



U.S. Environmental Protection Agency



User Guide for the Interactive Conceptual Diagram (ICD) Application

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Preface

This user guide provides general guidance on how to use the Interactive Conceptual Diagram (ICD) application on the Causal Analysis/Diagnosis Decision Information System (CADDIS) website (www.epa.gov/caddis). The ICD application is a tool designed to help users create conceptual diagrams for their causal assessments, and then link supporting literature to those diagrams.

Development of this guide coincides with the 2010 release of CADDIS, which includes the ICD application. The ICD User Guide is intended to be used by anyone using the ICD application, and it should allow any new user to employ the application without further instruction.

Recommended citation:

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1 Introduction

1.1 The Interactive Conceptual Diagram (ICD) Application

The Interactive Conceptual Diagram (ICD) application is part of the U.S. EPA's Causal Analysis/Diagnosis Decision Information System (CADDIS) website (see Section 1.2). In CADDIS, conceptual diagrams are used as visual tools for structuring causal assessments of stream biological impairment; these diagrams illustrate hypothesized pathways by which human activities and associated sources and stressors may lead to biotic responses in aquatic systems. The ICD application builds upon this role for conceptual diagrams, linking supporting literature to hypothesized causal pathways and using conceptual diagrams as the front-end for searching an online citation database of this literature-based information.

By organizing literature evidence along the causal pathways laid out in conceptual diagrams, the ICD application helps you visualize where evidence for different pathways is strongest, and where evidence may be weak or lacking. It can help you structure your causal assessment, as well as communicate and defend the results of that assessment, by linking evidence to the assessment road map as laid out in your conceptual diagram. Literature evidence already entered into the ICD database can help you gain a better understanding of how sources, stressors, and responses may be operating in your system, and to quickly and efficiently provide you with peer-reviewed scientific literature relevant to specific cause-effect linkages of interest to you, which you can then apply in your own causal assessment.

The ICD tool provides:

1. A set of U.S. EPA-constructed conceptual diagrams illustrating human activities, associated sources and stressors, and potential biotic responses (collectively referred to as shapes), which can be used to search the ICD literature database for peer-reviewed scientific literature supporting linkages among selected shapes;
2. An online graphical editor that allows users to create new (or modify existing) interactive conceptual diagrams and link new or existing references to those diagrams;
3. A collaborative workspace, whereby users can grant other users the ability to revise diagrams they have created.

This User Guide explains how to use the ICD tool to access supporting references linked to existing diagrams, create new diagrams and link supporting references to them, share and revise diagrams with selected collaborators, and add new entries to the ICD online citation database.

1.2 The CADDIS Website

Thousands of water bodies in the United States are listed by states as biologically impaired, and for many of these the pollutant causing the impairment is reported as "unknown". Accurate and defensible identification of pollutants is an essential element of many regulatory and water quality management programs. For example, when a water body is listed as biologically impaired under Section 303(d) of the Clean Water Act, states and tribes must determine the cause of that biological impairment, calculate a level of the pollutant that would allow biological condition to return to acceptable levels, and prepare an implementation plan to achieve these objectives. Thus, determining probable causes of impairment is crucial for directing management efforts towards effective solutions.

The U.S. EPA's Causal Analysis/Diagnosis Decision Information System, or CADDIS, is a website designed to help scientists and resource managers in the regions, states and tribes find, access, organize, use and share information for causal assessments in aquatic systems. It offers a methodological framework for causal assessment based on the U.S. Environmental Protection Agency's Stressor Identification process (USEPA 2000), as well as technical content (e.g., information on common stressors and analytical methods) and tools (e.g., data analysis applications) for use in these assessments. The ICD application is one of several tools available on the CADDIS website.

2 System Requirements

This section covers the minimum system requirements for accessing and using the ICD application.

2.1 Internet Connection

An Internet connection is required since the ICD is a web-based application. Because some diagrams may contain large amounts of data (shapes, linkages, references, etc.), a high speed Internet connection is recommended for optimal use.

