

UNIVERSITY OF NORTH CAROLINA

Digital Innovation Lab

prospect

data visualization

PROSPECT

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About Prospect

Prospect is a plugin for WordPress that enables users to collect and curate data and then enable the wider public to visualize and access that data. The graphical representation of data – whether it be geographical information shown on maps, temporal data shown on timelines, interpersonal relationships shown as connected graphs, etc. – can facilitate end-users in comprehending it quickly and analyzing it in domain-specific ways.

Prospect is intended for analyzing large data sets when the user is exploring visual representations of information space, looking for patterns in these visual representations and drilling deeper into those data items that are of interest.

An increasing amount of data has become available in digital format through digital sources. Prospect aims to maximize the potential of this data and the efforts of scholars, particularly in the realm of Digital Humanities, by adopting these strategies.

- Build on modular, open source frameworks. Software development is a complex and time-intensive process. Leveraging open source frameworks that provide as much of the required functionality as possible minimizes the start-up costs to those who wish to use digital tools.
- Support most fundamental data types in humanities research. Given that place, time and relationships are fundamental aspects of the human experience, appropriate data types and visualizations must be supported.
- Ease of use. Scholars seldom have the time to master complex software tools, but neither should they in order to get their data into a digital framework.
- Public-facing visibility. Public engagement is a cardinal virtue in the agenda of the Digital Humanities Lab. Digital projects need to be visible and usable by anyone with access to the internet.

Our experience in the Digital Innovation Lab has brought us to the conclusion that these goals are best realized by building a platform as a plugin that complements and extends WordPress. This allows a user to have all of the rich functionality that comes with

WordPress, and all of its other plugins, without having to write custom code to support those features. Prospect, instead, extends just what is missing from WordPress to make it a sophisticated platform for processing and visualizing complex data. WordPress is the most popular content management system for websites in the world and a large number of engaged software developers is constantly updating and evolving its open-source code base.

Technologies always involve a set of tradeoffs. It is expensive to build custom-made applications for specialized data sets and digital technologies must be updated and maintained frequently as elements of the information technology infrastructure change. Prospect attempts to provide as many commonly-used data types and visualizations as possible, so as to support as broad a range of use-case scenarios as possible. Maintaining a single generalized platform is much less expensive than sustaining a set of custom platforms that are specific to each project and data set.

Prospect's Data Model

The data used by Prospect may come from any source – imported spreadsheets, data created by human users in Prospect Record editing forms, or data generated programmatically by other WordPress plugins – as long as it is stored in Record posts in the proper format.

Prospect understands how to process and visualize the data on your website after three inter-related types of entities have been configured:

- Attributes: Attributes are the atomic units – the basic building blocks – of your data entries. Every Attribute is defined as having a specific data type (such as Text, Number or Latitude-Longitude Coordinate). Some data types can have *Legends* that tell Prospect how to convert an Attribute value to a visual color.
- Templates: A Template is a collection of Attributes that defines a particular kind of data object in your collection (such as a person, an event, an artifact, and so on). You can define as many different Templates for your data as you deem appropriate.
- Exhibits: An Exhibit is a description of how a set of Templates should be represented graphically: you can choose one or more views from a set of visualization types (such as Map and Timeline), and then configure the capabilities of that visualization type for the specific characteristics of each Template.

Once these three types of data entities have been configured, they (either individually or collectively as a *configuration package*) can be saved and uploaded to another website, which will function as previously configured. This configuration bundling enables users to create domain-specific solutions that can be exported and shared with others. The Digital

Innovation Lab has several *configuration packages* available that address common curation and visualization needs on its website that can be used with Prospect.

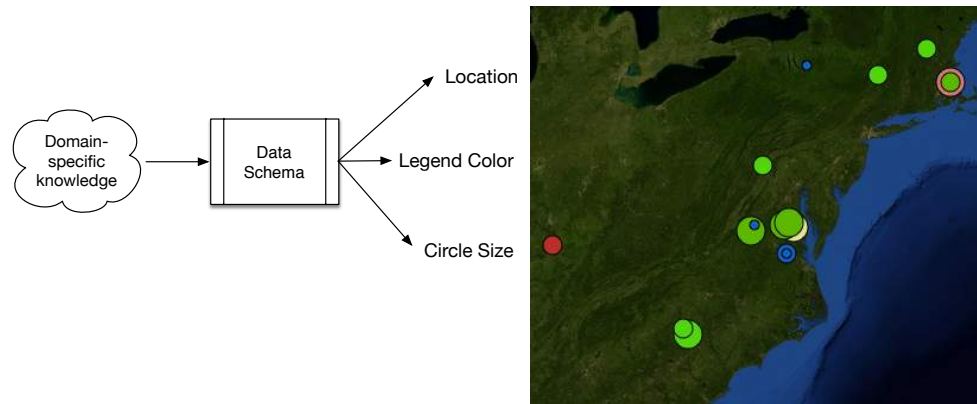
Data Visualization

Although people often speak of software as being “smart,” in reality what software on a computer can do is no better than what the human users have programmed it to do and the information it has available. Prospect allows you to create digital representation of the information you work with, to specify how aspects of that data correspond to visual features (such as color and location), and then – given the information and configuration settings you provide – to create graphical representations of that data.

Let’s say, for example, that you wish to create a digital project about the presidents of the United States. You would need to move your project through several successive stages:

- Decide what aspects of these men you wish to represent and codify in digital form. This information might include their names, their birthplaces and death places, their lifespans, their religious origins, their political party affiliation, and so on.
- Create a *data schema* to represent all of these aspects of U.S. presidents. In Prospect, this means you must:
 - create an Attribute for each aspect of a President; if this Attribute is of Text, Vocabulary, Number or Dates types, you can create a Legend to convert a value into a color for graphical representation.
 - create a Template that gathers together all of these Attributes that form the definition of a president.
- Create Record data for as many presidents as you wish using this schema.
- Create an Exhibit that specifies how the data schema representing a president is to be interpreted on a specific visualization or set of visualizations.

The process of translating from the information defined by a particular domain of knowledge into a data schema, and from the data schema to a graphical representation, is often referred to as *mapping* (as a conceptual activity – not to be confused with cartography). This process could be represented abstractly with the following graph.



You (the project creator) must map your domain-specific knowledge about presidents onto a data schema representing presidents in digital form; that data schema must then be mapped to the graphical features of each of the visualizations in the Exhibit that you wish to create. Once you supply these mappings, Prospect can take as much data as you provide to it and translate it so that it can take on a graphical representation.

Each of Prospect's different visualizations have particular characteristics and capabilities; the kinds of visualizations you wish to provide may inform or influence the data schema you create. If you wish to provide a spatial map (a cartographical representation) of your data, for example, each Record needs a Latitude-Longitude coordinate of some sort.

Thus, in order to design an effective Exhibit (or Volume), you need to keep in mind both ends of the visualization mapping process: the particulars of your domain-specific information as well as the features of Prospect's visualizations.

System Requirements

In order to use Prospect, you will need:

- WordPress running on a webserver;
- the ability to install and activate plugins;
- the Prospect plugin itself;
- an account on the website (a WordPress blog) with Administrator privileges;
- an up-to-date web browser that supports Flexbox (the CSS technique) and local storage (Firefox 28+, Chrome 29+, Internet Explorer 11+, Opera 15+, Safari 6.1+, Android 4.4+, iOS 7.1+...);
- this manual.

End-User Devices

Prospect assumes that the end-user has a device with a display that is large enough to support the purposes of data visualization. That is, it does not try to accommodate smart phones or other devices with very small displays that are inherently unsuited to displaying graphical representations of data.

You should furthermore use the ability of your web browser to zoom in or out the size of Prospect's output display to best suit your purposes on your device. Changing scale or size is not functionality provided by Prospect itself as it is handled by web browsers.

The speed at which the visualizations are rendered depend upon the capabilities of the end-user's device, in terms of the speed of the processor, the amount of available working memory, and the connection between that device and the internet.

About This Manual

In order to describe the use of Prospect effectively, this manual will need to differentiate between several kinds of information, which relate to different contexts and situations. This is accomplished with different fonts and text styles:

- Text that appears on the user interface (i.e., on your web browser), such as menu commands or button names, will be styled in bold Futura font, such as this: "When you are done, click the **Save Settings** button."
- Special terms or definitions will be styled with italics, such as this: "A *Legend* is a specification for converting..."
- Emphasis will be styled in underlines.
- Text that describes or represents data, URLs or text internal to computer software (such as the names of files or directories) will be styled in the Courier font, such as this: "Copy your files into the `php/scripts` directory."

Whenever a connected sequence of user interface actions is described, each step will be separated by ">" (the greater-than sign). For example, selecting the menu option **Save...** from the **File** menu would be described as "Choose **File > Save...**"

There are three special kinds of notes that appear in this manual:

- **NOTE:** Highlights a caveat, conditional or unintuitive item of information.
- **WARNING:** Alerts you to crucial information that could lead to a potential source of errors or difficulties.
- **EXAMPLE:** Explains a feature by giving an example.

This manual distinguishes between the four distinct roles that people have when interacting with Prospect:

- Administrators: Users who have complete control over the website and can configure and control its operation from the back-end Dashboard.
- Editors: Users who are able to edit Records and approve publishing them for public visibility through the back-end Dashboard.
- Contributors: Users who can create and edit Records through the back-end Dashboard.
- End-users: Users who interact with Prospect data through front-end visualizations (Exhibits) and may or may not have a WordPress account on the web server.

NOTE: This manual does not describe the use and operation of WordPress itself. For information of this nature, see: www.wordpress.org

User Roles, Data Creation and Work Flow

Prospect leverages WordPress's built-in support of distinct user roles and privileges, and post status, to enable a workflow process for the creating, editing and publishing of data in crowd-sourcing scenarios. In other words, a potentially large group of users (assigned the Contributor role) create the majority of useful data, a small number of users (assigned the Editor role) verify the reliability of the data and intervene when necessary, and a very small number of users (assigned the Administrator role) create the standards and formats of the data in the first instance.

The roles and privileges of user roles (for those who have a WordPress account on the web server) are as follows:

- Contributors can:
 - Create, edit or delete their own Records. Records remain in Draft state and are not publicly visible until an Editor or Administrator approves them (sets their state to "Published").
- Editors can:
 - Create, edit or delete their own Records;
 - Edit or delete other people's Records;
 - Change the status of any Record to "Published" or "Draft";

- Edit, delete or change the status of a Perspective (defined below).
- Administrators can:
 - Create, edit or delete any Record created by any user;
 - Change the status of any Record to “Published” or “Draft”;
 - Create and configure any of the other data entities related to Prospect (Attributes, Templates, Exhibits, Maps and Perspectives).

Data Records

The data visualized by Prospect is stored in Records. There are essentially three ways to get your data into Records so that Prospect can use it:

1. After you define the relevant Attributes and Templates, Prospect has enough information to generate online forms and present them to the user, who can proceed to create and edit Records.
2. You can use a WordPress plugin to import your data from a spreadsheet into WordPress. You will need to provide the right information in the appropriate format, however.
3. You can create or use a third-party WordPress plugin that generates or extracts data and brings it into the WordPress database as Record posts. As long as there is adequate data in the correct format, and it has been given the “Published” status, Prospect will automatically send that data on to the end-user; no human intervention is necessary. This option, however, is essentially a customized solution that requires some technical knowledge about the operation of WordPress and Prospect.

The data necessary to define Records, and the format in which it must be provided, is explained in chapter 5.

Bundled with CSV Importer Plugin

The Prospect plugin (as of version 0.9.1) comes bundled with the **CSV Importer** plugin. This is because, in the majority of cases, it will be both useful and necessary to import Record data stored in CSV files (which is compatible with most spreadsheet applications).

When you activate Prospect, the CSV Importer tool will be automatically activated as well and be available via the **Tools** menu on the Dashboard.

NOTE: Prospect will first check to see if the CSV Importer plugin code has already been activated to try to avoid conflicts (i.e., redundantly defining a software module that already exists). This check may not cover all cases,

however. You should do your best to ensure that only one version of CSV Importer is active on your website at a time.

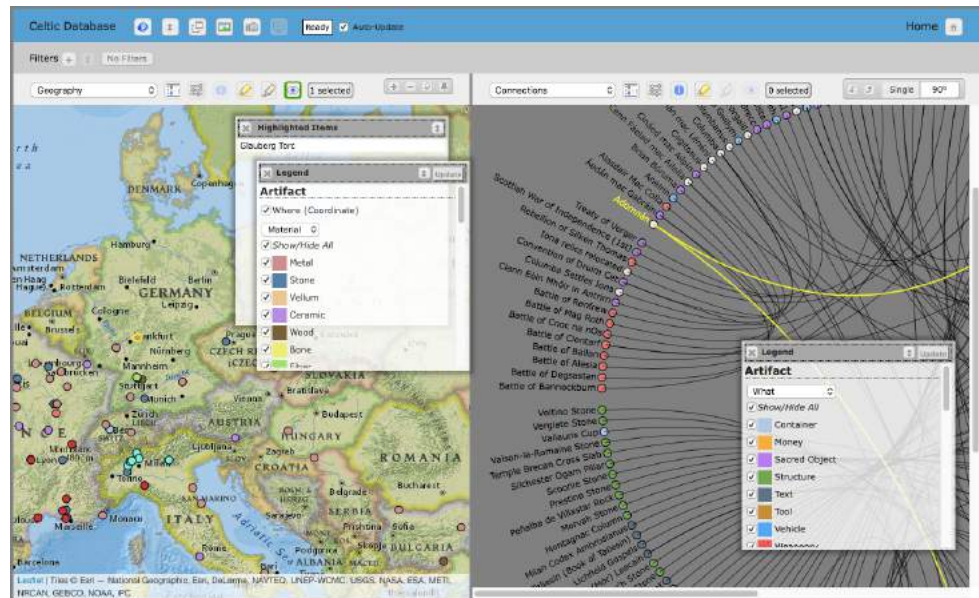
WARNING: The CSV Importer plugin cannot handle very large data files: the size of data in a file is a function of both its height (in rows) and width (in columns). If you have a large data set which seems to cause a problem for CSV Importer when you try to import it, you will need to break it up into smaller chunks (grouped by row) which can be ingested separately and cumulatively.

Prospect's Front-End Visualizer

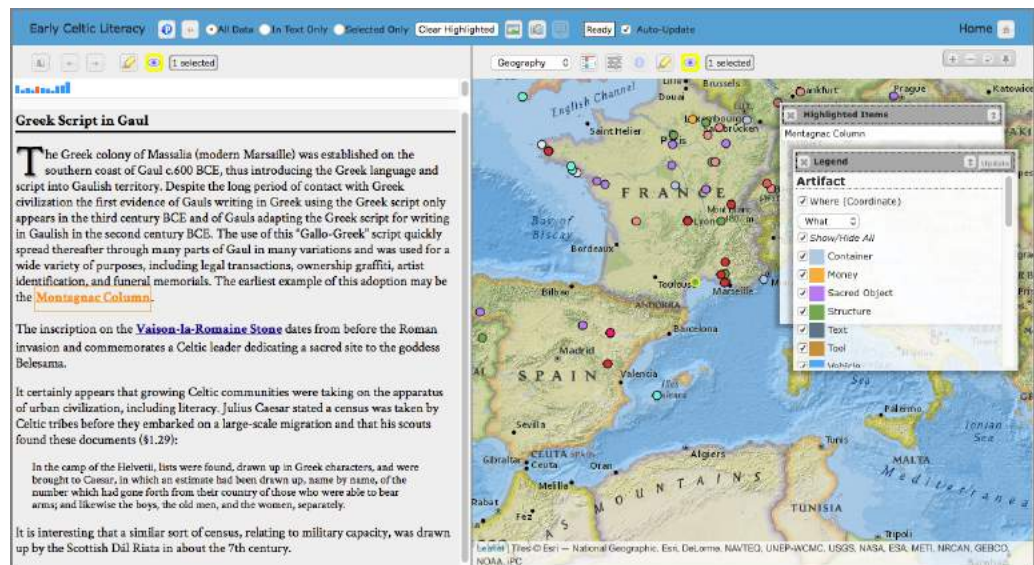
Prospect's front-end visualizer enables end-users to visualize and interact with data of up to four different Template types. End-users can:

- filter data so that items with particular characteristics are discarded from view
- highlight (i.e., select) data with particular characteristics
- choose one or two simultaneous visualizations of the resulting data
- choose which Legend to use for the colors of graphical features in the visualization
- open the Inspector dialog to examine the items selected in one of the visualizations more closely

The screen below illustrates the Prospect Exhibit visualizer in action: data is being displayed on two side-by-side visualizations – a map and a network –, each with its own Legend.



Prospect also allows you to create *Volumes*, which visualize references to data in textual sources, thus effectively providing dynamic diagrams. The screen below illustrates the Prospect Volume visualizer in action: the items referred to in the text on the left are shown in the visualizer on the right, and one of these has been selected by the user (and thus visually highlighted in orange text on the left and a yellow outline on the right):



The **Inspector** allows the end-user to scroll through all of the items currently selected in a visualization. It will display the values of specific Attributes and supports the use of media playback widgets: audio, video (via YouTube) and textual transcripts (that can display two side-by-side columns of text). These playback widgets can select particular excerpts from longer recordings through the use of Timestamps and, if an audio or video

stream is displayed alongside a transcript, they will be automatically synchronized to one another.



You can also see all of the items in the system that belong to a particular Template type without using the front-end visualizer at all. If you view a Template from the Dashboard, the Template's page becomes a listing of items: each entry in the listing contains the name of the Record post as a hyperlink, with which you can access the Record's page. The view below is an excerpt from a sample Template page.



Prospect also defines a WordPress shortcode that allows you to insert a listing of Records like this into any WordPress post page.

Prospect Perspectives and Readings

Once your Prospect website is loaded with Record data and has been configured to show Exhibits, it will be possible for end-users to explore the data in many complex ways: filtering out data with certain characteristics, selecting (highlighting) data with particular

characteristics, focusing on specific regions of visual space, and so on. Given the range of possibilities for exploring multifaceted data and the potentially enormous size of information space, how might a scholar direct attention to particular aspects of the data, or comment upon certain features of the information, or guide the user to understand particular interpretations of the data? Or even simplify the operation of Prospect to make an introduction to the data less daunting?

Prospect introduces a special feature for Exhibits called a *Perspective*. A Perspective enables an end-user to save the state of his/her visualization with an annotation so that the same view can be recalled at a later time with a textual explanation. If the end-user has an account on the WordPress web server, that Perspective can be published (by a user with the proper credentials) so that it is visible to anyone who views the Exhibit. Any end-user can always save a Perspective in his/her own personal web browser so that it is available for later recall.

Since a Perspective is a particular state of an Exhibit, every Perspective is tied to a specific Exhibit. When the end-user loads a particular Exhibit, all of the Perspectives that have been Published for that Exhibit are also loaded (and *only* those Perspectives).

The same basic mechanism exists for Volumes but the “snapshot” saved by this mechanism is called a *Reading* (since Volumes have a different set of controls and displays than Exhibits do).

Prospect's Origins

Prospect was conceived in the Digital Innovation Lab of the University of North Carolina at Chapel Hill in 2015. The software was designed by Michael Newton, with frequent feedback from users and focus groups in the DIL. It was implemented by him in PHP and JavaScript, with contributions to the CSS styles by Breon Williams and to the JavaScript components by Kevin Jacoby, and general support from the UNC OASIS group.

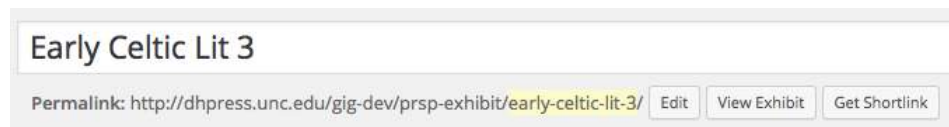
The design for Prospect was deeply informed by the experience of creating and using the Digital Innovation Lab's previous Digital Humanities platform, DH Press, on which Michael Newton was lead developer from early 2014. Several focus groups were held in the Digital Innovation Lab in early 2015 in which DH practitioners critiqued and contributed to the initial proposal. Stakeholders have continued to provide valuable, ongoing feedback.

Prospect's features were also informed by Michael Newton's experience as software engineer on the Iconographer information visualization project in 1992-93 at the University of Glasgow, the “Feuch” information visualization project in 1993-94 at the University of Glasgow, and his collaboration with the Scholar's Lab of the University of Virginia on a Digital Humanities project funded in 2007-8 by the National Endowment for the Humanities titled “Finding the Celtic” (a customization of the COLLEX platform).

Exhibits: End-User Experience

This chapter describes the features of Prospect's Exhibit visualizer from the viewpoint of the end-user. There are two main ways of invoking the Exhibit visualizer:

- Click the **View Exhibit** button in the Dashboard when editing an Exhibit (in WordPress 4.3 or earlier) or the link that follows the **Permalink:** label (in WordPress 4.4 or later).
- Use the URL to view the Exhibit (that follows the **Permalink:** label in the Dashboard when editing an Exhibit) as a link to redirect the end-user's browser to the Exhibit.



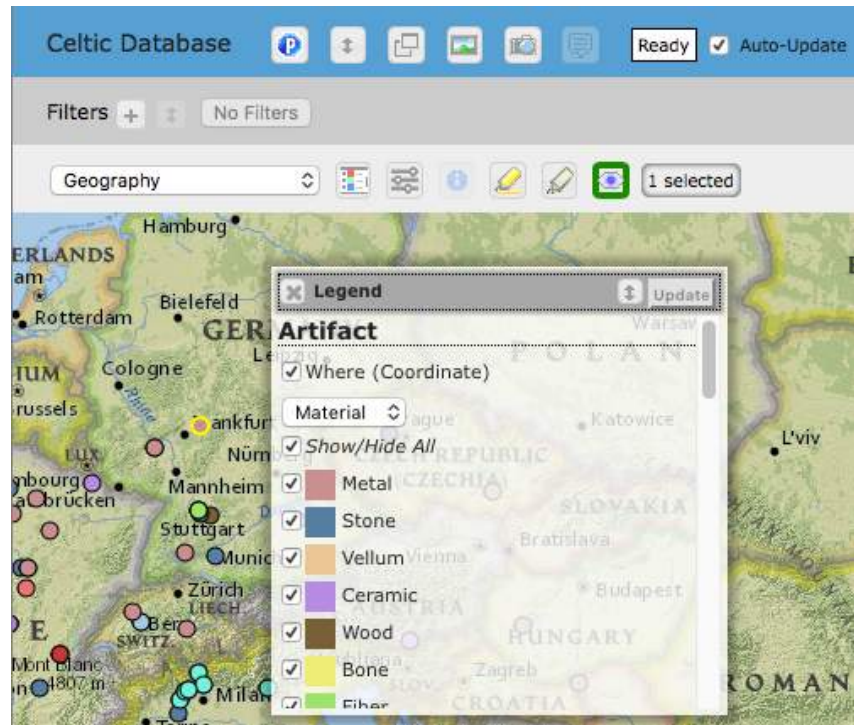
The Prospect visualizer screen display consists of a vertical stack of visual elements (from top to bottom):

- the Command Bar
- the Filter Stack
- the View Frame

Command Bar

Filter Stack


View Frame




The Command Bar


The Command Bar provides information about the current Exhibit and icons for functions that affect the overall state of the visualizer when viewing the Exhibit.


The title of the Exhibit being viewed is displayed on the far left of the Command Bar.


To get information about Prospect, click the **About Prospect** icon button .

The Filter Stack can occupy considerable visual space on the display. To hide or show the Filter Stack, click on the **Show/Hide Filters** icon button .

The View Frame in the bottom of the browser window can either show a single visualization or two visualizations (side-by-side). To show two visualizations (if you currently see only one) or just one visualization (if you currently see two), click the **Show/Hide View 2** icon button .

To display one of the Perspectives available for this Exhibit, click the **Show Perspective** icon button . See chapter 9 on Perspectives for more information.

To save the current state of Prospect (your current use in this Exhibit) as a Perspective, click the **Save Perspective** icon button . See chapter 9 on Perspectives for more information.

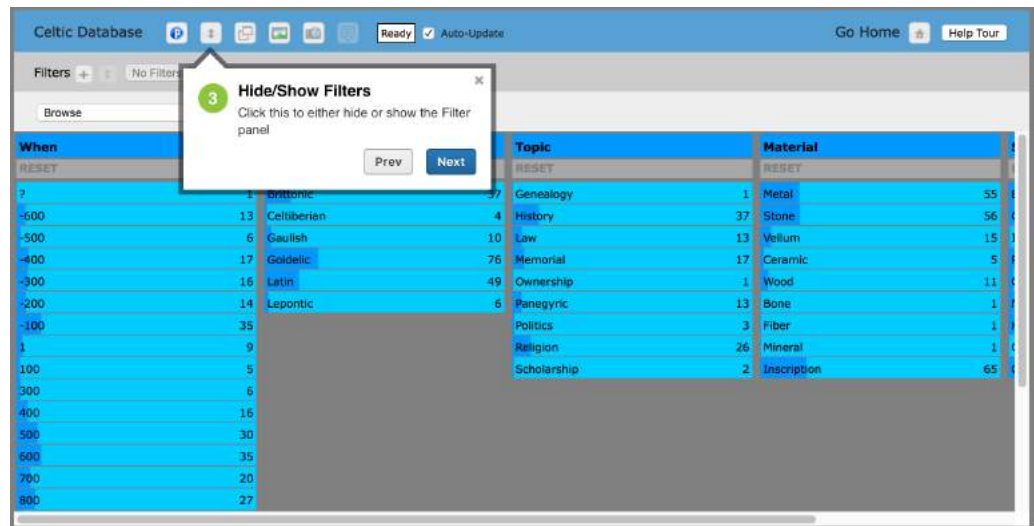
If you have displayed a Perspective, its annotation will be available to view. To show or hide it, click the **Show/Hide Annotation** icon button .

When you first load a Prospect visualizer, it has to retrieve all of the data before it can respond to your requests. The “state” box to the right of the icons initially states **Loading** (red letters against a yellow background) but the message changes to **Ready** after all data has been loaded from the webserver.

If the **Auto-Update** checkbox is checked, then the visualization is always immediately updated whenever you make a change on the user interface. You might not want updates to happen automatically if you have a large data set that takes a long time to display on the screen, however. If you uncheck the **Auto-Update** checkbox, then you have to click the **Run Filters** button whenever you make a change to a Filter setting or the **Update** button on the Legend whenever you make a change to the Legend settings.

If the Exhibit has been provided with a label and URL for a Home icon button  it will appear on the right side of the Command Bar.

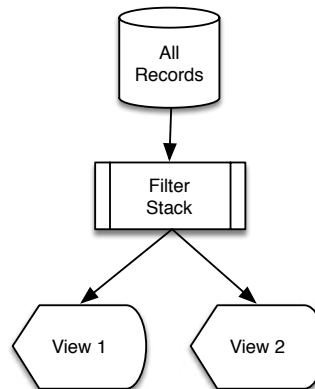
If the website administrator has indicated that help tips should be available for the Exhibits and Volumes of the website, a button titled **Help Tour** will appear in the far right of the Command Bar. If you click the **Help Tour** button, a series of floating dialog boxes (such as that below) will guide you through a tour of the user interface.



Filter Stack

The data in an Exhibit can potentially consist of thousands of Record items. The visualization of such a large number of items can be prohibitively difficult to comprehend and it can be difficult to find a particular item or pattern with so many items sharing the same visual space. You can create one or more Filters to remove Records from the data set so that they will not appear in the visualizations of your View Frame.

The flow of data in Prospect can be represented by the following graph:



All of the data of the Exhibit must pass through all of the conditions set up by the Filters in the Filter Stack to be represented visually in the View Frame.

The right-most button at the top of the Filter Stack displays the current state of the Filters and whether or not you need to press it to run the data through the Filters of the Filter Stack:




- If there are no Filters, the button will be disabled and read **No Filters**.
- If you have created a new Filter or changed the settings of a Filter (and the **Auto-Update** checkbox is not checked), this button will be enabled and read **Run Filters** (as above).
- If you have run the data through the Filter Stack, it will be disabled and read **Filtered**. (This will happen automatically if the **Auto-Update** checkbox is checked.)

Each Filter is specific to a single Attribute of Text, Vocabulary, Number, Dates or Pointer type; since an Attribute does not necessarily appear in every type of Template, you must specify (by checking the associated checkbox) the types of Templates to which each Filter should be applied. The checkbox will be disabled if the Attribute does not appear in the corresponding Template type. For example:




Any items that appear in the View Frame (which can contain one or two independent visualizations) can be highlighted (selected) manually or by using the Highlight dialog.

To create a new Filter, click the **New Filter** icon button  at the top-left of the Filter Stack. A dialog box will appear with the names of the Attributes of the data set, such as the following:




NOTE: It is possible for the Administrator to hide Attributes from this list, so this list may not include every Attribute defined for the Exhibit and data set.

Select the Attribute you wish to use as a filter criterion and press the **Add** button. The ***Remove/Hide All*** option is a special Filter (explained below), and hence its title is italicized.

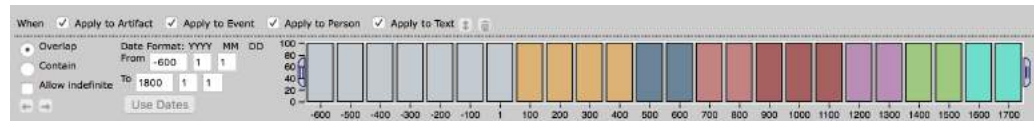
The Filter Stack can occupy a lot of vertical space on the screen once you create one or more Filters. To hide all of the Filters so that all that remains of the Filter Stack is the uppermost control bar, click the **Show/Hide Filters** icon button .

Every filter consists of a header and a body. The header contains:

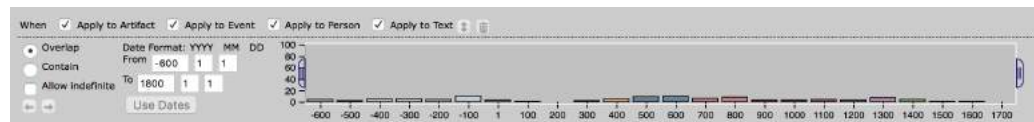
- the name of the Attribute
- a checkbox for every Template type labeled **Apply to....**
 - If this checkbox is checked, then all items belonging to this Template type are checked and only those that pass the condition of the Filter will pass through the Filter Stack.
 - If this checkbox is not checked, then any item that does not belong to this Template type is allowed to pass through.
- a **Toggle** icon button  that hides or shows the body of this Filter.

- a **Delete Filter** icon button  that causes this Filter to be deleted.

What is displayed in the body of the Filter will depend on the type of the Attribute. Below is an example of a Filter for an Attribute of the Dates type, which allows you to disregard items whose value for a Dates Attribute does not overlap with a particular date range or cannot be contained within a particular date range.



When you first create a Vocabulary, Number of Dates Filter, all of the bars in the bar graph will be displayed as full (i.e., at 100%). After the data is run through the Filter, however, the bars will be adjusted to reflect the actual percentage of items which match the particular Vocabulary, Number or Dates categories you indicated as acceptable for the particular Templates that you indicated with checkboxes. Any categories marked as unacceptable according to the criteria of your Filter will by definition be empty (i.e., at 0%). Items belonging to Templates not affected by the Filter will not affect the resulting percentages.



NOTE: There is no bar in the graph to represent the indefinite value.

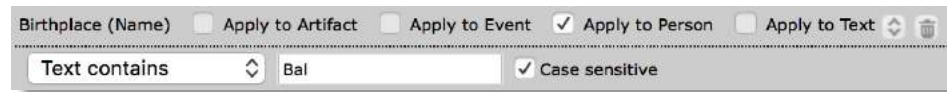
Text Filters

A Filter on a Text Attribute compares the text entered by the user into the Filter edit box with the corresponding Attribute value in the item. The drop-down menu on the left contains three different options for testing for a match between the item's Attribute value and the user text:

- **Text contains:** The user text only has to appear somewhere in the item's Attribute value for the test to be considered successful. For example, Prospect would let an item pass through the Filter if its Attribute value is **Athens** and the user has entered **the**.
- **Exact match:** The user text must be an exact match for the item's Attribute value.
- **Regular expression:** The user text is to be interpreted as a Regular Expression and is applied to the item's Attribute value interpret Regular Expressions (not explained in this manual).

The **Case sensitive** checkbox only applies to the **Text contains** and **Exact match** options: uncheck this only if you need text to match regardless of consideration of whether letters are upper- or lowercase.

NOTE: Doing a case-insensitive text match test takes more time and memory than a literal case-sensitive test.



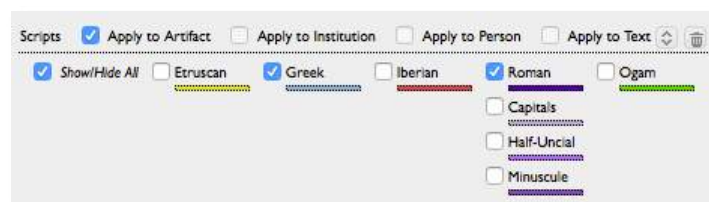
For example, only Person Records which have a Text Attribute called “Birthplace (Name)” whose value contains the text **Bal** will pass through the Filter above. Names such as “Balmoral” and “South Baltimore” will pass this test. Records belonging to Templates other than “Person” will pass through.

NOTE: The Text Filter does a simple string match rather than evaluating a regular expression.

Vocabulary Filters

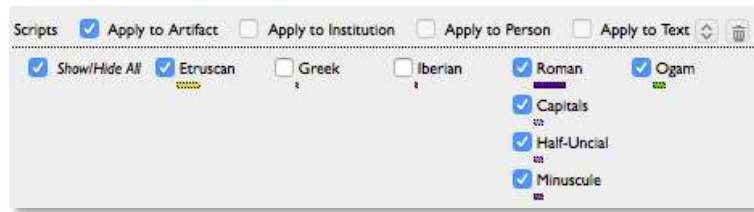
A Filter on a Vocabulary Attribute will create checkboxes for all of the vocabulary terms you have defined for the Attribute. If any terms are arranged in parent-child hierarchies, child terms will be displayed below their parent terms. When you click a parent term on, all of its children are automatically turned on as well (although you can deselect the children individually).

Check the checkboxes whose associated terms are allowed to pass through the Filter. Only items that have one or more matching terms for the Attribute will be allowed to pass through the Filter.



In the Vocabulary Filter shown above, the user has (un)checked fixed Vocabulary terms so that the only items of Template type “Artifact” that can pass through the Filter are those that have a value of “Greek” or “Roman” in the value of their “Scripts” Attribute. Even an item whose “Scripts” Attribute value is “Capitals” will not pass through since “Capitals” was not checked, even though it is a child of “Roman.”

Once the data is run through the Filter (by clicking **Run Filters**, or automatically in the case of a Perspective), the horizontal bars will be resized to show the relative number of items which passed through the Filter with each criterion:



NOTE: An item’s Vocabulary Attribute value can have multiple values, but only the first of these that match one of the checked boxes on the Vocabulary Filter is accounted for in the resulting graphs.

If you check the **Show/Hide All** checkbox, it will check or uncheck all of the Vocabulary checkboxes in this filter.

NOTE: If the Vocabulary Attribute allows for multiple values, then an item only needs to have one of its multiple values match the checked values. In the case of the above example, if an Artifact has the values “Ogam” and “Greek” in its Scripts Attribute, it will pass the Filter test since “Greek” is an allowable value (even if “Ogam” is not).

Tags Filters

A Filter on a Tags Attribute looks and operates virtually identical to that of a Text Attribute, except that the Filter examines all of the item’s (possible) tags to see if one of them matches the text entered in the text edit box. The way that a match is evaluated depends on the option chosen from the drop-down menu on the left:

- **Tag that contains:** The user text only has to appear somewhere in the item’s Attribute value for the test to be considered successful. For example, Prospect would let an item pass through the Filter if one of the tags in its Attribute value is **Athens** and the user has entered **the**.
- **Exact tag match with:** The user text must be an exact match for one of the tags of the item’s Attribute value.
- **Regular expression:** The user text is to be interpreted as a Regular Expression and is applied to the item’s Attribute value. This is an advanced feature for users who know how to formulate and interpret Regular Expressions (not explained in this manual).

The **Case sensitive** checkbox only applies to the **Text contains** and **Exact match** options: uncheck this only if you need text to match regardless of consideration of whether letters are upper- or lowercase.

NOTE: Doing a case-insensitive text match test takes more time and memory than a literal case-sensitive test.

State ☒ Apply to Mass Shooting

Tag that contains ☒ Case sensitive

For example, if the end-user entered the text **C** into the text entry box (as above) and selected the **Tag that contains** checkbox, then items which have the values “CA,” “CO,” “CT,” “NC,” and “SC” for any of their tags would pass through the Filter.

Number Filters

A Filter on a Number Attribute will create a widget based on the Attribute’s definition, particularly on its minimum and maximum values, its “granularity” (magnitude of groupings of numbers) and the Attribute’s Legend.

If the corresponding Number Attribute allows indefinite values, the end-user will be able to click the **Allow indefinite** checkbox; otherwise, the checkbox will be disabled. There is no bar on the graph to represent the items with indefinite values.

The Number Filter attempts to keep the text entry boxes coordinated with the graphical representation of the numeric range on the bar graph, so that when you change one, the other is updated. For example, when you move the left or right handles of the user selection “brush” in the graph, the **Min** and **Max** number values will be updated.

If you enter value **Min** and **Max** number values into the text entry boxes and click the **Use Numbers** button, Prospect will move the user-selection “brush” on the graph to reflect this numeric range as best it can, but this may only be a rough approximation, depending on the granularity of your numeric range categories. If there are any errors in the values entered into the boxes, they will be highlighted with yellow and red, as below:

Terms ☒ Apply to President

☐ Allow indefinite

Min Max

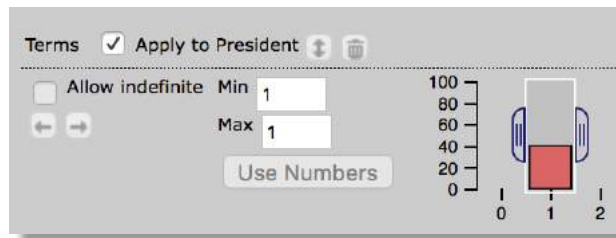
The graph shows a vertical axis from 0 to 100 with major ticks every 20 units. A horizontal bar is present at the 0 level. A selection brush is positioned over the bar, spanning from 0 to 3. The 'Max' value of 3 is highlighted in yellow, indicating an error.

Errors are caused when:

- illegal characters are entered (other than numbers and the minus sign)
- numbers exceed valid minimum and maximum values for the Attribute
- the **Min** value is greater than the **Max** value

If the numbers you have entered are valid, however, the **Use Numbers** button will be enabled. Click it to apply the numbers to the graph and register them with the Filter for

use, as in the illustration below. You must still click the **Run Filters** button for the Filter to take effect, if the **Auto-Update** checkbox is not checked.



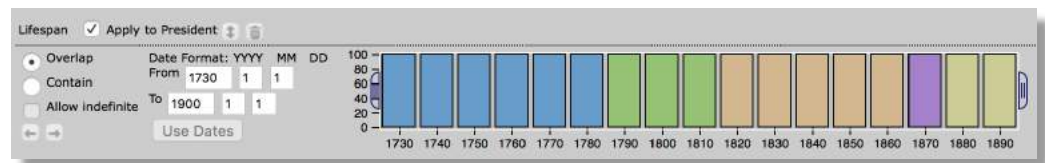
In the Number Filter shown above, the user has configured the Filter so that the only items of Template type “President” that pass through are those in which the value of the “Terms” Attribute is exactly 1. These settings could have been provided by either entering “1” into the **Min** and **Max** text edit boxes or by dragging the left and right handles of the horizontal “brush” on the graph.

The label given at the bottom each bar in the display will correspond to the minimum value in the range represented by the bar. The numeric size of the range will depend upon the value you have given for the **Group values together by** settings in the Attribute configuration, but can be easily inferred by looking at all of the labels in the Filter display.

If you click the left-arrow or right-arrows on the left side of the Number Filter, the selected area will move to the right if it has not already reached the left-most or right-most position of the range.

Dates Filters

A Filter on a Dates Attribute will create a widget based on the Attribute’s definition, namely, its start date, end date, “granularity” (size of chronological chunks), and the Legend created for the Attribute.



The label given at the bottom each bar in the display will correspond to the minimum date in the range represented by the bar. The size of the date range will depend upon the value you have given for the **Group Dates together by** settings in the Attribute configuration, which can be easily inferred by looking at all of the labels in the filter display.

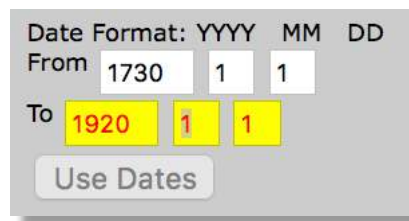
A Dates Filter can either require an overlap between the period set by the Filter and the value of the Attribute in the item, or else that Dates values in items be completely

contained within the Filter range, depending on whether the **Overlap** or **Contain** radiobox is selected.

If the corresponding Dates Attribute allows indefinite values, the end-user will be able to click the **Allow indefinite** checkbox; otherwise, the checkbox will be disabled. There is no bar on the graph to represent the items with indefinite values.

The Dates Filter attempts to keep the text entry boxes coordinated with the graphical representation of the date range on the bar graph, so that when you change one, the other is updated. For example, when you move the left or right handles of the user selection “brush” in the graph, the **From** and **To** dates will be updated to the corresponding year, month and day values.

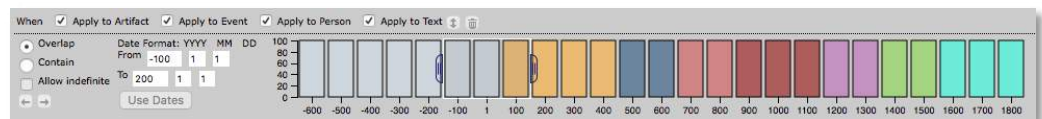
If you enter valid year, month and day values into the text entry boxes and click the **Use Dates** button, Prospect will move the user-selection “brush” on the graph to reflect the date range as best it can, but this may only be a rough approximation, depending on the granularity of your date range categories. If there are any errors in the values entered into the boxes, they will be highlighted with yellow and red, as below:



Errors are caused when:

- illegal characters are entered (those other than numbers and the minus sign)
- numbers exceed valid values for years, months or days in the defined Date range
- **From** values are greater than **To** values

If the numbers you have entered are valid, however, the **Use Dates** button will be enabled. Click it to apply the numbers to the graph and register them with the Filter for use, as in the illustration below. You must still click the **Run Filters** button for the new date range to be applied to the data, however, if the **Auto-Update** checkbox is not checked.



