The World Data Mapper

Product Specification

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1. Introduction

This document describes the specification for The World Data Mapper, an application for managing regional data that is organized hierarchically. Note such information could be used for things like tracking regional Covid-19 stats. The application will allow the user to organize and edit hierarchical regions. Note a subregion denotes a region that is contained within its parent. A sibling would have the same parent but no overlap with another sibling. So, for example, Alabama and Alaska have the same parent, the USA, so they are siblings. In this application we will organize this data and editing information about each region's name, capital, leader, and landmarks.

Note that we will use region flags in our user interface, but those will be retrieved not provided. Meaning, your application will simply pull the flags based on the name of the region from known locations that are determined beforehand. So, for example, there is no "uploading" of flags.

Platform

The application will be a full-stack MERN Web application using the same code base as our ToDo Tracker example, so it should use Mongo Atlas, Express, React, and Node as well as Apollo and GraphQL. Note that the ToDo Tracker application should be the basis for this design.

2. Use Cases

Below is a list of all the ways our users will interact with our system.

Use Case Number	Use Case
2.1	Create Account
2.2	Cancel Account Creation
2.3	Login to Account
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Missing Use Cases

Note that there are a few cases that still will be needed and are left up to the developer to work out:

- **Naming a Map File** – all map files require a name. Note the name is also the root parent region.
- **Renaming of a Map File** – all map files should be renamable.
- **Map File and Subregion Deletion (and its descendants) verification** – nothing should be deleted without checking with the user first.
- **Moving a subregion to a different parent region** – there needs to be an easy to use mechanism where the user can change the parent region for any region in the region viewer screen. Note the diagram provided in Figure 3.7 provides an edit button but it should work in concert with the selection of an existing node to serve as parent.

Use-Case Number:	2.1
Use-Case Name:	Create Account
Actors:	Map Data Owner/Editor
Preconditions:	The user has a working Internet connection, has loaded the application page, and is not currently logged in.
Postconditions:	A new account is created for the user, unique to their email address, complete with a secret password and account name for display purposes.
Story:	The user arrives at the welcome screen and would like to start making map data files and so clicks on the "Create Account" button. The user can then enter their name, email, and password in the provided text fields and press the Create Account button. This will add the account to the database but will not log the user in. The user will then need to do that separately.
Scenario:	Joe Shmo is a user who wishes to make a map data file of the world. Joe goes to our welcome page and clicks on "Create New Account". This brings up the Create Account dialog where he enters "Joe Shmo" in the name field, joe@shmo.com in the email field, and JoeShmo123 in the password field. He then clicks on the Create Account button and a new account is created and he is then taken back to the welcome screen where he may now login.
Exceptions:	No two users can create an account using the same email address. Should one try to create an account using an email that is already in use the application should provide appropriate, nicely styled feedback.
When available:	First Benchmark
Frequency of use:	Once for the lifetime of an account.
Open Issues:	All necessary security measure must be taken to ensure secure access to account information and user data.

2.1   Create Account Use Case Diagram

Use-Case Number:	2.2
Use-Case Name:	Cancel Account Creation
Actors:	Map Data Owner/Editor
Preconditions:	The user has a working Internet connection, has loaded the application page, and is not currently logged in but is in the process of making a new account.
Postconditions:	The user is returned to the welcome page without a new account created.
Story:	The user arrives at the welcome screen and would like to start making map data files and so clicks on the "Create Account" button. The user can then starts to enter data in the required fields but then decides against making a new account and so presses the "Cancel" button.
Scenario:	Joe Shmo is a user who wishes to make a map data file of the world. Joe goes to our welcome page and clicks on "Create New Account". This brings up the Create Account dialog where he starts entering data in the text fields. Joe then realizes he already has an account and so simply decides to Cancel this process.
Exceptions:	N/A
When available:	First Benchmark
Frequency of use:	May happen to any given user many times.
Open Issues:	Good feedback must be provided for when a user tries to create an account using an already registered email address, as this is the most likely reason why a user may wish to cancel this process.

2.2   Cancel Account Creation Use Case Diagram

Use-Case Number:	2.3
Use-Case Name:	Login to Account
Actors:	Map Data Owner/Editor
Preconditions:	The user has a working Internet connection, has loaded the application page, and is not currently logged in.
Postconditions:	The user is logged into their account and is brought to their home page.
Story:	The user arrives at the welcome screen and would like to start making map data files and editing existing map files. The user presses the Login button and is brought to the login screen where they enter a registered email and password and press the Login button. The user is then brought to their home page where their existing map files are scrollably listed in most recently accessed order.
Scenario:	Joe Shmo is a user who wishes to make a map data file of the world. Joe goes to our welcome page and clicks on "Login" and is brought to the login screen. Joe enters joe@shmo.com with the password JoeShmo123 and clicks Login. The login combo is validated and he is brought to his homepage where there is a listing of five maps he's already created and can now edit if he wishes: The World, Middle Earth, Azeroth, The Caribbean, and New York City.
Exceptions:	Should the user enter either an unregistered email address or an email address in the wrong format or the incorrect password the application must not fial.
When available:	First Benchmark
Frequency of use:	Once per each session. Once logged in a user may edit many map files.
Open Issues:	All necessary security measure must be taken to ensure secure access to account information and user data.

2.3   Login to Account Use Case Diagram

Use-Case Number:	2.4
Use-Case Name:	Cancel Login
Actors:	Map Data Owner/Editor
Preconditions:	The user has a working Internet connection, has loaded the application page, and is not currently logged in but is in the process of trying to do so.
Postconditions:	The user is returned to the welcome page without a new account created.
Story:	The user arrives at the welcome screen and would like to start making map data files and so clicks on the "Login" button. The user can then starts to enter data in the required fields but then decides against doing so, perhaps because they have forgotten their account information, and so presses the "Cancel" button.
Scenario:	Joe Shmo is a user who wishes to make a map data file of the world. Joe goes to our welcome page and clicks on "Login". This brings up the Create Account dialog where he starts entering data in the text fields. Joe then realizes he does not wish to login and so presses the "Cancel" button.
Exceptions:	N/A
When available:	First Benchmark
Frequency of use:	May happen to any given user many times.
Open Issues:	Good feedback must be provided for when a user tries to login using a bad account, as this is the most likely reason why a user may wish to cancel this process.

