action to change a property of a widget.
Precondition(s)	<ul style="list-style-type: none"> • The user created a project • The user added a widget to the project • The user added a data source to the project • The user created a data subset • The user created a default action that uses the data subset
Action(s)	<ol style="list-style-type: none"> 1. The user opens the Actions Panel 2. The user clicks the add button 3. The user selects data subset as the action type 4. The user selects the data subset to target 5. The user alters the data subset definition 6. The user clicks the okay button to close the dialog and apply the action
Postcondition(s)	<ul style="list-style-type: none"> • The property affected by the default action was updated for the changes to the data subset

ID	T7.2.12.3
Name	Modifying an action
Requirement(s)	R3.6.3
Description	The user modifies an action.
Precondition(s)	<ul style="list-style-type: none"> • The user created a project • The user added a widget to the project • The user added a default action that changes a property of a widget

Action(s)	<ol style="list-style-type: none"> 1. The user opens the Actions Panel 2. The user selects the action 3. The user clicks the modify action button 4. The user changes the value of the changed property 5. The user clicks the okay button to close the dialog
Postcondition(s)	<ul style="list-style-type: none"> • The workspace is updated to reflect the new property value defined in the action

ID	T7.2.12.4
Name	Removing an action
Requirement(s)	R3.6.4.1
Description	The user removes an action.
Precondition(s)	<ul style="list-style-type: none"> • The user created a project • The user added a widget to the project • The user added an action
Action(s)	<ol style="list-style-type: none"> 1. The user opens the Actions Panel 2. The user selects the action to be removed 3. The user clicks the remove action button
Postcondition(s)	<ul style="list-style-type: none"> • The removed action no longer appears in the list of actions • The removed action is no longer available as an option when creating an event

ID	T7.2.12.5
Name	Removing an action used by an event
Requirement(s)	R3.6.4
Description	The user removes an action that is currently being used by an event in the project.
Precondition(s)	<ul style="list-style-type: none"> • The user created a project • The user added a widget to the project • The user added an action • The user added an event using the action
Action(s)	<ol style="list-style-type: none"> 1. The user opens the Actions Panel 2. The user selects the action to be removed 3. The user clicks the remove button 4. The user clicks okay on the dialog that appears informing the user that the action is in use by an event and cannot be deleted.

	<ol style="list-style-type: none"> 5. The user removes the event using the action 6. The user repeats steps 1-3.
Postcondition(s)	<ul style="list-style-type: none"> • The removed action no longer appears in the list of available widget actions in the Properties Panel • The removed action is no longer available as an option when adding an event to the widget

ID	T7.2.12.6
Name	Using data bound to a widget in an action
Requirement(s)	R3.6.5
Description	The user dynamically displays data bound to a widget using actions and events.
Precondition(s)	<ul style="list-style-type: none"> • The user created a project • The user added a USMap widget to the project • The user has bound a data file containing per-state data to the map • The user added a textblock widget to the project
Action(s)	<ol style="list-style-type: none"> 1. The user opens the Actions Panel 2. The user clicks the add button to create an action 3. The user selects the Property Action as the Action type 4. The user selects the textblock widget as the affected widget 5. The user enters {{name.field}} as the new value for the textblock's text property, where name is the name of the dataset bound to the USMap and field is the name of a field in the specified data set. 6. The user creates a click event targeting the USMap to fire the created action.
Postcondition(s)	<ul style="list-style-type: none"> • When the user clicks on a state on the USMap widget, the text in the textblock changes to display the designated data field for that state.

ID	T7.2.12.7
Name	Using mouse event information in an action
Requirement(s)	R3.6.5
Description	The user displays the location of the current mouse click in a text block.
Precondition(s)	<ul style="list-style-type: none"> • The user created a project • The user added a USMap widget to the project • The user has bound a data file containing per-state data to the map • The user added a textblock widget to the project

Action(s)	<ol style="list-style-type: none"> 1. The user opens the Actions Panel 2. The user clicks the add button to create an action 3. The user selects the Property Action as the Action type 4. The user selects the textblock widget as the affected widget 5. The user enters {{x}}, {{y}} as the new value for the textblock's text property. 6. The user creates a click event targeting the USMap to fire the created action.
Postcondition(s)	<ul style="list-style-type: none"> • When the user clicks on the USMap widget, the text in the textblock changes to display the coordinates of the mouse click as percentages of the workspace's horizontal and vertical dimensions.