In the Dates Filter above, the user has specified that all Person items must pass the condition of the Filter and dragged the Filter brush to the period between the 1st century BCE and the 2nd century CE. Dates values that would pass through this Filter include:

- 199 (a single year)
- -100 (100 BCE)
- -100/199 (100 BCE to 199 CE)
- 200-1-1 (January 1 of the year 200 CE, the last possible date)
- 199/201 (199 CE to 201 CE)
- -101/-100 (101 BCE to 100 BCE)

If you click the left-arrow or right-arrows on the left side of the Dates Filter, the selected area will move to the right if it has not already reached the left-most or right-most position of the range.

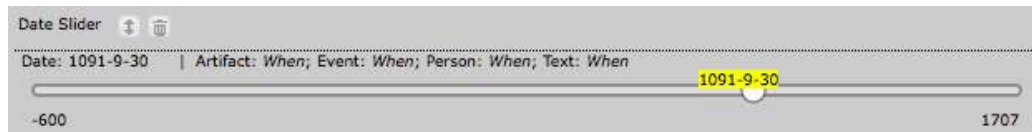
Date Slider

The Date Slider is a special Filter with a single slider handle which allows the user to select a single date to apply to the Dates Attribute of multiple Templates: in other words, the single Date set by the end-user is tested against the values of Record data, if a Dates Attribute has been configured for the corresponding Template. All of the Records whose value for the Dates Attribute “intersects” with the date of the Filter handle will pass through the Filter.



The date set by the end-user using the handle is shown in the top-left corner (it is “553-12-31,” or December 31, 553, in the example above). The minimum date on the Date Slider is shown in the lower-left corner (the year 600 BCE in the example above) and the maximum date is shown in the lower-right corner (the year 1707 CE in the example above). The Date Slider also shows the Templates to which it is applied, and the specific Dates Attribute for each, in the central area (in this case, the “When” Attribute of the “Artifact,” “Event,” “Person” and “Text” Templates).

When you drag the handle left or right, a yellow tooltip will appear above the handle and show you the date at that position. When you let go of the handle, the Date Slider Filter’s date will be set and the date in the top-left corner will be updated.



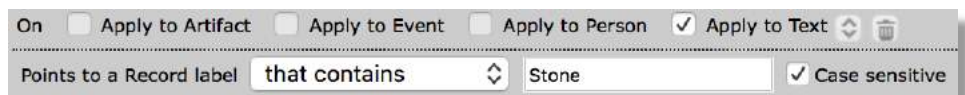
Pointer Filters

A Filter on a Pointer Attribute compares the text entered by the end-user into the Filter edit box with the labels of all the items whose IDs are in the value of the Pointer Attribute. The drop-down menu on the left contains three different options for testing for a match between the labels pointed to by the item's Attribute value and the user text:

- **that contains:** The user text only has to be a part of the label of the items pointed at by the item's Attribute value for the test to be considered successful. For example, Prospect would let an item pass through the Filter if its Attribute value pointed to an item whose label is **Athens** and the user has entered **the**.
- **is exact match:** The user text must be an exact match for a label of an item pointed to by the item's Attribute value.
- **Regular expression:** The user text is to be interpreted as a Regular Expression and is applied to the labels pointed to by the item's Attribute value. This is an advanced feature for users who know how to formulate Regular Expressions (not explained in this manual).

The **Case sensitive** checkbox only applies to the **that contains** and **is exact match** options: uncheck this only if you need text to match regardless of consideration of whether letters are upper- or lowercase.

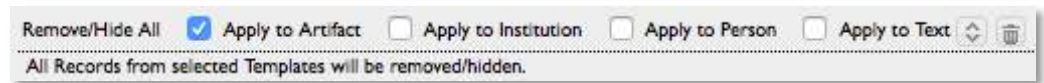
NOTE: Doing a case-insensitive text match test takes more time and memory than a literal case-sensitive test.



Let's say, for example, that you have a Template called "Person" which contains a Pointer Attribute called "Parents." Each item contains the IDs of the parents of the Person that this item represents. If you created a Filter on the "Parents" Attribute and entered **John** into the Filter's edit box, the result would be all of the items for people who had a parent whose name contained the string "John." Items with labels "John Smith" and "Robert Johnson" would both qualify.

Remove/Hide All Filters

If your Exhibit consists of multiple Template types, you may wish to hide all of the items of a particular Template from the view of one of your visualizations. This is the purpose of the **Remove/Hide All** Filter.



In the example above, all of the items of the “Artifact” Template type will be removed from the resulting visualizations (since the corresponding checkbox has been checked).

Relationships and Roles

If your Exhibit uses Qualified Relationships, the list of Filters will include the **Relationships and Roles** option. This Filter will limit the Qualified Relationship data to items that match the Relationship option you have selected from the drop-down menu and any of the Roles you have indicated (by checking the associated checkbox and selecting an option from the drop-down menu).

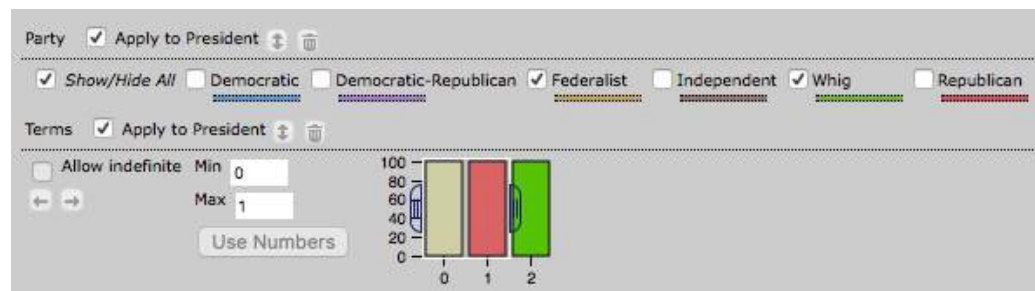


In the above example, the only Qualified Relationships that pass through the Filter are those which are marked as “Familial.” We could further limit Qualified Relationships to those that include the “Parent” Role by checking the middle checkbox.

For more information about Qualified Relationships, see chapter 7.

Passing Through the Filter Stack

In order to pass through the Filter Stack, items need to pass through all of the conditions that are applied to them.




In the above example, the only items belonging to the “President” Template type that pass through the Filter Stack to the View Frame are those that:

- have “Federalist” or “Whig” as values in their “Party” Attribute, and
- have values of 0 or 1 in their “Terms” Attribute.

The Highlight Filter

It can be hard to find and identify an item (or set of items) on a visualization that can contain large numbers of items, especially when the feature you're looking for is not represented by the visualization. For example, how do you identify all of the people who have the first name "John" if they are only shown on a map as dots colored by their gender?

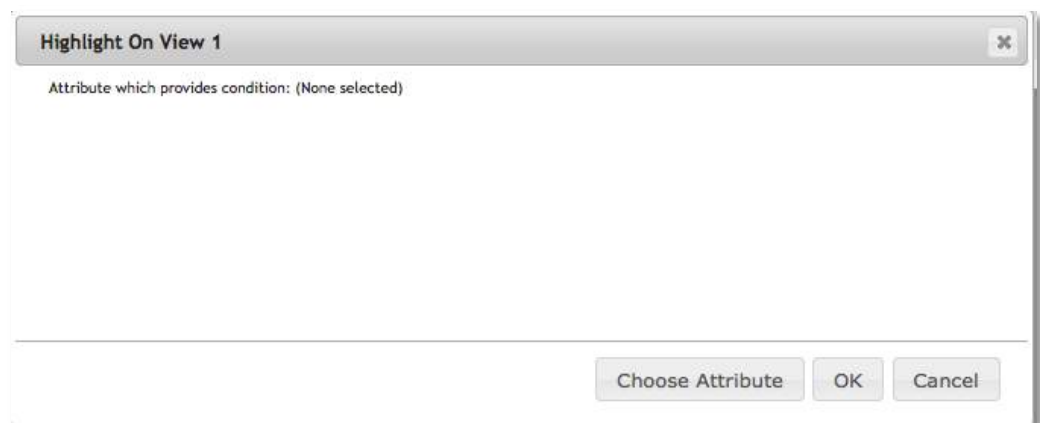
This is the purpose of the Highlight Filter: it allows you to create a Filter on any of the Attributes of the Exhibit's data set, but instead of removing items that do not meet the conditions of the Filter, it highlights (or selects) items that do meet the condition of the Filter.

To apply a Highlight Filter to the current visualization, click the **Highlight** icon  in the control bar. After the Highlight Filter has been applied, the matching items will be highlighted on the visualization (in a visualization-specific way). You can see the items and their details by opening the Inspector modal window.

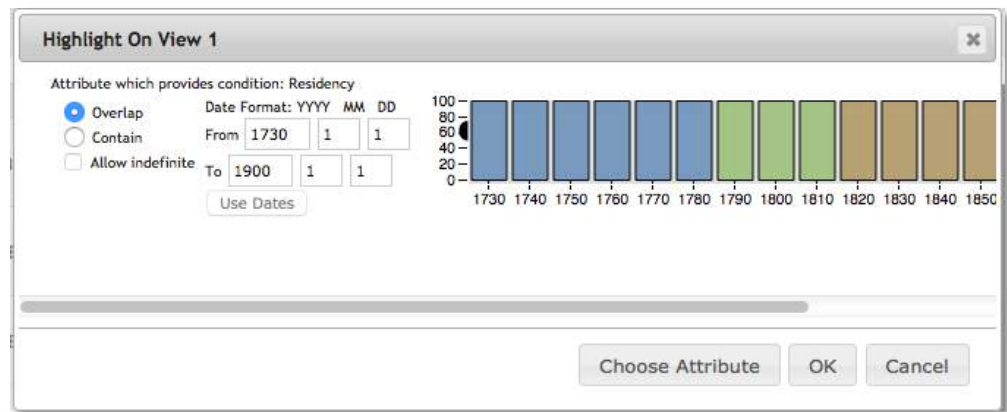
NOTE: The Highlight icon is only available on visualizations that represent individual items. Other visualizations (the Facet Browser, Stacked Graph, Facet Flow, and MultiBlock Map) aggregate items into groups and represent those groups as items on the display. In these visualizations, you highlight sets of items by clicking on one of the aggregate group items.

When the Highlight Filter is a Vocabulary, Number or Dates Filter, the resulting bar graphs will represent the percentage of the total number of items that meet the Filter criteria (rather than any particular Template).

Each of the two visualizations in the View Frame has its own Highlight Filter.



The first time that you click the Highlight icon, the dialog box that appears will be empty. Click the **Choose Attribute** button to choose which of the available Attributes should be used to create a Highlight Filter.



The Filter will appear and behave the same in the Highlight dialog as it does in the Filter Stack (although there is more space available to display them in the Filter Stack). To use this Filter to Highlight items in your view, click the **OK** button. To close the dialog without affecting the view, click the **Cancel** button.

View Frame

The View Frame can display either a single visualization or two side-by-side visualizations of any type defined for the Exhibit. The control bar at the top of each visualization contains a drop-down menu and row of icon buttons that control the content of the View and apply actions to it:



The drop-down menu on the left has a list of the titles of all of the visualizations that have been defined for the current Exhibit. Choose the visualization you wish to see from the menu: the view will change accordingly, as will the state of the icon buttons. Those actions that the visualization does not support will be disabled.

When a visualization supports a Legend, it will hover on top of the visualization. To hide the Legend (when it is visible) or show it (when it is hidden), click the **Show/Hide Legend** icon


Some visualizations may have special settings available on a dialog box. To access the optional settings for this visualization, click the **View Options** icon


If this visualization has an explanatory hint, you can display it by clicking on the **Visualization Notes** icon


Highlighted Items and the Inspector


Each of an Exhibit's two visualizations can have its own set of highlighted items. This highlighted set is either the result of applying the Highlight Filter or of user actions (i.e.,



clicking items on the display). The highlight set will be cleared automatically whenever the user switches to a different visualization or modifies the data via the Filter Stack.

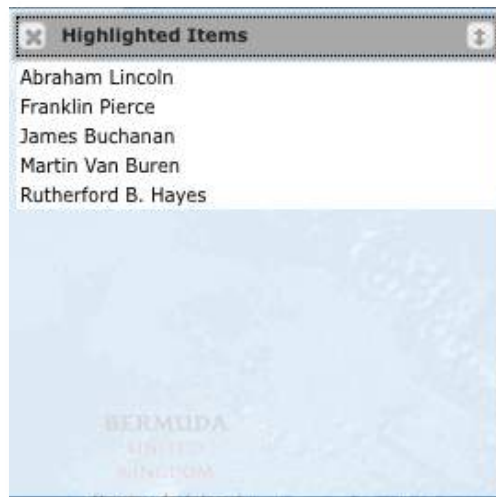
The **Highlight** icon  is used to find and highlight items with particular Attribute values, as explained previously above.

To clear the current selection (i.e., to deselect all of the items that are currently highlighted), click the **Clear Highlighted** icon .

Whenever items have been highlighted on the visualization, the **Show Highlighted** icon  will pulse with a green outline. When you click this icon, the Inspector modal dialog will appear and allow you to examine all of the selected items.



The Selection Readout just to the right of the icons displays the number of items that are currently selected: if there are currently five items selected, the display should look like this: . When you click on the Selection Readout, the **Highlighted Items** list opens.

The **Highlighted Items** list is a floating window that opens the first time you select an item; it displays the names of all of the items that are currently selected. The close button  on the left side of the handle closes **Highlighted Items** list; the min-max button  on the right side of the handle either “minimizes” the **Highlighted Items** list (causing everything below the handle to be hidden) or “maximizes” it.



If you click on one of the names in the list, the **Inspector** will open up directly on that item.





Once the **Inspector** has been opened, you can look at details of all of the items that have been selected. To go to the previous or next item in the selected set, click the left arrow  icon or the right arrow icon . To go directly to one of the items in the selected set, choose its name from the dropdown menu on the top of the **Inspector**.

To go to the Record post page providing the greatest amount of detail about the item currently showing in the Inspector, click the **See Item** button.

When you hover the cursor over the title of the current item, the **record-id** of the corresponding item will appear as the cursor's tooltip text.

Legends

Legends allow you to color the graphical representations of items on your visualization according to one of the Attributes in its Template definition. The Legend sits on top of your visualization: to move the Legend, click on the grey handle at the top and drag it to a new location. The close button  on the left side of the handle closes the **Legend**; the min-max button  on the right side of the handle either “minimizes” the **Legend** (causing everything below the handle to be hidden) or “maximizes” it.

Each of the Template types has its own section in the Legend: the Template's label is shown in large bold letters, followed by:

- one or more of the Attributes that control the location of items on the display, with an associated checkbox that turns on or off the use of that Attribute.

- a drop-down menu that allows you to select which Attribute is currently being used to provide the color scheme for items of this Template type.
- a **Show/Hide All** checkbox that, when you click it, will either turn on or off all of the Legend values below it.
- a list of Legend values for this Attribute.



If you click a checkbox for a Legend value/color pair, it will toggle its state. If you click the label for a Legend value/color pair, it will select it and deselect all of the other Legend values for the Template.

NOTE: If the Attribute shown in a Legend is of the Number or Dates data type and indefinite values have been enabled for that Attribute, the first entry in the Legend's list will be labeled **Indefinite**.

If the **Auto-Update** checkbox on the Command Bar is checked, then any changes that you make to the Legend will be applied and made visible immediately. Otherwise, you will need to click the **Update** button for the visualization to get updated according to your changes. This button will only be enabled if you have made a change on the Legend that could affect the visualization (and **Auto-Update** is not enabled); otherwise it is disabled.

Items will only be visually represented in a visualization if:

1. the Attribute controlling their location has been checked for their corresponding Template on the Legend
2. they have a value for that location Attribute

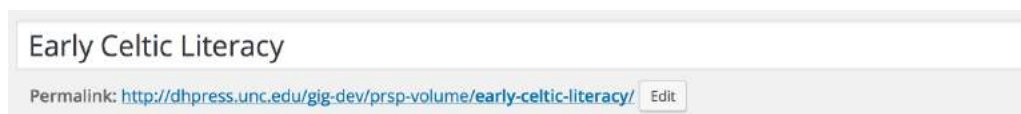
3. there is at least one Legend value whose checkbox has been checked for the Attribute providing colors
4. the item has at least one value that matches the value/color pairs that have been checked in the Legend

Volumes: End-User Experience

This chapter describes the features of Prospect’s Volume visualizer from the viewpoint of the end-user. The Volume visualizer allows a user to read a text which is connected to visualizations of data, so that items that are referred to in the text can be highlighted in a corresponding dynamic diagram.

There are two main ways of invoking the Volume visualizer:

- Click the **View Volume** button in the Dashboard when editing an Volume (in WordPress 4.3 or earlier) or the link that follows the **Permalink:** label (in WordPress 4.4 or later).
- Use the URL to view the Volume (that follows the **Permalink:** label in the Dashboard when editing a Volume) as a link to redirect the end-user’s browser to the Exhibit.



Using an Anchor in the Volume URL

If you have marked top-level HTML elements in your content with IDs, you can use that as an anchor appended to the end of the URL for your Volume. Prospect will search for the element with the given ID and open the text at the appropriate section.

EXAMPLE: If, for example, you have a paragraph in your text that begins with the tag

```
<p id="fred"> ...
```

You can get Prospect to open the Volume at the section that makes the paragraph marked “fred” visible by using a URL like:

```
http://mysite.com/prsp-volume/myvol/#fred
```

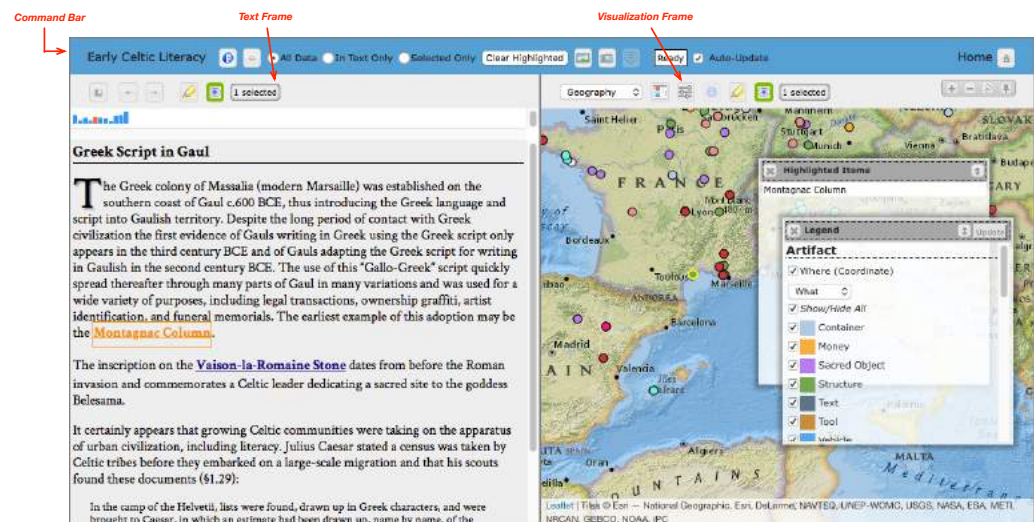

IMPORTANT: You cannot use both an anchor and a Reading; if you supply a Reading for a Volume, any anchor parameter in the URL is ignored.

The Volume Visualizer Display

The command bar is a long horizontal bar at the top of the Prospect visualizer screen display. The rest of the display is split horizontally into two sections:

- The Text Frame, on the left
- The Visualization Frame, on the right

The contents of the Text Frame – some subset of the Volume’s HTML document – can contain references to items that can be displayed in the views of your Visualization Frame. It is possible, however, for items to appear on one side (in the Text Frame or the Visualization Frame) but not the other. Prospect’s Volume visualizer attempts to coordinate the selection so that, as much as possible, the items highlighted on one side are also highlighted on the other.





The Command Bar

The Command Bar provides information about the current Volume and icon buttons for functions that affect the overall state of the visualizer when viewing the Volume.



The title of the Volume being viewed is displayed on the far left of the Command Bar.

To get information about Prospect, click the **About Prospect** icon .


The **Min/Max Text Pane** button  either increases the Text Pane (on the left) to its maximum width or decreases it to its minimum width.





The Volume visualizer allows you to choose one of three possible “View Modes”:

- If you choose **All Data**, all of the items in your entire database will be displayed (if possible) in the Visualization Frame and items selected in one will be selected in the other.
- If you choose **In Text Only**, only those items that appear in the current Reading Pane will be displayed (if possible) in the Visualization Frame and items selected in one will be selected in the other.
- If you choose **Selected Only**, only those items that are selected in the Reading Pane will be displayed in the Visualization Frame. You can make further selections of items in the Visualization Frame and examine them independently from the Reading Pane selection.

To clear the current selection on both frames, click the **Clear Highlighted** button.

To display one of the Readings available for this Volume, click the **Show reading** icon . See chapter 9 for more information.

To save the current state of Prospect (your current use in this Volume) as a Reading, click the **Save Reading** icon . See chapter 9 for more information.


If you have displayed a Reading, its annotation will be available to view. To show or hide it, click the **Show/Hide Annotation** icon .

When you first load a Prospect visualizer, it has to retrieve all of the data before it can respond to your requests. The “state” box to the right of the icons initially states **Loading** (red letters against a yellow background) but the message changes to **Ready** after all data has been loaded from the webserver.

If the **Auto-Update** checkbox is checked, then the visualization is always immediately updated whenever you make a change on the user interface. You might not want updates to happen automatically if you have a large data set that takes a long time to display on the screen, however. If you uncheck the **Auto-Update** checkbox, then you have to click the **Update** button on the Legend whenever you make a change to the Legend settings.

If you provided a label and URL for a Home button in the **General Settings** of the Exhibit, it will appear on the far right of the Command Bar.


Text Frame

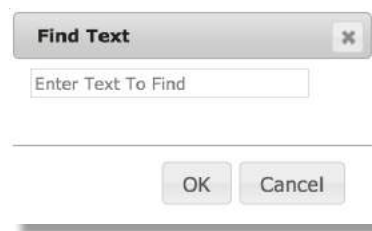
The control bar at the top of the Text Frame contains icons that control its behavior. The left-most **Show/Hide Table of Contents** icon button  controls whether the Text Frame is occupied by the Table of Contents or the Reading Pane.

The Reading List

The Volume visualizer always maintains a “Reading List” for the Volume you are currently using. The Reading List indicates which sections are of interest to you. When you use the arrow icon buttons to move backward or forward through a Volume on the Reading Pane, the visualizer will skip over sections that are not on the Reading List.

To select or deselect sections on the Reading List:

- check or uncheck the associated checkbox on the Table of Contents, or
- click the **Un/Check Reading List** checkbox in the Table of Contents control bar, which checks or unchecks all of the sections at once, or
- click the **Find Text** icon  on the Table of Contents control bar, which allows you to search for a specific text string in the Volume:



All sections which contain the text will be selected in the Reading List.

- Click the **Find in Text** button on the **Inspector**.



All of the sections which contain embedded references to this item will be selected in the Reading List.


Table of Contents

When the Text Frame contains the Table of Contents, it has the following appearance:



If you click the **Un/Check Reading List** checkbox, it will check or uncheck all of the checkboxes on the Reading List (i.e., every section in the Table of Contents).

If you click the **Show/Hide All Sections** checkbox, it will select or deselect every section in the Table of Contents.

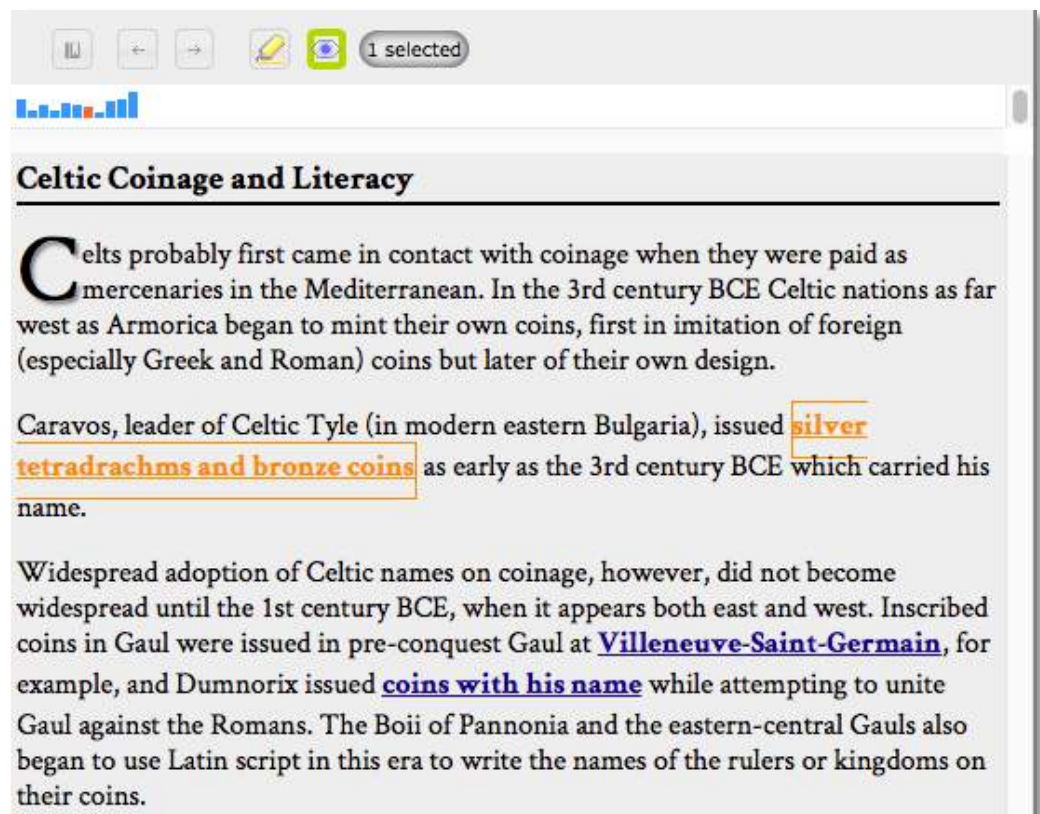
To expand or collapse the secondary-level sections within a primary-level section, click the plus icon button  to the left of the primary-level section title.

To add or remove a specific section to/from the Reading List, check or uncheck the associated checkbox on the left of the section (before the section title).

The sections that are currently displayed in the Reading Pane will be indicated with a yellow highlight outline. Click on any part of the section (other than the checkbox), at primary or secondary level, to indicate that you do (or don't) want its contents included in the Reading Pane. The Reading Pane will contain the contents of all selected (i.e., highlighted) sections.


Reading Pane

When the Text Frame contains the Reading Pane, it has the following appearance:



The left- and right-arrow icon buttons in the control bar at the top of the Reading Pane allow you to move through the Reading List, select references to item embedded in the text, or open the Inspector for the current selection of items.


Click the **Previous** (left-arrow) icon button  to go to the previous section in the Reading List.

Click the **Next** (right-arrow) icon button  to go to the next section in the Reading List.

If you click the **Highlight** icon , Prospect will bring up a dialog box that allows you to specify a condition with an Attribute Filter.



If you click **OK** on the Highlight dialog box, all of the references to items which meet the conditions of the Attribute Filter will be selected in the text. (This mechanism works the same as in the Exhibit visualizer.)

If you click the **Show Highlighted** icon button , the Inspector dialog box will appear and allow you to examine details of all of those items whose references are currently highlighted in the Reading Pane.


The Bookmark is contained in the narrow horizontal strip below the Text Frame's control bar. It represents the current state of the Table of Contents in summary form.



Every section in the Table of Contents is represented on the Bookmark by a thin vertical bar (in the same order); the relative (textual) length of each section determines the height of the bar; sections that are currently shown in the Reading Pane are colored an orange outline; sections that are selected in the Reading List (but not otherwise in the Reading Pane) are blue, otherwise they are grey.

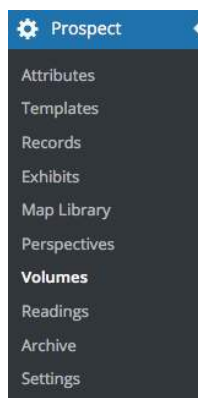
References to items in the contents of the Reading Pane are shown in bold, dark-blue type; when you select them, they turn yellow-orange. Links to webpages outside of the Volume are shown in a light-blue color.

Visualization Frame

The Visualization Frame on the right looks and operates like the View Frame of an Exhibit except that the **Clear Selection** icon  is not in the control bar but rather is a button on the Command Bar. This is because it is a “global” command that affects both frames. See details about visualization controls in chapter 2.

Configuring Attributes, Templates, Exhibits and Volumes

This chapter will explain how to create, define and archive the definitions of Prospect's basic data entities: Attributes, Templates, Exhibits and Volumes. We can refer to this as “configuring Prospect,” which is distinct from supplying data to Prospect (for visualization and other purposes).



Because of the interdependencies between these data entities, and relationships implicit in these interdependencies, you must almost always define and configure them in this order:

1. Attributes
2. Templates
3. Exhibits (or Volumes)

You can define (or import) overlay Maps any time before you need them when configuring an Exhibit or Volume.

Prospect Dashboard Editors

Although each entity has its own specialized editor on the WordPress Dashboard, all of the editors have a few things in common:

- Every Dashboard editor has a button on the top-left titled **Verify and Prepare ...**. You must click this button before you press the **Publish, Save Draft** or **Update** button. If there are any errors in your definition, an error message will appear in red next to the button for five seconds. You must correct the error before the entity can be saved in WordPress.
- *Internal IDs*: Prospect distinguishes between external labels (which are displayed to the end-user but not significant for any other purpose) and internal IDs. The

latter must always be unique across that data entity type (i.e., Attribute, Template, etc.) in your entire website, as they are used for the purpose of locating and using a specific definition or piece of data. Volumes and Exhibits must have IDs that are unique across both of those data types, however.

WARNING: Avoid using the straight-vertical double-quote character (") in all of your configuration settings. If you need to use quotation marks, use the single-quotation marks (') or angled open- and close-double-quote characters (" "). This is because the straight double-quote character is a special character used in the encoding of data that is passed over the internet. Prospect attempts to remove this character from all text in order to reduce the likelihood of encoding errors and mysterious bugs when data is passed between the web server and a user's browser.

Attributes

Attributes values are the basic building blocks of Records. An Attribute corresponds to a column in a spreadsheet or a field in a database table. WordPress stores data as indiscriminate blobs. An *Attribute* definition describes how to treat this basic unit of data and how to interpret it to create meaning in a graphical representation.

Perhaps most fundamental in this definition is the type of data represented by this Attribute. The currently supported data types are:

- *Vocabulary*: short for “fixed vocabulary”; a pre-selected and limited set of discrete options, such as **Male**, **Female** and **Unknown**.
- *Text*: a single textual entry without any limitations or format imposed upon it, such a name or a description.
- *Tags*: one or more short textual descriptors.
- *Number*: numerical values, currently only integers.
- *Dates*: a single date or a date range.
- *Lat-Lon*: a latitude-longitude coordinate on a map, with a comma separator, such as **2.36772, 53.091**.
- *X-Y*: an x-y coordinate on a Cartesian grid with the y-axis reversed, with values increasing as they move downwards, as on computer screens, with a comma separator, such as **319, 88**.
- *Image*: the URL to a JPG, PNG or GIF file.

- *Link To*: the URL to an external webpage on another webserver.
- *Audio*: the URL to an MP3 file or to a SoundCloud audio recording.
- *YouTube*: the code for a YouTube video (rather than the entire URL).
- *Transcript*: the URL to a text file that has been formatted with timestamps, which must conform to a rigorous standard (see chapter 11).
- *Timecode*: start-stop timecodes for an excerpt from a recording, which must conform to a rigorous standard (see chapter 11).
- *Pointer*: the ID of another Record. Some visualizations use Pointers to draw connections between items on displays; the Inspector and Record Post pages also turn IDs of Pointer Attributes into links to Record Post pages.
- *Join*: the ID of a Record from a dependent Template whose data will be added to this Record at runtime. (See the “Pointer and Join Attribute Usage” section of chapter 10.)

The Attribute Dashboard editor automatically reconfigures itself according to the specific needs and possibilities of the data type, which you choose from the **Data type** dropdown menu.

NOTE: As a general principle, you should provide as much configuration information to Prospect as possible. This enables it to create interfaces and visualizations that best suit your data. As you know your data best, you are best positioned to anticipate its characteristics and how to make them intelligible to the user.

Verify and Prepare Attribute Definition for Publish/Update

Attribute's external label: Roles Privacy Setting: Open (Public)

Attribute's unique internal id: roles alt-name Use this Custom Field name

Attribute value delimiter (single character or blank): , Available as Filter in Exhibit

Contributor Hint: Explain Attribute entry to contributor

Data type: Vocabulary

All Attribute definitions require the following settings:

- **External label:** The label that will represent the Attribute to the user. This must be no longer than 32 characters and can consist of any combination of letters, numbers, spaces and punctuation.

NOTE: If the **External label** begins with an underscore character “_” it will not be displayed in the Inspector or on the Record webpage before the Record value itself (which is normally labelled). It is strongly suggested that this special usage be reserved for Attributes of “Image” type, and not be used for Attributes of Text, Vocabulary, Number or Dates types.

- **Privacy Setting:** You must specify whether the Attribute will be **Open** (visible to the end-user) or **Private** (hidden from the end-user and only visible to users with accounts on your website).

NOTE: Attributes that are Private cannot be used in any aspect of visualization; they are essentially for internal record-keeping purposes only, such as identifying data sources or indicating the state of completeness of a Record.

NOTE: Join Attributes cannot be set as **Private**; if they are, the setting is ignored. If you wish for the Attribute values in the joined data to be private, you must configure the Attributes in the dependent Template as **Private**. (The difference between dependent and independent Templates is explained in the section about Templates below.)

- **Unique Internal ID:** An identifier for this Attribute that must be unique across the Attributes of your website. The Internal ID can only consist of “plain-vanilla” (i.e., non-accented) letters, numbers, hyphens and underscores and cannot be longer than 24 characters.

WARNING: The term **disable** is reserved and cannot be used as an Attribute ID.

You will maximize the speed of Prospect and minimize the memory used by your data by making the ID short; you will need to refer to and recognize this ID when configuring Prospect and dealing with your data, however.

WARNING: The Attribute ID is also the name of the custom field used by WordPress to store data associated with posts. WordPress reserves custom field names that are prefixed with the underscore character for special purposes: you therefore should not use Attributes IDs that begin with the underscore.

The drop-down menu to the left of the **Use this Custom Field name** button has a list of all of the custom fields used on your website; if you wish to use the name of a custom field currently selected on the drop-down menu for

your Attribute, select it from the menu and click the **Use this Custom Field name** button.

Attributes values are stored in custom fields in WordPress and the Internal ID of the Attribute is used as the name of the custom field. This creates a one-to-one correspondence between them. If you have imported your Record data from a spreadsheet, the name of the column, the name of the custom field, and the Internal ID must be the same!

- **Value delimiter:** If you need to be able to represent multiple values in each Record Attribute (and the data type supports multiple values), you must specify the single character that will separate values in your data.

NOTE: Prospect currently only supports multiple values for the following Attributes types:

- **Vocabulary**
- **Tags**
- **Lat-Lon:** Whether the multiple points are displayed as lines or polygons depends on the type of map you use and the number of points in the Attribute value.
- **Pointer**

WARNING: You cannot use a comma as the delimiter for **Lat-Lon** Attribute types, since the comma is already used to separate the latitude from the longitude components.

- **Available as Filter:** When viewing an Exhibit, the end-user can create Filters based on the values of certain types of Attributes (those of Text, Vocabulary, Tags, Number, Dates, and Pointer data types). The state of this checkbox specifies whether or not this Attribute will be available to the end-user for creating a Filter.

NOTE: This setting was added in Prospect 1.2. The Attribute will be available by default to an end-user viewing an Exhibit or Volume if it has not been set otherwise.

- **Contributor Hint:** If you need to explain the meaning or usage of this Attribute value to the Contributors who will be creating and editing Records, enter that explanation into this text box.

Vocabulary, Text, or Tags? How to Choose

The Vocabulary, Text and Tags data types in Prospect are very similar in some ways, as they all are textual values, but they operate differently and have different capabilities:

- *Vocabulary*: a Vocabulary Attribute definition must define a fairly limited, pre-defined set of discrete possibilities; a Vocabulary Attribute can define a Legend (a colors for each possible term); the value of a Record's Vocabulary Attribute value consist of multiple terms.
- *Text*: the value of a Record's Text Attribute must consist of a single textual value (corresponding to a "string" in software parlance); a Text Attribute can define a Legend consisting of a fairly small, pre-defined set of text patterns and colors.
- *Tags*: the project administrator does not predefine the set of possible tags beforehand; a Tags Attribute does not support the use of a Legend; the value of a Record's Tags Attribute can consist of a set of textual tags; tags require exact matches: the tag "name" is not considered the same as the tag "Name," for example.

You can use either of these three types where a "faceted" Attribute is needed in a Facet Browser, Stacked Chart, Facet Flow, or MultiBlock Map visualization. Colors are randomly assigned to tag values when they are needed.

A Tags Attribute cannot be used as a Legend, however.

IMPORTANT: The "Tags" Attribute data type is internal to the Prospect plugin and does not interact with the WordPress mechanism for tags, categories and taxonomies. If you want to use WordPress's ability to tag Record posts, you can always tag posts using the Dashboard. You can also tag Records in your spreadsheet if you import data with the CSV Importer.

Attribute Ranges

In the case of Attributes of Number and Dates types, you can specify the range of allowable values (the minimum and maximum), how values should be grouped together as aggregates, and a color for special indefinite values (if you want the Attribute to allow them).

Set Valid Date Range

Earliest Date: Year Month Day

Latest Date: Year Month Day

Group Dates together by

Use ☒ color for indefinite Date values

You should choose the size of your groupings according to the order of magnitude of the range of values (from minimum to maximum) and how succinct you want graphical displays and options to be for the using (the granularity of representation).

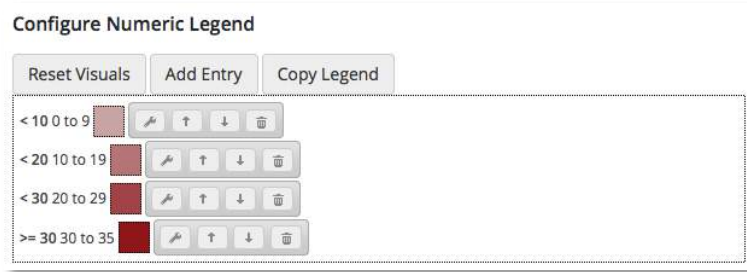
- In the case of Numbers, you are asked the number of digits that should be used to group values together: **0** indicates that every numeric value should remain distinct; **1** indicates that numbers should be grouped together by tens (so that 11 and 12 would be grouped under 10, and 22 and 27 would be grouped under 20, and so on); **2** indicates that numbers should be grouped together by hundreds (so that 127 and 189 would be grouped under 100, and 241 and 277 would be grouped under 200, and so on); and so on.
- In the case of Dates, you can specify whether dates are grouped together by **Day, Month, Year, Decade** or **Century**.

Legends translate defined values of a particular data type into a color value for visualizing, but what about the case when you wish to see an item represented graphically even when it does not have a definite value for a given Attribute value? If you wish for your Number or Dates Attribute to create a special placeholder for indefinite values, you must check the **Use color for indefinite values** checkbox and provide a color in the color box on the right by clicking on it.

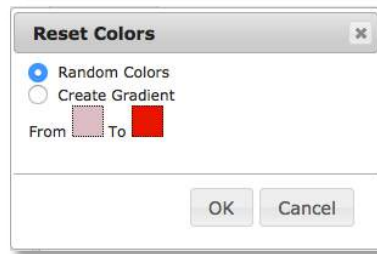
Attribute Legends

In the case of Attributes of Vocabulary, Text, Number and Dates types, you can configure a *Legend* in order to tell Prospect how to convert Attribute values to colors in a graphical representation. The Legend will always be presented to the end-user on the Prospect visualization in the same order and manner as you configure it in the Attribute editor Dashboard.


Text Attribute Legend entries can associate text patterns with labels and colors. Vocabulary Attribute Legends represent specific and discrete vocabulary terms which can be arranged into a parent-child hierarchy. In the case of Numbers and Dates, each Legend entry can be a range of values.



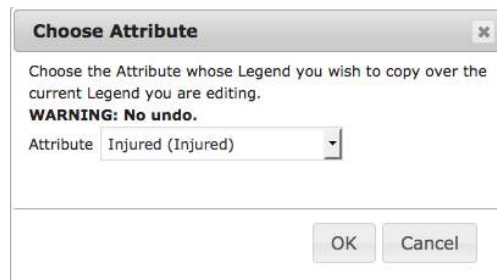
When configuring Legends of all Attribute types, you can either click the color box to the right of each Legend label to change each color value, or you can click the **Reset Visuals** button, which presents a dialog box that can change all of the Legend colors at once.



If you select **Random Colors**, Prospect will assign colors to each of your Legend values randomly. If you prefer a progressive gradation of color values, choose the initial and final color (by selecting each of the two color boxes) and select **Create Gradient**.

You can add a new entry to your Legend by clicking the **Add Entry** button, which will allow you to name the entry and specify the range of values in it. To edit the value or label later, click the wrench icon  on the left end of the icon bar to the right of the color box. To reorder the entries in your Legend, click the up or down arrow icon.