2.4   Cancel Login Use Case Diagram

Use-Case Number:	2.5
Use-Case Name:	Update Account
Actors:	Map Data Owner/Editor
Preconditions:	The user has a working Internet connection, has loaded the application page, and is currently logged in.
Postconditions:	Account details like user name, email, and password are updated in the database and the user is returned to their home screen.
Story:	The user is logged into their account and clicks on their account name in the application toolbar. This brings them to an page where they can see their login name, email address (the unique identifier), and their password, which is shown as *****s. The user enters updated information for these fields and presses the Update button. This changes the user's values in the database and returns the user to their home screen.
Scenario:	Joe Shmo is a user who wishes to change his password. Joe is logged in and on his home page or some other application screen where his name is available to click in the toolbar. Joe clicks on his name and is brought to an update account screen. In that screen Joe changes his name to Joey and his password to 123JoeShmo and then clicks Update. This updates this data in the database and returns Joe to the welcome screen.
Exceptions:	No two users can have an account using the same email address so this must be made sure not to happen during the updating of an account.
When available:	First Benchmark
Frequency of use:	Many times for the lifetime of an account.
Open Issues:	All necessary security measure must be taken to ensure secure access to account information and user data.

2.5   Update Account Use Case Diagram

Use-Case Number:	2.6
Use-Case Name:	Cancel Update
Actors:	Map Data Owner/Editor
Preconditions:	The user has a working Internet connection, has loaded the application page, and is currently logged in and on the screen for updating their account.
Postconditions:	The user is returned to their home screen and no changes are made to their account.
Story:	The user is logged in and would like to change their login name, email, and/or password. The user clicks on their name in the top toolbar and is brought to the update account screen. The user decides against changing their account and so presses the Cancel button and is returned to their home screen without any changes made.
Scenario:	Joe Shmo is a user who is logged in and would like to change their password. Joe clicks on his name in the toolbar and goes to the update account screen. Joe enters new information but then decides against updating. Joe presses "Cancel" and returns to his home screen where again he can see his map data files scrollably listed in order of most recently accessed.
Exceptions:	No two users can create an account using the same email address. Should one try to create an account using an email that is already in use the application should provide appropriate, nicely styled feedback.
When available:	First Benchmark
Frequency of use:	Many times for the lifetime of an account.
Open Issues:	All necessary security measure must be taken to ensure secure access to account information and user data.

2.6   Cancel Update Use Case Diagram

Use-Case Number:	2.7
Use-Case Name:	Logout of Account
Actors:	Map Data Owner/Editor
Preconditions:	The user has a working Internet connection, and is currently logged in to the site.
Postconditions:	The user is logged out and returned to the welcome screen.
Story:	The user has already logged into the site and would like to logout, perhaps to instead create or use another account. The user clicks on the Logout button and is logged out and returned to the welcome screen.
Scenario:	Joe Shmo is a registered user who is logged in and decides he wants to create another account for different purposes. Joe sees the Logout button on the toolbar and clicks on it. This instantly logs him out and returns him to the welcome screen where he can now either create another account or login with another account.
Exceptions:	N/A
When available:	First Benchmark
Frequency of use:	At most once per session.
Open Issues:	All necessary security measure must be taken to ensure secure access to account information and user data.

2.7   Logout of Account Use Case Diagram

Use-Case Number:	2.8
Use-Case Name:	Create Map Data File
Actors:	Map Data Owner/Editor
Preconditions:	The user has a working Internet connection and is logged in.
Postconditions:	The user is brought to the Region Spreadsheet screen for a brand new map data file where they can start to build their data.
Story:	The user is logged into the application and is viewing their home screen. The user presses the Create New Map button and is prompted for the name of the map and is then brought to the region spreadsheet screen.
Scenario:	Joe Shmo wishes to make a map for keeping track of all of the counties, town, and villages in the state of New York. Joe is logged in and on his home page. He clicks on the "Create New Map" button and then must provide the name of the root region (New York) as the name of the map.
Exceptions:	Multiple files can have the same name but would need different unique ids. Note this is true in applications like Google Sheets where you can name multiple files the same thing.
When available:	First Benchmark
Frequency of use:	Once for the lifetime of a file. Many times per session for a user.
Open Issues:	The manner of getting the name of a new map is to be determined.

2.8   Create Map Data File Use Case Diagram

Use-Case Number:	2.9
Use-Case Name:	Delete Map Data File
Actors:	Map Data Owner/Editor
Preconditions:	The user has a working Internet connection, is currently logged in and has at least one already existing map data file.
Postconditions:	The map data file is removed from the database and the user's home screen is updated to reflect it.
Story:	The user is logged in and already has at least one map data file listed on their home page. The user clicks on the "Trash" button next to the file they wish to delete. The application verifies that the user really wishes to permanently remove the file and upon verification it is removed from the file system. The home page for the user then no longer includes this file.
Scenario:	Joe Shmo is a logged in user who had previously made a map data file for New York but it was all wrong and Joe wishes to get rid of it. Joe is on the home screen and sees it listed there and presses the "Trash" button next to it. The system verifies with Joe that he really wishes to permanently remove the file. Joe validates this and the file is removed and Joe is back at his home screen and there is no longer a map file listed for New York.
Exceptions:	The user may cancel deletion during the verification process.
When available:	First Benchmark
Frequency of use:	Once for the lifetime of an account.
Open Issues:	The process of deletion verification is to be determined by the developer.

2.9   Delete Map Data File Use Case Diagram

Use-Case Number:	2.10
Use-Case Name:	Select Map Data File
Actors:	Map Data Owner/Editor
Preconditions:	The user has a working Internet connection, is logged in and has already made at least one data file.
Postconditions:	The user is brought to the region spreadsheet screen where they may begin editing the selected data file.
Story:	The logged in user is on the welcome screen where there is at least one existing map data file in their scrollable list of map data files. The user clicks on the one they wish to edit and is brought to the region spreadsheet screen where they may then begin editing that region's data.
Scenario:	Joe Shmo is a user who previously created a map data file called "New York". This file is listed on Joe's home page. Joe clicks on this file, the program then retrieves the data for this map file from the database and loads it into the region spreadsheet controls so that the he can editing them. This means all the subregion listings and all necessary hierarchically organized data is loaded for use. Joe then begins editing New York.
Exceptions:	N/A. If a file is listed in a user's home page it should be editable.
When available:	First Benchmark
Frequency of use:	Many times per session if a user wishes to edit multiple files.
Open Issues:	All necessary security measure must be taken to ensure secure access to account information and user data.