7.2.13 Events

ID	T7.2.13.1
Name	Adding a click event to a widget
Requirement(s)	R3.7.1.1.1, R3.7.2
Description	The user adds a click event to a widget.
Precondition(s)	<ul style="list-style-type: none"> • The user created a project • The user added a widget to the project • The user added a change property action
Action(s)	<ol style="list-style-type: none"> 1. The user opens the Events Panel 2. The user clicks the add button 3. The user selects click as the event type 4. The user selects the widget as a trigger 5. The user selects the action 6. The user clicks the okay button
Postcondition(s)	<ul style="list-style-type: none"> • The added click event is displayed in the event list • The action added to the event is fired when the click event is triggered on the designated target

ID	T7.2.13.2
Name	Adding a hover event
Requirement(s)	R3.7.1.1.2, R3.7.2.1
Description	The user adds a hover event.
Precondition(s)	<ul style="list-style-type: none"> • The user created a project • The user added a widget to the project

	<ul style="list-style-type: none"> The user added a change property action
Action(s)	<ol style="list-style-type: none"> The user opens the Events Panel The user clicks the add button The user selects hover as the event type The user selects a widget to target The user selects the action The user clicks the save button
Postcondition(s)	<ul style="list-style-type: none"> The added hover event is displayed in the event list The action added to the event is fired when the hover event is triggered on the designated target

ID	T7.2.13.3
Name	Adding a move event
Requirement(s)	R3.7.1.1.3, R3.7.2.1
Description	The user adds a move event.
Precondition(s)	<ul style="list-style-type: none"> The user created a project The user added a widget to the project The user added a change property action
Action(s)	<ol style="list-style-type: none"> The user opens the Events Panel The user clicks the add button The user selects move as the event type The user selects a widget to target The user selects the action The user clicks the save button
Postcondition(s)	<ul style="list-style-type: none"> The added move event is displayed in the event list The action added to the event is fired when the move event is triggered on the designated target

ID	T7.2.13.4
Name	Modifying an event
Requirement(s)	R3.7.3
Description	The user modifies an event.
Precondition(s)	<ul style="list-style-type: none"> The user created a project The user added a widget to the current project The user added an action

	<ul style="list-style-type: none"> The user added an event triggering an action
Action(s)	<ol style="list-style-type: none"> The user opens the Events Panel The user selects the event The user clicks the edit button The user changes the selected action The user clicks the okay button
Postcondition(s)	<ul style="list-style-type: none"> The new action is triggered when the event is fired

ID	T7.2.13.5
Name	Removing an event
Requirement(s)	R3.7.4
Description	The user removes an event from a widget in the current project.
Precondition(s)	<ul style="list-style-type: none"> The user created a project The user added a widget to the current project The user added an action The user added an event triggering an action
Action(s)	<ol style="list-style-type: none"> The user opens the Events Panel The user selects the event The user clicks the delete button
Postcondition(s)	<ul style="list-style-type: none"> The event is no longer in the list of events <p>Interacting with the workspace no longer triggers the action used in the deleted event</p>

7.2.14 Google Analytics

ID	T7.2.14.1
Name	Adding Google Analytics
Requirement(s)	R3.8
Description	The user adds a Google Universal Analytics tracking code to the current project and enables it for the selected widget.
Precondition(s)	<ul style="list-style-type: none"> The user created a project The user added a widget to the project The user selected a widget The user registered a valid Google Analytics account outside of the WAVED application

	<ul style="list-style-type: none"> The user registered a website with Google Analytics and received a Universal Analytics tracking code
Action(s)	<ol style="list-style-type: none"> The user opens the Google Analytics Panel The user enters the UA tracking code they received in the designated field The user enters a valid event category in the designated field The user clicks the add button The user opens the Properties Panel The user checks to log google analytics
Postcondition(s)	<ul style="list-style-type: none"> The entered UA tracking code and event category persist in the Google Analytics Panel as the user navigates the WAVED application. When the project is exported and embedded in a webpage that matches the domain registered with the supplied Google Analytics UA code, clicking on the widget within the webpage logs Google analytics.