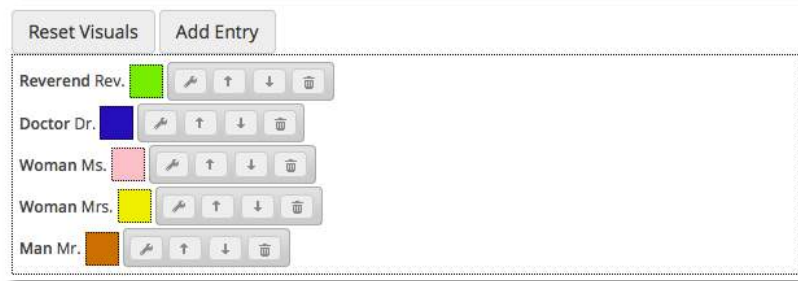
If there are other Attributes of this same data type that have Legends, the **Copy Legend** button will appear. If you click this button, a dialog will appear that will allow you to choose another Attribute whose Legend you have already defined.



If you click the **OK** button on this dialog, the Legend from the Attribute definition you choose will be copied into the current Attribute Legend and replace whatever existed before.

Legends for Text Attributes

Each Legend entry in a Text Attribute configuration consists of a label and a text pattern which is used to test for matches in the corresponding Attribute value of each Record. The first Legend entry that matches any part of a Record's corresponding Text Attribute value will be used to provide the color.



Each Legend entry is listed in the Legend portion of the Attribute editor Dashboard, displaying:

- The Legend entry label (in bold)
- The text pattern
- The Legend entry color
- A toolbar of icon buttons for operating on this Legend entry

WARNING: The text patterns are case-sensitive. You will need to provide separate Legend entries for lowercase and uppercase text patterns if text values can be both uppercase and lowercase.

EXAMPLE: You might create a Legend for personal names that provided a color for Records based on honorific abbreviations prefixed to peoples' names (shown above). The labels and text patterns in the Legend entries might be represented as (colors not shown here):

- (label) "Reverend" (text pattern) "Rev."
- (label) "Doctor" (text pattern) "Dr."
- (label) "Woman" (text pattern) "Ms."
- (label) "Woman" (text pattern) "Mrs."
- (label) "Man" (text pattern) "Mr."

The text pattern "Dr." comes first in the list so that it is matched before any gender-specific entries. For example, if a Record whose value for this Text Attribute is "Rev. Mr. John Smith" it will match both the "Reverend" and "Man" entries but since the former is listed first, it will provide the color for the item.

Legends for Vocabulary Attributes

A Vocabulary Attribute is defined differently from the other Attribute types because terms are always one of a small number of pre-determined choices (rather than free-text strings) and because Vocabulary terms can be arranged into a two-level (parent-child) hierarchy, such as that below.

Configure Vocabulary Legend

1. Etruscan

2. Greek

3. Iberian

4. Roman

1. Capitals

2. Minuscule

3. Half-Uncial

4. Cursive

5. Ogam

Every term in a Vocabulary configuration must be unique, regardless of whether it is a parent or child in the hierarchy. The most appropriate and specific child term should be provided for a Record's Attribute value. Child terms can either provide their own unique color or inherit the color of their parent.

You should conceptualize a parent term as a placeholder for the “family” as well as a generic marker for what isn't covered by the more specific children in the group. For example, in the Vocabulary above describing scripts, “Roman” is the parent of child terms “Capitals,” “Half-Uncial,” and “Minuscule.” You should use the children terms whenever possible, but you could use the parent term “Roman” if the script doesn't quite match one of the child category terms. “Roman” does not, however, stand for or include all of its children automatically in Prospect.


To add a new term to your Legend, enter its value in the text entry box on the top left (shown with the ghost text “New Vocab Term”) and click the **Add Entry** button. You can reorder entries in the list by pressing the up and down arrows in the icon toolbars to the right of the term color box. A Vocabulary entry can consist of any text but has a limit of 32 characters.

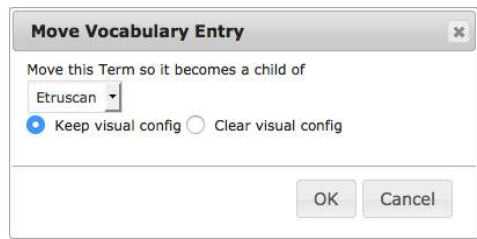
WARNING: Although a Vocabulary term can consist of any set of characters, you must ensure that whatever delimiter character you choose for your Attribute definition – if any – does not appear in any of the Attribute term names.

If you click **Collect Terms**, Prospect will read all of the data in the Records in your website, stored in the custom field whose name you have specified with the **Internal ID** setting, parsing it with the **Value Delimiter** character. Any terms that appear in your Record but that do not appear in the current list will be added.

WARNING: You must first assign correct values for the **Internal ID** and **Value delimiter** settings for the **Collect Terms** operation to work properly!

WARNING: Prospect will not remove Vocabulary terms in your Legend that do not appear in the Records. The only way to ensure that the only terms that appear in your Legend are those that exist in the Records is to first delete all entries and then click **Collect Terms**.

To change the position of a term in the Legend hierarchy, click the left-right arrow icon  on the left end of the icon bar. This will enable you to make it the “child” term of one of the existing entries (if it is currently on the top level), or else to move it back to the top-level if it is currently a child.



A Vocabulary Legend term can either have its own color, or else inherit the color of its parent. If you choose the **Clear visual config** option, the color for the child entry will be blank and it will inherit its parent's color. You can also set the child to inherit its parent's color by clicking on the child's color box, which will bring up the Iris color selector:



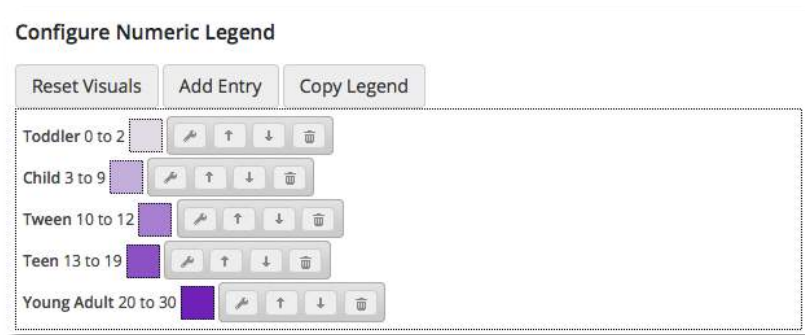
If you check the **Remove visuals** checkbox, the child's color will be removed.

Legends for Number Attributes

You can create a Legend for a Number Attribute so that numeric values can be translated into colors on visualizations.

Each Legend entry is listed in the Legend portion of the Attribute editor Dashboard, displaying:

- The Legend entry label (in bold)
- The numeric range for this entry
- The Legend entry color
- A toolbar of icon buttons for operating on this Legend entry



EXAMPLE: Let's say you created a numeric Attribute to represent age. You might define its Legend with labels and numeric values as follows (and as shown above):

- "Toddler": 0-2
- "Child": 3-9
- "Tween": 10-12
- "Teen": 13-19
- "Young Adult": 20-30

and so on.

If you selected the **Use color for indefinite Number values** checkbox in the range section of this Attribute configuration, the color you selected in the color box will be automatically prefixed to the Legend for this Number Attribute with the title

Indefinite. Be sure that the color you choose there is distinct from those you provide for the Legend entries of definite values.

IMPORTANT: The numeric values in each entry of the Legend are inclusive. That is to say, a value in a Record's Attribute will match a Legend entry if it is the minimum or maximum value or anything in between.

Legends for Dates Attributes

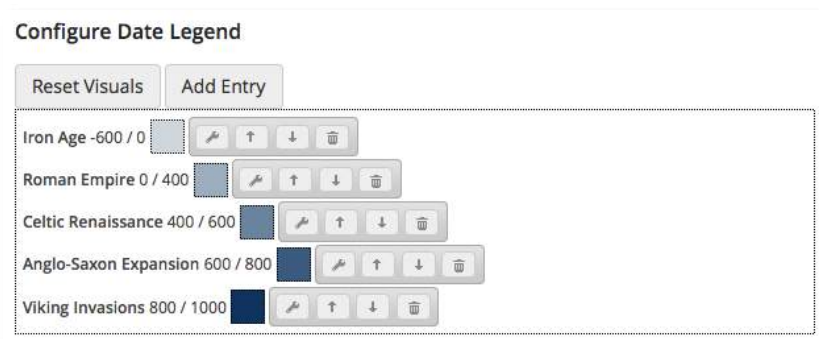
The Legends you create for Dates Attributes are used in two different ways in Prospect:

- to provide Legend colors for visualizations and Filters, as with other Attribute Legends;
- to provide background colors and labels for the backdrop of Timeline visualizations. These effectively provide Attribute-specific “periodizations” of time.

Each Legend entry is listed in the Legend portion of the Attribute editor Dashboard, displaying:

- The Legend entry label (in bold)
- The date range for this entry, minimum and maximum (see note below)
- The Legend entry color
- A toolbar of icon buttons for operating on this Legend entry

IMPORTANT: The maximum (or end) date in a date range is an exclusive one that a date within the range cannot actually reach. This contrasts with the usage of Legends for Number Attributes. For example, if the maximum date is given as 1945, then the last allowable date in the range is December 31, 1944.



If you selected the **Use color for indefinite Dates values** checkbox in the range section of this Attribute configuration, the color you selected in the color box will be

automatically prefixed to the Legend for this Dates Attribute with the title **Indefinite**. Be sure that the color you choose there is distinct from those you provide for the Legend entries of definite values.

Legend Design: Best Practices

The purpose of a Legend is to translate values into visual features so that an end-user can quickly and easily comprehend the general patterns of the data and seek more detail about particular items if interested.

Your Legends should consist of between two and a dozen entries. If you rely on more than a dozen entries in your Legend, not only will it be tedious for end-users to scroll through all of the Legend entries, but it will become increasingly difficult to distinguish between different colors (although you can reuse parent colors if you define parent-child hierarchies for Vocabulary Attributes).

The order in which you list Legend entries is significant, in that Prospect will show your Legend entries in the order on the front-end visualizer in which you provide them, and it will attempt to find matching values in the Record in the order in which the entries appear in the Legend.

Given that items that are selected on a visualization are highlighted by drawing a yellow border around them, you should avoid using any bright yellow colors in your Legends.

The labels for instantaneous events (those that only have a start date) are currently shown in black on the Timeline visualization. This means that when you define Dates Legends, you should use colors upon which black will be visible (i.e., avoid deeply saturated colors).

Templates

A *Template* is a set of Attributes that describes a specific kind of entity: a person, an event, an artifact, a book, etc. All of your Records must supply values that conform to a particular Template definition. A Prospect Template corresponds closely to terms and concepts in other information technology domains:

- A table in database terminology
- A class in object-oriented programming terminology

And so on. If you're looking at your project data in a spreadsheet, the Template definition would be the collection of column names which define this kind of "data container."

When you define and configure a Template, you are providing the following information:

- What Attributes make up this Template type?

- What Attributes appear on Record pages? How do playback widgets operate and what Attributes do they use?
- How should the listing of Records belonging to this Template type be displayed on the Template's page?

There are two kinds of Templates, *independent* and *dependent*:

- Only independent Templates can be viewed in an Exhibit. An independent Template can have all of the Attributes it needs, or its data can be augmented by pointing to records in dependent Templates.
- Dependent Templates exist only to supply their Attribute values to independent Templates.

In standard database terminology, Records belonging to dependent Templates are *joined* to Records belonging to independent Templates. The advantage of this system is that information that is recurrent and redundant, or is used by multiple Records, can be minimally stored in a separate source. Whenever the data is needed, we only need to point to it and it will be added to our Record.

NOTE: Due to how Templates are defined, you must create dependent Templates before you create independent Templates that use them.

NOTE: In order to keep the data model simple, dependent Templates can only be joined to independent Templates. In other words, dependent Templates cannot be joined to other dependent Templates (and thus only a single level of join is supported).

Join Attributes and dependent Templates are advanced features meant for users who are familiar with the equivalent features of databases. There is an explanation of the use of a dependent Template with a Join Attribute in an independent Template in the “Pointer and Join Attribute Usage” section of chapter 10.

As with Attributes, you must supply an **External label** for each Template type (which will be presented to end-users). It can consist of any set of characters, with a maximum length of 32 characters.

You must also supply an **Internal ID** for the Template type. It can only consist of a maximum of 32 “plain-vanilla” (i.e., non-accented) letters, numbers, underscores and hyphens.

NOTE: You will maximize the speed of Prospect and minimize the memory used by your data by making the ID short; you will need to refer to and recognize this ID when configuring Prospect and dealing with your data, however.

NOTE: If you imported your Record data from a spreadsheet, the Template internal ID must correspond to the value you put into the `tmpl-id` column.

The **Hint for Record IDs** text edit box allows you to enter a help hint for the users who will be creating Records of this Template type. You (as the project administrator) may decide upon a particular protocol for creating Record IDs which you can explain here. It will be made available to users using the Record Editor.

Template's external label:

Template's unique internal id: ☐ Dependent Template

Hint for Record IDs:

Label for each Record supplied by:

Attribute ID	Type	Join Dependent	Display on Post	
name	Text		<input checked="" type="checkbox"/>	<input type="button" value="↑"/> <input type="button" value="↓"/> <input type="button" value="🗑"/>
portrait	Image		<input checked="" type="checkbox"/>	<input type="button" value="↑"/> <input type="button" value="↓"/> <input type="button" value="🗑"/>
order	Number		<input type="checkbox"/>	<input type="button" value="↑"/> <input type="button" value="↓"/> <input type="button" value="🗑"/>
lifespan	Dates		<input checked="" type="checkbox"/>	<input type="button" value="↑"/> <input type="button" value="↓"/> <input type="button" value="🗑"/>
in_white_house	Dates		<input checked="" type="checkbox"/>	<input type="button" value="↑"/> <input type="button" value="↓"/> <input type="button" value="🗑"/>
party	Vocabulary		<input checked="" type="checkbox"/>	<input type="button" value="↑"/> <input type="button" value="↓"/> <input type="button" value="🗑"/>
terms	Number		<input type="checkbox"/>	<input type="button" value="↑"/> <input type="button" value="↓"/> <input type="button" value="🗑"/>
birthplace	Join	loc	<input checked="" type="checkbox"/>	<input type="button" value="↑"/> <input type="button" value="↓"/> <input type="button" value="🗑"/>
deathplace	Join	loc	<input checked="" type="checkbox"/>	<input type="button" value="↑"/> <input type="button" value="↓"/> <input type="button" value="🗑"/>
religion	Vocabulary		<input checked="" type="checkbox"/>	<input type="button" value="↑"/> <input type="button" value="↓"/> <input type="button" value="🗑"/>
max_slaves	Number		<input checked="" type="checkbox"/>	<input type="button" value="↑"/> <input type="button" value="↓"/> <input type="button" value="🗑"/>
web_page	Link To		<input checked="" type="checkbox"/>	<input type="button" value="↑"/> <input type="button" value="↓"/> <input type="button" value="🗑"/>

Every independent Template must include a Text Attribute whose data value (in a Record of this Template type) will serve as the label for the Record. You can choose which Text Attribute to use (if there is more than one) with the **Label for each Record supplied by** drop-down menu.

NOTE: You can ignore the label setting when you are configuring a dependent Template.

When you first create a new Template, it will be blank. To add an Attribute to it, click the **Add Attribute** button. A dialog box will appear that will allow you to choose from any of the currently defined Attributes that are not already in your Template.

NOTE: You must have already defined an Attribute before it can be added. You are thus advised to define Attributes before defining Templates.

WARNING: Prospect cannot coordinate your Attribute and Template definitions as you create, modify and delete them. Thus, if you add an Attribute to a Template and later delete the Attribute definition, you must update your Template definition.

If the Attribute is of the Join type, you must click the corresponding cell in the **Join Dependent** column in order to specify which dependent Template will supply the Record for the join. A dialog box will appear with the names of all currently defined dependent Templates.

WARNING: Prospect will not allow you to save your Template definition until you specify the dependent Template for all Join Attributes. You thus cannot add a Join Attribute to an independent Template until you first define that dependent Template.

WARNING: If you supply a dependent Template that you later delete, you will need to edit any independent Templates that referred to it in the **Join Dependent** column.

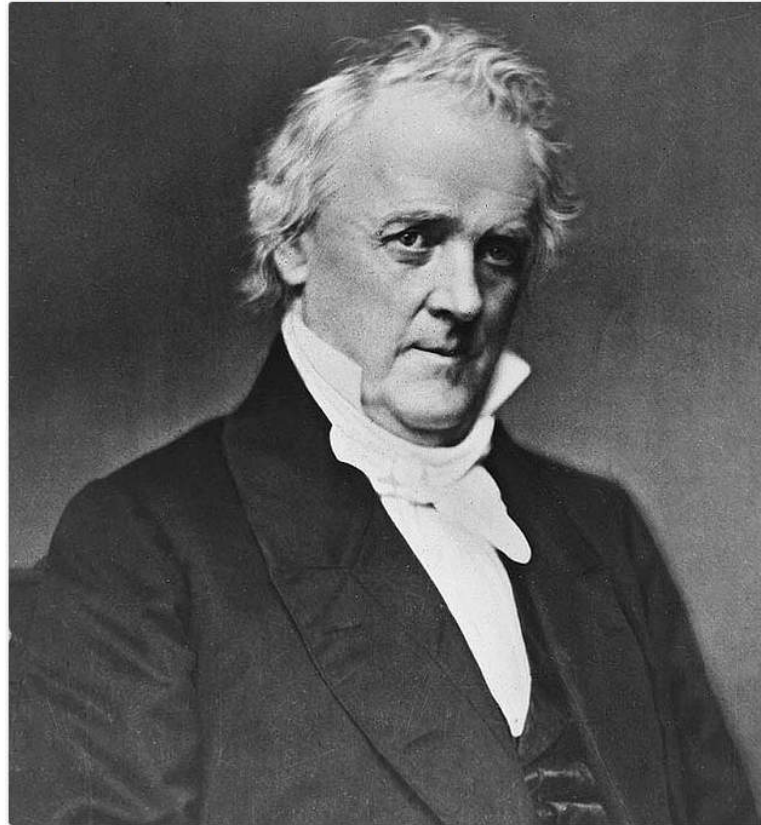
Every Template must also specify which Attributes will be inserted into the Post page that WordPress creates for Records of this Template type. These Attribute values are displayed before any “blog text” associated with the Record. Indicate that the Attribute should be displayed on the Record’s Post page by checking the corresponding checkbox in the **Display on Post** column.

NOTE: Attribute values taken from joined Records (inserted via a Join Attribute) cannot be displayed on Record Post pages, regardless of the Display on Post checkbox.

For example, given the Attributes that were checked for the President definition above, a Record using this Template type might be displayed as a Post page for the end-user as below (the exact output will depend on the WordPress theme you are using on your website).

Name: James Buchanan

Portrait:



Lifespan: From 1791-4-23 to 1868-6-1

Residency: From 1857-3-4 to 1861-3-4

Party: Democratic

Religion: Presbyterianism

Max Slaves: 0

Webpage: [\(See Link\)](#)

The order in which you list the Attributes in the definition of a Template matters, in the sense that this is the order in which they will be listed on the Post pages of Records. You can change the order by using the up- and down-arrow icons in the rightmost column.

NOTE: The value will only be shown on the Post page if it has been defined for the Record and does not come from a joined dependent Record.

To remove the Attribute from the Template definition, click on the trash can icon.

Template Widget Configuration

Since every Template can have Attributes that can be used to operate Prospect playback widgets and these widgets can also appear on a Record page of this Template type, you need to configure these widgets on a Template-by-Template basis.

If you wish to disable the corresponding widget (or aspect of its functionality), choose **disable** from the corresponding drop-down menu.

Configure Widgets on Record Post Page displays

Audio: **disable** YouTube: **youtube_url**

Transcript1: **disable** Transcript2: **disable** TimeCode: **timestamp**

Template Post Configuration

When you view a Template from the Dashboard, Prospect will create a listing of all of the Records in the website that belong to that Template type. You can configure the way that this listing is displayed with the bottom-most section of the Template configuration panel:

Template Post Page Display Configuration

Display Type: **Tiling Cards** Image: **picture** Additional Content: **material**

Choose the display style for the list from the **Display Type:** drop-down menu. The display below illustrates an example of the **Primary Image Card** display style.



The name of Record posts is always used in the listing. Most display styles enable an image to be displayed as well: choose the Template's Attribute that will provide the image from the **Image:** drop-down menu, or choose **disable** if no image is to be shown.

Most display styles will also allow one further Attribute value to be shown in textual representation (of Text, Vocabulary, Tags, Dates and Numbers data types). Choose the Attribute which will provide this extra textual information from the **Additional Content:** drop-down menu.

WARNING: Since WordPress themes can make arbitrary and unpredictable changes to the HTML and CSS of webpages, it is impossible for Prospect to anticipate and account for all of the ways in which themes can interfere with the Template’s Record listing. If necessary, you (or your system administrator) can accommodate your selected theme by modifying the CSS styles defined in `css/view-template.css`

Prospect defines a WordPress *shortcode* that allows you insert a listing of Record data into any WordPress post page in any of the supported styles described above. For details, see chapter 10 “Advanced Topics.”

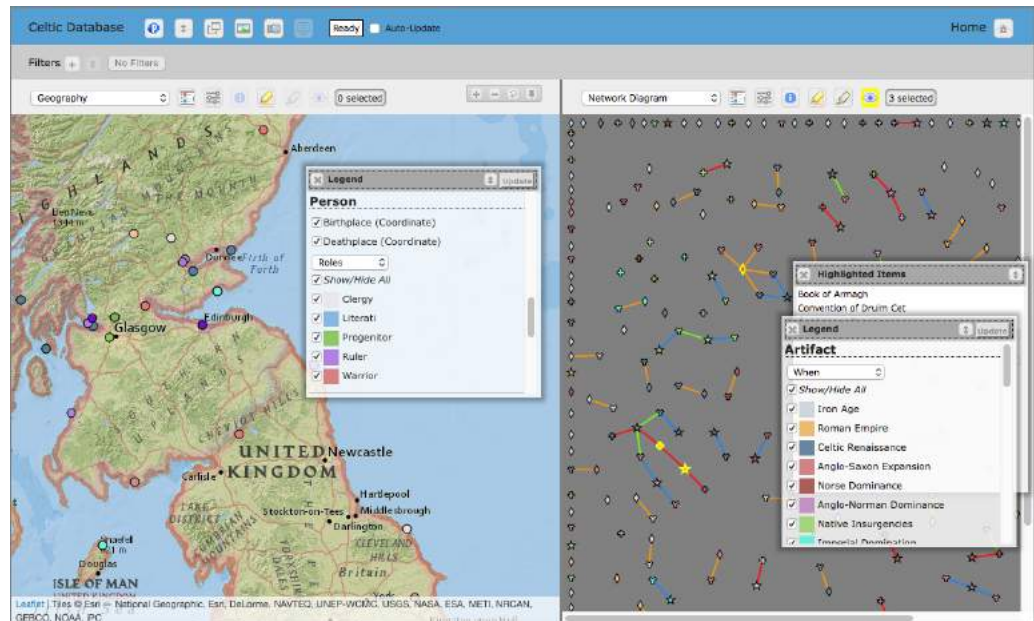
Template Design: Best Practices

The user experience is supported best if your Templates share as many Attributes in common as possible. Allowing different Templates to share the same Attributes allow them all to be affected by the same Filters and to use a consistent set of Legends on visualizations.

For example, if your data set consists of Template definitions for people, events, buildings and books, you could define Attributes called “name,” “when,” and “place” for each of these, even if their meaning and usage for each type of Template will be slightly different. Place might refer to the place of birth for a person, while it might refer to the place of publication or authorship for a book.

Exhibits

An *Exhibit* is a set of visualizations which are configured so as to specify how the Attributes of Template types correspond to visual features. Although you can define as many different Template types as you wish on your Prospect website, a single Exhibit can only handle up to four different independent Templates at once.



When you configure an Exhibit, besides the visualizations, you must also specify:

- a title and unique ID for your Exhibit
- a home page (URL) for your Exhibit that the end-user can return to (if any)
- the Attributes and Widgets to show in the Inspector modal window. The Inspector allows the end-user to look at the details of the items s/he has selected on a view.

Only Exhibits that are set to the **Published** state can be seen shared with end-users without personal accounts on your webserver. To make Exhibits that are restricted to end-users with accounts of Editor or Administrator status, set their state to **Pending Review** (using the **Quick Edit** link in the Exhibit Dashboard).


Each of the different visualizations has different capabilities and functions. They are covered separately in chapter 6.

General Settings

You can configure basic settings of your Exhibit on the **General Settings** panel.

General Settings

Exhibit's external label: Celtic Database

Exhibit's unique internal id: celtdb 

☐ Show Help Tour
☐ Disable Perspective Buttons
☒ Enable Auto-update

Home button label: Home

Home URL: https://exploringcelticciv.web.unc.

"Celtic Database" will display Template types:

☒ art
☒ event
☒ person
☒ text

☒ Enable Date Slider

Start Date -600

End Date 1707

Initial handle Date (or leave blank) YYYY-MM-DD

☒ Create when Exhibit opened

Dates Attribute for art: when

Dates Attribute for event: when

Dates Attribute for person: when

Dates Attribute for text: when

☐ Enable Qualified Relationships

The text you enter in the **Exhibit's external label** edit box will be presented to the end-user as the name of the Exhibit when s/he views it on a web browser.

You must also provide the **Exhibit's unique internal id**, which must be no more than 24 characters in length and consist entirely of "plain-vanilla" (i.e., non-accented) letters, numbers, underscores and hyphens. The Exhibit's unique id will ensure that Perspectives are tied to the correct and appropriate Exhibit configuration.

If you check the **Show Help Tour** checkbox, then the Help Tour will be available for end-users on this Exhibit, regardless of the default setting for your website on the **Settings** webpage.

If you check the **Disable Perspective Buttons** checkbox, then the icons (and options) associated with Perspectives will be hidden from the user on this Exhibit.

If you check the **Enable Auto-Update** checkbox, then the **Auto-Update** checkbox will be checked by default when the Exhibit is opened.

If you wish to provide a Home button on the Prospect visualization screen that takes the end-user to a particular web page, you must provide both a name in the **Home button label** edit box and the address of that webpage in the **Home URL** edit box.

NOTE: If you leave either one of these settings blank, the **Home** button will not be shown.

Although the IDs of all of the Templates defined on this Prospect website will appear in the **General Settings** box, you can only select up to four of them (by checking their checkboxes).

Check the **Enable Date Slider** checkbox if you wish to configure a Date Slider for your Exhibit. You can only configure one Date Slider Filter per Exhibit. Since a Date Slider can be applied to the (potentially different) Dates Attributes of multiple Templates, you need to provide the following settings:

- **Start Date** (required): The earliest date in the date range, in the format **YYYY-MM-DD**. You must provide the year, even if you omit the month or date.
- **End Date** (required): The latest date in the date range, in the format **YYYY-MM-DD**. You must provide the year, even if you omit the month or date.
- **Initial Handle Date** (optional): The date at which the handle is initially placed when the Dates Slider is created, in the format **YYYY-MM-DD**. You must provide the year, even if you omit the month or date. If you leave this blank, the handle will be created in the very middle of the date range.
- If you check the **Create when Exhibit opened** checkbox, then the Date Slider will be created as the first Filter when the Exhibit is opened by the end-user. Otherwise, it will be available on the list of Filters.
- Each of the Templates defined in your WordPress website will be listed with a drop-down menu of the Dates Attributes, as well as the **disable** option. Only those Records whose Template has a Dates Attribute will be subjected to the condition of the Filter; if **disable** is chosen for a Template, then its Records will automatically pass through the Filter.

Check the **Enable Qualified Relationships** checkbox in order to indicate that your Exhibit will be using Prospect's Qualified Relationship functions. Your project's data must be defined specifically with Qualified Relationships in mind in order to take advantage of these functions. For further details, see chapter 7.

Inspector Settings

The settings in the **Inspector** panel allow you to specify which Attributes from each Template type should be shown in the Inspector (of the front-end visualizer) and if any media playback widgets should be displayed. Since every Template type can contain a

different set of Attributes, Attribute-specific configuration must be done for each Template type.

The screenshot shows the 'Inspector' panel with the following sections:

- Playback Widgets:** A row of checkboxes for ☐ Audio, ☐ Load SoundCloud, ☐ YouTube, ☐ Transcripts, and ☐ Dual Transcripts.
- ☐ Disable "See Record" button
- Size overrides (leave blank for default):** Two text boxes for 'Width' and 'Height', both containing the word 'Default'.
- Attributes to Display:** A sub-panel with a header 'Choose the Attribute(s) to display according to Template type:' and a tabbed interface with 'art', 'event', 'person', and 'text' tabs. The 'art' tab is active, showing a list of attributes with checkboxes and left/right arrows:
 - ☒ what
 - ☒ material
 - ☒ when
 - ☒ scripts
 - ☒ picture
 - ☒ see-more
 - ☒ where.name
 - ☒ where.alt-name
 - ☒ where.region
 - ☐ name
 - ☐ where.coord
- Below the attributes list are four expandable sections: 'Audio Widget', 'YouTube Widget', 'Transcript Widget', and 'Timecodes (for Playback widget segments)'.

The top line of checkboxes enables you to configure which media playback widgets will be enabled (if the item shown has an Attribute value to support it) in the Inspector and tell Prospect how the modal should be sized to accommodate those widgets. You must both check the widget checkboxes at the top of this panel and configure the widget in the associated subpanel for the widget – Audio, YouTube or Transcript – to operate in the Inspector.

If any of your Audio Attributes point to a SoundCloud resource (rather than a plain MP3 file hosted somewhere online), you must check the **Load SoundCloud** checkbox so that the SoundCloud code file is loaded with Prospect.

If you wish to use side-by-side transcripts, you will need to check both **Enable Transcripts** and **Enable Dual Transcripts**.

If you click the **Disable "See Item" button** checkbox, the **See Item** button will be hidden from users on the Inspector.

The **Size overrides** text entry boxes allow you to set absolute pixel sizes for the width and height of the Inspector (rather than use Prospect's default sizes, are based on which

playback widgets you have enabled, attempting to create a minimally-sized dialog window).

The order and format of data and media displayed in the Inspector are as follows:

- The first content displayed is generated from the values of Attributes enabled on the **Attributes to Display** accordion. They are left-justified. Images try to display at their “natural” width; if they are wider than the available horizontal space, they are scaled to fit.
- Next comes a single playback widget (if any); which one appears depends on which widgets you have enabled and which one has supporting data in the corresponding Attribute values in the Record being displayed. All playback widgets are scaled to use all of the available width of the Inspector.
- Next comes the transcript widget (if it has been enabled and there is corresponding data in the Record being displayed). It will expand horizontally to use all available space.

Attributes to Display

The Inspector will display the values of Attributes for Records if the corresponding checkbox is checked in the **Attributes to Display** subpanel. You can also change the order that the Attributes are displayed in the Inspector by clicking on the associated left and right arrow icons.

Playback Widget Settings

The **Audio Widget**, **YouTube Widget** and **Transcript Widget** sub-accordions allow you to select which Attributes should be used to supply data for these respective playback widgets on a Template-by-Template basis.

Regardless of which playback widget is in use, a Record can limit playback on that media to a particular segment by providing a timecode. You can configure the timecode setting by selecting a Timecode Attribute from the **Extract Timecode:** menu on a Template-by-Template basis in the **Timecodes (for Playback widget segments)** sub-accordion. For more detail on the use of timecodes, see chapter 11.

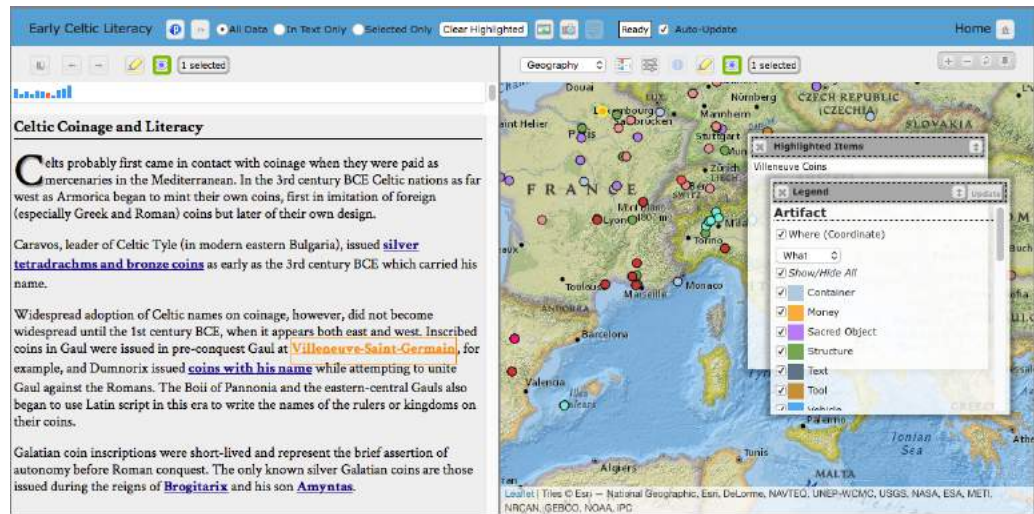
Viewing an Exhibit

There are two methods for viewing an exhibit you have created:

1. Click the **View** link that appears when you hover over the name of an Exhibit in the Dashboard Exhibit directory.
2. Click the URL labelled **Permalink** at the top of the Dashboard Exhibit editor.

Volumes

A *Volume* is similar to an Exhibit except that it allows you to coordinate references to Records in a text source (in a frame on the left side of the window) with graphical representations of those Records in visualizations (in a frame on the right side of the window).



Like an Exhibit, a Volume can only handle up to four different independent Templates at once in the set of visualizations that you configure, which are limited to those that represent individual Records, rather than aggregate views (i.e., Directory, Cards, TextStream, Map, Pinboard, Timeline, Network Wheel, Network Graph and Bucket Matrix). When you configure a Volume, besides the visualizations, you must also provide:

- a title and unique ID for your Volume
- a home page (URL) for your Volume that the end-user can return to (if any)
- the Attributes and Widgets to show in the Inspector modal window. The Inspector allows the end-user to look at the details of the items s/he has selected on a view
- an HTML text source in the Dashboard text editor.

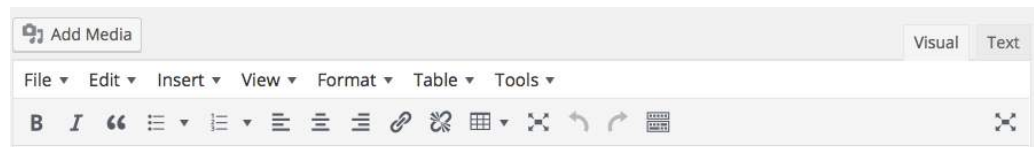
Only Volumes that are set to the **Published** state can be seen shared with end-users without personal accounts on your webserver. To make Volumes that are restricted to end-users with accounts of Editor or Administrator status, set their state to **Pending Review** (using the **Quick Edit** link in the Dashboard).

Technical Requirements

You can edit your Volume's text by using the word processing tools on the WordPress Dashboard editor (rather than hand-coding HTML), but these require the following extra configuration steps:

- Add the TinyMCE Advanced plugin and activate it for your website
- Go to the configuration options: **Settings > TinyMCE Advanced**
- In the **Advanced Options** section, check the checkbox labeled **Stop removing the <p> and
 tags when saving and show them in the Text editor**
- Click the **Save Settings** button to save your changes to the configuration.

The upper section of the Dashboard content editor should look like this:



Saving and Loading Volume Data

Prospect's standard mechanisms for saving and loading Volumes (the **JSON Export** links on the Dashboard directory and the **Archive** page) currently only save or load the visualization configuration but do not include the textual/blog post portion of your Volume data.

In order to save and restore the HTML (textual) portion of your Volume, you can either:

- Use the **Import** and **Export** mechanisms in the **Tools** section of the WordPress Dashboard
- Copy the HTML text from the Dashboard editor into a separate file (to save it) and paste it from that file into the Dashboard editor (to restore/move it)

Volume HTML Text Formatting

You should have a basic understanding of HTML before creating and editing a Prospect Volume, given that you must format your text entry (using the Dashboard text editor) very carefully so as to adhere to the following rules:

- All text must be enclosed in one of the following HTML tags: **h1**, **h2**, **p**, or **blockquote**. No textual content can be left outside of one of these structured types of blocks.
- You can embed **img** tags to point to graphical images within **p** blocks.

- When Prospect loads a Volume, it parses the HTML blog content so that:
 - h1 tags mark primary divisions in the Table of Contents.
 - h2 tags mark secondary divisions in the Table of Contents

You can mark text with the h1 and h2 tags in the **Visual** Tab by selecting **Format > Formats > Headings**

- You can also insert h3 tags for styling purposes (but it will not cause a section break).
- If you wish to embed a reference to a Record in the text, you must do so using an a (link) tag in the following format:
 - Set the href destination to # followed immediately by the record-id of the Record

You can embed a links either by using the **Visual** or **Text** tab of the Volume Dashboard editor, but the image below illustrates the use of the **Insert/Edit Link** icon button in the **Visual** editor.

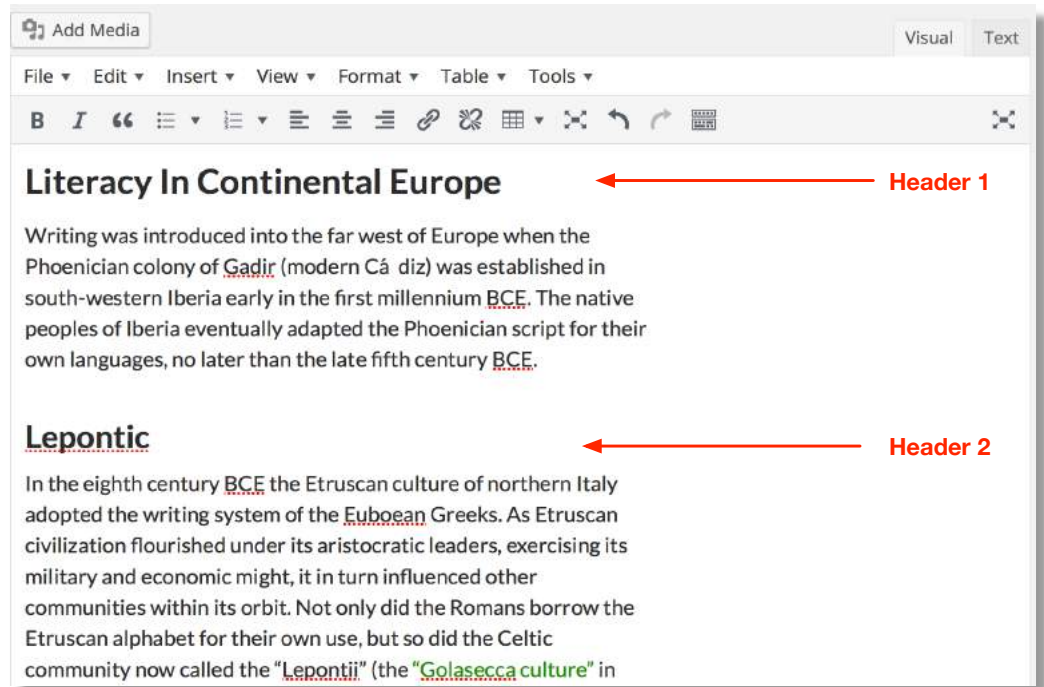


EXAMPLE: A reference to the Record whose ID is p-tjefferson would be accomplished by providing a value of #p-tjefferson for the URL; the HTML text will appear as: `Thomas Jefferson`.

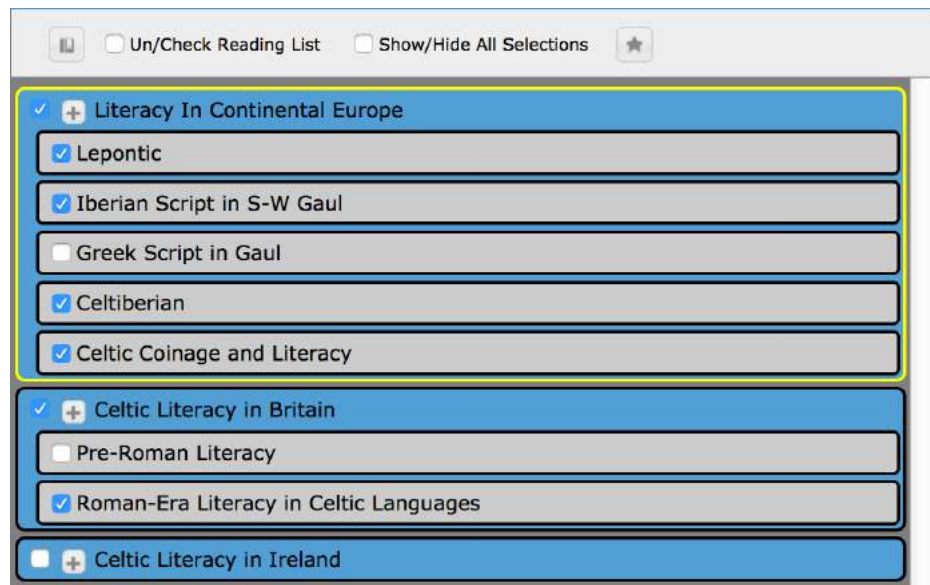
- You can also embed a (link) tags that point to other webpages:
 - Set the href attribute to the appropriate destination
 - The href attribute cannot contain an anchor value (i.e., the character "#" cannot appear in the URL).

EXAMPLE: A reference to the WikiPedia entry about Thomas Jefferson will appear in the HTML version of the text as: `Thomas Jefferson`

HTML content that looks like this in **Visual** tab of the Dashboard editor



is parsed by Prospect to create a Table of Contents that looks like this:



Configuring from Imported Record Data

One common use-case scenario for Prospect is that you may wish to configure your Prospect website from the “data up”: in other words, you can first import your Records from CSV files (see details in chapter 5), and use the data in those Records to guide and

simplify the process of configuring your Attributes and Templates. You should already be familiar with the concepts of Prospect before attempting this, but the following notes suggest how this might streamline your configuration work.

1. Upload your Record data to the WordPress server. Prospect comes bundled with the **CSV Importer** plugin, but you can use any importer plugin that you prefer.

WARNING: Each Record must be of custom post type `prsp-record`, have an appropriate value for the `tmpl-id` custom field and have a unique id in the `record-id` custom field, as explained in the chapter 5.