2.10   Select Map Data File Use Case Diagram

Use-Case Number:	2.11
Use-Case Name:	Go Home
Actors:	Map Data Owner/Editor
Preconditions:	The user is logged in and working on a map data file.
Postconditions:	The map data file the user is working on is closed and the user is returned to their home screen.
Story:	The user is editing map data either on the region spreadsheet page or the region viewer page and wishes to start editing a different file. The user clicks on the "The World Data Mapper" link in the top-left of the application and the file is closed and the user is returned to their home page.
Scenario:	Joe Shmo is a user who is logged in and is currently editing the subregions for his New York map. Joe realizes he needs to update a different map and so decides to return to his home page to access it. Joe clicks on the "The World Data Mapper" link in the toolbar and the New York map data is closed and Joe is returned to his home page. Note that since New York was the last file he accessed, it would be listed at the top of his recent files.
Exceptions:	N/A. Note all edits are saved so there is no reason to prompt for saving work. Note transaction stacks should always start anew when an editing session starts.
When available:	First Benchmark
Frequency of use:	Many times per session.
Open Issues:	All necessary security measure must be taken to ensure secure access to account information and user data.

2.11   Go Home Use Case Diagram

Use-Case Number:	2.12
Use-Case Name:	Navigate to Ancestor Region
Actors:	Map Data Owner/Editor
Preconditions:	The user has a working Internet connection, is logged in and is editing a map data file on either the region spreadsheet or region view screens.
Postconditions:	The user is brought to the region spreadsheet for another region which would be an ancestor of the region being edited.
Story:	The user is editing a map and sees an ancestor region listed in the top toolbar, which lists the full path to the current region. The user clicks on one of the ancestor regions. The user is then brough to the region spreadsheet screen for that ancestor region.
Scenario:	Joe Shmo is editing a map for "The World". Joe is currently on "New York", which lists two ancestors: "North America" and "The World". These are both shown in the top toolbar. Joe clicks on "North America" and is brought to the region spreadsheet for North America where he can now edit that particular region.
Exceptions:	The root region, which should be the same name as the map data file, has no ancestors, so there is nothing to click on there.
When available:	First Benchmark
Frequency of use:	Many, many times per session, this is essential map data navigation.
Open Issues:	All necessary security measure must be taken to ensure secure access to account information and user data.

2.12   Navigate to Ancestor Region Use Case Diagram

Use-Case Number:	2.13
Use-Case Name:	Add new Subregion
Actors:	Map Data Owner/Editor
Preconditions:	The user has a working Internet connection, is logged in, and is editing a map data file.
Postconditions:	A new subregion is added to the region being edited.
Story:	The user is editing a region and wishes to add a subregion to that region. The user is on the region spreadsheet screen and presses the Add Subregion button. A new row is added for the new subregion with initial dummy data that can then be edited.
Scenario:	Joe Shmo is logged in and is editing the United States region. Joe Shmo is on the region spreadsheet screen and clicks the plus, which is for adding a new subregion. A new row instantly is appended to the end of the list and can then be edited by Joe so as to add a new state to the USA map data.
Exceptions:	Multiple subregions can have the same name, but all should have unique identifiers.
When available:	First Benchmark
Frequency of use:	Many, many times per session.
Open Issues:	The look and feel of the UI components is approximated by the mockup diagrams. The UI designer should ensure they look good and operate properly. Note that this must be undoable.

2.13   Add new Subregion Use Case Diagram

Use-Case Number:	2.14
Use-Case Name:	Edit Subregion
Actors:	Map Data Owner/Editor
Preconditions:	The user has a working Internet connection, is logged in, and is viewing region map data on the regions spreadsheet screen.
Postconditions:	A subregion's data is updated.
Story:	The user is logged in and editing on of their maps. The user is viewing a region's data on the region spreadsheet screen. Listed there are that region's subregions. The user clicks on either that subregion's name, capital, or leader, and that field in the table becomes activated, letting the user enter the data directly inside a text field in the table.
Scenario:	Joe Shmo is a logged in user editing The World. Joe is editing the United States, whose data is currently loaded and so all its states are listed in the region spreadsheet screen. All 50 states are listed there as Joe had previously entered them. Joe clicks on "Albany", listed on the row for New York. This turns the Albany display into an editable text field. Joe changes the capital to Buffalo and his enter, which completed the transaction and turns it back into a label.
Exceptions:	Note that subregions may have subregions themselves or not. An empty table would mean it's a leaf in our map data file.
When available:	Second Benchmark
Frequency of use:	Many, many times per editing session.
Open Issues:	The look and feel of the UI components is approximated by the mockup diagrams. The UI designer should ensure they look good and operate properly.

2.14   Edit Subregion Use Case Diagram

Use-Case Number:	2.15
Use-Case Name:	Navigate to Subregion
Actors:	Map Data Owner/Editor
Preconditions:	The user has a working Internet connection, is logged in, and is editing a region map on the regions spreadsheet screen.
Postconditions:	A subregion's data is loaded into the controls of the region spreadsheet screen for editing.
Story:	The user is logged in and editing on of their maps. The user is viewing a region's data on the region spreadsheet screen. Listed there are that region's subregions. The user clicks on one of the subregion names in the table and it is then loaded as the region for editing in the table with all its own subregions loaded as rows in the table.
Scenario:	Joe Shmo is a logged in user editing The World. Joe is editing the United States, whose data is currently loaded and so all its states are listed in the region spreadsheet screen. All 50 states are listed there as Joe had previously entered them. Joe click on "New York" and now Region Name: is changed from "United States" to "New York". The table now lists all the counties in the state of New York that Joe had entered during the editing of this map data file.
Exceptions:	Note that subregions may have subregions themselves or not. An empty table would mean it's a leaf in our map data file.
When available:	First Benchmark
Frequency of use:	Many, many times per editing session.
Open Issues:	The look and feel of the UI components is approximated by the mockup diagrams. The UI designer should ensure they look good and operate properly.