7.2.15 Project Tree

ID	T7.2.15.1
Name	Selecting components
Requirement(s)	R3.9.1.1, R3.9.1.2
Description	The user select a component from the project tree
Precondition(s)	<ul style="list-style-type: none"> The user created a project The user added a widget to the project The user selected the workspace from the combo box
Action(s)	<ol style="list-style-type: none"> The user opens the Project Tree Panel The user clicks the widget in the project tree
Postcondition(s)	<ul style="list-style-type: none"> The clicked widget is selected

ID	T7.2.15.1
Name	Deleting a component
Requirement(s)	R3.9.1.3
Description	The user deletes a component from the project tree
Precondition(s)	<ul style="list-style-type: none"> The user created a project The user added a widget to the project The user selected the widget

Action(s)	<ol style="list-style-type: none">1. The user opens the Project Tree Panel2. The user clicks the delete button
Postcondition(s)	<ul style="list-style-type: none">• The widget was deleted• The workspace is selected

8. Traceability Matrix

Requirement	Description	Test Cases
R3.1	Welcome Screen Requirements	
R3.1.1	On launch	
R3.1.1.1	Create a new project	T7.2.1.1
R3.1.1.2	Load an existing project	T7.2.1.1
R3.1.2	Creating a Project	
R3.1.2.1	Launching an application	T7.2.1.1
R3.1.2.2	Creating a new project	T7.2.1.1, T7.2.1.2
R3.1.2.3	Abandoning changes	T7.2.1.2
R3.1.3	Project name	T7.2.1.1, T7.2.1.2
R3.1.3.1	Project name uniqueness	T7.2.1.1, T7.2.1.2
R3.1.3.2	Project name length	T7.2.1.1, T7.2.1.2
R3.1.3.3	Project name character restriction	T7.2.1.1, T7.2.1.2
R3.1.4	Loading a Project	
R3.1.4.1	Loading a saved project	T7.2.3.1, T7.2.3.2
R3.1.4.2	Selecting a saved project from a list	T7.2.3.1, T7.2.3.2
R3.1.2.3	Validating the project loaded correctly	T7.2.3.1, T7.2.3.2
R3.1.2.4	Abandoning changes	T7.2.3.2
R3.2	Main Interface Requirements	
R3.2.1	Updating the workspace	T7.2.5.1, T7.2.5.3
R3.2.2	Refreshing the workspace	T7.2.5.2
R3.2.3	Functionality of the workspace	T7.2.5.2
R3.3	Data Requirements	
R3.3.1	Valid Data File Formats	
R3.3.1.1	Acceptable Formats	
R3.3.1.1.1	CSV	T7.2.11.1
R3.3.2	Uploading a Data Source	
R3.3.2.1	Uploading data	T7.2.11.1
R3.3.2.2	File type restrictions	T7.2.11.1
R3.3.2.3	Name Requirements	
R3.3.2.3.1	Name length	T7.2.11.1
R3.3.2.3.2	Valid characters	T7.2.11.1
R3.3.3	Viewing a Data Set	
R3.3.3.1	Viewing data	T7.2.11.2
R3.3.3.2	Preview row count	T7.2.11.2

R3.3.4	Creating a Data Subset	
R3.3.4.1	Data subset name	
R3.3.4.1.1	Name Length	T7.2.11.6
R3.3.4.1.2	Character Restriction	T7.2.11.6
R3.3.4.2	Data source to derive from	T7.2.11.6
R3.3.4.3	Creating the conditional	
R3.3.4.3.1	A data field	T7.2.11.6
4.10.4.3.2	Comparison Operators	
R3.3.4.3.2.1	Less than	T7.2.11.6
R3.3.4.3.2.2	Less than or equal to	T7.2.11.6
R3.3.4.3.2.3	Equal to	T7.2.11.6
R3.3.4.3.2.4	Not equal to	T7.2.11.6
R3.3.4.3.2.5	Greater than	T7.2.11.6
R3.3.4.3.2.6	Greater than or equal to	T7.2.11.6
R3.3.4.3.3	A user-supplied value	T7.2.11.6
R3.3.4.4	Logical Operators	
R3.3.4.4.1	AND	T7.2.11.6
R3.3.4.4.2	OR	T7.2.11.6
R3.3.4.5	Logical Operator Precedence	T7.2.11.6
R3.3.5	Removing A Data Set	
R3.3.5.1	Removing data	T7.2.11.3
R3.3.5.2	Prompt if children exist	T7.2.11.5
R3.3.5.3	Recursively delete	T7.2.11.5
R3.3.5.4	Remove data from server	T7.2.11.3
R3.3.5.5	Restrictions on removing data	T7.2.11.4
R3.3.5.6	Prompt if removing is restricted	T7.2.11.4
R3.4	Widgets Panel Requirements	
R3.4.1	Adding widgets to a project	T7.2.8.2
R3.4.2	Available Widgets	
R3.4.2.1	U.S. Map	T7.2.8.1
R3.4.2.1.1	Map Display	T7.2.8.1
R3.4.2.2	Line Graph	T7.2.8.1
R3.4.2.2.1	Display data points	T7.2.8.1
R3.4.2.2.2	Display lines	T7.2.8.1
R3.4.2.3	Button	T7.2.8.1
R3.4.2.3.1	Button display	T7.2.8.1
R3.4.2.4	Text Block	T7.2.8.1
R3.4.2.4.1	Text block display	T7.2.8.1
R3.4.2.9	Tooltip	T7.2.8.1