2. Create an Attribute definition for each of the attributes specific to your Record data. You can choose the custom field for the Attribute from the drop-down menu.
3. Since Prospect now has your data stored in Records on the server, you can quickly configure any Legends for Vocabulary Attributes by:
 - a. Providing the appropriate delimiter character (if any);
 - b. Clicking the **Add Terms** button;
 - c. Choosing specific colors or generating random colors or gradients.
4. After you have defined all of the Attributes, you can collect them together in the Template definition. Give the Template the same Internal ID as you used in the `tmpl-id` field in your spreadsheet.

Modifying Attribute, Template, Exhibit and Volume Definitions

Due to the nature of Prospect's data entities and the relationships between them, there is a set of implicit dependencies between Attributes, Templates and Exhibits/Volumes, namely:

- Exhibits and Volumes describe configurations of Templates and Attributes and thus are dependent upon the definitions of both.
- Templates describe bundles of Attributes and widget settings for particular Attribute types, and thus are dependent upon Attribute definitions.
- Independent Templates may rely upon dependent Templates to supply a set of joined Attributes and thus can be dependent upon them.

Any changes to one entity you make can have ripple effects on others, especially if that entity is relied upon by others. You should observe the following guidelines to minimize any side-effects.

Modifying Attributes

If you are deleting an Attribute, you should first remove any reference to that Attribute from Exhibits, Volumes, and Templates before you delete it. If you edit a Template, Exhibit or Volume after deleting an Attribute definition, all references to it will be removed but you may need to reconfigure many different aspects of the configuration.

If you are adding a new Attribute after you have already defined Templates, Exhibits or Volumes, you should not encounter any problems.

Avoid creating any Perspectives or Readings until after all of your Attributes have been configured. A Perspective or Reading may not load correctly if it relies upon an Attribute whose configuration has been modified or deleted.

Modifying Templates

If you are deleting a Template, you should first remove any reference to it in any Exhibits and Volumes that had used it. If it is a dependent Template, first remove any Join Attributes in independent Templates that point to it.

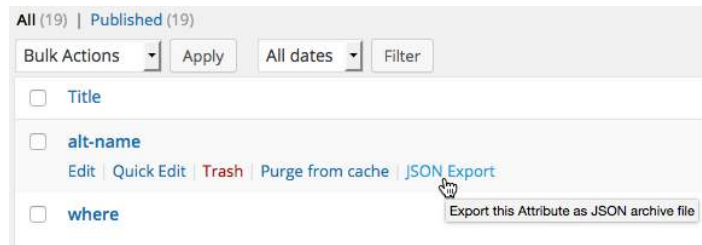
If you are removing Attributes from a Template, you should first remove any use of those Attributes from any Exhibits and Volumes. If you edit an Exhibit or Volume after deleting a Template definition, all references to it will be removed but you may need to reconfigure many different aspects of the configuration.

Modifying Exhibits and Volumes

If you modify an Exhibit, or the definitions of any of the Templates that have been displayed in an Exhibit, any Perspectives that you have created for it previously could be rendered useless. Similarly, if you delete an Exhibit, any Perspectives that refer to it could be orphaned. Make sure to modify or remove Perspectives on the server in these cases. The same applies to Volumes and Readings.

Backup Individual Items

You can export the definition of any single, specific item (an Attribute, Template, Exhibit, Volume, Map, Perspective or Reading) by clicking on the **JSON Export** link that appears when you hover over it in the Dashboard directory. The **CSV Export** link will appear when you hover over a Record in the Dashboard directory.



WARNING: This does not currently save the HTML portion of a Volume. See notes below in the “Saving and Loading Volume Data” section.

Importing and Exporting Backups

Prospect’s **Archive** page allows you to export backups of collections of any of your data entities, or to import these backups into your website. Select **Prospect > Archive** from the menu on the left side of your WordPress Dashboard.

From the **Archive** page, you can click on one of several links or buttons to export particular bundles of definitions:

- **Export all Attributes as JSON file**
- **Export all Templates as JSON file**
- **Export Data Dictionaries for all Templates:** Exports all of the Template definitions in your website as human-readable Data Dictionaries in a text file.
- **(Export this Template type with all Attributes) As JSON archive file:** Choose which Template you wish to export from the drop-down menu on the left. That specific Template, as well as all of the Attributes used to define it, will be exported to you as a JSON file.
- **(Export this Template type with all Attributes) As Data Dictionary:** Choose which Template you wish to export from the drop-down menu on the left. That specific Template, as well as all of the Attributes used to define it, will be exported to you as a human-readable Data Dictionary in a text file.
- **Export Records:** When you select this button, all of the Records which belong to the Template type you choose from the drop-down menu on the left will be exported as a CSV file.
- **Export All Exhibits as JSON file**

- **Export Perspectives:** When you select this button, all of the Perspectives which are associated with the Exhibit you choose from the drop-down menu on the left will be exported as JSON file.
- **Export all Perspectives**
- **Export All Volumes as JSON file**

WARNING: This does not currently save the HTML portion of a Volume. See notes below in the “Saving and Loading Volume Data” section.

- **Export Readings:** When you select this button, all of the Readings which are associated with the Volume you choose from the drop-down menu on the left will be exported as JSON file.
- **Export all Readings**
- **Export all Maps as JSON file**
- **Export all Attributes, Templates, Exhibits and Volumes from this website as a JSON file:** When you select this link, the definitions of all of these entities will be exported as a single JSON file.

WARNING: This does not currently save the HTML portion of a Volume. See notes below in the “Saving and Loading Volume Data” section.

The **Upload Archive** button can be used to import any of these JSON files (that define Attributes, Templates, Exhibits, Volumes or Maps) to your website.

If you have archive bundle files that you can upload to Prospect to create a ready-made configuration for your work, you can skip the rest of this chapter.

WARNING: If you attempt to import an entity but there is already an entity with that internal ID in your website, it will be ignored (so that your pre-existing definition remains untouched).

For details on how to import Record data that you have saved (or “exported”) from Prospect using the CSV Importer plugin bundled with Prospect, see the “Importing Record CSV files (advanced)” section of chapter 5 in this manual.

WordPress Archiving

Since all of the settings for the configuration of Attributes, Templates, Exhibits and Volumes, and all of the data that defines Records, Maps and Perspectives, are stored in

WordPress posts, you can also use the tools built-in to WordPress for exporting and importing the data in your website that has been created for and by Prospect.

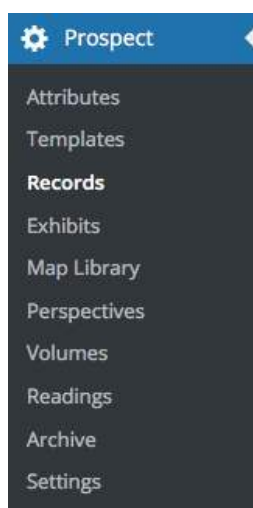
On the other hand, Prospect's **Archive** page allows you to export bundles of entities together in a way that allows you to manage configurations of data that may be more convenient and beneficial for you and your collaborators.

You can choose whichever option seems most appropriate for your purposes.

Configuring Records and Creating Record Data

After your website has been configured according to the nature and needs of your data universe – how it is defined and how values can be translated into colors – you need to supply the actual data that Prospect is to process and visualize in the form of *Records*.

Whereas a Template specifies a sort of entity – a particular set of Attributes – a Record is a manifestation of a specific set of values of a Template type. Once you have defined a Template to describe a president in the abstract, for example, you might create a Record to describe a concrete example of a president, such as Thomas Jefferson.



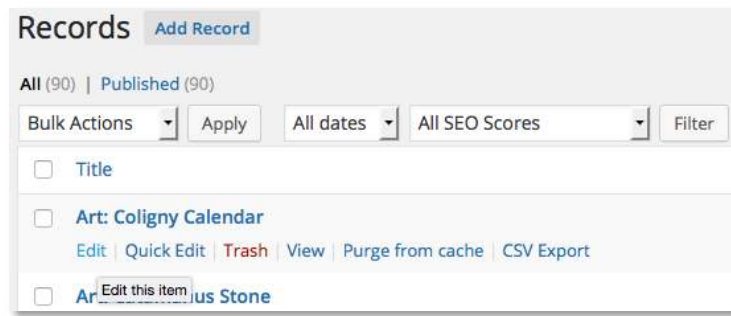
Record Dashboard Editor

Now that you have defined Attributes and Templates, Prospect knows the format of all possible Records in your data universe. It can therefore present forms to create and edit that data to users that have accounts that allow them to use the WordPress Dashboard.

Any user with an account on your website with Contributor, Editor or Administrator status will be able to create or edit Records. Records will not be supplied to the front end visualizer, however, until they have been Published by a user with an account having Editor or Administrator privileges. See the “Roles, Data Creation and Work Flow” section above for more detail.

detail.

You can create new Records or edit current Records by selecting **Prospect > Records**. Either click on **Add Record** to create a new one or edit an existing Record by clicking on the **Edit** link that appears when you hover over a Record in the Directory.



You will be able to edit all Prospect values in the **Edit Record** metabox that appears on the WordPress Dashboard.


The screenshot shows a 'Verify and Prepare Record for Publish/Update' form. The form contains the following fields and buttons:

- Unique Record ID:** t-coligny
- Template Type:** Text (text)
- Name:** Coligny Calendar
- Also known as:** (empty field)
- When From:** ~100 MM DC To ~199 MM DC
- Where ID of Record to Join:** loc-coligny
- Select ID:** (button)
- Languages:** Gaulish
- Clear:** (button)
- Brittonic:** (dropdown)
- Add:** (button)
- Topic:** Religion
- Clear:** (button)
- Genealogy:** (dropdown)
- Add:** (button)
- On (Record ID or IDs):** a-coligny
- Set ID:** (button)
- Subject (Record ID or IDs):** (empty field)
- Set ID:** (button)
- Author (Record ID or IDs):** (empty field)
- Set ID:** (button)
- See more URL to webpage:** https://en.wikipedia.org/wiki/Coligny_calendar

As in the other Prospect Dashboard editors, you must click the **Verify and Prepare Record ...** button before you press the **Publish** or **Update** button on the right side of the Dashboard to save your changes. If there are any obvious problems with your data, Prospect will show a red error message above the **Verify and Prepare Record ...** button.


WARNING: You will not be able to save your Record until you address any problems that Prospect signals with your Record data.

Every Record must have an ID that is unique across the Records of your entire website. It must consist only of “plain-vanilla” (i.e., non-accented) letters, numbers, underscores and hyphens and be no longer than 32 characters. Enter this ID into the **Unique**

Record ID text box. You can get general advice about the ID, or a hint about how to create IDs for a Record of this Template type (if it has been defined by the project Administrator), by clicking the information icon button .

Choose one of the Template definitions you have supplied from the **Template Type** drop-down menu in the top-right corner.

Prospect will provide all of the needed fields on the form according to the definition of the Template you choose from the menu. The values in each field, and how they operate, depend on what type of Attribute they are.

If a Contributor hint has been supplied in an Attribute definition an information icon button  will appear to the right of the Attribute editing area.

Editing Text Attribute Values

Avoid using the straight-vertical double-quote character (") in all text values: if you need to use double quotes, use the angled open- and close-double-quote characters (“”). This is because the straight double-quote character is a special character used in the encoding of data that is passed over the internet. Prospect will automatically remove this character from your text in order to reduce the likelihood of encoding errors and mysterious bugs when data is transferred between the server and a user’s browser.

Editing Vocabulary Attribute Values

There are two possibilities for a Vocabulary Attribute:

- It has been configured with a delimiter character and can therefore accept multiple values.
- The delimiter character has been left empty and hence the corresponding Vocabulary value can only have one possible value.

The text box contains the Vocabulary value and you can either edit it by hand or use the accompanying buttons on the right. All of the terms defined for the Vocabulary are available on the dropdown menu on the right-hand side. Vocabulary terms that are children in a parent-child hierarchy are prefixed with the “>” character.

If the Attribute can only contain a single value, the **Set** button will set the textbox to the value in the dropdown menu. If the Attribute can contain multiple values, you will have both a **Clear** button (which erases the current setting entirely) and an **Add** button (which adds the value currently in the dropdown menu to the setting).

NOTE: The order in which Vocabulary values are entered into a multiple-value list is significant in the sense that the first match (for the checked boxes of the current Legend) will be used to provide the color for the visual representation of the Record. You should ideally, therefore, prioritize the order in which you list the Vocabulary terms for the Attribute value.

Editing Number Attribute Values

Number Attribute values are fairly straightforward. The minimum and maximum values for this Attribute are entered to the right of the edit box and you will receive an error if the value you enter is outside these bounds. Leave the value blank if appropriate.

WARNING: Do not use commas or periods when entering a numeric value.

You can create an “indefinite” Number value by entering the question mark (“?”) into the edit box. Creating this “indefinite” placeholder Number value allows your Record to be assigned a special color from the Legend you create and to appear in Number Filters, but it cannot be used on visualizations when a Number is required (such as a Map which has been configured to use a Number Attribute to scale markers).

Editing Dates Attribute Values

Dates Attribute values are complex because they attempt to capture some of the non-trivial nature of temporal events.

Dates values can represent:

- either a single day, month or year, or else a range with start and end. If a single date value is intended, leave all of the fields in the **To** portion empty.
- years BCE (Before Common Era) if you make the year values negative.
- as complete or exact a date as is appropriate. Although you must provide a value for the year, months and days are optional.
- an ongoing or incomplete date range (in other words, one that continues to the present day) by using the value “open” for the end year.
- a degree of uncertainty by prefixing the year with the tilde symbol (“~”). A “fuzzy” event or range will be indicated visually with a gradated color (at the start or end of a range, or both, according to which years are prefixed with ~).

You can also create an “indefinite” Dates value by entering the question mark (“?”) into the **From** year field (the first of the grouping). Creating this “indefinite” placeholder Dates value allows your Record to be assigned a special color from the Legend you create and to appear in Dates Filters, but it cannot be used to render the Record on a Timeline.

When From To

The example above represents a Dates range from the year 600 BCE to the year 550 BCE.

When From To

The example above represents a Dates range from approximately November 2 of 50 BCE (as -50 is prefixed with ~) to approximately April 8 of 11 CE.

When From To

The example above represents an incomplete Dates range that began on June 25, 1965 and has not yet finished. Such ranges can represent individuals who are still alive, for example.

When From To

The example above represents a Dates range from May of 1910 to August of 1920.

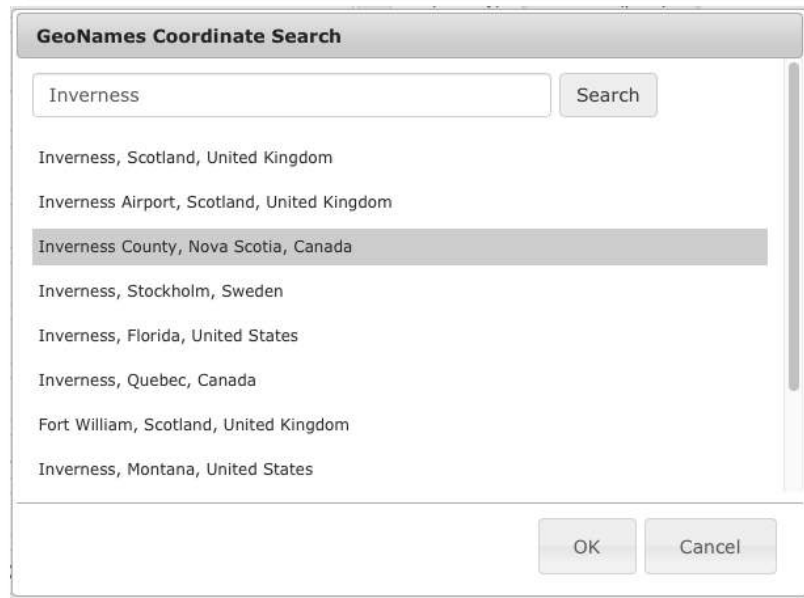
Editing Lat-Lon Attribute Values

Prospect supports the possibility that Contributors might need to enter their current Latitude-Longitude coordinate into Records. This data cannot be obtained from the user until permission is explicitly granted through the web browser.

Coordinate Lat,Long:

If this permission is granted, a **Here** button will appear on the right-hand side of the Lat-Lon edit box. If you click the **Here** button, the current Lat-Lon location (as best as the browser is able to determine) is inserted into the edit box.

If you click the magnifying glass icon 🔍 that appears on the far right, a dialog box opens that allows you to find and insert the coordinates for named locations via the Geonames webservice.



Enter the name of the location into the text entry box and either press the Return key or click the **Search** button.

If you see the name of the location whose coordinates you wish to insert into this Attribute of your Record, click it (the portion corresponding to the name you entered) and click the **OK** button.

Editing Pointer and Join Values

The values of both Pointer and Join Attributes need to be IDs of other Records. Rather than require that you memorize Record IDs or look up them up through others means, a button on the right side of the edit box will bring up a dialog box with all of the relevant Record IDs. You can browse through them and then choose the appropriate Record.



- Join Attribute values, by definition, can only contain a single Record ID and the Template definition specifies which dependent Template will be joined for this Attribute. The **Select ID** button will bring up a list of defined Record IDs that have been defined for the dependent Template.
- If you have left the Delimiter character blank for a Pointer Attribute, it can only represent a Pointer to a single Record. The **Set ID** button will appear to the right of the edit box. Selecting it brings up a dialog box that first asks you for the identity of the Template for the Record you wish to identify; after you select the Template, you can choose from the list of all of the Record IDs belonging to that Template type.

- If you have specified a Delimiter character for a Pointer Attribute, and thus enabled multiple values, the **Add ID** button will appear to the right of the edit box. It operates just like the Select ID button for Pointer Attributes (as explained above), but it will add the selected Record ID to your edit box.

Importing Record CSV files

Prospect saves the data entities above (Attributes, Templates, Exhibits, and Volumes) in JSON archive files because their structures are predefined and consistent and they are defined in a specialized, hierarchical and non-tabular manner. Records, on the other hand, are defined entirely by you according to your own purposes and will vary from project to project, but they can be stored in a single-level tabular fashion. It is much more efficient and logical to save these as Comma-Separated Value (“CSV”) spreadsheet files than as JSON files.

General Requirements for any Import Tool

Although Prospect comes bundled with the **CSV Importer** plugin, and saves files in the format that that plugin expects, there are many other CSV-import plugins for WordPress that can bring data into your website for use with Prospect. They all expect CSV files to be in some specific format in order to translate the data into WordPress posts.

Although you can choose to use any plugin you wish, you must format your CSV spreadsheet file in the appropriate format and ensure that your chosen CSV-import plugin can:

- Set the WordPress post type
- Add arbitrary custom fields to the post

When you create a CSV spreadsheet file to represent and store the Records of data for your website, each row in the spreadsheet represents a specific Record and every column represents an Attribute value. There are three special columns you must have set in, and import from, your spreadsheet for Prospect to work properly:

- The **post_type** value must be set to **prsp-record**
- The **tmpl-id** custom field must be set to the internal ID of a Template type you define (or has been defined by an archive bundle)
- The **record-id** custom field must be an identifier for the Record that is unique across your entire website

These considerations may make more sense after you learn more about Prospect and look at examples of CSV data files available from the Digital Innovation Lab on the Prospect website.

WARNING: CSV import tools cannot check the validity of your Record data and do not give you any feedback about it. It is therefore imperative that your Record data is clean before it is imported and that you check it after import to ensure that it came through properly.

Some common problems with data are:

- using the incorrect date format (see Appendix B);
- leaving a delimiter character at the end of a multiple-value line;
- using special accented characters but not writing the CSV file in UTF-8 format.

Importing Large Data Sets via CSV Files

All webservers and webservices have limitations. If you are importing a very large amount of data (in the thousands of cells, when you multiply rows by columns) and you receive an error, you will need to subdivide your data. Split your single file into two or more files – each with the same header row, which CSV importers need to understand the data – and import them individually.

Using the Built-In CSV Importer Plugin

Prospect saves Record data in CSV spreadsheet files in a format that can be imported by the **CSV Importer** plugin (bundled with Prospect). This plugin expects there to be columns entitled `csv_post_title` and `csv_post_type`.

If you are creating your own CSV spreadsheet file in order to import your data into Prospect, follow these guidelines:

- Create a column entitled `csv_post_title`: the value for every Record in this column should be some human-readable title for the item. It is only for labeling and identifying your Record in the Dashboard.
- Create a column entitled `csv_post_type`: the value for every Record must be `prsp-record`.
- Create a column entitled `tmpl-id`. You must assign the same ID to all Records that belong to the same Template (following the guidelines given previously above). Use this value as the Internal ID of the Template when you create it.
- Create a column entitled `record-id`. You must assign a unique ID to every Record (following the guidelines above Record IDs given previously above).

- Create a column for each of the Attributes needed for your Records. The column names will be the Attribute IDs, so you must follow the guidelines about the format of Attribute IDs given previously above.

EXAMPLE: For example, the first several columns and rows of the Presidents sample data set have the following values, in order for the **CSV Import** plugin to process them properly:

csv_post_title	csv_post_type	record-id	tmplt-id	name
George Washington	prsp-record	p-gwashington	pres	George Washington
John Adams	prsp-record	p-jadams	pres	John Adams
Thomas Jefferson	prsp-record	p-tjefferson	pres	Thomas Jefferson
James Madison	prsp-record	p-jmadison	pres	James Madison
James Monroe	prsp-record	p-jmonroe	pres	James Monroe
John Quincy Adams	prsp-record	p-jqadams	pres	John Quincy Adams

WARNING: The **CSV Importer** WordPress plugin is extremely fussy about column names. If there is an extra space at the end of the name in a column heading, for example, all of the data will be ignored.

Technical Considerations: Accented Characters and UTF-8 Compatibility

Prospect and WordPress assume that all text is encoded in UTF-8 format, to ensure that non-ASCII characters (such as accented vowels and consonants) are represented properly. You must ensure that your spreadsheet application reads and writes data in UTF-8 format, or your data will need to be re-edited manually in the Record editor of Prospect's Dashboard. Every application has its own way of selecting the format it uses for text, so you will have to refer to your application's documentation or help system on this issue.

NOTE: Prospect currently uses an internal string comparison algorithm that causes accented characters to come after unaccented characters. Thus, the names "Alice," "Àla," and "Zoe" would be put in alphabetical order: "Alice," "Zoe," and "Àla."

Special Considerations: Entering Values

You must ensure that the values you enter in each cell of your spreadsheet are exactly and literally correct, on a letter-by-letter basis, and that they do not contain any extraneous characters or extra spaces (such as at the beginning or end).

Special Considerations: Dates Values

Values for Dates Attributes need to be provided in a specific format that allows for a single date or date range of variable precision. This format can be represented with the following expression:

$(\sim)(-)\text{YEAR}(-\text{MONTH}(-\text{DAY}))(/(\sim)(-)\text{YEAR}(-\text{MONTH}(-\text{DAY})))$

In other words:

- There can either be one date or two (separated by the slash character “/”);
- The number given for the year can be positive (for dates in the Common Era), or negative (for years Before Common Era);
- The number given for the year can be prefixed by the tilde character “~” to indicate uncertainty about exactness.
- The month can be provided or left out (to indicate the entire year).
- If the month is provided, the day can also be provided. If no day is indicated, the entire month is indicated by default.

The single question-mark character (“?”) is used for the “indefinite” Dates placeholder.

The following values would be valid Dates for Prospect Records that could be put into CSV files for import (the meaning of these values is “translated” in parentheses afterward):

- ~700 (about the year 700 CE)
- -1200 (the year 1200 BCE)
- ~-100-11/1 (from about November of 100 BCE to year 1 CE)
- -9-11-30/~110-8 (from November 30 of 9 BCE to about August 110 CE)
- 1935-2-28/1978-11-30 (from February 28, 1935 to November 30, 1978)
- 1965-6-25/open (from June 25, 1965 to the present)
- ? (indefinite)

WARNING: If you are entering Dates values using a spreadsheet application, it may assume that Dates values are mathematical expressions that need to be evaluated. Thus, if you enter “-100-1-5” a spreadsheet application may evaluate this as the number “-106” and replace your date with this single number. You may need to indicate to your spreadsheet application that the values in this column should be treated as “Text” and not evaluated as mathematical formulae.

Viewing Records In Detail

There are several ways you can reach the WordPress page for a Record:

- by clicking the **View** link that appears when you hover over a Record in the Dashboard;
- by clicking the URL to the Record that appears after the **Permalink** label in the Edit Record dashboard;
- by clicking a Record post name on the Template view page;
- by clicking the **See Item** button in the Inspector (when viewing an Exhibit or Volume)
- by going directly to the URL associated with the Record.



The information on the Record page – the playback widgets available and the Attributes displayed – is determined by the configuration provided on the Edit Template page of the Dashboard. The page will display the WordPress content and Prospect playback widgets and Attributes in the following order:

- Playback widgets
- Attribute content
- Record page content

"It was a brave, new time, sort of..."

Cookie policy



SOHP
K0825 · Maggie Ray Whitton

SOUNDCLOUD
Share

4:51

▶ 50

Name: Bemis Center November 2014 Table 1
Date: 2014-11-8
Institution: Bemis Center
City Name: Omaha
Host: BLM
Tags: blacklivesmatter, Gentrification
Audio: ([Go To Audio](#))
This is a short summary of this event ...

WARNING: Since WordPress themes can make arbitrary and unpredictable changes to the HTML and CSS of pages, it is impossible for Prospect to anticipate and account for all of the ways in which themes can interfere with the Record page. If necessary, you (or your system administrator) can accommodate the styles of your selected theme by modifying the CSS styles defined in `css/view-record.css`

Visualization Types

This chapter explains the functions and configurations of all of the visualizations available for Exhibits and Volumes. Each type of visualization is explained in its own section below. Keep in mind that some visualizations represent distinct, individual Records while others aggregate Records together and show them as groups. There are, furthermore, several visualizations that are specifically designed for Qualified Relationships.

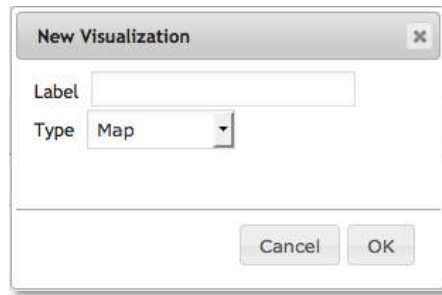
While Exhibits can use any kind of visualization, Volumes only support visualizations that represent individual Records (not Qualified Relationships). The various types of visualizations can be summarized as follows (each visualization is described in detail in its own section below):

- **Directory (Individual Records):** A directory listing of Records.
- **Cards (Individual Records):** Records are shown as colored cards; cards can display the textual contents of selected Attributes and an optional image.
- **Facet Browser (Aggregations):** The values for each Attribute, and relative frequency of those values, are represented as a series of buttons used to control Record selection.
- **TextStream (Individual Records):** Records are represented by textual representation of an Attribute which can be sized and colored by a Legend.
- **Pinboard (Individual Records):** Records are shown as colored dots on top of a graphic image; can add an SVG layer whose opacity can be controlled by the user.
- **Timeline (Individual Records):** Records are shown as colored dots (for discrete events) or bars (for timespans) on a chronological timeline.
- **Stacked Chart (Aggregations):** Records are first grouped along the x-axis according to the value of one Attribute, and then stacked in a vertical group with other Records according to the value of a second Attribute.

- Network Wheel (Individual Records): Records are arranged as dots on the outer rim of a large wheel and connected with color lines to other Records with which they have relationships.
- Network Graph (Individual Records): Records are represented as colored dots moving freely through space although connected in network graphs with colored lines to other Records.
- QR Network Graph (Qualified Relationships): Very similar to the previous visualization, except that this network uses QR-data specifically to model connections, coloring links by the Relationship type and allowing them to be selected by the user.
- Bucket Matrix (Individual Records): Records are represented as colored dots sorted into “buckets” according to the value of a specific Attribute and connected to other Records with which they have relationships with colored lines.
- Facet Flow (Aggregations): Records are grouped together along a sequence of colored horizontal bars according to the value of a set of Attributes, and are included in a “flow” between two bars if and only if the Record has both values. This is an implementation of “parallel sets.”
- MultiBlock Map (Aggregations): Records are first aggregated into super-sets according to the value of a primary Attribute (whose value is displayed as a label for the super-set) and then subdivided into smaller, colored subsets according to a secondary Attribute. Multiple secondary Attributes may be available, although only one is active at a time. This is an implementation of a type of “treemap.”
- Ego Graph (Qualified Relationships): The user can choose any item that is in a Qualified Relationship; this item is displayed at the center of a set of concentric circles on which are all inter-connected items for up to six degrees of separation.
- Map 1 (Individual Records): Records are shown as colored shapes on a map; multiple coordinates are represented as lines or Polygons; overlay maps can be added to the base map and controlled individually; connections between Records can be represented as colored lines.
- Map 2 (Individual Records): Records are shown as colored dots on a map; multiple coordinates are represented as “broadcast” from a central point, connected by colored lines; overlay maps can be associated as groups and controlled collectively.
- QR Map (Qualified Relationships): Similar to the previous visualization (Map 2), except that it has been created specifically to handle Qualified Relationship data.

When configured to show each item in a Qualified Relationship, the links between them are colored by Relationship type and can be individually selected by the user.

To create a new visualization when configuring an Exhibit or Volume, open the **Visualizations** panel and click the **Add Visualization** button. The following dialog box will appear:




Enter a unique label for the visualization in the **Label** text edit box, select one of the visualization types from the **Type** drop-down menu and click **OK**.

IMPORTANT: All of the visualizations in your Exhibit must have unique labels. This is because when the end-user saves a Perspective, that Perspective must be able to uniquely identify the visualizations that were being displayed.

The order in which you create visualizations is significant in the sense that it will determine the order in which they will appear in the drop-down menu of the front-end visualizer: the first visualization you create will be the default visualization displayed when the end-user opens the Exhibit or Volume (unless the end-user has used a URL with an embedded Perspective ID). All other visualizations will be listed, in the order in which they were created, in the drop-down menu.

All visualizations you create will be have a common top-level set of edit boxes and controls in the accordion panel:

- An up-down arrow icon  which will hide or show all of the details regarding the configuration of this visualization;
- A text edit box that allows you to change the label for this visualization at any time;
- A text edit box titled **View Hint:** that allows you to create a note to explain details about the visualization to the end-user, should you wish to provide any extra information. (See note below.)

WARNING: You cannot enter double-quotation marks (") into the View hint. Any entered will be automatically removed.


- A trash can icon that will delete the visualization when you click it.

Records cannot be represented graphically if they are missing an Attribute value required by that visualization. For example, a Record cannot be represented on a Map if it is missing the Lat-Lon Attribute that has been configured to supply the geographical coordinate (the Attribute to be used is determined by the Template type) or the Attribute currently selected for the Legend (which supplies the color of the Map feature).

Visualization Legends

You can provide Legends for Text, Vocabulary, Number and Dates Attributes (as explained in the section about configuring an Attribute), but since not all visualization types represent individual Records as colored objects, not all of them support the use of Legends.

In the case of those visualizations that display Legends on a Template-by-Template basis (Cards, TextStream, Map, Pinboard, Timeline, Network Wheel, Network Graph and Bucket Matrix), the order in which the Attribute IDs (which provide the Legends) appear in an Exhibit or Volume configuration is significant in that the Legends will be displayed in that order on the Legend menu, and the initial Legend will be the default.

The first two icon buttons following **Provide Legends:** (the checkbox icon ☒ which has the tooltip label “All On” and the null icon button  which has the tooltip label “All Off”) allow you to turn on or off all of the Legends displayed for the current Template with a single click. The order of the Legends displayed for each Template can be changed by clicking the left-arrow and right-arrow icon buttons that follow each Attribute ID.

Excluding Template Types from a Visualization

By default, Prospect assumes that you wish to show the Records of all of the Templates whose names you have checked to display on every visualization of the Exhibit or Volume. If you wish to exclude a particular Template type from a visualization, you can:

- not select the necessary Attribute used to locate the Record spatially on the visualization (or, in the case of Maps, Pinboards, Timelines and Bucket Matrices, select **disable** for the coordinate or Dates Attribute); or
- deselect all of the available Legend Attributes for that Template type on that visualization.

Automatic Hints

Most of Prospect's visualizations automatically create text for the hint box based on configuration settings. Any hint text that you (as the administrator configuring visualizations) supply will appear after the automatically-generated text. Automatic hint text is explained on a visualization-by-visualization basis below.

Viewing an Exhibit or Volume



There are two methods for viewing an Exhibit or Volume you have created:

1. Click the **View** link that appears when you hover over the name of an Exhibit or Volume in the Dashboard directory.
2. Click the URL labelled **Permalink** at the top of the Dashboard editor.

Directory

A Directory is the simplest possible visualization of Records. It groups all of the Records of each Template together, listing their Attributes like a spreadsheet. If an Image Attribute is shown on a Directory, it is restricted in width regardless of its original size.


Artifact

Name	Where (Region)	When	Picture	Material	Scripts	Product Of
Adeptus stone	Britain	From about 720 to about 770		Stone	Minuscule, Ogam	Inchmarnock
Botorrita Plaque 1	Iberia	From about -100 to about -50		Metal	Iberian	
Botorrita Plaque 3	Iberia	From about -50 to about 0		Metal	Iberian	
Castell Dwyran Stone	Britain	From 540 to 550		Stone	Capitals, Ogam	
Castelletto Ticino Inscription	Cisalpine	From -600 to -550		Stone	Etruscan	
Silchester Ogam Pillar	Britain	From about 380 to about 420		Stone	Ogam	
Vercelli Inscription	Cisalpine	From about -150 to about -31		Stone	Roman, Etruscan	
Vergiate Inscription	Cisalpine	From about -510 to about -490		Stone	Etruscan	

Institution

Name	Where (Region)	When
Armagh	Éire	From about 600 to now
Bangor-on-Dee	Britain	From about 560 to about 613
Cloyne	Éire	From about 580 to now
Fahan	Éire	From about 540 to about 1111

The Directory visualization does not currently support a Legend. Click as many Records as you wish. Selected Records will be highlighted in yellow and are de-selected if they are clicked again.

The end-user can change the order in which items are displayed in the Directory by clicking on the **View Options** icon . This will bring up a dialog box listing all of the possible Attributes that can be used for providing a sort order of items:

Sort By ✕

Artifact: When ⬇

Institution: Name ⬇

Person: Birthplace (Name) ⬇

Text: Topic ⬇

OK

Cancel

The settings available on the Dashboard for the configuration of a Directory visualization are as follows:

Directory: Listing

View Hint:

Choose the Attribute(s) to display according to Template type:


art inst person text

Show content: ☒ name ☒ where.region ☒ when ☒ picture ☒ material ☒ scripts ☒ prod-of ☐ where.name ☐ where.coord ☐ see-more

Choose all of the Attributes you wish to display in the Records of each Template type by checking or unchecking the associated checkbox (which will display the ID of the Attribute).

You can change the order in which the Attributes are displayed by clicking the left and right arrow icons.

Data Requirements and Behavior

The Directory visualization will show every Record in the data stream, regardless of whether an Attribute is missing or not. To sort the Records of a Template type according to a particular Attribute, either click the **View Options** icon  or the Attribute name at the top of the column. The Attribute name will become underlined.

When the Records are sorted on a Number or Dates Attribute, indefinite values always come first; values left blank in the Record always come last.

Cards

The Cards visualization represents each Record as a card with a title and a content area that can contain an image, textual values or both.

The Cards visualization colors the background of each card according to the Legend selected for its associated Template.

Artifact



Institution



When you click a card, the background of its title (if any) and the border of the entire card turns yellow. Select as many cards as you wish: click again to deselect. Two cards are selected in the example below (“Castell Dwyran Stone” and “Castelletto Ticino Stone”):

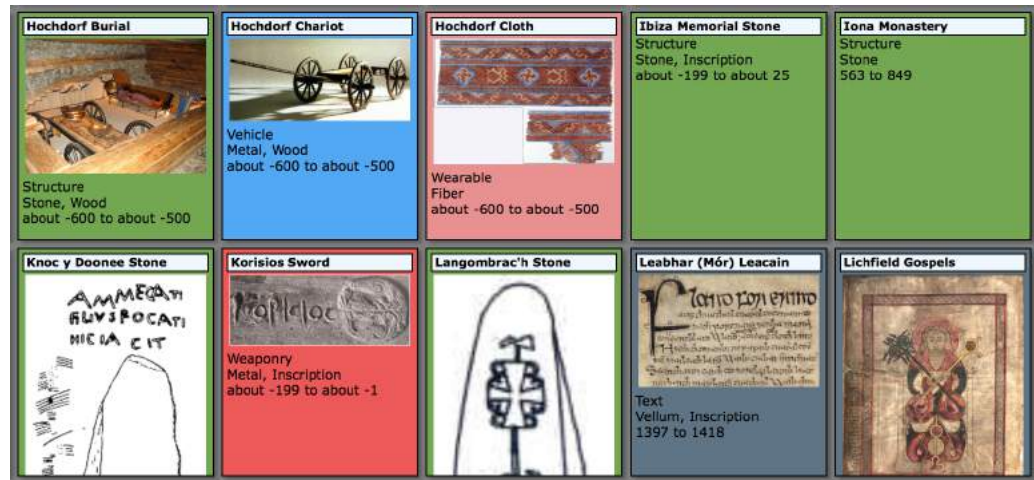
Artifact




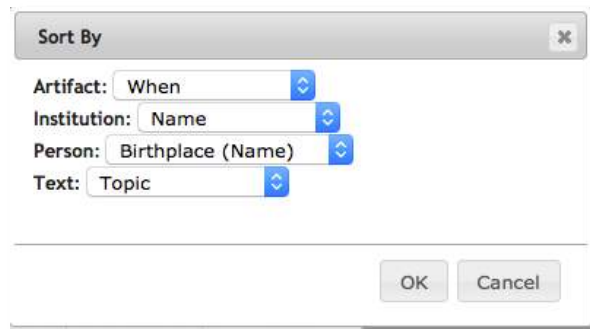
If a Template has an Image Attribute, it can be shown on the Card visualization (you are limited to one Image per Card). It can either be shown on the left third of the width of the Card (as above), or stacked vertically beginning with the Image (occupying the full width, as below). If there is no value for the Image Attribute on a Card, the entire Card width will be available for textual content. If you select an Image but there is no textual content (selected in the **Show Content** section of configuration), the Image will occupy the entire width of the Card.

If you use the former option (Image on the left, as above), your images should be cropped to have a narrow aspect ratio; if you use the latter option (content stacked vertically, as below), your images should be cropped to have a “landscape

orientation” aspect ratio. Any image or textual content that does not fit the Card will simply be cropped (as shown below).



The end-user can change the order in which Cards are displayed in the Directory by clicking on the **View Options** icon . This will bring up a dialog box listing all of the possible Attributes that can be used for providing a sort order of items:



The settings available on the Dashboard for the configuration of a Cards visualization are as follows:

Cards:

View Hint:

☒ Show Title Width: Height: ☒ Stack image vertically

Choose the Attribute(s) to visualize on each card according to Template type:

art event person text

Image:

Show content: ☒ what ☒ material ☒ when ☐ name ☐ scripts ☐ see-more ☐ where.name ☐ where.alt-name ☐ where.coord ☐ where.region

Provide Legends: ☒ what ☒ material ☒ when ☒ scripts ☒ where.region ☐ name ☐ where.name ☐ where.alt-name

If you check the **Show Title** checkbox, the title of the Record will be displayed at the top of the card. Select the relative **Width** and **Height** of the cards from the associated drop-down menus.

If you check the **Stack image vertically** checkbox, any content on the Cards will begin with the selected Image, occupying the full width, followed by textual representations of the Attributes selected in the **Show content** section of each Template. If you leave this checkbox unchecked, any Image shown on the Card will be restricted to the left third of its width.

Configure the rest of the Attributes on a Template-by-Template basis. Select the Attribute to provide the image for each card from the **Image:** drop-down menu or else select the **disable** option.

Select all of the Attributes whose content should be rendered on the card by checking their associated checkboxes on the **Show content:** list. You can change the order in which content is shown on the card by moving the Attribute with the left and right arrow icons.

Select which Attributes will provide Legends for the cards by checking the appropriate Attributes on the **Provide Legends:** list.

Data Requirements and Behavior

The Cards visualization will show every Record in the data stream, regardless of whether an Attribute is missing or not.

If you wish to remove all Records of a particular Template type from a Cards visualization, you must deselect all Attributes in both the **Show content** and **Provide Legends** sections of the Template configuration.

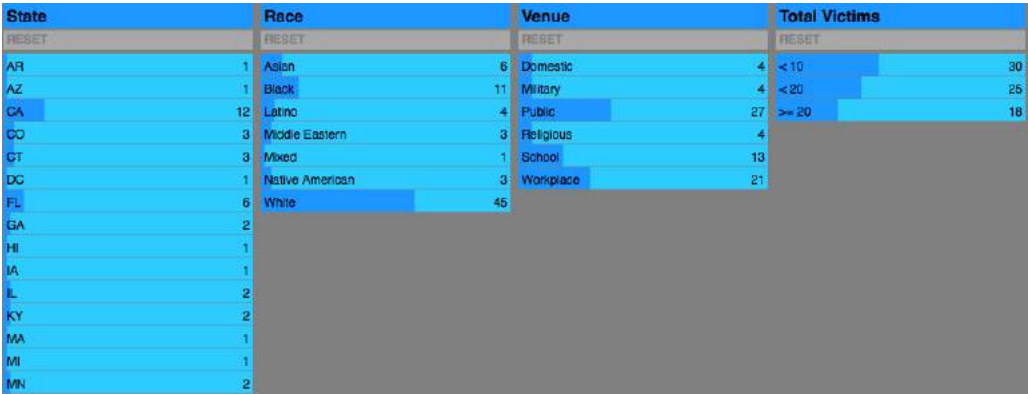
When the Records are sorted on a Number or Dates Attribute, indefinite values always come first; values left blank in the Record always come last.

If you wish for images to be shown on the cards with aesthetically pleasing results, you must ensure that the aspect ratio of your images corresponds to the width and height settings you have chosen for your cards. Although internal padding should appear between the bottom of the image and the bottom of the card, it will not appear when the image is too long: the image will fill as much of the bottom of the card as will fit and then be truncated.