2.15   Navigate to Subregion Use Case Diagram

Use-Case Number:	2.16
Use-Case Name:	Delete Subregion
Actors:	Map Data Owner/Editor
Preconditions:	The user has a working Internet connection, is logged in and is editing a region on the region spreadsheet screen.
Postconditions:	A subregion is removed from its region and all of its descendants are deleted as well.
Story:	The user is logged in and is editing a region on the region spreadsheet screen. The region has subregions listed in the table. The user clicks on the delete subregion button next to the subregion. Deletion is verified, warning the user that not only would that region be deleted but all of that subregion's descendants as well. If the user validates this choice the subregion and its descendants are deleted.
Scenario:	Joe Shmo is a user who is editing The World map data. Joe is currently editing The United States and so there is a row for each state. Joe clicks on the "X" delete button next to "New York" in the table. This application makes sure Joe knows that this will remove all of the counties of New York in addition to New York. Joe confirms this step and New York is removed from the United States.
Exceptions:	All subregions can be deleted if desired.
When available:	Second Benchmark
Frequency of use:	Many times per session.
Open Issues:	Note that this must be undoable.

2.16   Delete Subregion Use Case Diagram

Use-Case Number:	2.17
Use-Case Name:	Sort Table
Actors:	Map Data Owner/Editor
Preconditions:	The user has a working Internet connection, is logged in, and is editing a region in the region spreadsheet screen.
Postconditions:	The subregions table is sorted according to the selected criteria.
Story:	The user is editing a map data file and is currently on the region spreadsheet screen for a region that has multiple subregions. The user clicks on either the Name, Capital, or Leader column header and the table of subregions is then sorted by that criteria. Note, if the table was already sorted by that criteria it will reverse the sorting in descending/ascending order, depending on which case had existed.
Scenario:	Joe Shmo is editing The World and is on the region spreadsheet screen for the United States. Joe clicks on the "Capitols" table header and all the state rows in the table are sorted according to their capital names.
Exceptions:	If the table is empty the column headers should not be selectable and should look as such.
When available:	Second Benchmark
Frequency of use:	Many times per session.
Open Issues:	The look and feel of the UI components is approximated by the mockup diagrams. The UI designer should ensure they look good and operate properly.

2.17   Sort Table Use Case Diagram

Use-Case Number:	2.18
Use-Case Name:	Undo
Actors:	Map Data Owner/Editor
Preconditions:	The user has a working Internet connection, is logged in, is editing a region, and has made an edit.
Postconditions:	The last edit is undone and the display is appropriately updated.
Story:	The user is editing a region on either the region spreadsheet screen or the region viewer screen. The user either presses the undo button or types control-z. The most recently done transaction is undone. This may be adding a subregion, editing a subregion field, sorting a region table, deleting a subregion, changing a parent, adding a landmark, removing a landmark, or changing the landmark name.
Scenario:	Joe Shmo is a user editing the United States on the region spreadsheet screen. Joe changes the capital of New York in the table from Albany to Buffalo. Joe then presses the Undo button and that edit is undone, returning New York's capital to Albany.
Exceptions:	Note that foolproof design must be employed to prevent tempting the user with an unusable undo button.
When available:	Second Benchmark
Frequency of use:	Many, many times per editing session for a map data file.
Open Issues:	All edits that change region data must be undoable and redoable. Note removing a subregion and then undoing it must return it to its original index.

2.18   Undo Use Case Diagram

Use-Case Number:	2.19
Use-Case Name:	Redo
Actors:	Map Data Owner/Editor
Preconditions:	The user has a working Internet connection, is logged in, is editing a region, and has made an edit.
Postconditions:	The last undone edit is redone and the display is appropriately updated.
Story:	The user is editing a region on either the region spreadsheet screen or the region viewer screen. The user either presses the undo button or types control-z. The most recently done transaction is undone. This may be adding a subregion, editing a subregion field, sorting a region table, deleting a subregion, changing a parent, adding a landmark, removing a landmark, or changing the landmark name. The user then presses the redo button or types control-y. The most recently undone transaction is then redone.
Scenario:	Joe Shmo is a user editing the United States on the region spreadsheet screen. Joe changes the capital of New York in the table from Albany to Buffalo. Joe then presses the Undo button and that edit is undone, returning New York's capital to Albany. Joe then presses the Redo button, and that action is then redone, returning New York's capital to Buffalo.
Exceptions:	Note that foolproof design must be employed to prevent tempting the user with an unusable redo button.
When available:	Second Benchmark
Frequency of use:	Many, many times per editing session for a map data file.
Open Issues:	All edits that change region data must be undoable and redoable. Note removing a subregion and then undoing it must return it to its original index.

2.19   Redo Use Case Diagram

Use-Case Number:	2.20
Use-Case Name:	Navigate to Region Viewer
Actors:	Map Data Owner/Editor
Preconditions:	The user has a working Internet connection, is logged in and is editing a map data file.
Postconditions:	The user is brought to the region viewer screen for the subregion they wish to view and add/edit landmarks.
Story:	The user is editing a map data file and is on the region spreadsheet screen. The current region has a table of subregions. The user clicks on the landmark field for a particular subregion. The view is then switched away from the table view and instead to the region viewer screen, where one can then see all details regarding that subregion, including all landmarks fed to this subregion by its own subregions.
Scenario:	Joe Shmo is editing North America, which lists all the nations of North America. One nation listed is the United State of America. Joe shmo clicks on the USA row on the landmarks field, which shows a partial list of all the USA's landmarks. Joe Shmo is then taken to the region viewer screen where all the details for the USA are loaded, including the full, editable list of landmarks. Note that if USA itself has subregions with landmarks, their landmarks are listed in the landmarks list, but cannot be edited or deleted there. Only those landmarks added to New York.
Exceptions:	N/A one should be able to navigate to all subregions.
When available:	First Benchmark
Frequency of use:	Many times per session.
Open Issues:	Make sure subregion landmarks load properly for a region if that region is loaded in to that screen but only landmarks that are not inherited from descendants can be removed or edited.

2.20   Navigate to Region Viewer Use Case Diagram

Use-Case Number:	2.21
Use-Case Name:	Change Region Parent
Actors:	Map Data Owner/Editor
Preconditions:	The user has a working Internet connection, is logged in, and is editing a region on the edit subregion view.
Postconditions:	A subregion is moved from one parent to another.
Story:	To Be Determined
Scenario:	To Be Determined
Exceptions:	To Be Determined
When available:	Second Benchmark
Frequency of use:	Many times per session.
Open Issues:	This should be made easy to use.