2.2 Computer Platform

The ICD application is compatible with the following platforms:

- Microsoft Windows (2000 and newer)
- Mac OS X
- Linux

2.3 Adobe Flash Player

You need to have Adobe Flash Player (Version 10) installed on your computer before you can access the ICD application. The Adobe Flash Player is software for viewing animations and movies using computer programs such as a web browser. The latest version of Flash Player, Version 10.0.32.18, is available for Windows (2000 and newer; Win9x no longer supported), Linux, Solaris and Mac OS X.

To download the latest Adobe Flash Player, please visit: <http://get.adobe.com/flashplayer/> and follow the instructions to download and install the software. You also can test or view the version of Flash Player on your computer by visiting: <http://www.adobe.com/software/flash/about/>.

2.4 Web Browser

You need to have a web browser that supports Adobe Flash Player to access the ICD application; these browsers are listed in Table 1.

Table 1: OS platforms and browsers that support Adobe Flash Player

Platform	Browser
Microsoft Windows	Internet Explorer (and other browsers that support Internet Explorer ActiveX controls and plug-ins) Firefox, Mozilla, Safari, Netscape, Opera (and other plug-in based browsers)
Macintosh – OS X	Firefox, Opera, Safari
Linux	Mozilla, Firefox

Please be sure to turn off the pop-up blocker while accessing the ICD tool, as certain functions will not be available if the pop-up blocker is turned on.

3 Diagram Basics

There are two basic capabilities within the ICD application: **viewing pre-existing diagrams** created by either the U.S. EPA or other registered users, and **creating or editing your own diagrams**. The foundation of both of these functions is the conceptual diagram.

This section describes the basic structure of conceptual diagrams in the ICD tool. You may wish to open one of the three pre-existing, U.S. EPA-created diagrams currently in the ICD application for examples of these features: (1) a sediment diagram, containing human activities, sources, stressors, and responses related to sediment as a stressor; (2) a metals diagram, containing human activities, sources, stressors, and responses related to increased metals as a stressor; and (3) a composite diagram, containing all human activity, source, stressor, and response shapes, related to all the stressors considered on CADDIS. These diagrams illustrate linkages between stressors and their likely sources and effects, across a variety of stream types and sizes, based on peer-reviewed scientific literature. Given the number of shapes included in these diagrams, arrows denoting causal pathways have been omitted to avoid cluttering these diagrams. These diagrams are not meant to be definitive, but rather to illustrate key causal pathways (as denoted by shape highlighting; see Section 5.4) leading from human activities to biological impairment of streams.

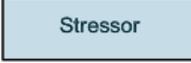
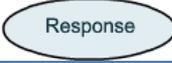
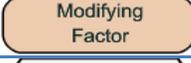
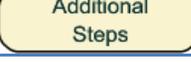
3.1 View Mode & Edit Mode

There are two modes in the ICD application. In **View mode**, users can view diagrams and retrieve supporting references for diagram linkages. In **Edit mode**, users can modify and construct diagrams and link supporting references to them. View mode is accessible to all users (public, registered, and administrative; see Section 4.1 for further discussion of these user roles); Edit mode is only accessible to registered and administrative users. As you will see below, diagram features and displays can vary between View and Edit modes; see Section 4 for more detailed information on ICD capabilities in View mode and Edit mode.

3.2 Shapes

There are seven shapes used to illustrate hypothesized causal relationships in the ICD application (and in CADDIS generally; see Table 2). Each shape does not necessarily occur in each diagram; rather, these are broad categories which users may find useful when structuring and interpreting diagrams. We recommend using these standardized shape types for the components in your diagrams, but don't spend too much time worrying whether you are using the "correct" shape for a specific component—rather, consistently use these shapes in a way that makes sense to you.

Table 2: Shapes used in ICD application diagrams

Shape	Definition
 Human Activity	Activity or land use that directly or indirectly leads to one or more sources
 Source	Entity that directly or indirectly leads to one or more proximate stressors
 Stressor	Physical, chemical, or biological entity that directly or indirectly induces one or more biotic responses of concern
 Response	Biological result of exposure to one or more stressors
 Modifying Factor	Process or state that modifies delivery or expression of a stressor
 Mode of Action	Process or state that causally connects a stressor to a biotic response
 Additional Steps	Process or state that causally connects a source to a stressor

Each shape in a diagram is given a label, or text name. Many shapes also are assigned a direction, which indicates whether the parameter represented by the shape is expected to change, increase, or decrease (see Table 3). If a direction is assigned, the relevant symbol will appear in front of the shape label. Throughout the remainder of this document, the term **shape** generally will be used to refer to the parameter represented by a shape (i.e., the shape, its text label, and any assigned direction).