Facet Browser

The Facet Browser visualization analyzes the Records in an Exhibit according to the values of a set of specified Attributes (of Text, Vocabulary, Tags, Numbers or Dates types), each of which occupies a column in the view. At the top of each column is the label for the Attribute; below that is a button titled **RESET** that deselects any value currently selected for the Attribute. The rest of each column consists of a number of rows corresponding to each possible value of that Attribute (used in the current data). The number of Records that have each corresponding value is shown on the far right of each button.

The “Mass Shootings” sample data set is illustrated below with the Facet Browser according to the State, Race, Venue and Total Victims Attributes.





You can constrain the current selection to Records with a particular value in one of the Attributes by clicking the corresponding bar button. The relative proportion of the number of Records in the current selection is indicated by the length of the darker blue bar that grows from left to right. If there is no current selection (as in the illustration above), the length of the darker blue bars indicates the proportion of values in the total

data set (after it passes through the Filter Stack) and will correspond directly to the numbers on the right hand side of each bar.

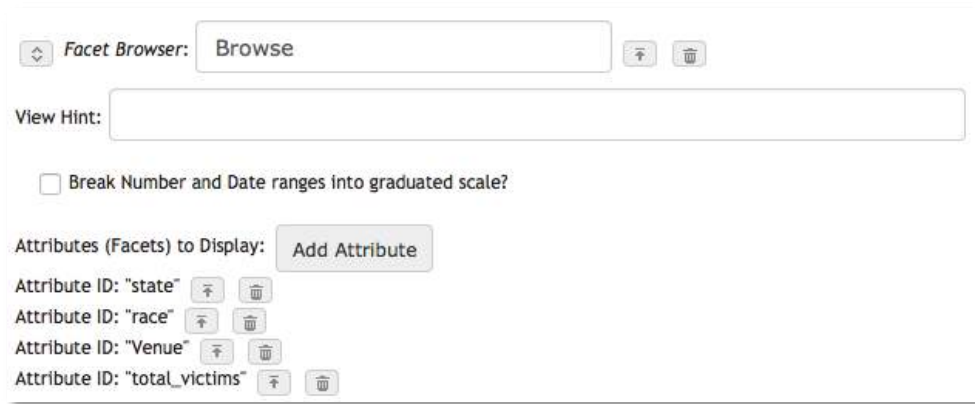


One specific value, “School,” has been selected in the illustration above. The act of selecting this button bar has had the effect of:

- enabling the **RESET** column for the Venue column (so that this selection can be deselected),
- disabling all values in the column except the one selected (“School”), and
- adjusting the length of the dark blue button bars for all of the other values to indicate their frequency in the set of Records containing the value “School” for the Venue Attribute.

The more Attribute value buttons you select, the more constraints you place upon the resulting data set (i.e., only Records with the corresponding values will be in the resulting selected set). As always, you can see the resulting Records by clicking the **Show Highlighted** icon button . Clicking the **Clear Highlighted** icon button  has the effect of clicking **RESET** for all Attribute columns.



The settings available on the Dashboard for the configuration of a Facet Browser visualization are as follows:



If you check the **Break Number and Dates ranges into graduated scale?** checkbox, all Attributes of the Number or Dates data types will be represented on the Facet Browser by a graduated scale (rather than just the entries you have configured for their Legends).

WARNING: If you choose this option, make sure that your Number or Dates Attribute definition has provided an appropriate and reasonable **Group values together by** or **Group Dates together by** setting in the configuration of the range of the Attribute. If the graduation of your scale is too small for the number of data items, the computation necessary to sort Records may take an excessively long time or consume all available memory.

You must add each Attribute you wish to display in the Facet Browser visualization by clicking the **Add Attribute** button and selecting the Attribute name from the list.

You can reorder the Attributes in the list clicking the up-arrow icon button . You can remove an Attribute from the Facet Flow visualization by clicking the trash icon button .

Data Requirements and Behavior

Since Attributes of the Vocabulary or Tags data types can have multiple values, the same Record can appear in multiple rows in a column of one of these types.

The Facet Browser does not attempt to create “hierarchical behavior” in the case of Fixed Vocabulary terms: each term appears as a separate button/bar graph and is treated independently of any children or parents it might have.

TextStream

The TextStream visualization displays an Attribute value as a text string, colors it with a Legend, sizes it with a numeric value (optional) and places it in a particular order with all of the other texts by sorting with the value of another Attribute. The Records of each Template type are kept together.



Click as many text boxes as you like: the border of each selected box will turn yellow; click again to deselect.

The settings available on the Dashboard for the configuration of a TextStream visualization are as follows:

TextStream: Slaveholding

View Hint:

Minimum Font Size: 8 Maximum Font Size: 50

Choose the Attribute(s) to use according to Template type:

pres

Record visible content: name Order by: order Text Size: max_slaves

Provide Legends: ☒ party ☒ religion ☒ max_slaves ☒ lifespan

☒ in_white_house ☒ terms ☐ name ☐ order

☐ birthplace.name ☐ deathplace.name

You must provide the **Minimum Font Size** and **Maximum Font Size** (in pixels) in the respective edit boxes. The setting for the **Minimum Font Size** will be used as default if you select **disable** for the **Text Size** setting.

You must configure all of the settings on a Template-by-Template basis.

Choose which Attribute will provide the value that will be displayed to represent the Record from the **Record visible content:** drop-down menu. This can be any Attribute type that can be displayed as text: Text, Vocabulary, Tags, Number, or Dates types.

Choose which Attribute will provide the sort order value for all of the Records from the **Order by:** drop-down menu. This can be any Attribute type whose value can be given a sorted order: Text, Number, and Dates types.

Choose which Number Attribute, if any, will provide the number used to set the size of the font for this Record's textual representation from the **Text Size:** drop-down menu. If a Template does not have any Number Attributes, or you do not wish to use this scale feature, select **disable** from the drop-down menu.

Check the checkbox for each Attribute ID you wish to provide a Legend for the TextStream visualization in the **Provide Legends:** section.

Automatic Hints

The TextStream visualization will automatically generate a user hint to explain the Attributes used to order and size Record.

Data Requirements and Behavior

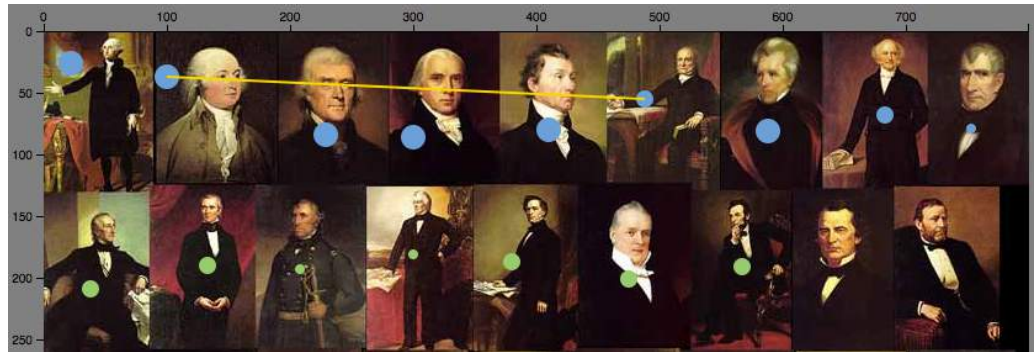
The TextStream visualization will only show Records which have a value for the selected content Attribute. The Record will not appear if the value for the selected Legend Attribute is left blank in the Record or if the user has de-selected the Attribute value on the current Legend.

If the **Order by:** Attribute is blank in the Record, it will come last in the list. If it is of Number or Dates data type and it is marked as indefinite, it will come first in the list.

If the **Text Size:** Attribute is blank or indefinite in the Record, it will be given the minimum pixel size.

Pinboard

A Prospect Pinboard enables you to represent Records as circles on top of an image by providing x,y pixel coordinates. Thus, Records can only be displayed on a Pinboard if their associated Template type has at least one X-Y Attribute and the particular Record has valid data for the chosen X-Y Attribute. The Pinboard visualization allows you to mimic many features of a Map but using a graphic image as a “landscape.”



The Prospect Pinboard visualization has a number of flexible features:

- Any of SVG overlays can be displayed on top of a base image.
- The Record items for each Template can be represented on the Pinboard by one of the following:
 - Circles, colored by the Legend

- One of seven different shapes, – where each Template is associated with a single particular type of shape – colored by the Legend
- An image

IMPORTANT: Your choice of these three options is applied to all of your Records: you cannot mix and match options, so that one Template's set of Records is represented by an image and the others by a shape, for example.

IMPORTANT: If you choose to represent Records with an image, nothing will show up in the Record's place if there is no image URL data in the Record. In this case, the colors on the Legend will no longer be applied; the categories in the Legend will simply act as a kind of filter.



- A Number Attribute can be used to scale the markers representing Records on the Pinboard (whether shapes or images). The size of the marker is determined by first considering the numeric value's position within the scale defined by the Number's Attribute range, and using that relative position against the Minimum and Maximum size parameters of the visualization.

EXAMPLE: You have a Template which has a Number Attribute called **Age**. You defined the range of **Age** to be between 0 and 120. When you configure the Pinboard, you provided a **Min Marker size** setting of 4 and a **Max Marker size** setting of 14. The Map is going to render a Record that has a value of 60 for **Age**. As 60 is exactly in the middle of the range, it produces a marker with a size of 9.

- A line can be drawn from the center of a Pinboard marker to one or more others whose IDs are given in a Pointer Attribute. Each Template has its own color setting so that these lines can represent different kinds of relationships.

Click as many Pinboard markers as you'd like: selected markers will be shown with a yellow border; click again to deselect them.

The settings available for the configuration of a Pinboard visualization are as follows:

Pinboard:  

View Hint:

Original Image URL:

Original Image Width: Height:

Display Width: Height:


Min Marker Size (1-50): Max Marker Size (1-50):

Shape Type:

Configure Attribute(s) by Template type

pres

X,Y Attribute to use:

Marker Size: **Connect to:** Link Line Color: 

For this Template, use shape :

Provide Legends: ☒ ☐ ☐ name ☒ order ☒ lifespan

☒ in_white_house ☒ party ☒ terms ☐ birthplace

☐ deathplace ☒ religion ☒ max_slaves

Overlay SVG Layers:

Provide the full URL to the background image in the **Original Image URL** edit box. Provide the full pixel width and height of the original image in the **Original Image Width:** and **Height:** edit boxes.

If you wish for the image to be scaled up or down in the visualization, provide a new width and height for the image in the **Display Width** and **Height** edit boxes.

If you wish to scale the size of the markers that represent Records (when a single coordinate pair is given for the value of the X-Y Attribute), you must provide both a **Min Marker Size** and **Max Marker Size** value. The **Min Marker Size** setting will be used to size markers if scaling is not done.

You must provide settings for the rest of the Pinboard configuration on a Template-by-Template basis. Configure each Template that you will be displaying in this Exhibit by selecting its tab and making the appropriate selections.

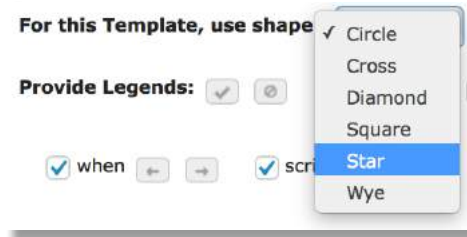
Select the X-Y Attribute that should be used to place a representation of the Record on the Pinboard from the **X,Y Attribute to use** drop-down menu.

Any Number Attributes defined by this Template type will appear in the drop-down menu labeled **Marker Size**. Each Template can either scale the size of representative circles with the Number Attribute you choose here or else use the default size (given by the **Min Marker Size** parameter) by selecting the **disable** option.

Any Pointer Attributes defined by this Template type will appear in the drop-down menu labeled **Connect to**. Select **disable** for this feature to be ignored. The ID(s) provided by this Attribute will be used to locate the representations of those Records and a link will be drawn from this Record to those other records using the color provided by the **Link Line Color** setting. You can provide the color either by entering a hex-color value (beginning with the number sign) or by clicking on the color box, which will bring up a dialog box to allow you to choose the color.

Choose which style of marker you wish to use to represent Records from the **Shape Type** drop-down menu:

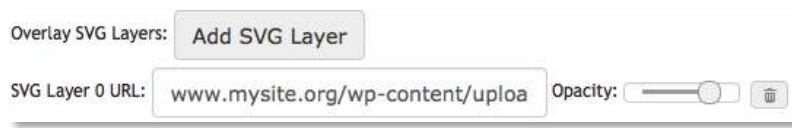
- If you choose **Circles**, all Records will be represented by a colored circle.
- If you choose **Shapes**, you will also need to choose which of six different symbols should be used for the Records of each Template type (on a Template-by-Template basis). They will be colored according to the current Legend selection.



- If you choose **Images**, then you will need to additionally choose which Image Attribute in the Template definition will be used to supply the image URL to represent each Record, or else **disable** if no appropriate Image Attribute is available or desired.



You can allow for as many Legends as you wish for Pinboard Templates: all of those Attributes whose checkboxes are checked following **Provide Legends** will be available on the Pinboard visualization.



You can also create layers of SVG overlays on your base image. Click the **Add SVG Layer** button for each layer you wish to add. Enter the full URL to each SVG file in the edit box and set the initial opacity of the layer with the **Opacity** slider. If you wish to delete this layer, click the trash can icon.

Automatic Hints

The Pinboard visualization will automatically generate a user hint to explain which Attributes, if any, are used to determine the size of markers.

Data Requirements and Behavior

The Pinboard visualization will only show Records which have a valid X-Y value for the selected **Locate Object By** Attribute. The Record will not appear if the value for the selected Legend Attribute is left blank in the Record or if the user has de-selected the Attribute value on the current Legend.

If the value for the **Marker Size:** Attribute is blank or indefinite in the Record, it will be assigned the **Min Marker Size** setting.

If you have chosen for Records to be represented by images (from the **Shape Type** drop-down menu) and have chosen an Image Attribute for the corresponding Template but the Record does not have any value for the Image Attribute, it will be left blank.

Timeline

The Prospect Timeline visualization allows you to represent Records on a chronological chart. All of the Records belonging to the same Template are grouped together in the same horizontal band and are displayed on top of the periodization (colors and labels) provided by the Legend of the Dates Attribute you have specified.

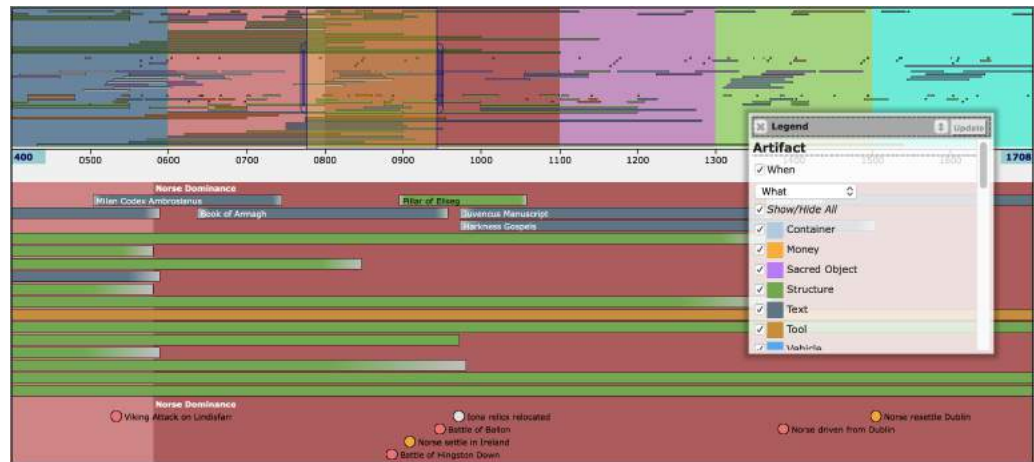
The Prospect Timeline visualization consists of two frames:

- the macro frame at the top, which contains all of the time events in miniature; a “zoom lens” in the macro frame can be moved and changed in size;
- the zoom frame below, which contains a zoomed-in view of the Records contained within the zoom lens of the macro frame.

Timeline events are displayed:

- either as instantaneous events happening on a single day (represented by circles) or as ranges of days (elongated rectangles), depending on whether there is just a start date or both a start date and end date

- either with definite end-points (solid color) or fuzzy end-points (gradients), depending on whether the start or end date is prefixed with “~”



Drag the yellow-tinted “zoom lens” on the macro frame (on the top) to change the time period displayed in the zoom frame; click and drag the left or right side of the zoom lens to change the scale (thus increasing or decreasing the amount of time shown in the lower zoom frame).

Click as many circles (representing “instantaneous” events) and bars (representing time ranges) as you’d like; click again to deselect. Selected Timeline markers will be shown with a yellow border.

The settings for the configuration of the Timeline visualization are as follows:

Timeline: Chronology

View Hint:

Height of Events in Zoom: 14
Width of Frame Axis Labels: 37

Macro Frame From Date: YYYY-MM-DD To Date: YYYY-MM-DD

Zoom Frame From Date: 250 To Date: 450

Choose the Attribute(s) to visualize according to Template type:

art inst person text

Dates Attribute to use: when

Provide Legends:
☒ langs
☒ topic
☒ when
☒ where.region

☐ name
☐ where.name

Set the height of each event item (in pixels) in the **Height of Events in Zoom:** edit box. This should generally be between 10 and 20 pixels in height.

Set the width of each frame's x-axis labels (in pixels) in the **Width of Frame Axis Labels:** edit box. This should generally be between 30 and 45 pixels and will depend upon the number of digits in the years of your data and the size of the abbreviated names of months in the language you are using.

If you wish to constrain the total timespan of the Timeline displayed, enter those chronological constraints in the **Macro Frame From Date:** and **Macro Frame To Date:** edit boxes. If you do not provide a date range in these settings, Prospect will take this range from the Dates Attributes provided for each of the Templates displayed.

If you wish for the zoom frame of the Timeline to open on a particular date range, enter the start and end Dates in the **Zoom Frame From Date:** and **To Date:** edit boxes respectively.

The rest of the settings for the Timeline must be set on a Template-by-Template basis.

Choose the Dates Attribute that will provide the chronological data for the Records of each Template from the **Dates Attribute to use:** drop-down menu.

Check the checkbox for each Attribute that for which you wish to provide a Legend for the Template's events in the **Provide Legends:** section.

Data Requirements and Behavior

The Timeline visualization will only show Records which have a valid Dates value for the selected **Dates Attribute to use** Attribute (indefinite Dates values will not be represented on the Timeline). The Record will not appear if the value for the selected Legend Attribute is left blank in the Record or if the user has de-selected the Attribute value on the current Legend.

The representation of time and temporal events on a computer-based calendar is actually a very complex issue. A little background information about the complications will help to explain some of the idiosyncrasies and limitations of the Timeline visualization.

Time is represented in JavaScript (the programming language of web browsers) as the number of milliseconds since the very moment that the year 1970 started. Thus is a negative number for time before 1970 and a positive number for time since then. This is an obviously very arbitrary and strange way to represent time. For a long and helpful history about the representation of time and calendars in JavaScript and other software platforms, see the blog post at: <http://curtisautery.appspot.com/5779342353235968>

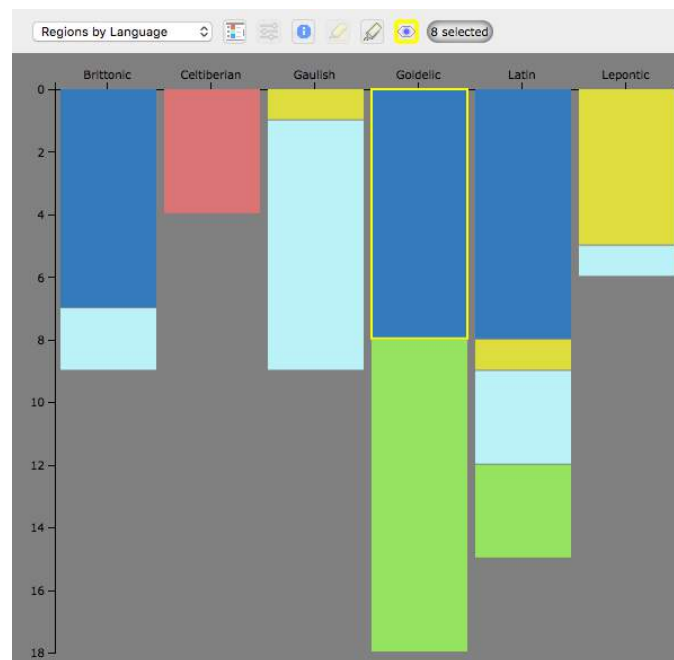
The outcome of this means of representation is that a particular day is actually demarcated by two millisecond marks: when the day begins and when it ends. If you represent a temporal event in Prospect as a single date – such as **2016, April 1916,** or **4 July 1776** – Prospect will treat it as a single millisecond code that begins at the

beginning of the respective day. It will be represented graphically as a circle at that millisecond location with its label trailing behind it (which can occupy up to 1.5% of the total time period space).

If you represent a temporal event as a range, it will be treated as a span between the millisecond at the beginning of the start day and the millisecond at the end of the last day. The label for the Record will be shown inside of the correspond bar between these two millisecond marks. Exactly how these ranges come out on your display – whether they occupy adequate space to be spotted easily and whether they are long enough for the labels to be readable – depends on the ratio of length of these ranges and the time period that you are representing on your timeline. If this is a problem, you might consider splitting the entire macro time span into two or more overlapping Timelines.

Stacked Chart

A Stacked Chart allows you to “slice” the dimensions of your Record data along two axes and aggregate Records into segments accordingly. Segments will be placed along



the x-axis accordingly to the value of one Attribute facet and will be colored according to the other. The size of each segment corresponds to the number of Records in it. If you select one or segments, you will be able to look at all of the Records in that segment or those segments with the Inspector.

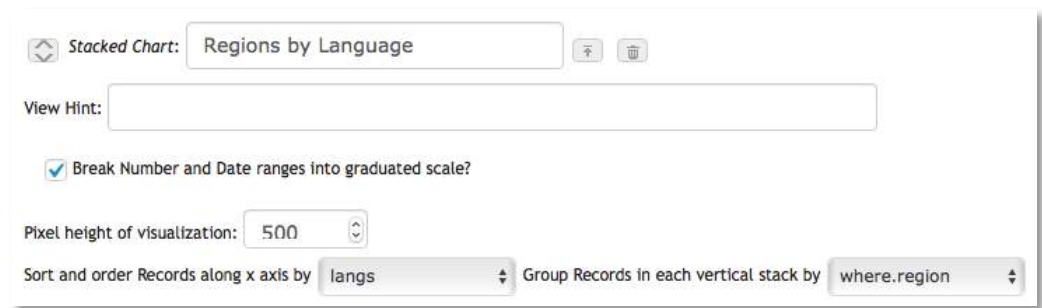
For example, in the visualization to the left, entitled “Regions by Language,” Records about inscriptions have been first divided according to languages (Brittonic, Celtiberian, etc.); each language group is then segmented according to region, which provides the color of the segment (the color scheme is provided by the region Legend, not shown on this image). The visual size of each colored segment corresponds to the number of Records in the group and is indicated by the ticks along the y-axis.

The user can select a segment by clicking on it: as each segment represents an aggregation, this is equivalent to selecting all of the Records in the segment. In this example, a segment representing inscriptions in “Goidelic” has been selected. When the Inspector is opened, all of the Records in this segment can be viewed.

You can choose any orderable Attribute (a “facet”) for the x-axis and y-axis of the Stacked Chart: any Text, Vocabulary, Tags, Numbers or Dates Attributes. While segments are produced along the y-axis according to the strict definition of your Attribute Legend, segmentation along the x-axis allows a little more flexibility:

- If the x-axis Attribute is of the Tags data type, each column stack will correspond to a distinct textual tag in this Attribute value of the Records;
- If the x-axis is of the Number or Dates data types, the x-axis can automatically a graduated scale according to the Minimum, Maximum and Group By settings of the Attribute’s range, rather than merely the specific groupings provided by the Attribute’s Legend.

The settings for the configuration of the Stacked Chart visualization are as follows:



Stacked Chart: Regions by Language

View Hint:

☒ Break Number and Date ranges into graduated scale?

Pixel height of visualization: 500

Sort and order Records along x axis by langs Group Records in each vertical stack by where.region

If the Attribute chosen for the x-axis is of the Number or Dates data type and you wish to have a graduated scale produced automatically for the full range of values, check the **Break Number and Dates ranges into graduated scale?** checkbox.

WARNING: If you choose this option, make sure that your Number or Dates Attribute definition has provided an appropriate and reasonable **Group values together by** or **Group Dates together by** setting in the configuration of the range of the Attribute. If the graduation of your scale is too small for the number of data items, the computation necessary to sort Records may take an excessively long time or consume all available memory.

Provide the pixel height for the visualization display in the **Pixel height of visualization** edit box. Although 400-500 are good default settings, you may wish to increase or decrease this according to the number of vertical segments in your data set and the size of the computer screens of your users.

Choose the facet Attribute to use for segmenting along the x-axis with the **Sort and order Records along x axis by** drop-down menu.

Choose the facet Attribute to use for segmenting along the y-axis with the **Group Records in each vertical stack by** drop-down menu.

Automatic Hints

The Stacked Chart visualization will automatically generate a user hint to explain which Attributes correspond to each axis.

Data Requirements and Behavior

The bars on the Stacked Chart visualization will only include Records which have definite (i.e., non-blank) values for both of the Attributes configured and which have at least one value for the **Group Records** Attribute that has been selected on the current Legend.

If the Attribute you have chosen for the **Sort and order Records along x axis by** drop-down menu is of the Text data type, the Legend values you have configured for this Attribute will appear along the x axis. If the Attribute you have chosen is of the Tags data type, each unique tag that appears in your Record data will appear along the x axis.

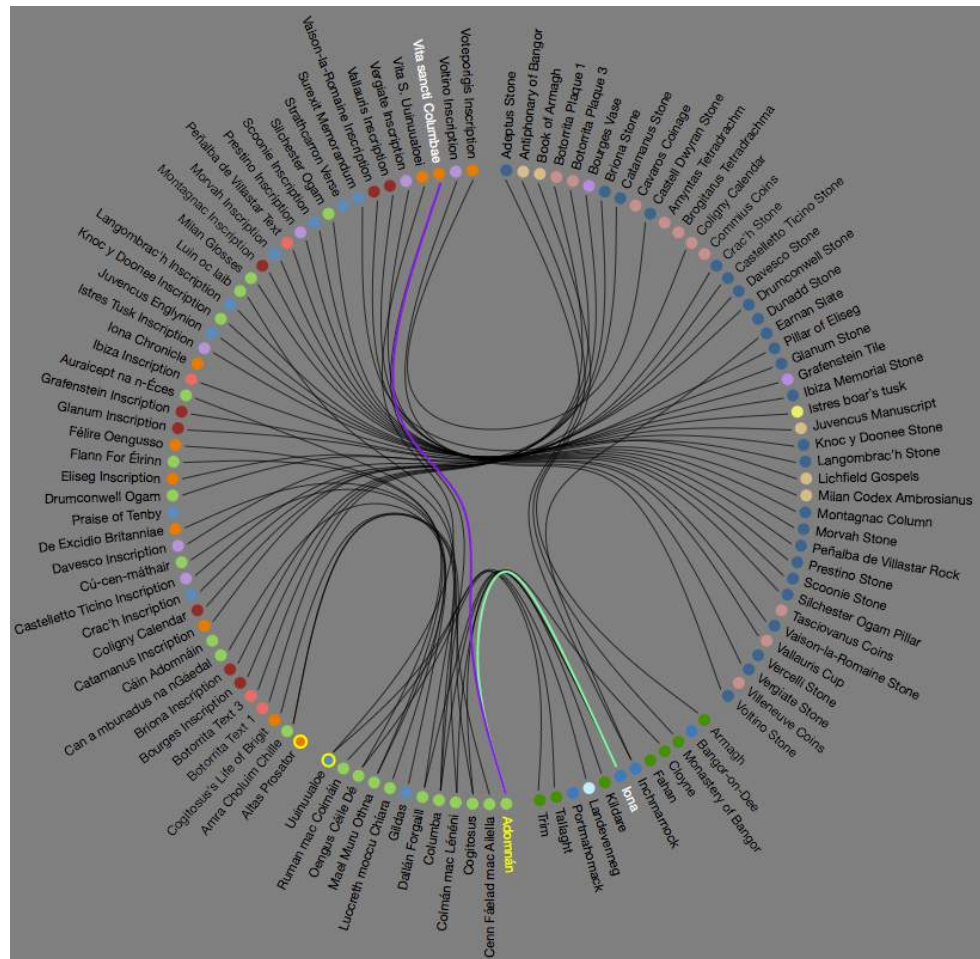
Network Wheel


The Network Wheel visualization offers one means of representing relationships between the Records in your data. In contrast to other relationship-oriented visualizations, the Network Wheel is designed to:

- keep Records of the same Templates together;
- ensure that the names of Records are always visible;
- allow for a different color for each kind of relationship;
- highlight the connections to single Records.

A dot is associated with the label of each Record and is colored by the corresponding Legend. Select a Record by clicking on the dot, which will add a yellow border to it; click it again to deselect it.

Two Records have been selected in the bottom left quadrant of the display below (as indicated by the yellow border around the colored dots).



Black lines show the connections between Records and are colored only when a Record label is selected: the connections are colored appropriately; the selected label is colored yellow and the labels of all Records that have connections to it are colored white. The Network Wheel hides Records that do not have any connections by default, but you can change that default by clicking the **View Options** icon , which brings up the dialog shown below:

Network Options

☒ Hide unconnected Records?

OK

Cancel

The Record for “Adomnán” at the bottom of the wheel has been selected below (causing its label to turn yellow); this Record is connected to two other Records, both of which

have had their labels highlighted in white with the connecting lines colored appropriately (according to the type of relationship between them).

The settings in the Dashboard for the configuration of the Network Wheel visualization are as follows:

The screenshot shows the 'Network Wheel' configuration interface. At the top, there's a dropdown menu set to 'Connections' with a trash icon to its right. Below this is a 'View Hint' box containing the text: 'Blue lines indicate where artifact made; green institutional affiliation; pink'. Underneath is a 'Maximum Label Pixel Width' input field with the value '140'. A section titled 'Network links based on Attribute/color pairs for each Template type' contains tabs for 'art', 'inst', 'person', and 'text'. Below the tabs is an 'Add Attribute/Color Pair' button. The 'Use Pointer Attribute:' dropdown is set to 'worked-at', and the 'Use color:' field shows the hex code '#82f7a9' next to a green color swatch and a trash icon. A 'Provide Legends:' section follows, with checkboxes for 'langs', 'when', 'birthloc.region', 'deathloc.region', 'name', 'alt-name', 'birthloc.name', and 'deathloc.name'. Each checkbox has a left and right arrow button next to it.

Enter the maximum pixel width needed for the labels of your Records into the **Maximum Label Pixel Width:** text box.

You must provide the other settings for the Network Wheel on a Template-by-Template basis.

Connections between Records are specified by Pointer Attribute values. Create as many entries for connections between Records of each Template type as you need by clicking the **Add Attribute/Color Pair** button.

Select which Pointer Attribute to use from the **Use Pointer Attribute:** drop-down menu and then choose a color to represent that relationship by either editing the hexadecimal code for the color in the **Use color:** edit box or by clicking on the color swatch to the right (which will bring up a color picker dialog box).

NOTE: You should not use the same Pointer Attribute twice for the same Template.

Delete unwanted Attribute/Color Pairs by clicking on the trash can icon on the right.

IMPORTANT: Only represent connections between Records once: the connection will be shown and highlighted regardless of which Record “end-point” is selected by the user. That is, if A and B are connected, you only need

to indicate that connection once, either with a Pointer value in A identifying B or a Pointer value in B identifying A. Don't create duplicate Pointers representing the same connection.

Select which Legends you want available for coloring Record nodes from the Attributes listed in the **Provide Legends** section.

Automatic Hints

The Network Wheel visualization will automatically generate a user hint to display the names and colors of links formed by Pointer relationships.

Data Requirements and Behavior

The Network Wheel visualization will display all Records which have at least one value for the Attribute that has been selected on the current Legend.

Network Graph

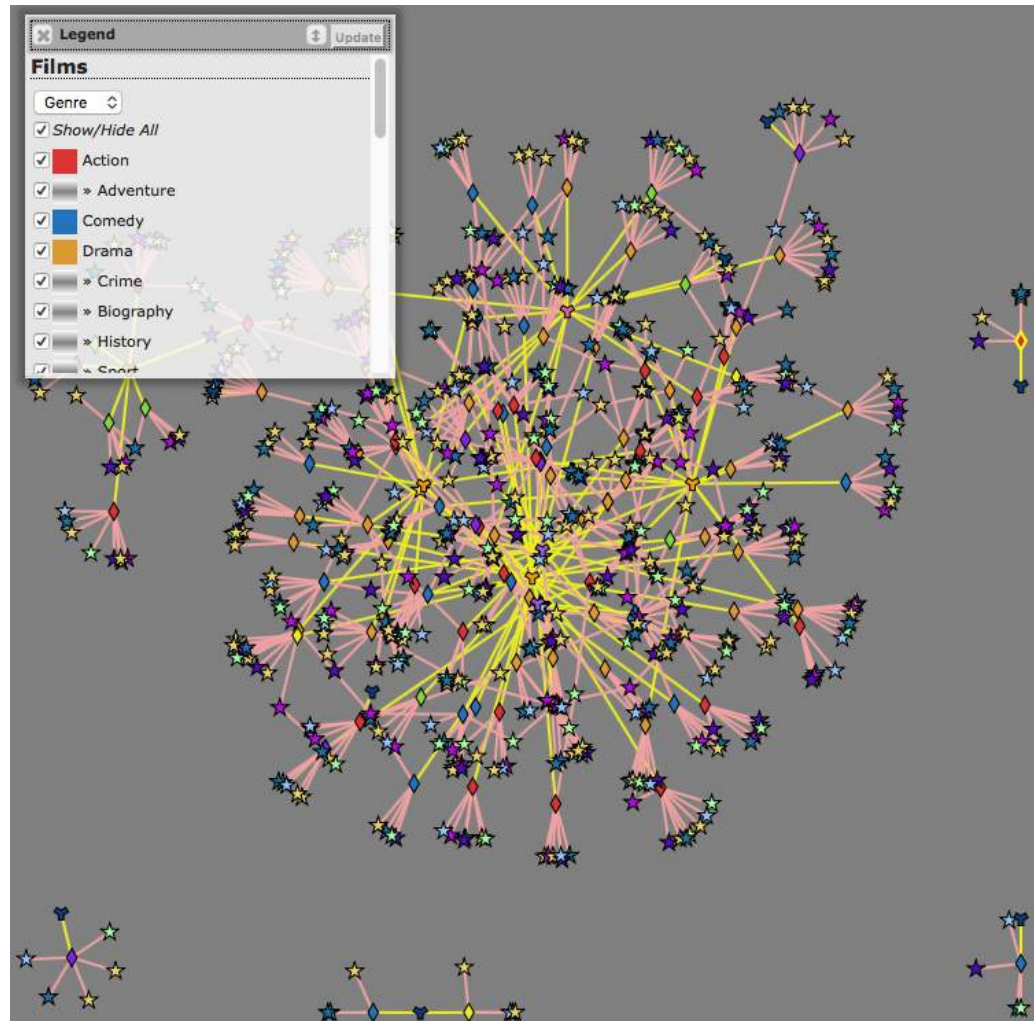
The Network Graph visualization offers one means of representing relationships between the Records in your data. In contrast to the other relationship-oriented visualizations, the Network Graph is designed to:

- group Records spatially by connecting them on the basis of their relationships (so that Records of different Templates are next to each other);
- create a visually compact representation (pack in as many Records as possible into the available display area);
- allow for a different shape for each Template type, or for Records to be represented by images;
- allow for a different color for the links connecting each kind of relationship;
- allow shapes or images representing Records to be sized according to a Number Attribute (optional).


Each Record is represented by a single marker which is colored (if it is not an image) by the corresponding Legend and can be sized according to an Attribute of the Number data type. If you hover the cursor over a marker, the label for the Record will appear in a tooltip. Select a Record by clicking on the marker, which will add a yellow border to it; click it again to deselect it. You can click and drag the dot to reorganize parts of your network graph.

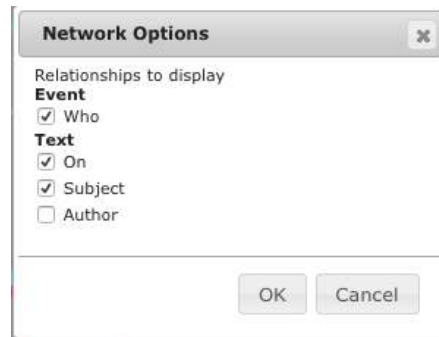
Prospect initially creates Network Graphs whose markers are in random locations and in motion. It may take a second or two for the “laws of physics” simulation to “cool down” and assign stable positions to the markers.

One Record has been selected near the right side of the display below (as indicated by the yellow border around the colored diamond).



Connections between Records are shown by colored lines. A single Network Graph can represent multiple kinds of relationships between Records: each different kind of relationship can have a different color.

You can turn on or off the relationships that are displayed on your Network Graph by clicking the **View Options** icon , which brings up a dialog such as shown below:



In this case, the administrator has originally configured the Network Graph to create connections from “Event” Records by using the value of the “Who” Pointer Attribute and to create connections from “Text” Records by using the values of the “On” Pointer Attribute, “Subject” Pointer Attribute and “Author” Pointer Attribute. The user has deselected the “Author” relationship, however, and the graph will be recreated if the **OK** button is clicked.

The settings in the Dashboard for the configuration of the Network Graph visualization are as follows:

Network Graph: [icon] [icon]

View Hint:

Min Marker Size (1-50): Max Marker Size (1-50): Display size:

Shape Type:

Configure Attribute(s) by Template type

art event person text

Marker Size:

Use Pointer Attribute: Use color:

For this Template, use shape:

Provide Legends: ☒ ☐ ☒ when ☐ ☒ where.region ☐ ☒ type ☐

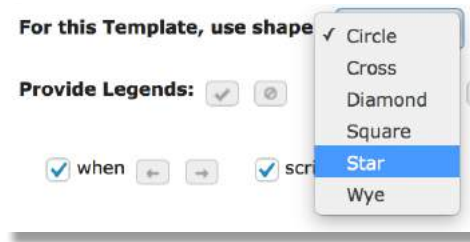
☐ name ☐ where.name ☐ where.alt-name

Enter the minimum and maximum size for Record markers into the **Min Marker Size**: and **Max Marker Size**: text boxes respectively. If no **Marker Size** Attribute setting is provided for a Template (e.g., it is left as **disable**), the **Min Marker Size** setting will be used. The network algorithm attempts to separate each marker from those to which it is connected by twice the **Max Marker Size** setting.

The Network Graph visualization always creates a square display: enter the number of pixels to use for the size of the width and height of the display into the **Display size:** text box. The size needed to display your Network Graph will depend upon the total number of Records shown and the degree of connectivity between them.

Choose which style of marker you wish to use to represent Records from the **Shape Type** drop-down menu:

- If you choose **Circles**, then all Records will be represented by a colored circle.
- If you choose **Shapes**, then you will also need to choose which of six different symbols should be used for the Records of each Template type (on a Template-by-Template basis).



- If you choose **Images**, then you will need to additionally choose which Image Attribute in the Template definition will be used to supply the image URL to represent each Record, or else **disable** if no appropriate Image Attribute is available or desired.



You must provide the other settings for the Network Graph on a Template-by-Template basis.

Connections between Records are specified by Pointer Attribute values. Create entries for connections between Records of each Template type by clicking the **Add Attribute/Color Pair** button.

Select which Pointer Attribute to use from the **Use Pointer Attribute:** drop-down menu and then choose a color to represent that relationship by either editing the hexadecimal code for the color in the **Use color:** edit box or by clicking on the color swatch to the right (which will bring up a color picker dialog box).

NOTE: You should not use the same Pointer Attribute twice for the same Template.

Delete unwanted Attribute/Color Pairs by clicking on the trash can icon on the right.

IMPORTANT: Only represent connections between Records once: the connection will be shown and highlighted regardless of which Record “end-point” is selected by the user. That is, if A and B are connected, you only need to indicate that connection once, either with a Pointer value in A identifying B or a Pointer value in B identifying A. Don’t create duplicate Pointers representing the same connection.

Select which Legends you want available for coloring Record nodes from the Attributes listed in the **Provide Legends** section.

Automatic Hints

The Network Graph visualization will automatically generate a user hint to display the names and colors of links formed by Pointer relationships.

Data Requirements and Behavior

The Network Graph visualization will display nodes for all Records which have at least one value for the Attribute that has been selected on the current Legend. If the value for the **Marker Size:** Attribute is blank or indefinite in the Record, it will be assigned the **Min Marker Size** setting.

The Network Graph will create connections between nodes based on the Attribute/Color pairs configured by the administrator and the selection made by the user on the **View Options** modal dialog box.

If you have chosen for Records to be represented by images (from the **Shape Type** drop-down menu) and have chosen an Image Attribute for the corresponding Template but the Record does not have any value for the Image Attribute, it will be left blank.

QR Network Graph

The QR Network Graph visualization has been created specifically to represent network graphs described by Qualified Relationships (described in greater detail in chapter 7). The QR Network Graph is designed to:

- connect and group Records spatially by their relationships (so that Records of different Templates can be next to each other);
- allow for a different shape for each Template type, or for Records to be represented by images;
- allow for a different color for each kind of relationship and for the user to select those relationships as entities in their own right;
- create a visually compact representation (pack in as many Records as possible into the available space);

- allow markers representing Records to be sized according to a Number Attribute (optional).

Each Record is represented by a single marker which is colored by the corresponding Legend (if it is not an image) and can be sized according to an Attribute of the Number data type. If you hover the cursor over a marker, the label for the Record will appear in a tooltip. Select a Record by clicking on the marker, which will add a yellow border to it; click it again to deselect it. You can click and drag the marker to reorganize parts of your network graph.

Select a relationship by clicking on the dotted link; it will become solid when it is selected.

Prospect initially creates QR Network Graphs whose markers are in random locations and in motion. It may take a second or two for the “laws of physics” simulation to “cool down” and assign stable positions to the markers.