2.21   Change Region Parent Use Case Diagram

Use-Case Number:	2.22
Use-Case Name:	Add Region Landmark
Actors:	Map Data Owner/Editor
Preconditions:	The user has a working Internet connection, is logged in, and is editing a region in the region viewer screen.
Postconditions:	A new landmark is added to the region.
Story:	The user is editing a region in the region viewer screen and types text into the text field at the bottom and either clicks the "Add New Landmark" (i.e. the plus) button or presses enter. This adds a new landmark to this region, which will be inherited then by all ancestor regions. This is added to the database for this region and it is reflected in the landmarks list.
Scenario:	Joe Shmo is editing the United States of America in the region viewer screen. Note there are landmarks listed from all of the USA's subregions. Like, the Statue of Liberty is listed, but cannot be edited or removed, as it is inherited from the subregion New York. Joe types "Washington Monument" into the text field at the bottom and then hits enter (or presses the add landmark button) and it adds that landmark to the USA region, which can only be edited or deleted from this region.
Exceptions:	Note that parents should not be able to remove child landmarks. Also note that duplicate named landmarks should not be allowed.
When available:	Second Benchmark
Frequency of use:	Many, many times per session.
Open Issues:	The look and feel of the UI components is approximated by the mockup diagrams. The UI designer should ensure they look good and operate properly.

2.22   Add Region Landmark Use Case Diagram

Use-Case Number:	2.23
Use-Case Name:	Remove Region Landmark
Actors:	Map Data Owner/Editor
Preconditions:	The user has a working Internet connection, is logged in, and is editing a map data file.
Postconditions:	A landmark is removed from a region and the database is appropriately updated, which should also update the display in the region viewer screen landmarks listing.
Story:	The user is editing a map data file and sees a listing of landmarks. Note the subregion landmarks will not have delete buttons next to them, but for the ones belonging to this region do. For one such landmark the user clicks on the delete landmark button for that landmark and the user is prompted to verify that they actually want to delete that landmark. If the user verifies this then it is removed from the region, and thus all ancestor regions as well.
Scenario:	Joe Shmo is editing the United States of America in the region viewer screen. Joe Shmo sees the Washington Monument in the landmarks listing and clicks on the delete button next to it. Joe is asked to verify this step, confirms it, and thus it is removed and deleted. Note that going to North America on this screen, would no longer show the Washington Monument either.
Exceptions:	All landmarks should be able to be deleted, but it must be done in the appropriate region, not in ancestor regions.
When available:	Second Benchmark
Frequency of use:	Many times per session.
Open Issues:	The look and behavior of the delete landmark verification process is to be determined.

2.23   Remove Region Landmark Use Case Diagram

Use-Case Number:	2.24
Use-Case Name:	Edit Region Landmark
Actors:	Map Data Owner/Editor
Preconditions:	The user is logged in an editing a map data file.
Postconditions:	A landmark name has been changed.
Story:	To Be Determined
Scenario:	To Be Determined
Exceptions:	No Duplicate Landmarks should exist, either in a region, or inherited
When available:	Second Benchmark
Frequency of use:	Many times per session
Open Issues:	The proper mechanism for this has not been determined and has been left to the developer.

2.24 Edit Region Landmark Use Case Diagram

Use-Case Number:	2.25
Use-Case Name:	View Previous Sibling Region
Actors:	Map Data Owner/Editor
Preconditions:	The user is logged in and is editing a map data file, viewing a region in the region viewer screen.
Postconditions:	The region viewer screen loads the previous sibling region for viewing and editing/adding/removing landmarks.
Story:	The user is editing a map data file and goes to the region viewer screen for a particular region. While on that region the user presses the Go To Previous button. This keeps the user on the same screen but this time loading the previous region in the list of subregions for this region's parent.
Scenario:	Joe Shmo is logged in and is editing The World. Joe is viewing Alaska in the region viewer screen and presses the Go To Previous button. The program then loads Alabama into the region viewer screen for the user to view and edit/add/remove landmarks. Note that the order of siblings is according to how they were sorted in the region spreadsheet screen for the parent. Note this scenario being describes assumes the USA subregions (i.e. states) are sorted by name.
Exceptions:	If the parent region has only one subregion, the one we are currently viewing, then Go To Previous will not work, so it should be disabled.
When available:	Second Benchmark
Frequency of use:	Many times per session.
Open Issues:	The look and feel of the UI components is approximated by the mockup diagrams. The UI designer should ensure they look good and operate properly.

2.25   View Previous Sibling Region Use Case Diagram

Use-Case Number:	2.26
Use-Case Name:	View Next Sibling Region
Actors:	Map Data Owner/Editor
Preconditions:	The user is logged in and is editing a map data file, viewing a region in the region viewer screen.
Postconditions:	The region viewer screen loads the next sibling region for viewing and editing/adding/removing landmarks.
Story:	The user is editing a map data file and goes to the region viewer screen for a particular region. While on that region the user presses the Go To Next button. This keeps the user on the same screen but this time loading the next region in the list of subregions for this region's parent.
Scenario:	Joe Shmo is logged in and is editing The World. Joe is viewing Alaska in the region viewer screen and presses the Go To Next button. The program then loads Arizona into the region viewer screen for the user to view and edit/add/remove landmarks. Note that the order of siblings is according to how they were sorted in the region spreadsheet screen for the parent. Note this scenario being describes assumes the USA subregions (i.e. states) are sorted by name.
Exceptions:	If the parent region has only one subregion, the one we are currently viewing, then Go To Next will not work, so it should be disabled.
When available:	Second Benchmark
Frequency of use:	Many times per session.
Open Issues:	The look and feel of the UI components is approximated by the mockup diagrams. The UI designer should ensure they look good and operate properly.

2.26   View Next Sibling Region Use Case Diagram

Use-Case Number:	2.27
Use-Case Name:	Navigate back to Region Spreadsheet
Actors:	Map Data Owner/Editor
Preconditions:	The user is logged in and editing a map data file and is currently viewing/editing a region in the region viewer screen.
Postconditions:	The user is brought to the region spreadsheet screen viewing the parent region and its list of subregions.
Story:	The user is editing map data and is viewing a region in the region viewer screen. The user clicks on the highlighted parent region link, which is shown in blue, and the user interface moves to the region spreadsheet screen for that parent region, thus showing all of this region's siblings in the table.
Scenario:	Joe Shmo is editing The World and is currently viewing the United States of America in the region viewer screen. Joe clicks on the blue text saying "North America" which brings him back to the region spreadsheet screen for North America.
Exceptions:	The root region can never be viewed in the region viewer screen as there will be no way to navigate it and data is not needed there.
When available:	First Benchmark
Frequency of use:	Many times per session.
Open Issues:	The look and feel of the UI components is approximated by the mockup diagrams. The UI designer should ensure they look good and operate properly.