Table 3: Shape direction symbols

Direction	Symbol	Description
Change in		Indicates change in shape parameter
Increasing		Indicates increase in shape parameter
Decreasing		Indicates decrease in shape parameter

A shape also can be designated as the child of another shape. Assigning parent-child relationships can help you hierarchically organize your diagram and control which shapes are displayed in View mode. Parent-child relationships are indicated by open and closed triangle symbols attached to shapes. Table 4 lists the symbols that denote parent-child linkages, where these symbols occur on a given shape, and how they are related to whether child shapes are shown or hidden on the diagram.

The ability to establish parent-child relationships was created for large, complicated diagrams (i.e., the composite EPA diagram) that users may occasionally want to view in less detailed form. This functionality will be evolving in future versions of the ICD, so we **generally recommend that you do not create any parent-child relationships in your own diagrams** (see Section 6.10).

Table 4: Parent-child symbols and their meanings

Symbol	Location	Description
	Below shape	Indicates the associated shape has child shapes that are currently hidden
	Below shape	Indicates the associated shape has child shapes that are currently displayed
	Above shape	Indicates the associated shape has a parent shape that is currently displayed

3.3 Linkages, Arrows & Lines

One main purpose of diagrams within the ICD application (and within CADDIS generally) is to illustrate the linkages between human activities, sources, stressors, and responses that make up causal pathways. As used here, a **linkage** is defined as a potential association between two shapes, which may be supported by peer-reviewed literature or other data sources. As described in Section 5, the ICD application allows users to search for references that support linkages among specific shapes. Ideally these associations are causal, although often all that can be stated with confidence is that correlations have been found to exist.

An **arrow** is defined as a visual cue that a linkage exists, or is hypothesized to exist. Arrows can be manually added between shapes using the **Arrow** button on the Edit mode toolbar (see Section 6.18). Currently, arrows are used only to illustrate hypothesized linkages visually; they are not attached to any supporting information themselves. **Note that arrows and lines have not been drawn on the three U.S. EPA-constructed diagrams in the ICD application to avoid cluttering the diagram.**

You also can add **lines** to your diagram, using the **Line** button on the Edit mode toolbar (see Section 6.18). Like the arrow button, the line button allows you to visually connect shapes (e.g., by connecting shapes or by drawing boxes around shapes you want to group), but does not create any kind of formal linkage among those shapes.

3.4 References

In the ICD application, the term **references** refers to citation information for peer-reviewed scientific literature supporting linkages among shapes. Hundreds of references are linked to the U.S. EPA-created diagrams in the ICD tool, and hundreds more are included in the ICD literature database but not yet linked to a specific diagram. Users can browse or search citations already entered into the ICD database; use the Upload Reference function to upload new references (i.e., those not already in the ICD literature database); or use the Enter New Citation function to manually add citations to the database one at a time (see Sections 6.19 and 6.20 for more detailed information on browsing and adding references).

3.5 Diagram Canvas & Tiers

The **canvas** is the background white area of the diagram. The size of the canvas is set when you create a diagram (see Table 5 for a list of available canvas sizes). Canvas size cannot be changed once a diagram is saved in the database; at that point, you must use **Save As** to create a new diagram with the desired canvas size. If possible, the canvas size should be set close to the end user's computer monitor resolution. The smaller the canvas size, the more scrolling the user will be required to do; the larger the canvas size, the more the zoom tool may need to be used to view parts of the ICD.