One Record has been selected near the upper left of the display below (as indicated by the yellow border around the team logo).



The connections between Records are colored by the Relationship parameter configured for the Exhibit’s Qualified Relationships.

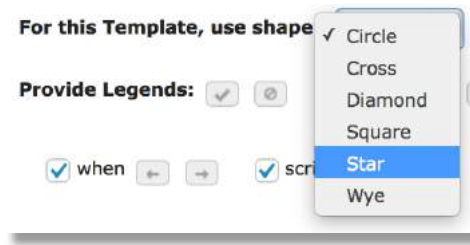
The settings in the Dashboard for the configuration of the QR Network Graph visualization (besides those for the Qualified Relationship configuration found in the General settings section) are as follows:

Enter the minimum and maximum pixel size for Record markers into the **Min Marker Size:** and **Max Marker Size:** text boxes respectively. If no **Marker Radius Size** Attribute setting is provided for a Template (e.g., it is left as **disable**), the minimum size will be used. The **Max Radius** number must be at least as large as the **Min Radius** number, however, as the average between them is used for the space between nodes. The network algorithm attempts to separate each marker from those to which it is connected by twice the **Max Marker Size** setting.

The QR Network Graph visualization always creates a square display: enter the number of pixels to use for the size of the width and height of the display into the **Display size:** text box. The size needed to display your Network Graph will depend upon the total number of Records shown and the degree of connectivity between them.

Choose which style of marker you wish to use to represent Records from the **Shape Type** drop-down menu:

- If you choose **Circles**, then all Records will be represented by a colored circle.
- If you choose **Shapes**, then you will also need to choose which of six different symbols should be used for the Records of each Template type (on a Template-by-Template basis).



- If you choose **Images**, then you will need to additionally choose which Image Attribute in the Template definition will be used to supply the image URL to represent each Record, or else **disable** if no appropriate Image Attribute is available or desired.

For this Template, use Image Attribute : picture

You must provide the other settings for the QR Network Graph visualization on a Template-by-Template basis. However, while you can select any set of Legends for the Templates that represent the entities referred to by your Qualified Relationships, the Template that provides the QR data itself must one and only one Vocabulary Attribute selected, that which specifies the type of Relationship (i.e., the Vocabulary Attribute which was selected as the **Relationships** Attribute in the QR configuration section of your Exhibit).

Automatic Hints

None.

Data Requirements and Behavior

The QR Network Graph visualization will display markers for all Records which have at least one value for the Attribute that has been selected on the current Legend. It will create connections between markers based on the data in the Qualified Relationship Records you have configured for your Exhibit, colored by the Relationship Legend.

If you have chosen for Records to be represented by images (from the **Shape Type** drop-down menu) and have chosen an Image Attribute for the corresponding Template but the Record does not have any value for the Image Attribute, it will be left blank.

For more information about Qualified Relationships, see chapter 7.

Bucket Matrix

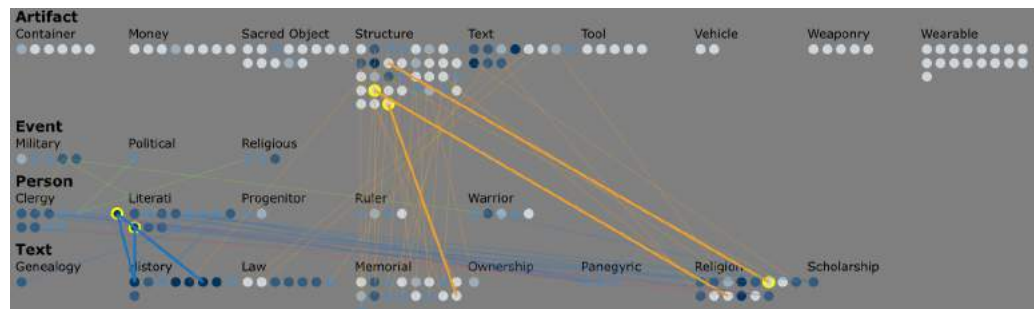
The Bucket Matrix visualization offers one means of representing relationships between the Records in your data. In comparison with other relationship-oriented visualizations, the Bucket Matrix is designed to:

- sort Records into “buckets” according to the value of a specific Attribute (on a Template-by-Template basis);
- create a visually compact representation (pack in as many Records as possible into the available space);
- represent the relationships between the Records situated in buckets so as to highlight cross-category connections;
- allow for a different color for each kind of relationship.


Each Record is represented by a dot which is colored by the corresponding Legend. If you hover the cursor over a dot, the label for the Record will appear in a tooltip. Select a Record by clicking on the dot, which will add a yellow border to it; click it again to deselect it.

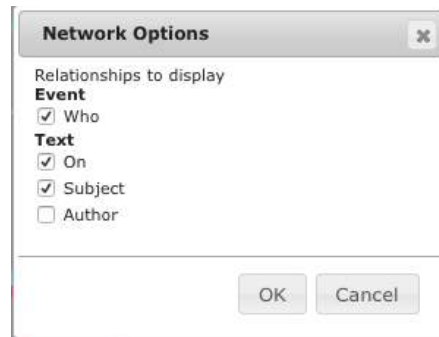
NOTE: If the Attribute used to create buckets into which Records are sorted allows for multiple values (i.e., the Vocabulary or Tags data types), a single Record may appear in multiple buckets (if it has multiple values). In this case, all instances of a Record (in multiple buckets) are selected or deselected when you click one of them.

Five Records have been selected in the display below (as indicated by the yellow border around the colored dots).



Relationships between Records are shown by colored lines. A single Bucket Matrix can represent multiple kinds of relationships between Records: each different kind of relationship can have a different color. The colored lines that represent relationships are initially faded out; whenever a dot is selected, all of the connections to or from it are given their full color value.

You can turn on or off the relationships that are displayed on your Bucket Matrix by clicking the **View Options** icon , which brings up a dialog such as shown below:



In this case, the administrator has originally configured the Bucket Matrix to create connections from “Event” Records by using the value of the “Who” Pointer Attribute and to create connections from “Text” Records by using the values of the “On” Pointer Attribute, “Subject” Pointer Attribute and “Author” Pointer Attribute. The user has deselected the “Author” relationship, however, and the graph will be recreated if the **OK** button is clicked.

The settings in the Dashboard for the configuration of the Bucket Matrix visualization are as follows:

Bucket Matrix: [icon] [icon]

View Hint:

Radius of each node: Width of buckets in nodes:

☒ Break Number and Date ranges into graduated scale?

Network links based on Attribute/color pairs for each Template type

art event person text

Sort into buckets by

Add Attribute/Color Pair

Use Pointer Attribute: Use color: [color swatch] [icon]

Use Pointer Attribute: Use color: [color swatch] [icon]

Provide Legends: ☒ ☐ ☒ when ☐ langs ☐

☒ where.region ☐ name ☐ alt-name ☐

☐ where.name ☐ where.alt-name ☐ topic ☐

All buckets on the display are always the same width (so that they line up vertically): the bucket width is the size of a dot (in pixels) multiplied by the number of dots per bucket (plus a little padding). The label for each bucket is also constrained by this width (it will

be truncated if it is any longer). Enter the pixel radius for the Record dots into the **Radius of each node:** text entry box. Enter the number of dots per bucket into the **Width of buckets in nodes:** text entry box.

If you check the **Break Number and Date ranges into graduated scale?** checkbox, buckets for Attributes of the Number or Dates data types will be form a graduated scale (rather than just the entries you have configured for the Legend) based on the Attributes' range settings.

You must provide the other settings for the Bucket Matrix on a Template-by-Template basis.

Select the Attribute used to create buckets for Records of this Templates by making a selection from the **Sort into buckets by** drop-down menu. To exclude Records of this Template type from the visualization, select **disable** from the menu.

Connections between Records are specified by Pointer Attribute values. Create entries for connections between Records of each Template type by clicking the **Add Attribute/Color Pair** button.

Select which Pointer Attribute to use from the **Use Pointer Attribute:** drop-down menu and then choose a color to represent that relationship by either editing the hexadecimal code for the color in the **Use color:** edit box or by clicking on the color swatch to the right (which will bring up a color picker dialog box).

NOTE: You should not use the same Pointer Attribute twice for the same Template.

Delete unwanted Attribute/Color Pairs by clicking on the trash can icon on the right.

IMPORTANT: Only represent connections between Records once: the connection will be shown and highlighted regardless of which Record “end-point” is selected by the user. That is, if A and B are connected, you only need to indicate that connection once, either with a Pointer value in A identifying B or a Pointer value in B identifying A. Don't create duplicate Pointers representing the same connection.

Select which Legends you want available for coloring Record nodes from the Attributes listed in the **Provide Legends** section.

Automatic Hints

The Bucket Matrix visualization will automatically generate a user hint to explain the Attributes used for creating “buckets” for each Template and to display the names and colors of links formed by Pointer relationships.

Data Requirements and Behavior

The Bucket Matrix visualization will display all Records which have at least one value for the “bucket sorting” Attribute and for the Attribute that has been selected as the current Legend. It will create connections between nodes based on the Attribute/Color pairs configured by the administrator and the selection made by the user on the **View Options** modal dialog box.

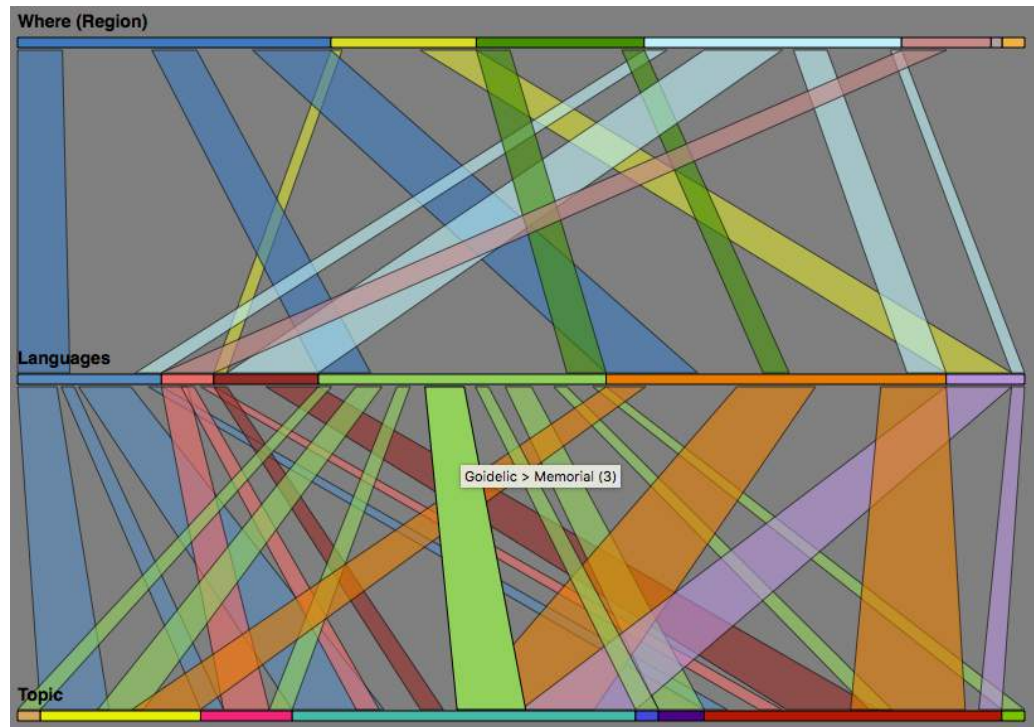
This visualization will only show “buckets” that have at least one Record in them, but the buckets will always occupy the same width regardless of how full they are. The resulting graphic display will always be set to the width and height necessary to contain all of the buckets.

Facet Flow

A Facet Flow visualization allows you to show the distribution of Attribute values and the relationship between the values of different Attributes (of Text, Vocabulary, Number and Dates types). This is a visualization technique formerly called “parallel sets.” You can show as few as two Attributes and as many as you’d like (although can be impractical to represent more than four).

Each Attribute is represented as a bar which is divided up into segments according to the Legend you have defined; the size of each segment corresponds to the number of Records that has this value for this Attribute. There are “flows” between the segments of each Attribute; the width of these “flows” corresponds to the number of Records that have the corresponding values in both Attributes.

If you hover over a segment of an Attribute bar, the name of the Attribute value will appear in a tooltip. Since flows overlap, they are displayed as semi-opaque until you hover over one. If you hover in a flow, it will be made fully solid and the name of both Attribute values it represents will appear in a tooltip.

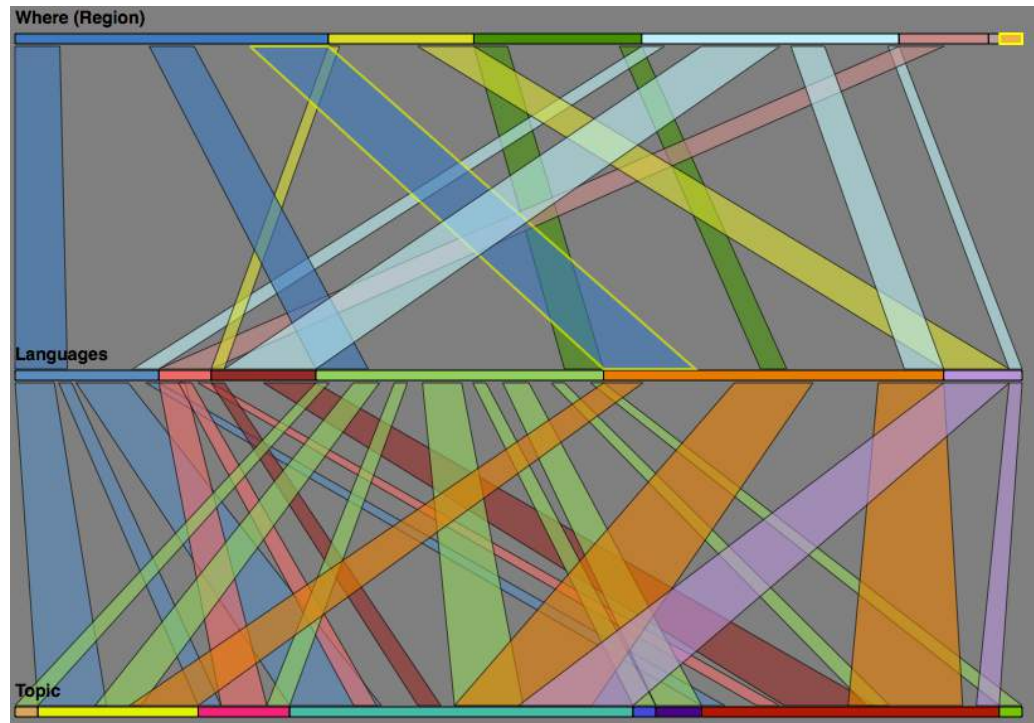


The user is hovering over a flow (colored green) in the lower center of the display above which has been made solid and brought to the top of its overlapping stack. The label of the flow “Goidelic > Memorial” appears at the cursor. This label indicates that the flow begins in the “Goidelic” segment of the “Languages” Attribute (in the center) and ends in the “Memorial” segment of the “Topic” Attribute (on the bottom).

The color of a flow is determined by the Attribute value from which it originates. In the case above, since the Language value “Goidelic” has been assigned a green color, all flows that originate in the “Goidelic” segment are colored green regardless of their endpoint.

Although the graphical size of flows is determined in a consistent and predictable manner from the relative size of items in its category, the placement of flows within an Attribute bar will depend upon the amount of space and the number of flows originating from the segment. Prospect attempts to allocate space for flows on each segment given the consideration that Attributes can have multiple values (in the case of Attributes of type Vocabulary), and that some items may not have corresponding values in both upper and lower Attribute categories.

The Facet Flow visualization displays aggregations of items rather than individual items. The end-user can select any set of bars or flows of interest, which causes them to be marked with yellow borders. When the Inspector is opened, all of the Records that correspond to these categories will be shown.



In the visualization above, the user has selected the top-right segment of the “Where (Region)” Attribute and the upper center blue flow (slanting downwards to the right) connecting the “Where (Region)” Attribute to the “Languages” Attribute. These are both given a yellow border to indicate that they have been selected. When the user opens the Inspector, all of the items that are included in these respective categories will be shown.

The settings for the configuration of the Facet Flow visualization are as follows:

Facet Flow:
Patterns

View Hint:

Display Width:
800

☒ Break Number and Date ranges into graduated scale?

Attributes (Facets) to Display:
Add Attribute

Attribute ID: "where.region"

Attribute ID: "langs"

Attribute ID: "topic"



Provide the pixel width of your Facet Flow visualization in the **Display Width** edit box. The more Records you have in your data set, the wider a space you will need to provide in order for your data to be represented accurately.

The pixel height of your Facet Flow visualization will be automatically determined by the number of Attributes you are viewing. Each horizontal Attribute row is separated vertically by a third of the horizontal width of the display.

If you check the **Break Number and Dates ranges into graduated scale?** checkbox, all Attributes of the Number or Dates data types will be represented by a graduated scale (rather than just the entries you have configured for the Legend).

WARNING: If you choose this option, make sure that your Number or Dates Attribute definition has provided an appropriate and reasonable **Group values together by** or **Group Dates together by** setting in the configuration of the range of the Attribute. If the graduation of your scale is too small for the number of data items, the computation necessary to sort Records may take an excessively long time or consume all available memory.

You must add each Attribute you wish to display in the Facet Flow visualization by clicking the **Add Attribute** button and selecting the Attribute name from the list.

You can reorder the Attributes in the list clicking the up-arrow icon button . You can remove an Attribute from the Facet Flow visualization by clicking the trash icon button .

Data Requirements and Behavior

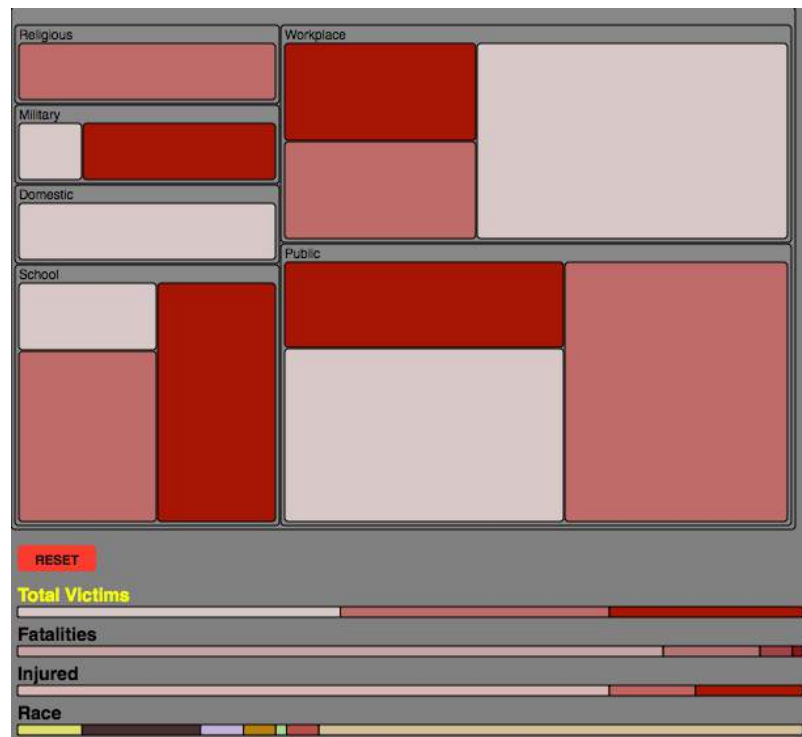
Each horizontal bar in the Facet Flow visualization groups Records together according to the value of the given Attribute. If the Attribute is of the Vocabulary or Tags data types, the same Record can appear in multiple segments of the horizontal bar (because multiple values are permitted for Vocabulary or Tags Attributes).

A Record will only appear in a flow (going between rows) if it has the corresponding value in both upper and lower segments. A single Record can appear in multiple flows at the same level because of the ability of Vocabulary and Tags Attributes to have multiple values.

MultiBlock Map

A MultiBlock Map allows you to explore patterns in your data two dimensions at a time by aggregating Records together using a visualization technique commonly called “treemaps.” A Prospect MultiBlock Map first groups Records together by a primary Attribute value; these primary groupings are split further by a secondary Attribute – but the end-user can choose dynamically between several secondary Attributes as well as see the distribution of values for all secondary Attributes of a particular category.

The treemap aggregation of Records is displayed in the upper part of the View Frame; all of the secondary Attributes you have provided are displayed in the bottom part. Between these is a button labeled **RESET** and an area where the current selection is displayed. The labels and outlines of selected items are shown in yellow.



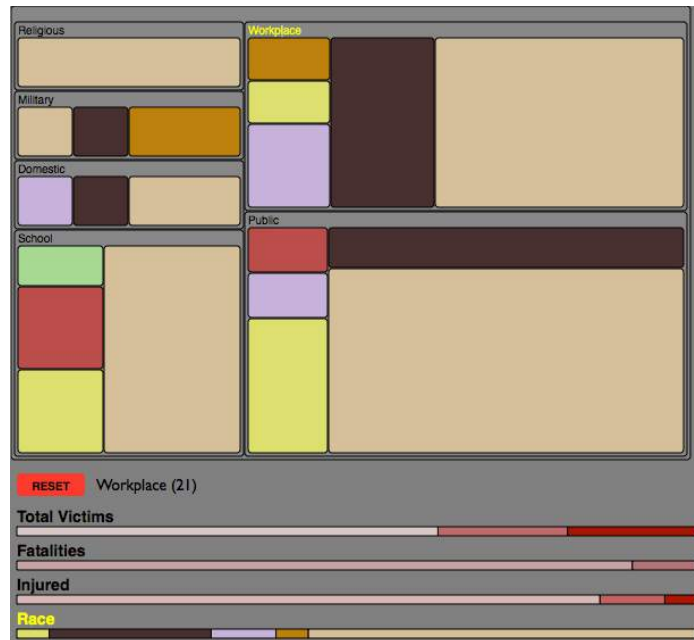
The visualization above displays data about occurrences of mass shootings in the United States: events are first grouped together according to the Attribute indicating the venue at which the shooting happened (“Religious,” “Workplace,” and so on); the secondary Attributes available are “Total Victims,” “Fatalities,” “Injured” and “Race.” The first secondary Attribute listed provides the default setting (“Total Victims,” in this case). Within each grouping of venue (the primary Attribute), Records are further subdivided according to the selected secondary Attribute: the greater the number of Records in each group, the larger the corresponding block will be. If you hover over a colored block, the corresponding Attribute values and number of Records will be displayed.

All of the values of the secondary Attributes are display in bars that are sized in proportion to the number of Records that have the corresponding value. If you hover over an Attribute value bar, a label for the corresponding Attribute value will be displayed.

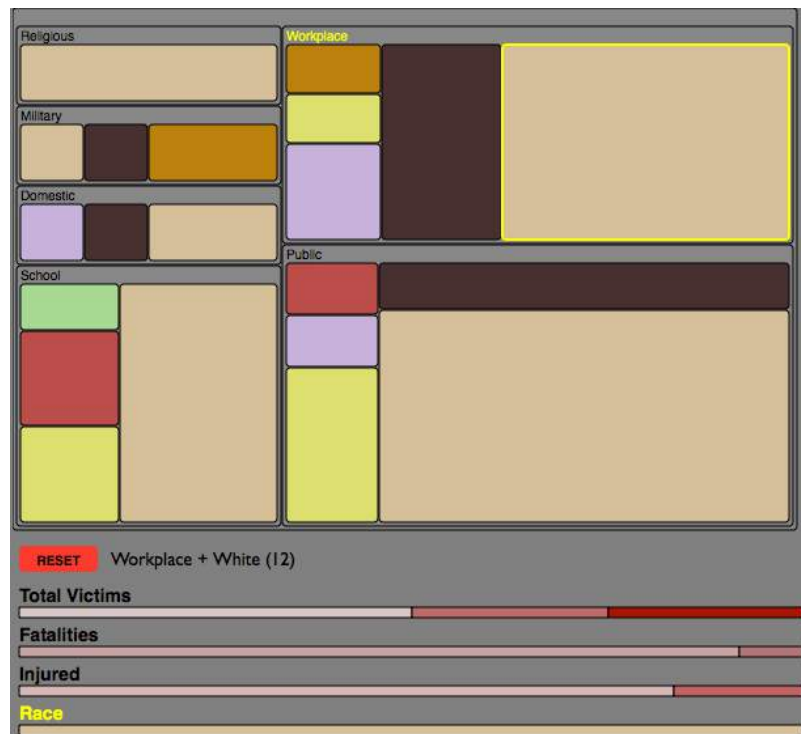
If you select a different secondary Attribute, the display will change to reflect the new secondary grouping criterion, as below.



If you select the title of one of the primary blocks (which will correspond to one of the values of the primary Attribute), that title will be shown in the middle (to the right of the **Reset** button) and the bars representing the secondary Attributes will change to indicate the distribution of values for all of the Records in that block. The visualization below indicates the distribution of all secondary Attribute values for all mass shootings that happened at a Workplace. Selecting a title also selects all of the Records in that grouping, which can be viewed in the Inspection Selector.



If you select a block within a grouping, the combined title of the primary and secondary Attributes, with the number of Records in those categories, will be shown to the right of the Reset button and the bars representing the secondary Attributes will change to indicate the distribution of values for all Records in that combined category. Both the block itself and the title of the parent category will be highlighted in yellow, as shown below.

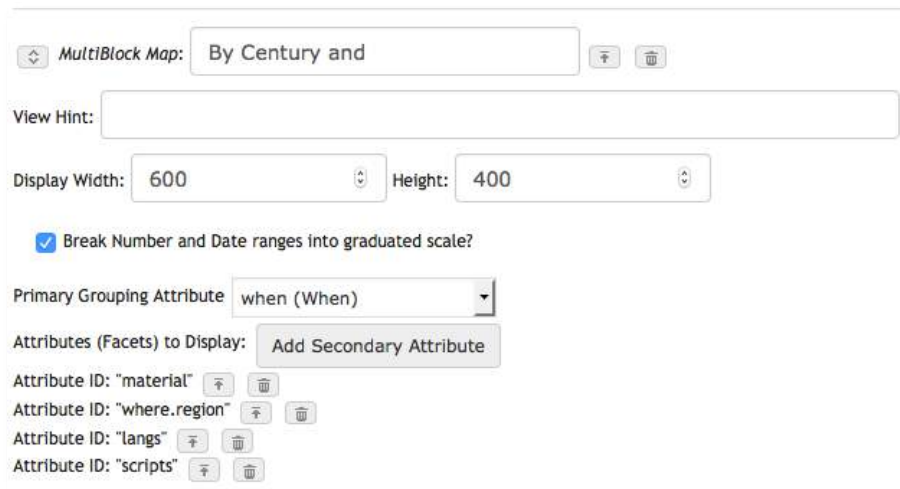


You can deselect a title and/or block by either

- clicking on it again,
- clicking the **RESET** button, or
- clicking the **Clear Highlighted** icon button in the View Frame's control bar.

When there is no current selection, the Attribute bars return to displaying overall distributions of corresponding values.

The settings for the configuration of the MultiBlock Map visualization are as follows:





The screenshot shows the configuration interface for the MultiBlock Map visualization. At the top, there is a dropdown menu labeled 'MultiBlock Map:' with the value 'By Century and'. Below this is a 'View Hint:' text input field. Further down are 'Display Width:' and 'Height:' input fields, both set to 600 and 400 respectively. A checkbox labeled 'Break Number and Date ranges into graduated scale?' is checked. Below this is a 'Primary Grouping Attribute' dropdown menu set to 'when (When)'. An 'Add Secondary Attribute' button is located next to it. At the bottom, there is a list of attributes: 'material', 'where.region', 'langs', and 'scripts'. Each attribute has an up-arrow icon to its left and a trash icon to its right.

Indicate the size of the space in which the treemap (set of aggregated blocks) should be displayed with the **Display Width:** and **Height:** settings. The more Records you have, and the greater the range between the minimum and maximum sizes, the more space you should allow. The **RESET** button and Attribute bars are displayed below this space.

If you check the **Break Number and Dates ranges into graduated scale?** checkbox, all Attributes of the Number or Dates data types will be represented by a graduated scale (rather than just the entries you have configured for the Legend).

You must select an Attribute to be used as the first dimension for aggregation: specify this Attribute with the **Primary Grouping Attribute** drop-down menu.

You must specify at least one secondary Attribute: add Attributes to the secondary list by clicking the **Add Secondary Attribute** button and selecting the Attribute you want from the dialog box. You can reorder the Attributes in the list clicking the up-arrow icon button . You can remove an Attribute from this MultiBlock Map visualization by clicking the trash icon button .

Automatic Hints

The MultiBlock Map visualization will automatically generate a user hint to explain the primary Attribute dimension used to group Records together into blocks.

Data Requirements and Behavior

Each block in the MultiBlock Map visualization contains Records that have the corresponding values for the selected primary and secondary Attributes. If the primary or secondary Attribute is of the Vocabulary or Tags data types, the same Record can appear in multiple blocks (because multiple values are permitted for Vocabulary Attributes).

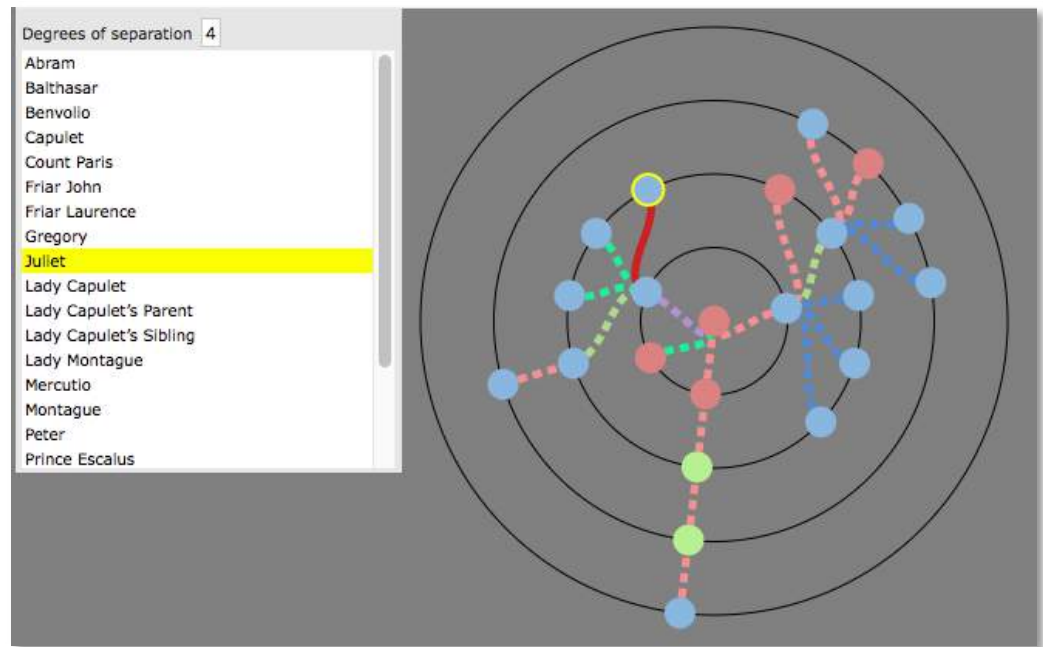
The bars displayed below the secondary Attributes in the lower part of the screen represent the distribution of the values in your Records overall. A Record may be represented here (in a secondary Attribute bar) but not in a block if its value for the primary Attribute is left blank. A single Record can be represented in multiple segments of a secondary Attribute bar of the Vocabulary or Tags data types.

Ego Graph

The Ego Graph visualization allows you to represent and explore a network of Qualified Relationships as they emanate from and enmesh specific entities: when you choose a specific item, it is placed in the center of the graph; all of its immediate connections are placed on the first ring around it and connected by colored links representing those relationships; all of the entities connected to the entities on the first ring are placed on the second ring out; and so on. The Ego Graph:

- displays a list of all of the entities which appear in at least one Qualified Relationship (in the list on the left);
- represents the network of Qualified Relationships from the linkages emanating from a single item;
- represents from one to six degrees of separation (a setting that can be changed by the user);
- will represent each entity exactly once (if it is connected to the graph);
- can represent each Template type with a different shape, display an “icon image” for each Record, or represent all Records as circles;
- colors each entity according to the current Legend selection (if icon images are not used);
- colors each selectable relationship link according to the Relationship Attribute setting of the Exhibit’s Qualified Relationship configuration.

Below is an example of the Ego Graph showing Relationships connecting the character Juliet (in Shakespeare's play "Romeo and Juliet") to other characters:



One character (a blue marker on the upper part of the second circle from the center) has been selected, as well as a red Relationship link between it and another blue marker.

The settings in the Dashboard for the configuration of the Ego Graph visualization are as follows:

The screenshot shows the 'Ego-Graph: Player Connections' configuration window. It includes a 'View Hint' text box, a 'Display size (in pixels)' spinner set to 400, a 'Marker size (2-50 pixels)' spinner set to 35, and an 'Initial degrees of separation (1-6)' spinner set to 3. The 'Shape Type' is set to 'Images'. Below, the 'Configure Attribute(s) by Template type' section shows tabs for 'nba-person', 'nba-qr', and 'nba-team'. The 'nba-person' tab is active, showing 'For this Template, use Image Attribute : image'. Under 'Provide Legends', there are checkboxes for 'position' (checked), 'name', and 'lifespan', each with left and right arrow buttons.

The Ego Graph visualization always creates a square display: enter the number of pixels to use for the size of the width and height of the display into the **Display size** text box. Since there will never be more than 6 concentric rings in the graph, the default setting (400 pixels) should suffice for most purposes, depending on the size of the nodes.

Set the size of the nodes in the graph by providing a number in the **Marker size** text box. Set the initial number of degrees of separation (i.e., the default number of concentric rings in the graph) in the **Initial degrees of separation** text box.

Choose which style of marker you wish to use to represent Records from the **Shape Type** drop-down menu:

- If you choose **Circles**, then all Records will be represented by a colored circle.
- If you choose **Shapes**, then you will also need to choose which of six different symbols should be used for the Records of each Template type (on a Template-by-Template basis).

This close-up shows the 'For this Template, use shape' dropdown menu. The menu is open, displaying options: Circle (checked), Cross, Diamond, Square, Star (highlighted in blue), and Wye. Below the menu, the 'Provide Legends' section is partially visible, showing a checked 'when' checkbox and a 'scr' label.

- If you choose **Images**, then you will need to additionally choose which Image Attribute in the Template definition will be used to supply the image URL to represent each Record, or else **disable** if no appropriate Image Attribute is available or desired.

For this Template, use Image Attribute : picture ▾

You must provide the other settings for the Ego Graph visualization on a Template-by-Template basis. However, while you can select any set of Legends for the Templates that represent the entities referred to by your Qualified Relationships, the Template that provides the QR data itself must one and only one Vocabulary Attribute selected, that which specifies the type of Relationship (i.e., the Vocabulary Attribute which was selected as the **Relationships** Attribute in the QR configuration section of your Exhibit).

Automatic Hints

None.

Data Requirements and Behavior

The Ego Graph visualization will only display nodes for Records which have at least one value for the Attribute that has been selected on the current Legend and which are involved in a Relationship type selected on the current Legend; each Record will only be represented by a single node which is created its first appearance in a Qualified Relationship (according to a breadth-first search); Qualified Relationships that are not on adjacent rings are ignored. The Ego Graph will only display as many rings (i.e., degrees of separation) as necessary for the network of the currently selected node, even if it is fewer than the current setting.

If you have chosen for Records to be represented by images (from the **Shape Type** drop-down menu) and have chosen an Image Attribute for the corresponding Template but the Record does not have any value for the Image Attribute, it will be left blank.

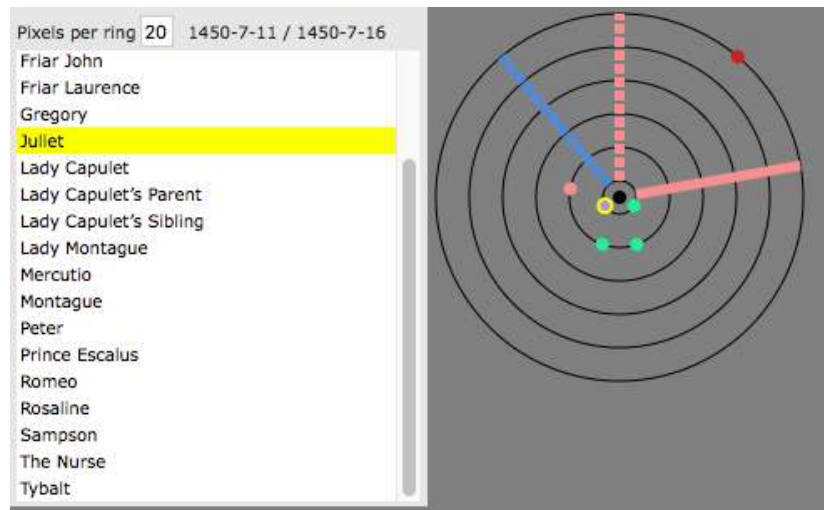
For more information about Qualified Relationships, see chapter 7.

Time Rings

The Time Rings visualization allows you to represent and explore the temporal aspect of Qualified Relationships that connect a single, specific entity: when you choose an entity, it is placed in the center of the graph; all of its associated relationships are represented as spokes or dots that are colored according to the type of relationship and placed on rings that represent chronological periods, moving outwards with the passage of time. The Time Rings visualization:

- represents all Qualified Relationships associated with a single item over that item's lifetime, either as dots (for instantaneous events) or spokes (for date ranges);
- uses the Dates Attribute configured for the visualization for the entity's Template type to get its lifespan; the Time Rings visualization only allows the end-user to select entities which have a date range for the attribute value (the current date is used as the **to** date if the value is **open**);
- uses the "Group Dates together by" setting of the Dates Attribute which has been configured as the **Dates** Attribute for Qualified Relationships in your Exhibit to determine the chronological gap between rings (days, months, years, decades or centuries);
- separates each ring graphically on the display by some number of pixels, which the end-user can change dynamically;
- displays the lifespan of the currently selected entity;
- displays the legend of the Vocabulary Attribute which has been configured as the **Relationships** Attribute for Qualified Relationships in your Exhibit and uses that legend to color items on the rings;
- when instantaneous events (dots) are selected, they have a surrounding yellow border; when date ranges (dashed lines) are selected, they become solid.

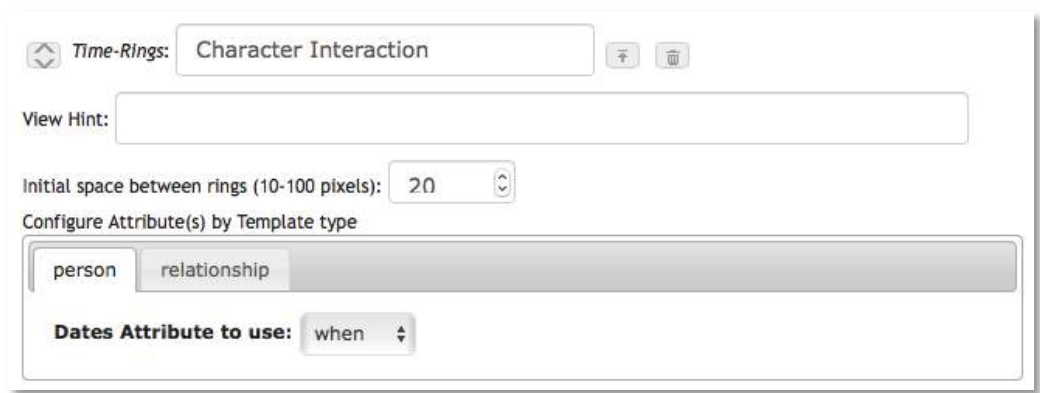
Below is an example of the Time Rings visualization showing Relationships connecting the character Juliet (in Shakespeare's play "Romeo and Juliet") to other characters through time (the play takes place over the course of six days):



The Dates Attribute configured for Qualified Relationships has been configured so that dates are grouped by individual days. The lifespan for Juliet (represented by the black dot in the center) has been set to the dates July 11, 1450 through July 16, 1450, since the only time of her life which is significant to the data are the six days of the play. Each of the six days has its own ring.

One instantaneous event (a purple node just below and to the left of the center) has been selected, as well as a date range (a pink spoke moving right and slightly up from the center).

The settings in the Dashboard for the configuration of the Time Rings visualization are as follows:



Time-Rings: Character Interaction

View Hint:

Initial space between rings (10-100 pixels): 20

Configure Attribute(s) by Template type

person relationship

Dates Attribute to use: when

The Time Rings visualization always creates a square display whose size is a product of the number of pixels between rings and the number of rings necessary to represent the lifespan of the selected entity.¹ Enter the default number of pixels to use as padding between rings into the **Initial space between rings** text box.

For each Template whose Records you wish to be appear on the selection list (on the left side of the visualization), select which Dates Attribute to use to provide a lifespan value from the drop-down menu (or leave as **disable**).

NOTE: You must leave the setting on the drop-down menu as **disable** under the Template tab that contains your QR Record data.

Data Requirements and Behavior

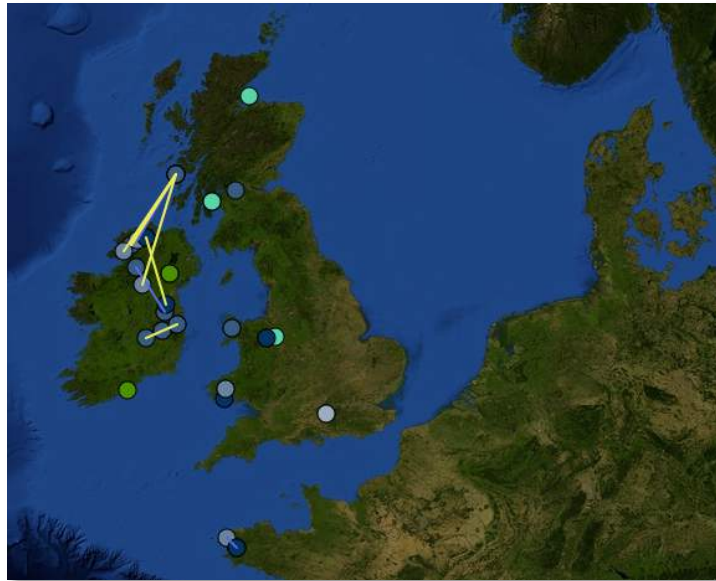
The Time Rings visualization will display the names, in the selection list on the left, of all Records that appear in a QR Record (whose Relationship is enabled in the current Legend) and that have a valid lifespan (in the corresponding Dates Attribute).