2.27 Navigate back to Region Use Case Diagram

Use-Case Number:	2.28
Use-Case Name:	Navigate between subregion fields
Actors:	Map Data Owner/Editor
Preconditions:	The user is logged in and is editing a region data file on the region spreadsheet screen, which shows multiple subregions in the table. The user is currently editing a particular textual field in the table, meaning either name, capital, or leader.
Postconditions:	The user's caret is moved to an adjacent (top, down, left, right) cell.
Story:	The user is editing a region on the region spreadsheet screen. The region has many subregions in the table, all with their own name, capital, and leader. The user clicks on one of these fields and it turns into a text field and the user edits that value. The user then presses the arrow keys on the keyboard to navigate to other fields. The up arrow moves the caret to the same field in the previous subregion, the down arrow moves the caret to the same field in the next subregion, the left and right arrows move the caret to the adjacent fields in the same subregion.
Scenario:	Joe Shmo is editing the United States of America in the region spreadsheet screen. Joe clicks on "Hartford", which is the capital field of "Connecticut". Hartford becomes editable and Joe can edit it. Once done editing Joe presses the right arrow and Hartford becomes uneditable while "Ned Lamont", the governor of Connecticut becomes editable. Joe changes the name of the governor and then presses the up arrow and the Connecticut governor field is no longer editable but the governor of Colorado is editable. Note this scenario being describes assumes the USA subregions (i.e. states) are sorted by name.
Exceptions:	Note that pressing the right key while editing a governor or pressing the left key while editing a name or the up arrow while editing a field in the first subregion or the down arrow while editing a field in the last subregion should all do nothing as there is no place to navigate as such.
When available:	Second Benchmark
Frequency of use:	Many, many times per session.
Open Issues:	The look and feel of the UI components is approximated by the mockup diagrams. The UI designer should ensure they look good and operate properly.

**2.28   Navigate between Subregion Fields Use Case Diagram**

3. User Interface Mockup Diagrams

The application will have the seven user interface contexts/views and should be made to look approximately so. Note there is one exception, it is up to the developer to decide two things: how a landmark may be edited on the region viewer screen and how an existing parent region should be changed to another existing region. Here are the mockups:

View Number	Description
3.1	Welcome Screen Context
3.2	Create Account Screen Context
3.3	Login Screen Context
3.4	Update Account Screen Context
3.5	Map Select Screen Context
3.6	Regions Spreadsheet Screen Context
3.7	Region Viewer Screen Context
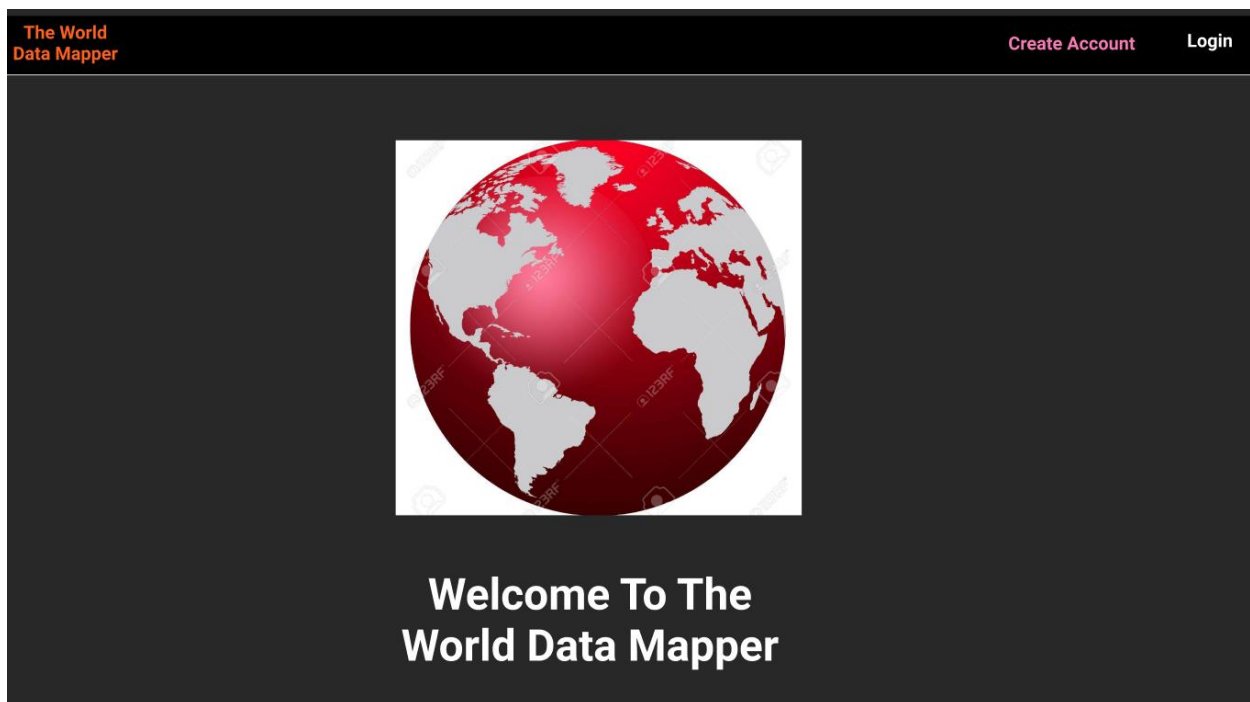
Figure 3.1: Welcome Screen Context
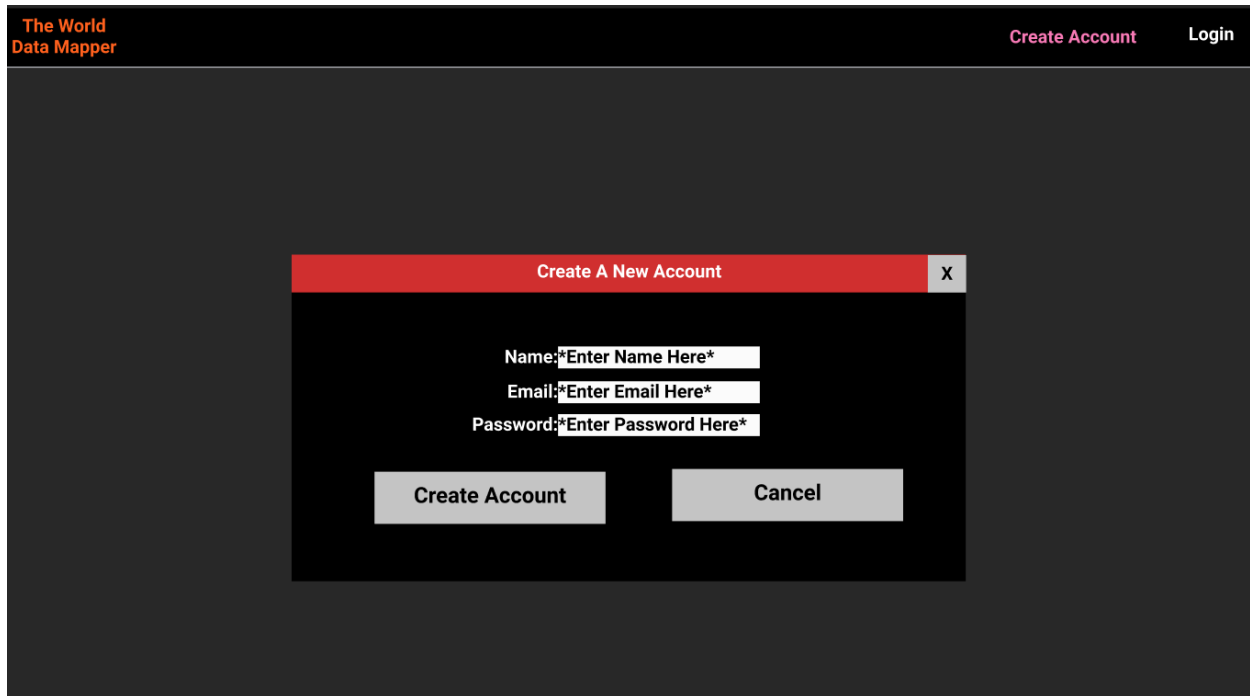
**Figure 3.2: Create Account Screen Context**
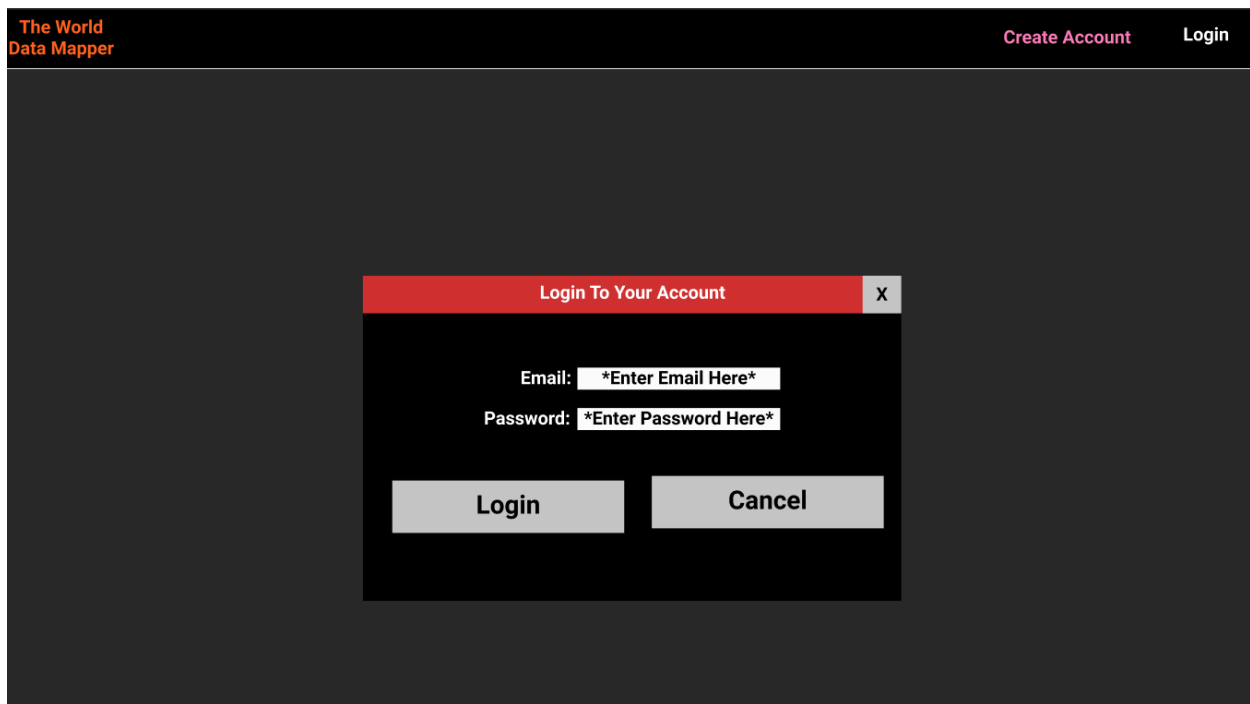