R3.4.2.9.1	Tooltip display	T7.2.8.1
R3.5	Properties Panel Requirements	
R3.5.1	Modifying a Widget	
R3.5.1.1	Modifying defined properties	T7.2.5.3
R3.5.1.2	Selecting to change properties	T7.2.5.3
R3.5.2	Workspace Properties	
R3.5.2.1	Height	
R3.5.2.1.1	Valid height	T7.2.5.1,
R3.5.2.1.2	Default height	T7.2.5.1
R3.5.2.2	Width	
R3.5.2.2.1	Valid width	T7.2.5.1
R3.5.2.2.2	Default width	T7.2.5.1
R3.5.2.3	Background Color	
R3.5.2.3.1	Valid color	T7.2.5.1
R3.5.2.3.2	Default color	T7.2.5.1
R3.5.3	Common Widget Properties	
R3.5.3.1.1	Name	
R3.5.3.1.1.1	Name length	T7.2.10.1, T7.2.10.3, T7.2.10.4, T7.2.10.5, T7.2.10.6
R3.5.3.1.1.2	Name uniqueness	T7.2.10.1, T7.2.10.3, T7.2.10.4, T7.2.10.5, T7.2.10.6
R3.5.3.1.1.3	Name character restriction	T7.2.10.1, T7.2.10.3, T7.2.10.4, T7.2.10.5, T7.2.10.6
R3.5.3.1.1.4	Default name	T7.2.10.1, T7.2.10.3, T7.2.10.4, T7.2.10.5, T7.2.10.6
R3.5.3.1.2	Visibility	
R3.5.3.1.2.1	Visibility values	T7.2.10.1, T7.2.10.3, T7.2.10.4, T7.2.10.5, T7.2.10.6
R3.5.3.1.2.2	Visibility default value	T7.2.10.1, T7.2.10.3, T7.2.10.4, T7.2.10.5, T7.2.10.6
R3.5.3.1.3	Log Google Analytics	
R3.5.3.1.3.1	Google Analytics	T7.2.10.1, T7.2.10.3, T7.2.10.4, T7.2.10.5, T7.2.10.6
R3.5.3.1.3.2	Google analytics default value	T7.2.10.1, T7.2.10.3, T7.2.10.4, T7.2.10.5, T7.2.10.6
R3.5.3.1.4	Horizontal Offset	
R3.5.3.1.4.1	Valid horizontal offset values	T7.2.10.1, T7.2.10.3, T7.2.10.4, T7.2.10.5, T7.2.10.6
R3.5.3.1.4.2	Measuring the offset	T7.2.10.1, T7.2.10.3, T7.2.10.4, T7.2.10.5, T7.2.10.6
R3.5.3.1.4.3	Default value	T7.2.10.1, T7.2.10.3, T7.2.10.4, T7.2.10.5, T7.2.10.6
R3.5.3.1.5	Vertical Offset	
R3.5.3.1.5.1	Valid vertical offset values	T7.2.10.1, T7.2.10.3, T7.2.10.4, T7.2.10.5, T7.2.10.6
R3.5.3.1.5.2	Measuring the offset	T7.2.10.1, T7.2.10.3, T7.2.10.4, T7.2.10.5, T7.2.10.6
R3.5.3.1.5.3	Default value	T7.2.10.1, T7.2.10.3, T7.2.10.4, T7.2.10.5, T7.2.10.6
R3.5.3.1.6	Height	
R3.5.3.1.6.1	Height value restriction	T7.2.10.1, T7.2.10.3, T7.2.10.4, T7.2.10.5, T7.2.10.6
R3.5.3.1.7	Width	