¹ The number of rings, in turn, is calculated from the lifespan of the selected entity and the chronological granularity specified by the “Group by” setting in the Dates Attribute configuration, as explained above.

For more information about Qualified Relationships, see chapter 7.

Map 1 (First Map Type)

Prospect offers two different geographical map visualizations: the one described in this section (Map 1) and the alternative map (Map 2) described in the next section. Prospect Map 1 enables you to represent Records as circles, lines or polygons on a map by geographical coordinates. Thus, Records can only be displayed if their associated Template type has at least one Lat-Lon Attribute and the particular Record has valid data defined for those Attributes.



The Prospect Map 1 visualization has a number of flexible features:

- Any of the single overlay Maps defined in the Map Library can be displayed on top of your selected Base Map (for information about individual overlay maps and the Map Library, see chapter 8).
- You can represent a Record in more than one location if it has multiple Lat-Lon Attributes. All of the multiple representations of that single Record will respond in parallel to user activity (i.e., if one marker is selected, they will all be selected).
- If the value in a single Lat-Lon Attribute is a single coordinate pair (e.g., “34.8876,-12.94328”), it will be displayed as a scalable and colored circle (see more below); if it consists of two coordinates, it will be drawn as a colored line; if it consists of more than two coordinates, it will be drawn as a colored polygon (whose color is determined by the corresponding Template’s active Legend).

- A Number Attribute can be used to scale circles representing Records on the Map. The size of the circle is determined by first considering the numeric value's position within the scale defined by the Number's Attribute range, and using that relative position against the Minimum and Maximum size parameters of the visualization.

EXAMPLE: You have a Template which has a Number Attribute called **Age**. You defined the range of Age to be between 0 and 120. When you configure the Map, you provided a **Min radius** setting of 4 and a **Max radius** setting of 14. The Map is going to render a Record that has a value of 60 for Age. As 60 is exactly in the middle of the range, it produces a circle with a radius of 9.

- A line can be drawn from the center of a marker to one or more other markers whose IDs are given in a Pointer Attribute. Each Template has its own color setting so that these lines can represent different kinds of relationships.


Click as many map markers as you'd like: selected markers will be shown with a yellow border; click again to deselect them. If multiple markers represent the same Record, they will be selected or deselected in tandem.

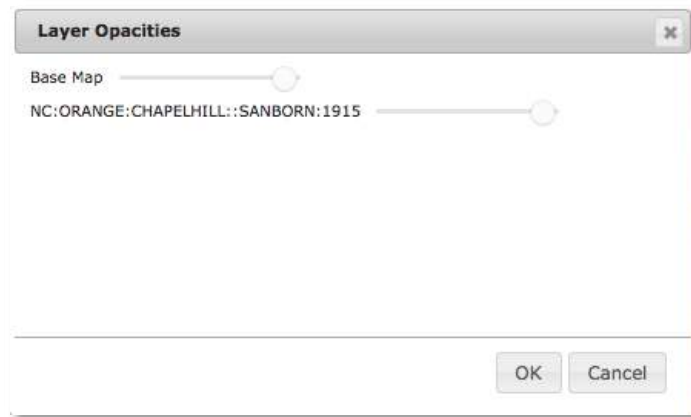
You can change the location displayed on the map by clicking and dragging it. The map visualization also contains a toolbar on the top right that contains icon buttons that affect what the map displays:



The plus icon zooms in the map display; the minus icon zooms out the map display; the clockwise arrow icon restores the zoom level and center point to their original starting point (provided by the Exhibit or Volume designer in the visualization configuration); the push-pin icon sets the center of the map to the end-user's current location (but does not change the zoom level).

NOTE: Prospect relies upon the capabilities of the browser to provide the end-user's current geographical location as well as permission to obtain it. Devices that have accurate GPS geolocation technology will produce accurate results; others, that fall back on the data provided by internet routers, will be less accurate in providing a geographical location.

If you click the **View Options** icon , a dialog box will appear that allows you to control the opacity of the base map and every overlay map shown on the Map 1 visualization:



The settings available for the configuration of a Map 1 visualization are as follows:

The Map 1 visualization will initially appear in the end-user's display centered on the coordinate given in the **Center Latitude** and **Longitude** edit boxes, with the zoom value given in the **Initial Zoom** edit box (which must be between 1 and 20).

If you wish to scale the radius of the circles that represent Records (when a single coordinate pair is given for the value of the Lat-Lon Attribute), you must provide both a **Min Radius** and **Max Radius** value. The **Min Radius** setting will be used to size circles if the **Marker Radius Size** Attribute is set to **disable** or no value is available in the Record data.

The **Clustering** checkbox is not currently used by the visualizer but is provided for future functionality.

You must provide settings for the rest of the Map 1 configuration on a Template-by-Template basis. Configure each Template that you will be displaying in this Exhibit by selecting its tab and making the appropriate selections.

Check all of the Lat-Lon Attributes that should be used to place a representation of the Record on the Map that follow **Locate Object by**.

Any Number Attributes defined by this Template type will appear in the drop-down menu labeled **Marker Radius Size**. Each Template can either scale the size of representative circles with the Number Attribute you choose here or else use the default size (given by the **Min Radius** parameter) by selecting the **disable** option.

Any Pointer Attributes defined by this Template type will appear in the drop-down menu labeled **Connect to**. Select **disable** for this feature to be ignored. The ID(s) provided by this Attribute will be used to locate the representations of those Records and a link will be drawn from this Record to those other records using the color provided by the **Link Line Color** setting. You can provide the color either by entering a hex-color value (beginning with the number sign) or by clicking on the color box, which will bring up a dialog box.

You can allow for as many Legends as you wish for Map Templates: all of those Attributes whose checkboxes are checked following **Provide Legends** will be available on the Map.

Select the base map you wish to use from the **Base Map Layer** drop-down menu. If your Map Library contains overlay map definitions, you will be able to add an overlay map by clicking the **Add Layer** button.



After you click the **Add Layer** button, a new entry will appear at the bottom of your Map configuration section that begins with the label **Map ID:**. Choose the ID of the overlay map you wish to use from the drop-down list and set its initial opacity with the slider labeled **Opacity:**.

Automatic Hints

The Map 1 visualization will automatically generate a user hint to explain which Attributes, if any, are used to determine the size of markers.

Data Requirements and Behavior

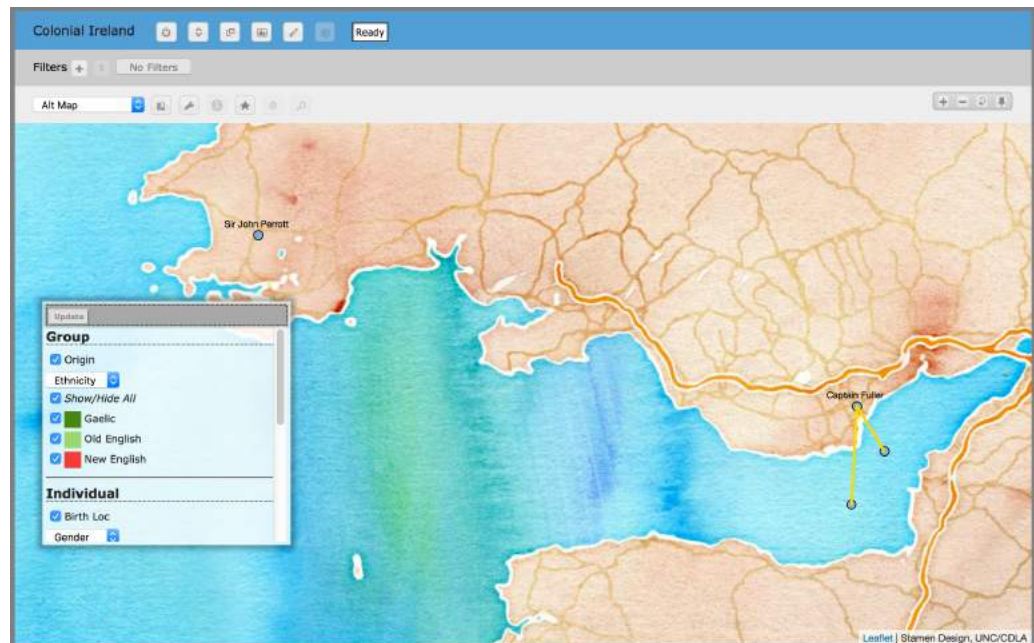
The Map 1 visualization will only show Records which have at least one value for the selected **Locate Object By** Attributes. The Record will not appear if the value for the

selected Legend Attribute is left blank in the Record or if the user has de-selected the Attribute value on the current Legend.

If the **Marker Radius Size:** Attribute is blank or indefinite in the Record, it will be assigned the **Min Radius** setting.

Map 2 (Second Map Type)

Prospect offers two different geographical map visualizations: the one described in this section (Map 2) and the map (Map 1) described in the previous section. The Prospect Map 2 visualization enables you to represent one or more connected Records as circles whose locations are described by geographical coordinates; markers can be labeled with the names of the Records. Thus, Records can only be displayed if their associated Template type has at least one Lat-Lon Attribute and the particular Record has valid data defined for that Attribute.



The Prospect Map 2 visualization has a number of flexible features:

- Any of set of overlay map groups defined in the Map Library can be displayed on top of your selected Base Map (for information about map groups and the Map Library, see chapter 8).
- If a Record has multiple values for its Lat-Lon Attribute, it will represent an “initial” anchor marker and multiple outlying markers connected to the anchor by lines. This might be conceptualized as a “broadcast” of information from one source location to one or more destination locations (i.e., a letter sent from one person to another, the distribution of newspapers, etc.). All of the multiple

markers specified by the Record will respond in parallel to user activity (i.e., if one marker is selected, they will all be selected).

- If the value in a Lat-Lon Attribute is a single coordinate pair (e.g., “34.8876,-12.94328”), it will be displayed as a scalable and colored circle (see more below); if, however, it consists of two or more coordinates, a marker will be placed at each non-initial Lat-Lon coordinate with the first coordinate connected to all of the others with colored lines (like spokes on a wheel).
- A Number Attribute can be used to scale the circles representing Records as markers on the Map. The size of the circle is determined by first considering the numeric value’s position within the scale defined by the Number’s Attribute range, and using that relative position against the Minimum and Maximum size parameters of the visualization. Multiple markers resulting from multiple Lat-Lon pairs will all be given the same size.

EXAMPLE: You have a Template which has a Number Attribute called **Age**. You defined the range of **Age** to be between 0 and 120. When you configure the Map, you provided a **Min radius** setting of 4 and a **Max radius** setting of 14. The Map is going to render a Record that has a value of 60 for Age. As 60 is exactly in the middle of the range, it produces a circle with a radius of 9.

- You can specify whether or not you would like the Record’s label to be displayed on the map centered above the “anchor” marker. (The label will not be shown above any “satellite” markers representing non-initial coordinates.) You can also assign colors for labels on a Template-by-Template basis.

IMPORTANT: When the label is shown, it only allows for about a 10-pixel radius before the marker begins to overlap with the label (although labels are always shown on top of markers).


Click as many map markers as you’d like: selected markers will be shown with a yellow border; click again to deselect them. If multiple markers represent the same Record, they will be selected or deselected in tandem.

You can change the location displayed on the map by clicking and dragging it. The map visualization also contains a toolbar on the top right that contains icon buttons that affect what the map displays:



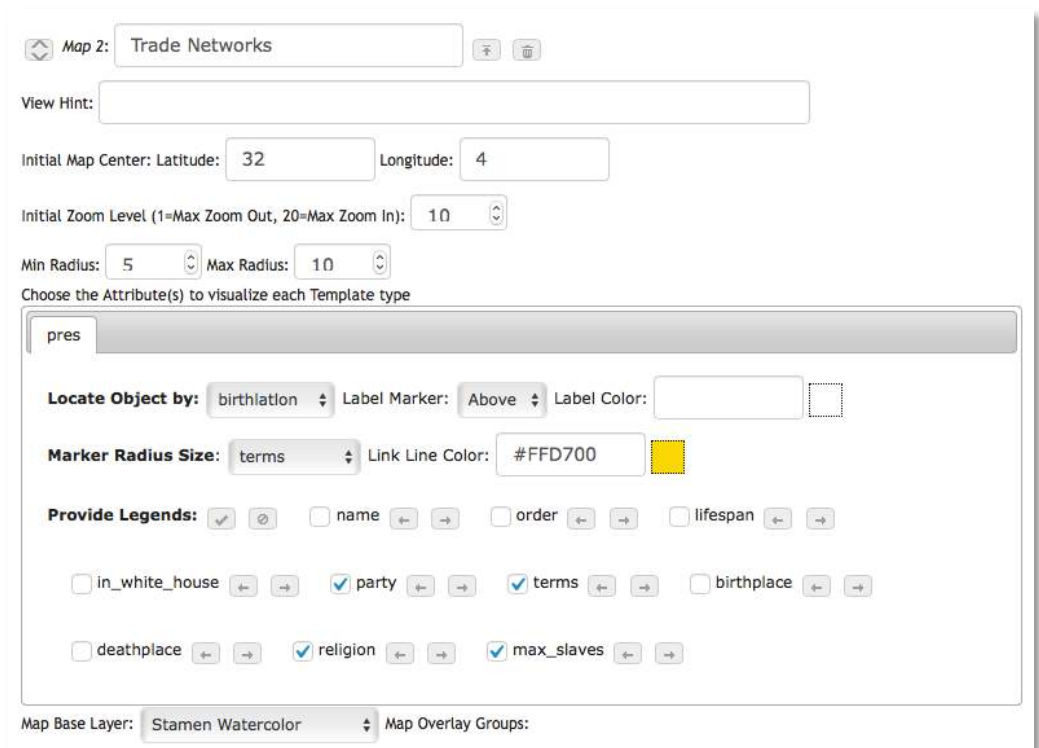
The plus icon zooms in the map display; the minus icon zooms out the map display; the clockwise arrow icon restores the zoom level and center point to their original settings (provided by the Exhibit or Volume designer in the visualization configuration); the push-pin icon sets the center of the map to the end-user’s current location (but does not affect the zoom level).

NOTE: Prospect relies upon the capabilities of the browser to provide the end-user's current geographical location as well as permission to obtain it. Devices that have accurate GPS geolocation technology will produce accurate results; others, that fall back on the data provided by internet routers, will be less accurate in providing a geographical location.

If you click the **View Options** icon , a dialog box will appear that allows you to control the opacity of the base map and every overlay map group shown on the Map 2 visualization:



The settings available for the configuration of a Map 2 visualization are as follows:

A configuration form for "Map 2". At the top, there's a dropdown menu for "Map 2:" set to "Trade Networks" with up/down and delete icons. Below it is a "View Hint:" text input field. Then, "Initial Map Center: Latitude:" with a text input "32" and "Longitude:" with a text input "4". Below that, "Initial Zoom Level (1=Max Zoom Out, 20=Max Zoom In):" with a spinner input "10". Then, "Min Radius:" with a spinner input "5" and "Max Radius:" with a spinner input "10". A section titled "Choose the Attribute(s) to visualize each Template type" contains a tabbed interface with a "pres" tab selected. Inside the "pres" tab, there are settings for "Locate Object by:" (dropdown "birthlatlon"), "Label Marker:" (dropdown "Above"), "Label Color:" (text input and color picker), "Marker Radius Size:" (dropdown "terms"), and "Link Line Color:" (text input "#FFD700" and color picker). Below these are "Provide Legends:" checkboxes for "name", "order", "lifespan", "in_white_house", "party", "terms", "birthplace", "deathplace", "religion", and "max_slaves", each with left/right arrow icons. At the bottom, "Map Base Layer:" is a dropdown set to "Stamen Watercolor" and "Map Overlay Groups:" is a text input.

The Map 2 visualization will initially appear in the end-user's display centered on the coordinate given in the **Center Latitude** and **Longitude** edit boxes, with the zoom value given in the **Initial Zoom** edit box (which must be between 1 and 20).

If you wish to scale the radius of the circles that represent Records, you must provide both a **Min Radius** and **Max Radius** value. The **Min Radius** setting will be used to size circles if the **Marker Radius Size** Attribute is set to **disable** or if no value is available in the Record data.

You must provide settings for the rest of the Map 2 configuration on a Template-by-Template basis. Configure each Template that you will be displaying in this Exhibit by selecting its tab and making the appropriate selections.

Select the Lat-Lon Attributes that should be used to place a representation of the Record on the Map from the **Locate Object by** drop-down menu.

If you wish for the Record's label to appear above the (initial) coordinate, select Above from the **Label Marker** dropdown menu.

If you leave the **Label Color** entry box empty, the label color will be black by default; otherwise, you can click on the square box to the right to get the Color Picker dialog box and set the hexcode for the color.

Any Number Attributes defined by this Template type will appear in the drop-down menu labeled **Marker Radius Size**. Each Template can either scale the size of representative circles with the Number Attribute you choose here or else use the default size (given by the **Min Radius** parameter) by selecting the **disable** option.

Choose a color to use when connecting "satellite" markers to the initial "anchor" marker by providing a value for the **Link Line Color** setting. You can provide the color either by entering a hex-color value (beginning with the number sign) or by clicking on the color box, which will bring up a dialog box.

You can allow for as many Legends as you wish for Map Templates: all of those Attributes whose checkboxes are checked following **Provide Legends** will be available on the Map.

Select the base map you wish to use from the **Base Map Layer** drop-down menu. If your Map Library contains map groups, you will be able to add an overlay map group from the Map Library by clicking the **Add Map Group** button.

The screenshot shows a configuration panel for Map 2. It includes a 'Map Base Layer' dropdown menu currently set to 'OpenStreetMap B/W'. To the right is a 'Map Overlay Groups' section with an 'Add Map Group' button. Below these, there is a 'Map Group ID' dropdown menu set to '1880s', an 'Opacity' slider control, and a trash icon.

After you click the **Add Map Group** button, a new entry will appear at the bottom of your Map configuration section that begins with the label **Map Group ID:**. Choose the ID of the overlay map group you wish to use from the drop-down list and set its initial opacity with the slider labeled **Opacity:**. You can add as many Map Groups as needed.

Automatic Hints

The Map 2 visualization will automatically generate a user hint to explain which Attributes, if any, are used to determine the size of markers.

Data Requirements and Behavior

The Map 2 visualization will only show Records which have at least one value for the selected **Locate Object By** Attribute. The Record will not appear if the value for the selected Legend Attribute is left blank in the Record or if the user has de-selected the Location Attribute value on the current Legend.

If the **Marker Radius Size:** Attribute is blank or indefinite in the Record, it will be assigned the **Min Radius** setting.

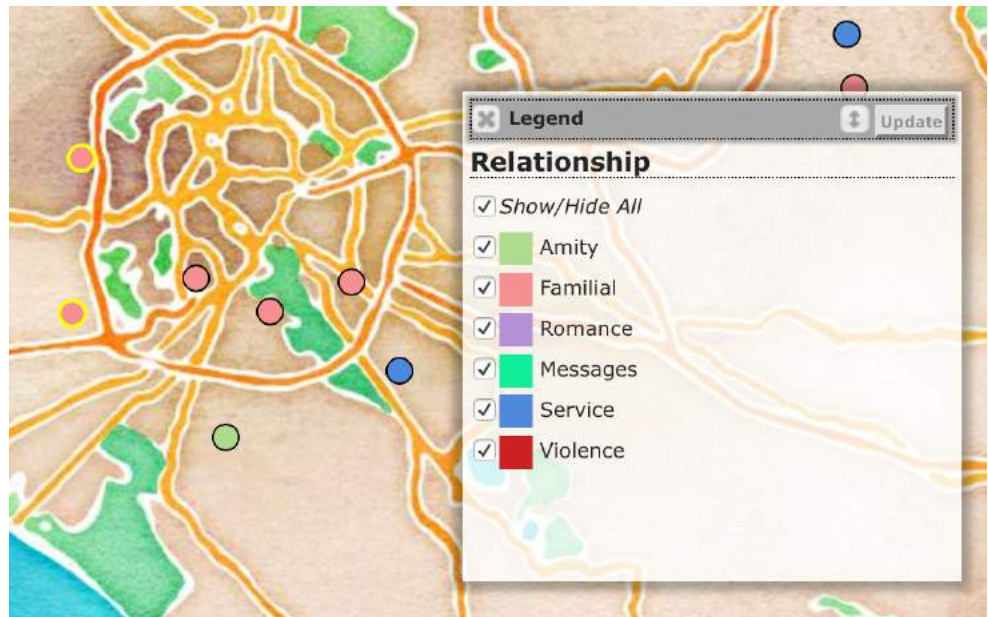
QR-Map

Prospect offers a special QR-Map visualization if you wish to represent Qualified Relationships in geographical space. There are two possible configurations for the QR-Map:

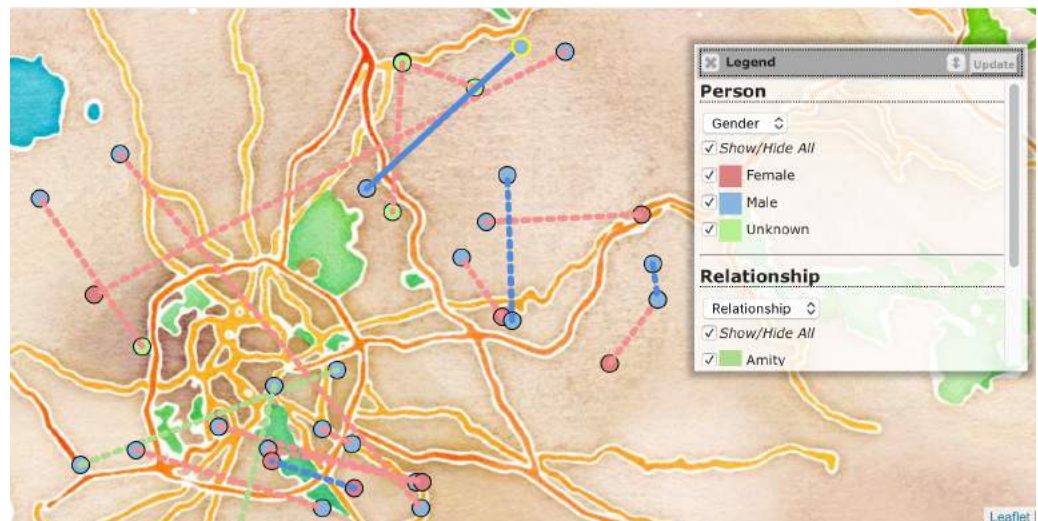
1. If you provide only one Lat-Lon Attribute in the Qualified Relationship configuration for the Exhibit configuration, then Qualified Relationships are conceptualized as being centered in a single location. The marker representing the QR on the map will be colored by the Legend of the Relationship Vocabulary Attribute.
2. If you provide both Lat-Lon and Lat-Lon Attributes in the Qualified Relationship configuration for the Exhibit configuration, then Qualified Relationships are conceptualized as connecting two discrete locations. The two markers on the map – each associated with one entity – are colored according to the currently selected Legend for the corresponding Template of the entity; a link will be drawn between the entities to represent the relationship, colored according to the Legend of the Relationship Vocabulary Attribute.

The QR-Map visualization supports overlay map groups (as described above for the Map 2 visualization) as well as scalable markers.

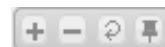
If you set your Exhibit's QR configuration to use only one Lat-Lon Attribute (case 1 above), the Legend will display the QR Relationship terms. If you select a marker on the map (causing it to have a yellow outline), the associated QR Record will be selected. The two leftmost pink markers in the display below have been selected.



If you set your Exhibit's QR configuration to use two Lat-Lon Attributes (case 2 above), the Legend will display the terms for your entities as well as the QR Relationship terms. Markers can be selected on the QR-Map as well as the links representing the Qualified Relationships between them. The upper center blue dot has been selected (indicated by the yellow outline) on the display below, as well as the blue link moving down and left from it (indicated by a solid, rather than dashed, line).




The QR-Map visualization also contains a toolbar on the top right that contains icon buttons that affect what the map displays:



The plus icon zooms in the map display; the minus icon zooms out the map display; the clockwise arrow icon restores the zoom level and center point to their original settings (provided by the Exhibit designer in the visualization configuration); the push-pin icon sets the center of the map to the end-user's current location (but does not affect the zoom level).

NOTE: Prospect relies upon the capabilities of the browser to provide the end-user's current geographical location as well as permission to obtain it. Devices that have accurate GPS geolocation technology will produce accurate results; others, that fall back on the data provided by internet routers, will be less accurate in providing a geographical location.

If you click the **View Options** icon , a dialog box will appear that allows you to control the opacity of the base map and every overlay map group shown on the QR-Map visualization:



The settings available for the configuration of a QR-Map visualization are as follows:

QR-Map: Relationship Map

View Hint:

Initial Map Center: Latitude: 39.828175 Longitude: -98.5795

Initial Zoom Level (1=Max Zoom Out, 20=Max Zoom In): 5

Min Radius (1-20): 7 Max Radius (1-20): 7

Configure Attribute(s) by Template type

institut person relation

Marker Radius Size: disable

Provide Legends: ☒ type ☐ name

Map Base Layer: Esri, Nat Geo Landscape Map Overlay Groups:

The QR-Map visualization will initially appear in the end-user's display centered on the coordinate given in the **Center Latitude** and **Longitude** edit boxes, with the zoom value given in the **Initial Zoom** edit box (which must be between 1 and 20).

If you wish to scale the radius of the circles that represent Records, you must provide both a **Min Radius** and **Max Radius** value. The **Min Radius** setting will be used to size circles if the **Marker Radius Size** Attribute is set to **disable** or no value is available in the Record data.

You must provide the other settings for the QR-Map visualization on a Template-by-Template basis.

Any Number Attributes defined by this Template type will appear in the drop-down menu labeled **Marker Radius Size**. Each Template can either scale the size of representative circles with the Number Attribute you choose here or else use the default size (given by the **Min Radius** parameter) by selecting the **disable** option.

NOTE: The **Marker Radius Size** option should be **disable** for the Template that provides the Qualified Relationship data.

The set of Attributes you select in the **Legends** section depend on whether you have configured your QR settings for one or two Lat-Lon coordinates:

1. (One Lat-Lon Attribute) The Template that provides the QR data must have one and only one Vocabulary Attribute selected, that which specifies the type of Relationship (i.e., the Vocabulary Attribute which was selected as the

Relationships Attribute in the QR configuration section of your Exhibit). The Legend selections for all other Templates should be empty.

2. (Two Lat-Lon Attributes) Select any set of Legends for the Templates that represent the entities referred to by your Qualified Relationships. The Template that provides the QR data itself must one and only one Vocabulary Attribute selected, that which specifies the type of Relationship (i.e., the Vocabulary Attribute which was selected as the **Relationships** Attribute in the QR configuration section of your Exhibit).

Select the base map you wish to use from the **Base Map Layer** drop-down menu. If your Map Library contains map groups, you will be able to add an overlay map group from the Map Library by clicking the **Add Map Group** button.



After you click the **Add Map Group** button, a new entry will appear at the bottom of your Map configuration section that begins with the label **Map Group ID:**. Choose the ID of the overlay map group you wish to use from the drop-down list and set its initial opacity with the slider labeled **Opacity:**. You can add as many Map Groups as needed.

Automatic Hints

The QR-Map visualization will automatically generate a user hint to explain which Attributes, if any, are used to determine the size of markers.

Data Requirements and Behavior

If the Qualified Relationship settings have been configured to display two markers, they will only appear if both coordinates exist in the QR Record and if the Records for both entities have Attribute values that provide a color for the currently selected Legend.

If the **Marker Radius Size** setting is set to a Number Attribute (rather than **disable**) but the data is blank or indefinite in the Record, markers will be sized according to the **Min Radius** setting.

Qualified Relationships

Prospect provides a user-defined data model: you (as the Administrator) define Attributes and clusters of Attributes (“Templates” which effectively become data containers). This is a good generalized means of creating user-configurable data schema, but the “static and flat” nature of data definitions creates inherent limitations: as there is only one level of metadata, those values cannot be made contingent, or nuanced, because there is no ability to attach metadata to/about the metadata itself.

For example, you can create Record to represent a person (“X”) and create a Pointer Attribute value in that Record that provides the identity of another Record (“Y”) to indicate that the father of person X is person Y. An Attribute consists only of a single value, however, – the ID of a Record – so there is no mechanism to create conditions or qualifications attached to that Pointer Attribute value that indicates, for example, “person X was married to person Y between the years 1900 and 1920.” That is essentially metadata about metadata.

The most straightforward mechanism for addressing this limitation – one that leverages the foundations of Prospect – is to allow for Records to represent relationships between other Records, so that the data can represent nuances and qualifications about relationships rather than just a simple Pointer. This is the definition of a *Qualified Relationship* (or “QR” for short) in Prospect.

If you wish to use Prospect’s Qualified Relationships mechanisms, you must define two different kinds of Templates:

- Templates that describe the entities involved in relationships;
- One or more Templates that describe the relationships themselves.

The Templates that you configure to express Qualified Relationships can have any Attributes in them that are appropriate for your universe of discourse, but to use Prospect’s QR mechanisms (i.e., the QR Filter and visualizations), you must provide several required Attributes and some optional ones. When you configure an Exhibit, you specify which Template to use for Qualified Relationships and which Attributes in the

Template provide the necessary Attributes. The configuration settings of an Exhibit are as follows:

- Required Attributes
 - Name: a Text Attribute providing some label for the relationship
 - Entity 1: a Pointer Attribute that points to the first entity in the QR
 - Entity 2: a Pointer Attribute that points to the second entity in the QR
 - Relationship: a Vocabulary Attribute that provides a (single-tier, non-hierarchical) set of terms that describe the possible set of relationships
 - Role 1: a Text Attribute that provides the predefined term for the role of the first entity in the relationship
 - Role 2: a Text Attribute that provides the predefined term for the role of the second entity in the relationship
- Optional Attributes:
 - Dates: a Dates Attribute that provides the time period for the QR
 - Lat-Lon 1: a Lat-Lon Attribute that provides a coordinate for the first entity of a QR, or for the entire QR (if no second coordinate is provided)
 - Lat-Lon 2: a Lat-Lon Attribute that provides a coordinate for the second entity of a QR
 - Certainty: a Numeric Attribute that provides the certainty (0%-100%) of the relationship (this is currently not used but defined for future extensions)

Notes on data requirements for QR Records:

- A single QR Record contains information about a single relationship between exactly two entities. You can always create multiple QR Records if more than two entities are involved in a relationship.
- The values for the Relationship, Role 1 and Role 2 Attributes in a Record can only have single values; they cannot use delimiters.

Besides defining and configuring the set of Attributes needed for the QR Template to meet these requirements and affordances, you will need to create and define a set of Vocabulary Attributes that provide Role terms for each of the kinds of relationships

defined by your Relationship Attribute. The values for the Role 1 and Role 2 Attribute must be taken from the set of terms provided by these Attributes; these (Role 1 and Role 2) are, however, Text Attributes in the QR Template because there is no way to predict beforehand which of these Vocabulary Attributes will provide the terms for Roles.

The use of Qualified Relationships can be illustrated by an example. Let's say that you're building a database to represent the relationships between characters in the play "Romeo and Juliet" by Shakespeare. The kinds of relationships might be listed as follows:

- Familial
- Service
- Romantic
- Goodwill

Each of these is a term in a Vocabulary Attribute we'll call "Relationship." Each of these four terms needs to correspond to a Vocabulary Attribute that provides the terms for the roles that entities can have in each of these four kinds of relationships. Here are four Vocabulary Attributes definitions that could meet those purposes (in the list below, the name of the Vocabulary Attribute is followed by list of terms for the role):

- Familial Roles: Parent, Child, Spouse
- Service: Master, Servant
- Romantic: Pursuer, Pursued, Spurned
- Goodwill: Friend, Enemy

There can be as many or as few terms in each Vocabulary Attribute as needed to provide all of the relevant roles for the relationships described by the database (at least one is required). Note, however, that these four Vocabulary Attributes never actually appear in any Template definition: instead, you must create a "lookup table" when defining an Exhibit that tells Prospect which Vocabulary Attribute to use when interpreting the associated kind of relationship.

Below are three QR Records (of many that would need to be created) that describe some of the dynamics in the play:

Name	Romeo's Wooing of Juliet
Entity 1	Romeo (ID for Romeo's Record)
Entity 2	Juliet (ID for Juliet's Record)

Relationship	Romantic
Role 1	Pursuer
Role 2	Pursued

Name	Romeo's Father
Entity 1	Romeo
Entity 2	Montague
Relationship	Familial
Role 1	Child
Role 2	Parent

Name	Enmity between Capulets and Montague
Entity 1	Montague
Entity 2	Capulet
Relationship	Goodwill
Role 1	Enemy
Role 2	Enemy

Exhibit Configuration

You must enable Qualification Relationships and provide the necessary settings in order to visualize them in an Exhibit.

NOTE: Qualified Relationships are currently only supported for Exhibits. They may be supported in Volumes in the future.

You must have already:

- defined a Template for your QR Records with the necessary Attributes

- defined a set of Vocabulary Attributes with terms for each of the Roles allowable for each type of Relationship used in your data.

NOTE: You should uncheck the **Available as Filter in Exhibit** checkbox for all of the Vocabulary Attributes which provide terms for Relationship Roles: the **Relationships and Roles** Filter provides a powerful and flexible mechanism for the end-user to filter QR Record data based on a combination of these values and it should not be necessary to create and use filters for the individual Attributes.

Open the **General Settings** panel in the Exhibit Editor and check the **Enable Qualified Relationships** checkbox. A number of drop-down menu options will appear to enable you to make configure further settings.

The screenshot shows the 'General Settings' panel with the following configuration:

- ☒ Enable Qualified Relationships
- QR Template: relation
- Entity 1: e1
- Entity 2: e2
- Dates: when
- Relationships: relation_type
- Role 1: r1
- Role 2: r2
- Lat-Lon 1: c1
- Lat-Lon 2: c2
- Certainty: disable
- Set Roles for Relationships (button)

Select the Template which will be used to provide the QR Record data in your Exhibit from the **QR Template** drop-down menu. This setting is required.

Select the Pointer Attribute in your QR Template which will provide the ID of the first entity in the QR Record data from the **Entity 1** drop-down menu. This setting is required and cannot be the same as the **Entity 2** setting.

Select the Pointer Attribute in your QR Template which will provide the ID of the second entity in the QR Record data from the **Entity 2** drop-down menu. This setting is required and cannot be the same as the **Entity 1** setting.

Select the Dates Attribute in your QR Template which will qualify the relationship in the QR Record data in chronological terms from the **Dates** drop-down menu. This setting is optional.

Select the Vocabulary Attribute in your QR Template which will provide the relationship term in the QR Record data from the **Relationships** drop-down menu. This setting is required.

Select the Text Attribute in your QR Template which will provide the term for the role of Entity 1 in the QR Record data from the **Role 1** drop-down menu. This setting is required and cannot be the same as the **Role 2** setting.

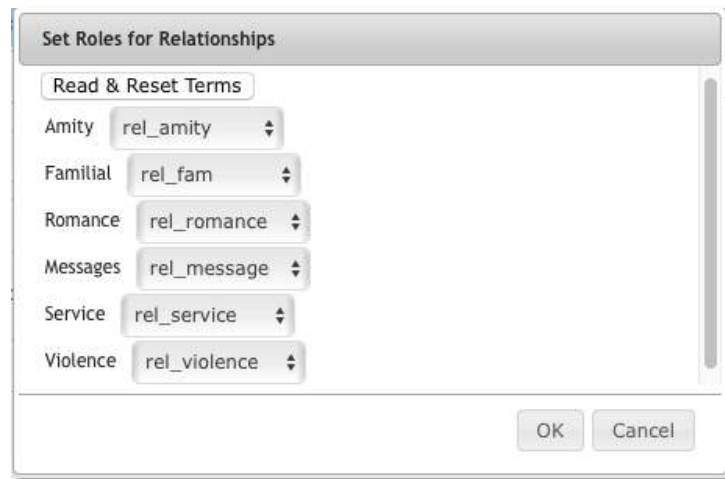
Select the Text Attribute in your QR Template which will provide the term for the role of Entity 2 in the QR Record data from the **Role 2** drop-down menu. This setting is required and cannot be the same as the **Role 1** setting.

Select the Lat-Lon Attribute in your QR Template which will provide the coordinate for Entity 1 (or the entire relationship, if located in a single location) in the QR Record data from the **Lat-Lon 1** drop-down menu. This setting is optional.

Select the Lat-Lon Attribute in your QR Template which will provide the coordinate for Entity 2 (if relationships are to be represented by two entities at two distinct locations) in the QR Record data from the **Lat-Lon 2** drop-down menu. This setting is optional.

The **Certainty** drop-down menu allows you to select a Number Attribute from your QR Template to specify the degree of certainty about the relationship. This setting is currently unused and is reserved for future use.

After you have set the **Relationships** option, you will need to provide a “map” (i.e., a set of associations) between the terms of the **Relationships** Vocabulary Attribute and the other Vocabulary Attributes which provide the term for each kind of relationship. Click the **Set Roles for Relationships** button and a dialog box such as that below will appear.



The first time that you do this after selecting a Relationship Attribute, you will need to click the **Read & Reset Terms** button in order for all of the relationship types to be read from the Attribute Legend definition.

A drop-down menu containing the names of all of the Vocabulary Attributes in your project will appear to the right of each of the terms of the Relationship Attribute. Select the Vocabulary Attribute containing the terms for each type of Relationship from each drop-down menu and then click **OK** to save this mapping.

WARNING: You must click the **Read & Reset Terms** button and choose the appropriate Vocabulary Attribute setting for each term whenever you change the Relationship setting or change the Vocabulary terms for the Attribute.

Visualizing Qualified Relationships

Since Qualified Relationships are expressed in standard Record data, they can be displayed on many of Prospect's standard visualizations: Directories, Cards, Timelines, and so on. However, Prospect has special visualizations that were designed specifically to handle the unique characteristics of Qualified Relationships:

- QR-Network
- QR-Maps
- Ego Graph
- Time Rings

See chapter 6 for details on how to operate and configure these visualizations.

Map Library

Prospect has several built-in “base map” definitions that you can use for Map visualizations (of both types):

- Esri National Geographic Landscape map
- Open Street map
- Black and White Open Street map
- Stamen Watercolor map
- Thunderforest Landscape map

WARNING: These base maps are not built into Prospect itself but are pointers to map services provided by open-source projects. Should one of them stop providing free services or alter their means of operation, the corresponding setting will cease to work properly and will need to be changed. This occurred with the Map Quest maps in July 2016: they have been removed from Prospect’s base map selections as of Prospect version 1.5.

WARNING: If a Map visualization has a reference to a base map or overlay map that does not exist, Prospect will signal an error (visible in the web browser’s error console).

Prospect is also able to add overlay layers of images on top of the base maps that you choose in your Map visualizations, as long as these overlay maps are served by a web server providing a standard Tiling Map Service (“TMS”). Depending on which map visualization you choose (Map 1 or Map 2), you can allow the user to fade in and out individual overlay maps (Map 1) or groups of related overlay maps (Map 2).

In order to use these overlay map layers, however, Prospect needs you to provide basic data about them. This data is stored in the entries in the Map Library. IDs for overlay maps and map groups will appear in the drop-down menu when you add overlay layers to map visualizations in the Exhibit and Volume Editors, as described in chapter 6.

You can provide definitions of overlay map entries in the Map Library by:

- creating and entering entries manually in the Dashboard, or
- importing the data from a CSV-file formatted with the appropriate columns, or
- importing a Map Library export file (in JSON format) via the **Archive** page.

WARNING: Prospect will try to gather together all of your Map definitions and send them to the Exhibit and Volume Editors every time they run. You should set the state of any Map whose definition is incomplete, or which is currently not in use, to **Draft** or **Pending Review**.

Map Groups

You can associate an individual overlay map with one or more map groups simply by entering the ID of the map group(s) into the Map Group IDs field of the overlay. This allows the Map 2 visualization to aggregate them together for the convenience of the end-user, when controlling the opacity of maps with the front-end visualizer.

Whenever you edit or view an Exhibit or Volume, Prospect looks at the definitions of all of the maps in the Map Library and parses the Map Group ID field, treating every unique identifier as a distinct map group. All overlay maps that have a particular Map Group ID are treated as belonging to the same

This means, however, that you must follow these guidelines carefully when editing Map Library definitions, Exhibits and Volumes:

- Map Group IDs must be exactly identical to be considered as referring to the same group: case and punctuation do count (so “This Group” is different from “This group” and “ThisGroup”);
- If you remove the Map Group ID entry from Map Library definitions such that there are no longer any map definitions that refer to this map group, you must remove all references to the Map Group ID from any Exhibits or Volumes that had used them.

Map Definitions via Manual Entry

The meaning of the necessary data will first be explained by reference to the form available in the Dashboard. All of this data is very technical in nature and will need to be provided by someone familiar with the features of the map services you are using.

The screenshot shows a web form titled "Edit Map" with the following fields and values:

Field	Value
Unique ID:	NC:ORANGE:CHAPELHILL::5
Short Name:	NC:ORANGE:CHAPELHILL::SANBORN:19
Map Group IDs:	1910s Orange County
Map URL:	http://www2.lib.unc.edu/dc/maptiles/sanborn/ChapelHill/1915/{z}/{x}/{y}.png
Inverse Y? (true or false)	false
Subdomain:	
Min Zoom:	12
Max Zoom:	20
Credits:	UNC/CDLA
N Bounds:	35.920276
S Bounds:	35.904836
E Bounds:	-79.043348
W Bounds:	-79.072339

Every entry in the Map Library needs a short, unique ID (that is not used by any other entry in the Map Library). This must consist only of alphabetic characters, numbers, hyphens, periods and underscores; it cannot begin with a period. Enter this into the **Unique ID** edit box.

It is convenient to provide a human-readable label for the overlay map entry. This should be as short and concise as possible, as it will be used as a label on the user interface. Enter this into the **Short Name** edit box.