Figure 3.3: Login Screen Context
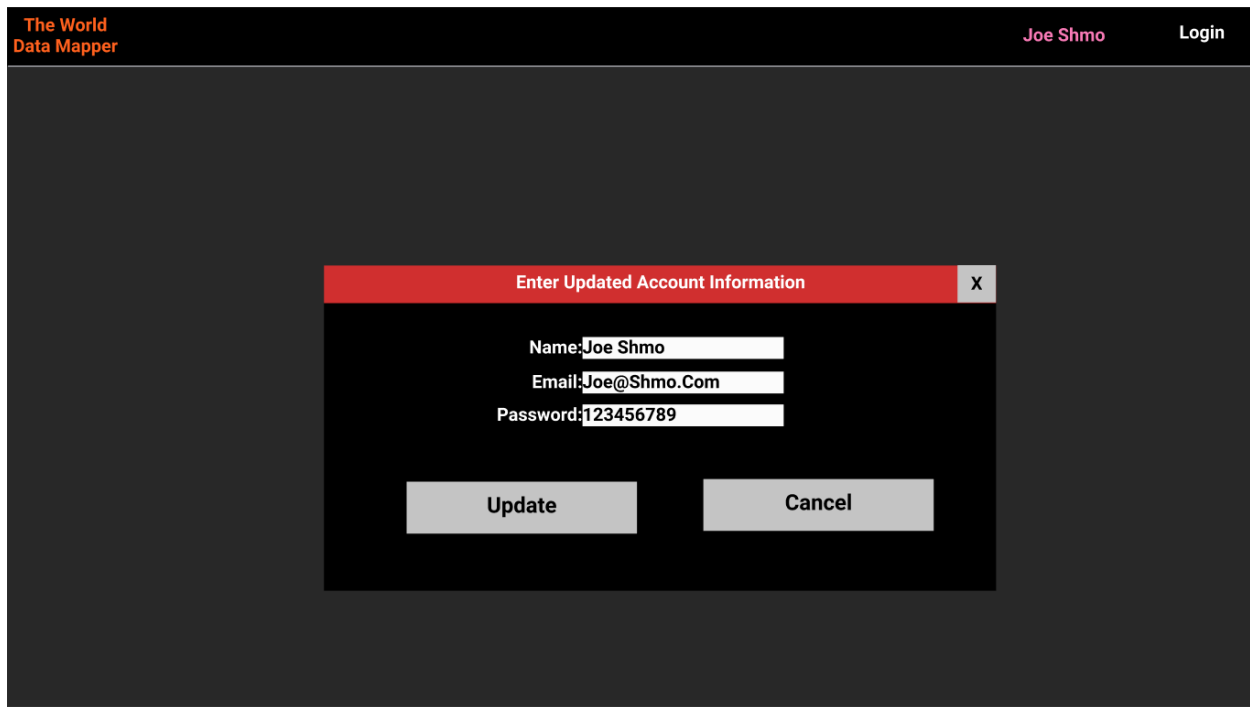
Figure 3.4: Update Account Screen Context
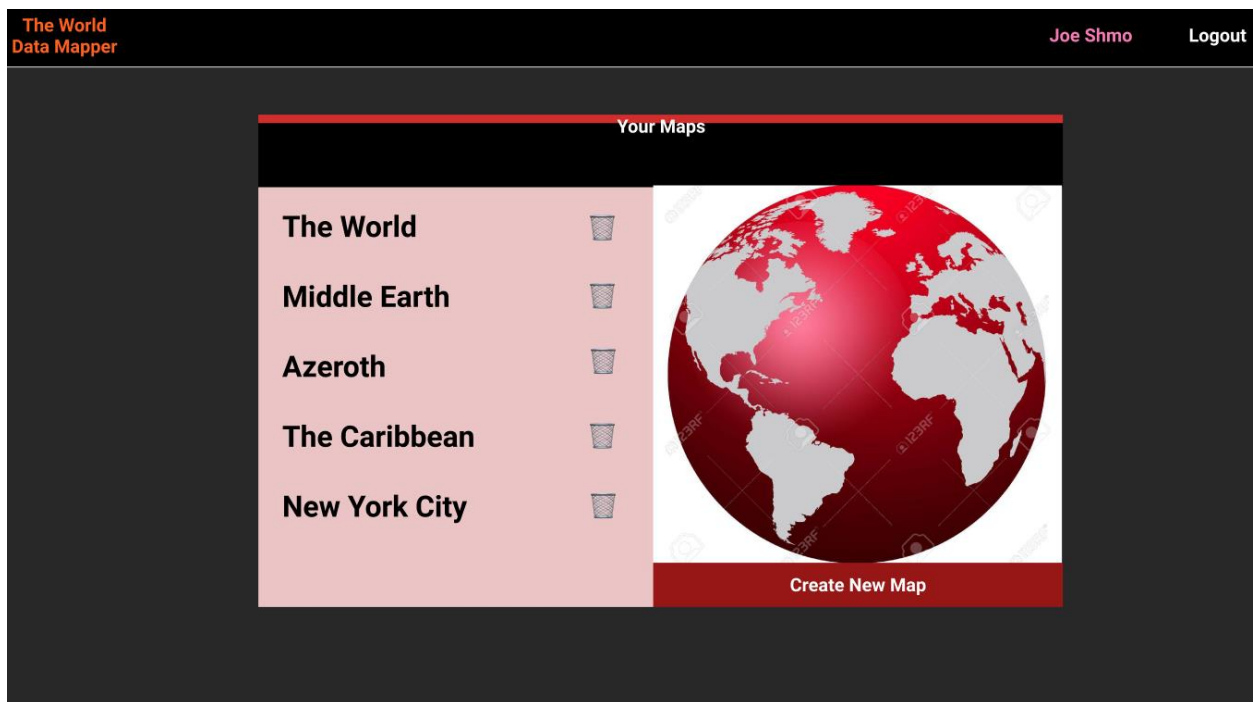
Figure 3.5: Map Select Screen Context

+   ↶ ↷   Region Name: United States

Name ↓	Capital ↓	Leader ↓	Flag ↓	Landmarks ↓
× Alabama	Montgomery	Kay Ivey		USS Alabama, ...
× Alaska	Juneau	Mike Dunleavy		Anchorage Museum, ...
× Arizona	Phoenix	Doug Ducey		Grand Canyon, ...
× Arkansas	Little Rock	Asa Hutchinson		Hot Springs National Park, ...
× California	Sacramento	Gavin Newsom		Golden Gate Bridge, ...
× Colorado	Denver	Jared Polis		Rocky Mountain National Park, ...
× Connecticut	Hartford	Ned Lamont		Mystic Seaport, ...
× Delaware	Dover	John Carney		Caesar Rodney Statue, ...
× Florida	Tallahassee	Ron DeSantis		Kennedy Space Center, ...
× Georgia	Atlanta	Brian Kemp		Ebenezer Baptist Church, ...
× Hawaii	Honolulu	David Ige		USS Arizona Memorial, ...
× Idaho	Boise	Brad Little		Middle Fork Of The Salmon River, ...
× Illinois	Springfield	J. B. Pritzker		Willis Tower, ...
× Indiana	Indianapolis	Eric Holcomb		Indianapolis Motor Speedway, ...
× Iowa	Des Moines	Kim Reynolds		Iowa State Fair, ...
× Kansas	Topeka	Laura Kelly		Dodge City, ...
.....	.....	.....	.....	.....

Figure 3.6: Regions Spreadsheet Screen Context

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Region Landmarks:

Empire State Building - New York
Grand Canyon - Arizona
× **Washington Monument**
YellowStone National Park - Wyoming

Region Name: United States

Parent Region: North America ✎

Region Captial: Washington DC

Region Leader: Joseph Biden

Of Sub Regions: 50

+ Old San Juan

Figure 3.7: Region Viewer Screen Context