R3.5.3.1.7.1	Width value restriction	T7.2.10.1, T7.2.10.3, T7.2.10.4, T7.2.10.5, T7.2.10.6
R3.5.4	U.S. Map Properties	
R3.5.4.1	Coloring	
R3.5.4.1.1	Coloring Schemes	
R3.5.4.1.1.1	All states same color	T7.2.10.1
R3.5.4.1.1.2	Four color scheme	T7.2.10.1
R3.5.4.1.2	Default coloring	T7.2.10.1
R3.5.4.2	Glyphs	
R3.5.4.2.1	Name	
R3.5.4.2.1.1	Name length	T7.2.10.2
R3.5.4.2.1.2	Name uniqueness	T7.2.10.2
R3.5.4.2.1.3	Name character restriction	T7.2.10.2
R3.5.4.2.1.4	Default name	T7.2.10.2
R3.5.4.2.2	Visibility	
R3.5.4.2.2.1	Visibility values	T7.2.10.2
R3.5.4.2.2.2	Visibility default value	T7.2.10.2
R3.5.4.2.3	Log Google Analytics	
R3.5.4.2.3.1	Google Analytics	T7.2.10.2
R3.5.4.2.3.2	Google analytics default value	T7.2.10.2
R3.5.4.2.4	Data	
R3.5.4.2.4.1	Selecting data	T7.2.10.2
R3.5.4.2.5	Color	
R3.5.4.2.5.1	Valid color value	T7.2.10.2
R3.5.4.2.5.2	Default color	T7.2.10.2
R3.5.4.2.6	Shape	
R3.5.4.2.6.1	Available glyph shapes	
R3.5.4.2.6.1.1	Circle	T7.2.10.2
R3.5.4.2.6.2	Default shape	T7.2.10.2
R3.5.4.2.7	Size	
R3.5.4.2.7.1	Specifying dimensions	
R3.5.4.2.7.1.1	Constant size	T7.2.10.2, T7.2.10.6
R3.5.4.2.7.1.2	Data dependent size	T7.2.10.2, T7.2.10.7
R3.5.4.2.8	Latitude	
R3.5.4.2.8.1	Latitude source	T7.2.10.2
R3.5.4.2.8.2	Valid latitude	T7.2.10.2
R3.5.4.2.9	Longitude	
R3.5.4.2.9.1	Longitude source	T7.2.10.2

R3.5.4.2.9.2	Valid longitude	T7.2.10.2
R3.5.5	Line Graph Properties	
R3.5.5.1	Title	
R3.5.5.1.1	Character restriction	T7.2.10.3
R3.5.5.2	X-Axis Label	
R3.5.5.2.1	Character restriction	T7.2.10.3
R3.5.5.3	Y-Axis Label	
R3.5.5.3.1	Character restriction	T7.2.10.3
R3.5.5.4	Graph Data	
R3.5.5.4.1	Graph data requirement	T7.2.10.3
R3.5.5.5	X-Axis Data	
R3.5.5.5.1	Valid x-axis value	T7.2.10.3
R3.5.5.6	Y-Axis Data	
R3.5.5.6.1	Valid y-axis value	T7.2.10.3
R3.5.6	Button Properties	
R3.5.6.1	Label	
R3.5.6.1.1	Label length	T7.2.10.4
R3.5.8	Text Block Properties	
R3.5.8.1	Text Content	
R3.5.8.1.1	Text content length	T7.2.10.5
R3.5.12	Tooltip Properties	
R3.5.12.1	Text Content	
R3.5.12.1.1	Text length	T7.2.10.6
R3.5.13	Binding Data To Widgets	
R3.5.13.1	Data must be bound to access the data	T7.2.11.7
R3.5.14	Unbinding Data from Widgets	
R3.5.14.1	Removing bound data	T7.2.11.8
R3.5.14.2	Only remove unused data	T7.2.11.8
R3.6	Action Panel Requirements	
R3.6.1	Creating an Action	
R3.6.1.1	Required information	
R3.6.1.1.1	Name	T7.2.12.1, T7.2.12.2
R3.6.1.1.2	Action type	T7.2.12.1, T7.2.12.2
R3.6.1.1.3	Affected widget	T7.2.12.1, T7.2.12.2
R3.6.1.1.4	Data set	T7.2.12.1, T7.2.12.2
R3.6.1.1.5	New value	T7.2.12.1, T7.2.12.2
R3.6.1.1.6	Apply immediately	T7.2.12.1, T7.2.12.2