You can associate an individual overlay map with one or more map groups by entering those map group IDs into the **Map Group IDs** edit box. You must separate each map group ID with the pipe character (“|”). Any spaces at the beginning or end of a map group ID will be automatically removed but it is suggested that you not enter them so as to minimize confusion.

Enter the full URL to the overlay map layer provided by your map server in the **Map URL** edit box. This URL will be specific to a particular map and necessarily contain variables in the form of {x}, {y} and {z}.

Some TMS map servers use an inverted y-axis. If this is true of the TMS map server you'll be using, enter **true** into the **Inverse Y?** edit box; otherwise, enter **false**.

If the TMS map server provides subdomains for this map, you must provide a list of these subdomain elements, separated by the pipe character (“|”), in the **Subdomain** edit box.

Provide the minimum and maximum zoom levels (numbers between 1 and 20) in the corresponding **Min Zoom** and **Max Zoom** edit boxes.

Credits are often displayed with maps to acknowledge their source. Provide any such credits in the **Credits** edit box.

The exact bounds of the map on North, South, East and West borders must be provided in the corresponding edit boxes.

Map Definitions via CSV Import

You can alternatively store information about Map Library entries in CSV files and import them when they are needed. CSV files can be imported using a variety of WordPress plugins, but assuming that you are using the **CSV Importer** plugin (bundled with Prospect), your CSV file must contain the following columns and values:

- **csv_post_title**: The name for the WordPress post associated with the overlay map definition. This should be indicative of the identity of the overlay map but it is only used to display the name of the map in the Map Library directory.
- **csv_post_type**: Must be set to **prsp-map**.
- **map-id**: The unique ID of this overlay map.
- **map_group_id**: One or more map group IDs separated by the pipe character (“|”).
- **map_sname**: The short name for the overlay map.
- **map_credits**: Text to acknowledge the creator or rights-holder of the map.
- **map_url**: The base URL for the overlay map on the Tiling Map Server.
- **map_subdomains**
- **map_n_bounds**: The latitude of the northern bound for the map.
- **map_s_bounds**: The latitude of the southern bound for the map.

- **map_w_bounds:** The longitude of the western bound for the map.
- **map_e_bounds:** The longitude of the eastern bound for the map.
- **map_min_zoom:** The minimum zoom level supported by the TMS.
- **map_max_zoom:** The maximum zoom level supported by the TMS.
- **map_inverse_y:** Set to **true** if the maps on the map server are placed on an inverted y-axis, **false** otherwise.

WARNING: Prospect will set the state of the Maps you have imported to **Published** by default. Change this to **Draft** or **Pending Review** if their definitions are incomplete or if they are not currently needed for your Exhibits.

Map Definitions via Archive (JSON) File

There are two ways to create an Archive (JSON) file relating to Map Library entries:

- Click the **JSON Export** button when you hover over an entry in the Map Library directory.
- Click the **Export all Maps as JSON file** link on the Archive page.

Either singular or multiple map files can be reimported into your Prospect Map Library via the **Import JSON Archive File** section of the **Archive** page.

WARNING: Prospect will set the state of the Maps you have imported to **Published** by default. Change this to **Draft** or **Pending Review** if their definitions are incomplete or if they are not currently being used by your visualizations.

Perspectives and Readings

The *Perspective* is one of the most innovative and important features of Prospect. A Perspective allows you to save the state of your interaction with an Exhibit visualization and recreate it at a later time for yourself or other users, along with an explanatory note.

This allows you to focus in on some subset of available data (by applying Filters), create a graphic analysis of the data (by choosing a visualization and choosing the appropriate settings), and write a short expository note about the meaning of what you've found.

A *Reading* is the equivalent feature for a Volume.

Perspective Data

When Prospect saves a Perspective, it saves:

- all Filters that you've created, with their settings;
- the Highlight conditions, with their settings, for either of the two View Frames (optional);
- the one or two visualizations that you've brought up on the View Frame, with their basic settings (which depend on the kind of visualization shown);
- an explanatory note that will appear in a floating window in the top-right part of the front-end visualizer.

When the Perspective is shown at a later time, Prospect recreates these settings, applies the Filters and the Highlight conditions, shows the results on the visualizations, and displays the text note.

The data saved for the visualizations in a Perspective is specific to the type of visualization shown:

- If you have created visualizations that have Legends, the Attribute chosen for each Template and the Legend selections will be saved.
- Directory and Cards views save the Attributes used for sorting each Template type.
- Facet Browsers save the values selected (if any) for each Attribute column.
- Maps save the center point and zoom level (scale) of the view.
- Timelines save the chronological position of the zoom frame.
- Network Graphs and Bucket Matrices save the on/off link settings set in the options dialog box and the Attribute selections on the Legend.

If you have an account on the WordPress server that hosts the data and you are logged in, you will be given the option to save your Perspectives on the WordPress website. Perspectives stored on the WordPress server (and set to “Published”) are available for public view by anyway looking at an Exhibit.

WARNING: As Prospect must send your credentials back to the WordPress server in order for your Perspective to be stored on it, you must be viewing the Exhibit with a URL that starts with the `https://` prefix (indicating a secure connection). If you are not, it is likely that you will not be able to save Perspectives.

Perspectives saved on the server are always saved initially in “Draft” state. Someone with Editor or Administrator credentials must set the state of the Perspective entry to “Published” for it to be available for viewing.

You will always have the option to save your Perspectives on your local Browser.

Reading Data

When Prospect saves a Reading, it saves:

- the current Reading List;
- the current selection of sections shown in the Reading Pane;
- the current View Mode;
- the conditions for determining the selection of Records highlighted, either:
 - the Highlight Filter from the Text Frame, or

- the Highlight Filter from the Visualization Frame, or
- an exact list of selected Records in both frames.
- the current state of the Visualization Frame;
- an explanatory note that will appear in a floating window in the top-right part of the front-end visualizer.

When the Reading is shown at a later time, Prospect recreates these settings, applies the Highlight conditions, shows the results on the visualizations, and displays the text note.

The data saved for the Visualization Frame in a Reading is specific to the type of visualization shown and is the same as for Perspectives, as explained above.


If you have an account on the WordPress server that hosts the data and you are logged in, you will be given the option to save your Perspectives on the WordPress website. Readings stored on the WordPress server (and set to “Published”) are available for public view by anyway looking at a Volume.

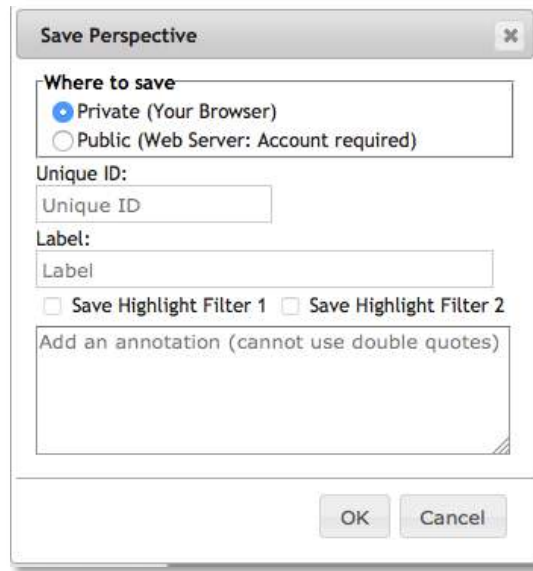
WARNING: As Prospect must send your credentials back to the WordPress server in order for your Reading to be stored on it, you must be viewing the Volume with a URL that starts with the **https://** prefix (indicating a secure connection). If you are not, it is likely that you will not be able to save Readings.

Readings saved on the server are always saved initially in “Draft” state. Someone with Editor or Administrator credentials must set the state of the Reading entry to “Published” for it to be available for viewing.

You will always have the option to save your Readings on your local Browser.

Saving a Perspective

To save the current state of the Prospect Exhibit visualizer as a Perspective, click on the **Save Perspective** icon  in the Command Bar. A dialog box will appear:

A screenshot of a 'Save Perspective' dialog box. It has a title bar with a close button. The main content area is divided into sections. The first section, 'Where to save', contains two radio buttons: 'Private (Your Browser)' which is selected, and 'Public (Web Server: Account required)'. Below this are three text input fields: 'Unique ID:', 'Label:', and 'Add an annotation (cannot use double quotes)'. There are also two checkboxes: 'Save Highlight Filter 1' and 'Save Highlight Filter 2'. At the bottom right are 'OK' and 'Cancel' buttons.

To save the Perspective locally on your web browser, select the **Private** setting of **Where to save**; to save the Perspective on the WordPress server, select the **Public** setting.

Enter an ID that will uniquely identify this Perspective in the **Unique ID** edit box. Although this ID will not be displayed to the user, it is needed to provide an identity that distinguishes this Perspective from all other Perspectives and Readings on this particular WordPress webserver. The ID must consist only of “plain-vanilla” (i.e., non-accented) letters, numbers, underscores and hyphens and be no longer than 24 characters.

Provide a human-readable label for the Perspective in the **Label**: edit box. This label will be presented to the end-user to identify the Perspective.

If the end-user created a Highlight Filter for either of the two View Frames, the corresponding **Save Highlight Filter** checkbox will be enabled. If it is checked, the settings for the Highlight Filter will be saved and reapplied when the Perspective is reloaded.

Provide any annotation you wish to make about the Perspective in the large edit box in the dialog box.

NOTE: You cannot enter double-quotation marks (") in the annotation. Any double-quotation marks you enter will be automatically removed.

Saving on the WordPress Server

If you have indicated that you want the Perspective to be saved on the WordPress server (an option that is only available if you have an account on the WordPress server and are currently logged in), you will get a confirmation message that provides the URL that will bring up the Perspective directly:



Perspective URL

To show this Perspective after it has been Published on the server, use the following URL:

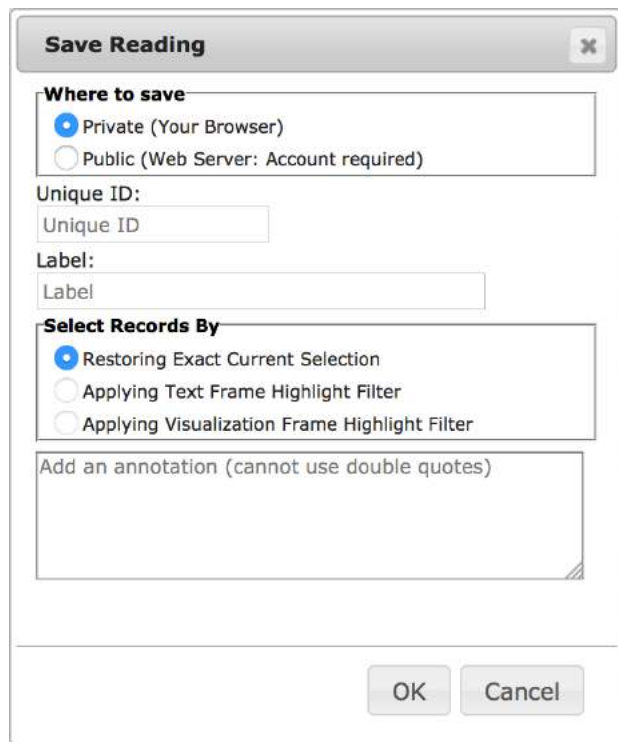
`http://dhpress.unc.edu/gig-dev/prsp-exhibit/eclit4/?prspctv=ddr2`

OK

The Perspective will be saved initially, however, as “Draft.” A user with Editor or Administrator credentials will need to set the status to “Publish” before it can be made visible to the public.

Saving a Reading

To save the current state of the Prospect Volume visualizer as a Reading, click on the **Save Reading** icon  in the Command Bar. A dialog box will appear:



Save Reading

Where to save

☒ Private (Your Browser)

☐ Public (Web Server: Account required)

Unique ID:

Unique ID

Label:

Label

Select Records By

☒ Restoring Exact Current Selection

☐ Applying Text Frame Highlight Filter

☐ Applying Visualization Frame Highlight Filter

Add an annotation (cannot use double quotes)

OK Cancel

To save the Reading locally on your web browser, select the **Private** setting of **Where to save**; to save the Reading on the WordPress server, select the **Public** setting.

Enter an ID that will uniquely identify this Reading in the **Unique ID** edit box. Although this ID will not be displayed to the user, it is needed to provide an identity that distinguishes this Reading from all other Perspectives and Readings on this particular WordPress webserver. The ID must consist only of “plain-vanilla” (i.e., non-accented) letters, numbers, underscores and hyphens and be no longer than 24 characters.

Provide a human-readable label for the Reading in the **Label:** edit box. This label will be presented to the end-user to identify the Reading.

The **Select Records By** section allows you to specify which Records will be highlighted when the end-user invokes the Reading:

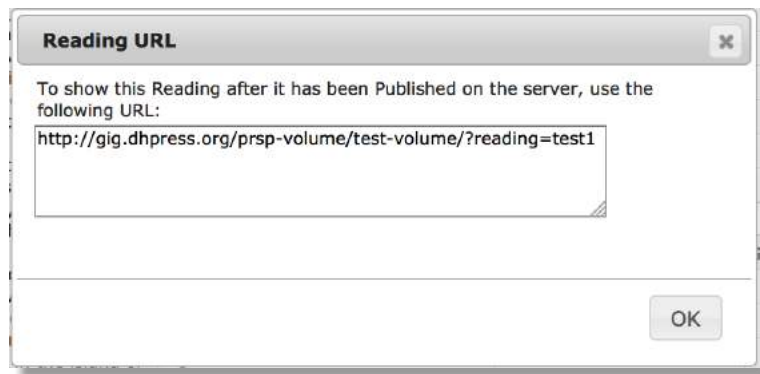
- If you choose **Restoring Exact Current Selection**, the IDs of the Records currently selected for both views will be saved and restored (this is a valid option even if no Records are selected).
- If you have created a Highlight filter for the Text Frame, you will be able to choose the **Applying Text Frame Highlight Filter** option if you wish for the Filter settings to be saved and automatically applied to the contents of the Text Frame.
- If you have created a Highlight filter for the Visualization Frame, you will be able to choose the **Applying Visualization Frame Highlight Filter** option if you wish for the Filter settings to be saved and automatically applied to the contents of the Visualization Frame.

Provide any annotation you wish to make about the Reading in the large edit box in the dialog box.

NOTE: You cannot enter double-quotation marks (") in the annotation. Any double-quotation marks you enter will be automatically removed.

Saving on the WordPress Server

If you have indicated that you want the Reading to be saved on the WordPress server (an option that is only available if you have an account on the WordPress server and are currently logged in), you will get a confirmation message that provides the URL that will bring up the Reading directly:



Editing Perspectives and Readings on WordPress

All of the information in the Perspectives and Readings that are saved on the WordPress server can be edited via the WordPress Dashboard.

Select **Prospect > Perspectives** or **Readings** for a directory listing of all Perspectives or Readings. If you select a Perspective or Reading for editing, the Dashboard will allow you to modify all of the associated data.

WARNING: Do not modify the JSON data unless you understand the details of how the data is encoded!

Displaying Perspectives and Readings

There are two ways that you can bring up a saved Perspective or Reading:


- If the Perspective or Reading is saved on your WordPress server, it can be brought up immediately via the URL provided in the dialog box that appears when you saved the Perspective or Reading.

In the case of a Perspective, this URL always follows the pattern:


exhibit_url/?prspctv=perspective_id

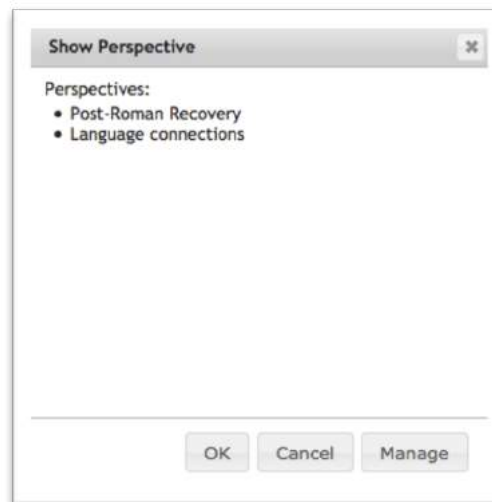
In the case of a Reading, this URL always follows the pattern:

volume_url/?reading=reading_id


- Any Perspective associated with the Exhibit, or Reading associated with the Volume, you are viewing – whether it was saved on the server or on your local web browser – is always available by clicking the **Show Perspective** or **Show Reading** icon  on the Command Bar.


IMPORTANT: Web browsers consider URLs beginning with **http** different from those beginning with **https**. The data stored in the local storage on your browser is attached to specific URLs. This means that if you save a Perspective or Reading while you are viewing an Exhibit or Perspective privately (in your browser), it will not be available or visible to you unless you are using the exact same protocol (**http** or **https**) you used when you saved it.

When you click the **Show Perspective** or **Show Reading** icon , the following dialog appears:



Click on the Perspective or Reading you wish to see and then click **OK**.

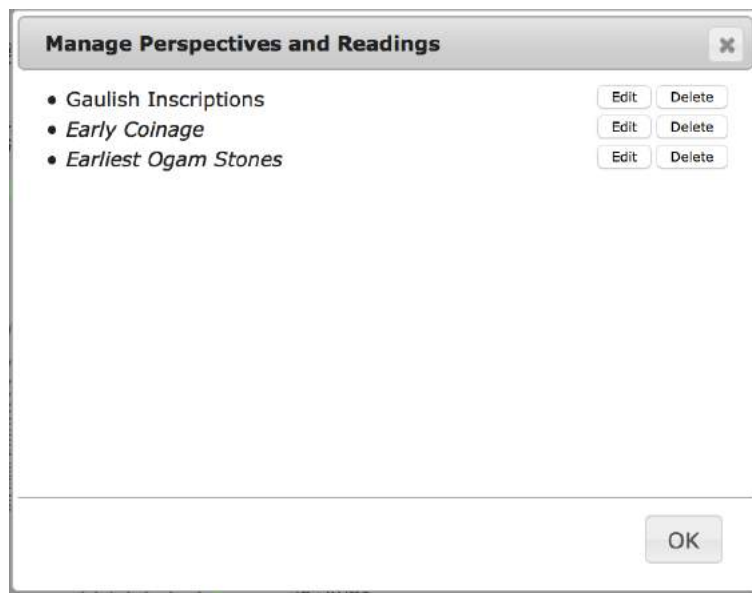
When you display a Perspective using either one of these methods, the Filter Stack is hidden. Click the **Show/Hide Filters** icon button  on the Command Bar on the top to show these elements on the display.

If the Perspective or Reading has an annotation attached, it will be shown in the top-right corner of the browser display. To show or hide it, click on the **Show/Hide Annotation** icon  of the Command Bar.

Managing Browser Perspectives and Readings

If you click the **Manage** button on the dialog above, or on the **Show Readings** dialog box in the Volume visualizer, you will be able to edit or remove the Perspectives and Readings stored locally in your web browser. Since these Perspectives occupy memory, you may wish to remove those that are obsolete or no longer useful to you.

The **Manage Perspectives and Readings** dialog looks like the following:



The Perspectives or Readings that are associated with the Exhibit or Volume you are currently viewing are listed first in the list. Perspectives and Readings associated with other Exhibits and Volumes appear after them in italics.

To edit the label or annotation of a Perspective, click on the **Edit** button to the right of the label. To remove a Perspective or Reading from the local storage of your web browser, click on the **Delete** button to the right.

Edit Perspective ✕

Label:
Language connections

Looking at Connections, emphasizing languages

OK Cancel

Advanced Topics

This chapter will cover some of the advanced technical aspects of Prospect, including language customization and configuring AJAX packet sizes. The first three sections below relate to settings provided by the **Settings** section of the **Prospect** menu on the Dashboard.

AJAX Packet Sizes

Prospect's front-end visualizer retrieves Records from the back-end code sitting on the server in batches requested by an AJAX request. Each batch requires working memory to process and collate the Records: the larger the number of Records in each batch, the more working memory it requires.

If this number is too large, it will overwhelm the working memory available on your WordPress web server and the request will fail. The smaller it is, however, the more fragmented the requests may be for loading a large data set and hence the longer it may take for end-users to get started their visualization experience.

You should provide the size of AJAX batch requests in a setting available on the **Settings** section of the **Prospect** menu.



Number of Records per AJAX request 1500

The number you provide will depend upon the amount of working memory available on your WordPress webserver and the number of Attributes in your Records. You may wish to consult your system administrator for recommendations.

Help System

You can enable or disable Prospect's help system for all of the Exhibits and Volumes on your website via the **Enable Help Tour** setting of the **Settings** section of the

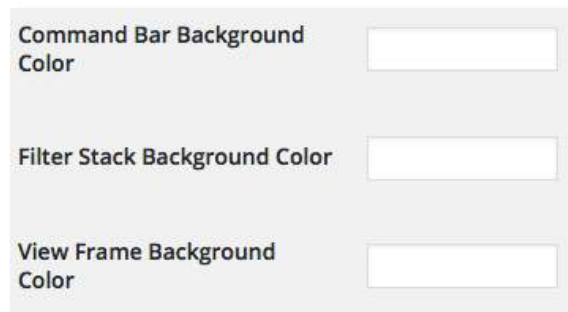
Prospect menu. This must be set to the text `true` in order for the help system to be loaded.

NOTE: Keep in mind that the `hopscotch` library that provides the help system functionality adds another 24K of JavaScript code, 12K of CSS, 10K of images and four server requests to Prospect's loading process. While end-users with good internet service may not notice the time needed to load these extra resources, other end-users with smaller bandwidth or poorer service may notice the increased requirements.

Custom Color Scheme

Prospect comes by default with a blue and grey color scheme for the front-end visualizers. You can change the background color of regions of the front-end visualizer by providing new background color settings.

Go to the **Settings** section of the **Prospect** menu and provide values in the following edit boxes.

A screenshot of a settings dialog box with a light grey background. It contains three rows, each with a label on the left and a text input field on the right. The labels are "Command Bar Background Color", "Filter Stack Background Color", and "View Frame Background Color". The input fields are empty.

WARNING: The values you provide will be simply inserted into the HTML of the front-end and must be valid hex codes or CSS color names. Prospect does not do error-checking on the text you provide.

Prospect Shortcode

Prospect defines a WordPress shortcode that will have the effect of inserting HTML to display a listing of Records into a post page. The shortcode itself is `prospect`. It has two required parameters and five optional parameters.

Required Parameters

The `prospect` shortcode must provide at least two parameters in order to operate:

- `template`: the ID of the Template whose Records are to be displayed.
- `display`: which display style should be used for the HTML output, which must be one of the following values:

- `list`
- `cards`
- `images`

The format of these various types of display are explained in the “Templates” section of chapter 4.

So, for example, the shortcode to display Records which belong to a Template whose ID is `pres` in the “cards” style would be:

```
[prospect template="pres" display="cards"]
```

Optional Parameters

If you want an image or additional textual information to appear in the representation of your Records, you will need to use the following additional (optional) parameters:

- `image_attr`: the ID of an Image Attribute.
- `content_attr`: the ID of a Text or Vocabulary Attribute.

The `prospect` shortcode also allows you to filter Records so that only those that meet a specific condition (based on Attribute values) are displayed. In this case, three further parameters are required:

- `filter_attr_id`: the ID of the Attribute whose value will be used as basis of conditional comparison.
- `filter_attr_val`: the value that should be checked against each Record’s Attribute value.
- `filter_attr_comp`: the type of comparison to do on Attribute values; must be either `=` or `!=`

So, for example, if you wished to display all Presidents (as a list) whose party affiliation was Whig, the shortcode would look like this:

```
[prospect template="pres" display="list"
filter_attr_id="party" filter_attr_val="Whig"
filter_attr_comp="="]
```

The shortcode to display all Presidents (as a set of images) whose party affiliation was not Federalist would look like this:


```
[prospect template="pres" display="images"  
filter_attr_id="party" filter_attr_val="Federalist"  
filter_attr_comp="!="]
```

Perspectives, Readings and Server Configuration

Prospect's mechanism that saves a Perspective or Reading to the WordPress server relies upon the ability to pass the user's credentials from the browser to the server over the internet. This, in turn, assumes that the user is viewing the Exhibit or Volume using a URL that starts with the `https` protocol prefix.

If you have problems, check the URL on your browser and its error console. If you have any problems, you may need to flush the cache.

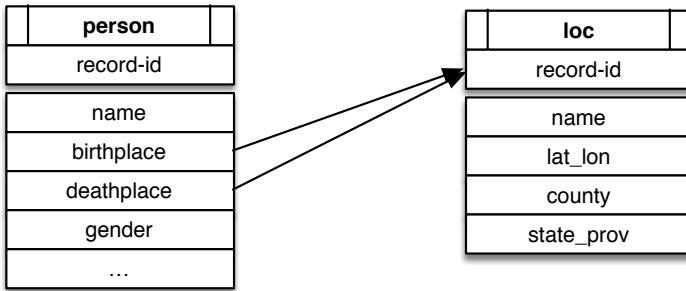
Pointer and Join Attribute Usage

Pointer and Join Attributes are similar in that they both identify other Records by their ID. While Pointer Attributes allow you to represent relationships between Records of any independent Template types, Join Attributes enable the data from the Record of a dependent Template type to be copied into the Record of an independent Template type. The use of Join Attributes and dependent Templates is an advanced topic and is best exploited by those with a knowledge of computer databases.

The value of a Pointer Attribute is used by certain visualizations to draw connections between items and by the Inspector and Record Post pages to create links to the Record Post page(s) of the Records indicated. The two Records – the “source” Record containing the ID of a “target” Record – remain distinct and independent, even if some relationship is implied by the Pointer.

The value of a Join Attribute, by contrast, is used when the Record data is fetched so that the values of a Record in a dependent Template can be entirely copied into the Record in an independent Template, so as to augment or supplement it. When the IDs of the Attributes that come from the dependent Template are shown in the Exhibit Editor, they are given in “dotted notation” to indicate both the Join Attribute that provided the ID for the dependent Template and the IDs of the individual Attributes in the dependent Record.

Say, for example, that you have a dependent Template with the ID *loc* and that Records of this Template type supply all of the location-specific information for your independent Template. Let's further assume that you have an independent Template with the ID *person* and that the *person* Template contains two Join Attributes called *birthplace* and *deathplace* that contain IDs for *loc* Records. This could be represented by the following diagram:



When a *person* Record is retrieved by Prospect, the *loc* Records whose IDs are stored in the *birthplace* and *deathplace* Attributes are used to find the matching *loc* Records, and all of these Attribute values are inserted into the *person* Record.

NOTE: If a Join Attribute value is left blank or no matching ID for it can be found in the corresponding dependent Template, the corresponding Attributes and Attribute values in the independent Template will be left undefined.

After a complete retrieval results in a person Record that can have dot-notation Attributes values where the single Join Attribute value once was.

person
record-id
name
birthplace.name
birthplace.lat_lon
birthplace.county
birthplace.state_prov
deathplace.name
deathplace.lat_lon
deathplace.county
deathplace.state_prov
gender
...

All of the characteristics of the Attributes from the dependent Template are preserved after they are copied into the independent Template. Prospect attempts to make intelligible labels for the combined Attributes by appending the labels of dependent Attributes in parenthesis. If, for example, the label for the *birthplace* Join Attribute is **Born** and the label for the name Attribute of the *loc* Template is **Place**, the resulting label for the joined Attribute will be **Born (Place)**.

REST Interface

Prospect takes advantage of WordPress's emerging REST API (in WordPress 4.4 supplemented by the WP REST API plugin). If you have activated the REST API plugin on a website that runs Prospect, Prospect will provide the following end-points for data communication (where *mybaseurl* is the URL to your website):

- *mybaseurl/wp-json/prsp/v1/attids*

This will return an array of all of the IDs of the Attributes published on this website.

- *mybaseurl/wp-json/prsp/v1/attribute/id*

This will return the definition of the Attribute whose ID is *id*.

- *mybaseurl/wp-json/prsp/v1/tempids*

This will return an array of all of the IDs of the Templates published on this website.

- *mybaseurl/wp-json/prsp/v1/template/id&t*

This will return the definition of the Template whose ID is *id*, along with the number of Records of this Template type (as a field named *n*).

If *t* is *r*, then no joins will be done in the case of Join Attributes in an independent Template; if *t* is *j*, however, and this is an independent Template, then all of the Attributes of dependent Templates pointed to by Join Attributes in the Template will be joined before they are returned.

- *mybaseurl/wp-json/prsp/v1/recids/id*

This will return an array of Record IDs belonging to the Template identified as *id*.

- *mybaseurl/wp-json/prsp/v1/records/id&from&to*

This will return an array of Record data for Records belonging to the Template identified as *id*, beginning with the record number *from* through record number *to*. The index number parameters *from* and *to* start at 0.

- *mybaseurl/wp-json/prsp/v1/record/id*

Returns the “raw” (non-processed and non-joined) definition of the Record whose ID is *id*. This interface is thus meant to allow the end-user to inspect and edit the Record entry.

NOTE: The consumer of the API must have sufficient credentials to inspect the Record data.

Language Customization

Prospect uses WordPress's standard internationalization techniques to support language independence and translation. Prospect includes a `.pot` file (in the `languages` directory) containing all of the distinct text strings in Prospect; translations of that text into other languages can be done independently using mechanisms within the WordPress repository. For technical details, see <http://developer.wordpress.org/plugins/internationalization/how-to-internationalize-your-plugin/>

There are two important quirks and caveats regarding these strings, however:

- Because of technical limitations, there are a few text strings that are enclosed in straight double-quotes ("). You must leave the quotation marks in place and only translate and replace the text inside.
- Because of technical limitations, there are several instances of text strings that are embedded within HTML statements. You must only translate and replace the relevant text (usually enclosed in straight double-quotes) and leave the rest of the HTML alone, exactly as before.

As of Prospect 1.3, the text used to customize the operation of D3 has changed. The text `no-d3-local` indicates that the default English text should be retained. If you wish for D3 to use other text or formatting options for a different target language, provide the appropriate JSON object definition, as explained at http://d3-wiki.readthedocs.io/zh_CN/master/Localization/

Transcription Files

The work of many scholars is grounded in fieldwork and recordings – video and audio – made with human subjects and other observable phenomena. Prospect supports the use of such ethnographic material by integrating “playback widgets” for YouTube videos and audio recordings directly in the Inspection Selector.

If you also have transcriptions for these materials, Prospect will automatically synchronize the transcription(s) with the A/V playback widget you configure. Given the multilingual nature of research and global subjects, Prospect allows you to designate one or two transcription texts which are shown side-by-side.

Transcription files must adhere to very strict guidelines to work properly:

- Transcription files must be plain text files (**.txt**) that are encoded in UTF-8 format.
- They must begin and end with timestamps.
- The only occurrences of the square brackets (“[” and “]”) in the transcription files should be to provide timestamps.
- Every timestamp must be on a line by itself.
- The transcript file must begin with the timestamp [00:00:00.0]
- The transcript file must have a concluding timestamp at its very end (with no text following it).
- Every timestamp must be in the format [HH:MM:SS:mm] where
 - HH is the number of hours (two digits) at the beginning of the following segment
 - MM is the number of minutes (two digits)
 - SS is the number of seconds (two digits)

- `mm` is the fraction of a second. If `mm` is only one digit, it specifies tenths of a second; if `mm` is two digits, it specifies hundredths of a second.
- If you are displaying dual transcript files, they must correspond to one another exactly (with the exact same number of segments and exact same timestamps).

Prospect will attempt to maintain the pattern of line breaks/carriage returns in your transcription files. You may need to experiment with line length and segmentation for an aesthetically pleasing result.

WARNING: The transcription mechanisms in Prospect will fail unless your WordPress website is open for public use. That is to say, if you restrict the reading privileges of your website in some way (i.e., so that only people with an account on your website can access it for reading), transcription files will not load properly.

The Prospect website contains examples of the use of transcript files to which you can refer.

Storing Your Transcription Files

Browsers do not like data being loaded from web servers other than that from which the webpage itself has been loaded. You will probably need to upload your transcription files to the Media Library of your WordPress server and use the URL to them there.

Using Timecode Attribute values to Extract Playback Segments

Prospect's Timecode Attribute allows you to playback extracted segments of audio or video records. If you are using a Transcript widget in the Inspection Selector, the values for the Timecode Attribute in your Records must exactly match the Timestamps in your transcription files.

Prospect's transcription widget looks for exact matches between Timecode Attribute values and Timestamp values in the transcription files. If these do not match, errors will ensue.

Trouble Shooting

Always be sure to test your data in your website before you let it loose upon the public.

Gather Data

If something does not look or behave as you expect, your first strategy should be to collect as much information as you can.

- Open the error console of your web browser. Unfortunately, every web browser has a different way of opening and accessing its error console: look for a command in the **View**, **Develop**, or **Tools** menus. Make a note of any errors.
- What version of Prospect are you using? (The version number will be shown in the **Plugins** section of the WordPress Dashboard and in the **About Prospect** dialog box.)
- What web browser are you using? What version? Does it support the features needed by Prospect?
- What version of WordPress is running on your web server? Is it recent enough to support Prospect's requirements?
- What version of PHP is running on your web server? Is it recent enough to support Prospect's requirements?

Known Problems

As of 1.8, the bugs or issues known to exist and yet to be addressed include:

- The draggable top bar of the Legend cannot currently be dragged on touchscreen devices (due to shortcomings of the jQueryUI library which have yet to be addressed).
- *Sorting strings with non-plain-ASCII characters*: JavaScript still does not provide a thorough and consistent manner for dealing with the variety of complex character sets (beyond “plain vanilla” ASCII) that exist. Until a comprehensive

solution is provided, Prospect uses its own optimized string comparison function which ends up putting accented characters at the end of all others. For details on JavaScript problems, see: <http://mathiasbynens.be/notes/javascript-unicode>

Symptoms

- *I can't see my data on the front-end visualizers:* Computers are very exacting about data. There are numerous potential pitfalls related to the “cleanliness” of your data and the configuration of your Exhibits that could result in an empty or non-functioning display. Consider these possibilities carefully:
 - Do you have the most recent version of your web browser?
 - Is your choice of WordPress theme interfering with the creation of the HTML page? Try switching to the most plain and generic theme that you have available and see if that makes a difference.
 - If there is anything wrong with the format of the columns in your CSV file, or the data entries in your CSV file, the data may not get imported into WordPress at all. Ending a column name with a space character can render the CSV Importer plugin inoperable. Look at your Record data by choosing the **Edit** link when hovering over a Record on the Record Dashboard.
 - Do you have all of the necessary columns in any spreadsheet of Records you have imported (e.g., `csv_post_type`, `tmpl-id` and `record-id`)? Do they all have the proper hyphens or underscores (you cannot use one where the other is required)?
 - Are the IDs of your Attributes, Templates and Records formatted properly? Review the relevant sections in this manual.
 - Does the value given for the `tmpl-id` column of the Records you have imported correspond to the ID given to one of the Templates you have defined?
 - If you are looking at a visualization that relies upon Legends (Cards, TextStream, Map, Pinboard, Timeline, Stacked Chart, Network Wheel, Facet Flow or MultiBlock Map), you must have defined the colors for the Legend in the Attribute configuration and your Records must have values that match the corresponding defined Legend values. If this is not the case, no color can be assigned and thus no graphical representation can be rendered.

- If you are looking at a visualization that requires an Attribute value in order to place or order Records on the display (TextStream, Map, Pinboard or Timeline), only those Records that have a well-defined value will be displayed.
- *The front-end visualizer is formatted strangely, is littered with non-Prospect text or graphics, or otherwise don't look correct.* Although Prospect attempts to discard all other JavaScript code libraries and CSS styles when it loads and creates the front-end visualizer (which corresponds to an Exhibit or Volume post page), it is still possible for the theme you've chosen or the other plugins you've activated to interfere with this process. Try changing your chosen theme and deactivating your plugins to determine if one of these is causing the problem.
- *Transcripts don't load properly; text appears that says something about logging in.* Transcription files will not work properly unless you configure your WordPress website to be readable by anybody (and not just people with user privileges). See notes in chapter 11.
- *My browser gives me a Cross-Origin Resource Sharing error when I bring up the Inspector.* Browsers try to prevent content from being loaded from disparate web servers in order to minimize the possibility that rogue code with ill intent will enter your browser from a non-vetted source. This error may be triggered when Prospect tries to load data from a server other than that which hosts your Exhibit, Volume and Record data.

If you get this error when you attempt to open the Inspector, it indicates that an attempt was made to load data that a Record points to which resides on another web server. To prevent this error from happening (if it actually is causing you problems), store the data on your own web server and modify your Record data to point to its new “home.”

- *The Dashboard Editors (for Attributes, Exhibits, Records and/or Templates) crash or behave erratically.* When you load editors in the Dashboard, other plugins are able to insert their own code and these have the possibility of interfering with Prospect's code. Try deactivating your other plugins one by one to see if this alleviates the problem; if you do find a conflict of this nature, please contact us with what you find.
- *The CSV Importer tool reports a timeout error.* All web servers and webservice have limitations. If you are importing a very large amount of data (in the thousands of cells, when you multiply rows by columns) you may receive a timeout error. Check to see how much, if any, of your Record data has been imported. You may need to subdivide your data. Split your single file into two or more files – each with the same header row, which CSV importers need to understand the data – and import them individually.

- *An error appears in the Transcript playback widget.* Make sure that you have used the **http://** prefix in the URL for the website.
- *The format of content on Record Pages is not properly formatted, or designated Attribute content or playback widgets do not appear at all.* The ability of WordPress themes to create an entirely arbitrary – and thus unpredictable – HTML structure and set of CSS styles is both the system’s strength and weakness. If the formatting of the page is a problem, the CSS styles may need to be altered to accommodate its placement within page, according to the context created by the theme.

If the Attributes or playback widgets that you configured to appear in the Template editor of the Dashboard do not appear at all, it may be because the theme is not creating an HTML element that Prospect expects to find in order to insert this content. If Prospect cannot find a DIV whose CSS class is **.entry-content**, it will not be able to insert the content that you have configured.

Data Quick Reference

This section provides a summary of the technical details and formats for Prospect data.

Required Columns in CSV File

For use with CSV Importer plugin:

- Set `csv_post_title` to the WordPress name for the Record
- Set `csv_post_type` to `prsp-record`
- Set `tmpl-id` to the internal ID of the Template type
- Set `record-id` to a unique ID
- Create columns for all of the Attributes specific to your Template type; each column needs a header with an Attribute ID.

IDs

- Consist only of non-accented letters, numbers, hyphens and underscores.
- Cannot use the ID `disable`.
- Do not begin with underscore “`_`” (as WordPress reserves this for internal purposes).
- Make as short as possible while still indicating their meaning.

Attribute Value Formats

- Text

- Do not use the straight-vertical double-quote character (") in text values: if you need to use double quotes, use the angled open- and closed-double-quote characters ("").
- Vocabulary
 - Vocabulary terms are limited to 32 characters but can consist of any combination of letters, numbers, punctuation, etc., as long as they are always exactly the same (including upper-/lowercase).
 - Spaces within a term are allowed but do not begin or end a term with a space.
- Number
 - Integers only; do not use commas or periods.
 - ? indicates an indefinite ("placeholder") value.
- Dates
 - *YYYY*

Years can always be prefixed by a tilde "~" to indicate fuzziness and/or a minus sign "-" for BCE, in that order.
 - *YYYY-MM*
 - *YYYY-MM-DD*
 - *YYYY-MM-DD/YYYY-MM-DD*
 - *YYYY-MM-DD/open*
 - ? indicates an indefinite ("placeholder") value.
- Lat-Lon
 - *x.x, y.y*
 - *x.x, y.y | x.x, y.y ...* (where "|" stands for whatever delimiter you have specified, which cannot be a comma)
- X-Y
 - *x.x, y.y*

- $x.x, y.y \mid x.x, y.y \dots$ (where “|” stands for whatever delimiter you have specified, which cannot be a comma)
- Image
 - Full URL to a JPG, PNG or GIF image file
- Audio
 - Either a full URL to an MP3 file hosted online, or
 - A full URL to a SoundCloud source in the format [//soundcloud.com/account/track](https://soundcloud.com/account/track)
- YouTube
 - Only the shortcode portion of a YouTube URL (following “?v=” at the end)
- Transcript
 - Full URL to a plain text file containing timecodes and text
- Timecode
 - **HH:MM:SS.ms–HH:MM:SS.ms**
- Pointer
 - The ID of another Record (or leave blank). Can take multiple IDs separated by delimiter character.
- Join
 - The ID of another Record (or leave blank).

Prospect Versions and Compatibility Issues

In order to use the features of the latest version of the plugin that you download, you may need to **Deactivate** the Prospect plugin and then re-**Activate** it from the **Plugins** menu of the WordPress Dashboard. Doing so does not have any effect on the data.

Version 0.9.9 (and before) to 0.9.10 (and above)

The format of the Perspective data changed in version 0.9.10, which will cause the following compatibility issues:

- Older versions saved a single “Selection Filter” which is ignored in newer versions;
- Number and Dates Filters save min/max values differently and cannot be used in newer versions.

Version 1.2 to Version 1.3.1

The format of the embedded references to Record IDs in Volume text changed from version 1.2 (when they were first introduced) to 1.3.1. Whereas in 1.2 embedding a Record ID required inserting the ID into the **data-id** attribute of an **a** link, in 1.3.1 onwards you merely prefix the Record ID with the hash character (“#”) and use that combination for the **href** attribute of the **a** link. This is simpler and enables all editing to happen on the **Visual** tab of the Dashboard editor.

Version 1.5

Map Quest maps are no longer available as base maps as of 1.5. If a map visualization in your Exhibit or Volume uses a Map Quest base map, edit it and choose another.

Version 1.6.1

Prospect 1.6.1 introduced new text-match options for Text, Tags, and Pointer Filters that did not exist previously. Prospect 1.6.1 interprets Perspectives and Readings saved in previous versions in the following ways:

- Text Filters and Pointer Filters both select the corresponding **contains** search option by default;
- If the **Part of tag** checkbox had been checked in the settings for a Tags Filter, the **Tag that contains** option will be selected; otherwise, the **Exact tag match with** option will be selected.

Version 1.7

Prospect 1.7 introduced the Auto-Update feature. If your Exhibit or Volume has not been configured with the **Enable Auto-Update** checkbox, it will be automatically enabled if there are less than 500 data items.