R3.6.2	Action Types	
R3.6.2.1	Valid action types	
R3.6.2.1.1	Change a property value	T7.2.12.1
R3.6.2.1.2	Change a data subset query	T7.2.12.2
R3.6.3	Modifying an Action	
R3.6.3.1	Actions can be modified	T7.2.12.3
R3.6.4	Removing an Action	
R3.6.4.1	Removing an action	T7.2.12.4, T7.2.12.5
R3.6.4.2	Restrictions on removing an action	T7.2.12.5
R3.6.5	Action Property Values	
R3.6.5.1	Specified Values	
R3.6.5.1.1	Valid value	T7.2.12.1
R3.6.5.1.2	Valid string form	
R3.6.5.1.2.1	X	
R3.6.5.1.2.1.1	Event x coordinate	T7.2.12.7
R3.6.5.1.2.2	Y	
R3.6.5.1.2.2.1	Event y coordinate	T7.2.12.7
R3.6.5.1.2.3	dataset.field	
R3.6.5.1.2.3.1	dataset	T7.2.12.6
R3.6.5.1.2.3.2	field	T7.2.12.6
R3.7	Event Panel Requirements	
R3.7.1	Event Types	
R3.7.1.1	Valid event types	
R3.7.1.1.1	A click event	T7.2.13.1
R3.7.1.1.2	A hover event	T7.2.13.2
R3.7.1.1.3	A move event	T7.2.13.3
R3.7.2	Creating an Event	
R3.7.2.1	Required information	
R3.7.2.1.1	Event type	T7.2.13.1, T7.2.13.2, T7.2.13.3
R3.7.2.1.2	Name of widget	T7.2.13.1, T7.2.13.2, T7.2.13.3
R3.7.2.1.3	Actions	T7.2.13.1, T7.2.13.2, T7.2.13.3
R3.7.3	Modifying an Event	
R3.7.3.1	Events can be modified	T7.2.13.4
R3.7.4	Removing An Event	
R3.7.4.1	Events can be removed	T7.2.13.5
R3.8	Google Analytics	
R3.8.1	Google Analytics tracking	T7.2.14.1

R3.8.2	Google Analytics requirements	T7.2.14.1
R3.8.3	Character Restriction	T7.2.14.1
R3.8.4	Google Analytics UA code form	T7.2.14.1
R3.8.5	Event character restrictoin	T7.2.14.1
R3.9	Project Tree	
R3.9.1	Listing Components	
R3.9.1.1	Displayed components	T7.2.15.1
R3.6.1.2	Select components	T7.2.15.1
R3.9.1.3	Deletable	T7.2.15.2
R3.9.2	Deleting a Widget	
R3.9.2.1	Deleting a widget	T7.2.9.1, T7.2.9.2
R3.9.2.2	Selected	T7.2.9.1, T7.2.9.2
R3.9.2.3	Delete restrictions on events	T7.2.9.2
R3.9.2.4	Delete restrictions on actions	T7.2.9.2
R3.10	Main Menu Requirements	
R3.10.1	Saving a project	
R3.10.1.1	Saving current project	T7.2.2.1
R3.10.1.2	Copying the project	T7.2.2.2
R3.10.1.3	Resaving	T7.2.2.1
R3.10.2	Deleting a project	
R3.10.2.1	Delete	T7.2.4.1, T7.2.4.2
R3.10.2.2	Open and delete	T7.2.4.2
R3.10.2.3	Prompt before delete	T7.2.4.1, T7.2.4.2
R3.10.2.4	Not visible after delete	T7.2.4.1, T7.2.4.2
R3.10.2.5	Delete files	T7.2.4.1, T7.2.4.2
R3.10.3	Export Visualization	
R3.10.3.1	Export File	
R3.10.3.1.1	Export a zip file	T7.2.6.1, T7.2.6.2
R3.10.3.1.2	Exported contents	
R3.10.3.1.2.1	HTML	T7.2.6.1, T7.2.6.2
R3.10.3.1.2.2	Javascript	T7.2.6.1, T7.2.6.2
R3.10.3.1.2.3	CSS	T7.2.6.1, T7.2.6.2
R3.10.3.1.2.4	Data Files	T7.2.6.1, T7.2.6.2
R3.10.4	Project Revision History	
R3.10.4.1	Undo	
R3.10.4.1.1	The user is able to undo	T7.2.7.1
R3.10.4.1.2	Undo disabled	T7.2.7.1
R3.10.4.2	Redo	

R3.10.4.2.1	Revert can be restored	T7.2.7.2, T7.2.7.3
R3.10.4.2.2	After change, cannot be restored	T7.2.7.2, T7.2.7.3
R3.10.4.2.3	Redo disabled	T7.2.7.3