Table 5: Available canvas sizes & the number of tiers in each size

Canvas Size (pixels)	Number of Available Tiers
1024 x 768	16
1280 x 960	20
1536 x 1152	24
1972 x 1344	28
2048 x 1536	32
2304 x 1728	36
2560 x 1920	40
2816 x 2112	44

The canvas in the ICD tool is split into multiple horizontal **tiers**, demarcated by dotted horizontal lines that are visible in Edit mode (Figure 1) but hidden in View mode. The height of the each tier is fixed, and the size of the canvas determines the number of tiers on the diagram (see Table 2). Tiers help users structure their diagrams by organizing the layout of shapes within the diagram. We recommend that you place each shape completely within a tier, rather than on the dotted line between tiers; if shapes are placed across tier dividers, the **Collapse/Expand** function (see Section 5.3) will not work properly.

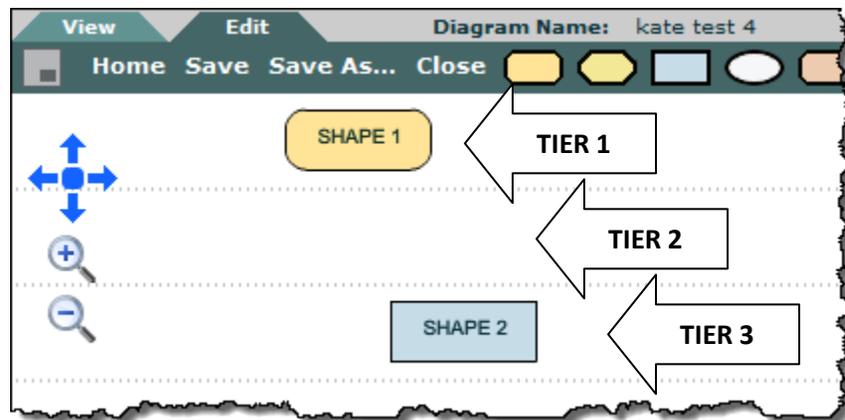


Figure 1: Tiers and their separators in Edit mode

In some cases, tiers can be “collapsed” to condense the viewing area when in View mode (see Section 5.3 for details on the Collapse/Expand function), particularly when child shapes are hidden. However, certain tiers are non-collapsible, meaning they are always visible in View mode. For example, any tier with a visible shape cannot be collapsed, and any tier specifically designated as non-collapsible cannot be collapsed (see Section 6.14 for details on designating non-collapsible tiers).

Because we recommend that you don’t use parent-child designations in your diagrams (see Section 3.2), the Collapse/Expand feature will be useful primarily with the large, EPA-constructed diagrams, and this functionality is likely to evolve in future versions of the ICD.

3.6 Navigation Controls & Diagram Inset

Navigation controls for each diagram are located on the left side of the canvas in both View mode and Edit mode (Figure 2). The function of each button on the navigation control is detailed in Table 6.

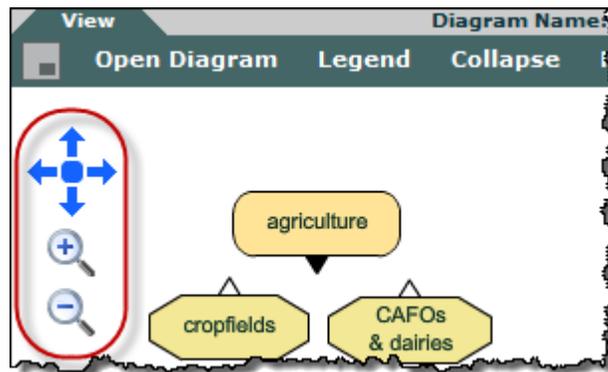


Figure 2: Navigation controls on the diagram

Table 6: Navigation control buttons

BUTTON	FUNCTION
	Zoom in
	Zoom out
	Move left
	Move right
	Move up
	Move down
	Reset diagram to original position

You also can navigate around the diagram using the **Inset** icon  on the top left corner of both the View and Edit mode toolbars. Clicking the **Inset** icon (or pressing the **Esc** key) once brings up the diagram inset, and clicking (or pressing) it again hides it. The inset shows an overview of the entire diagram, with a light blue box highlighting the portion of the diagram currently displayed on the screen given current navigation settings such as zoom level and diagram position (Figure 3). When viewing larger diagrams, it may help to leave the diagram inset visible to see which portion of the diagram you are viewing. To close the diagram inset, either click the **Inset** icon or press the **Esc** key again.

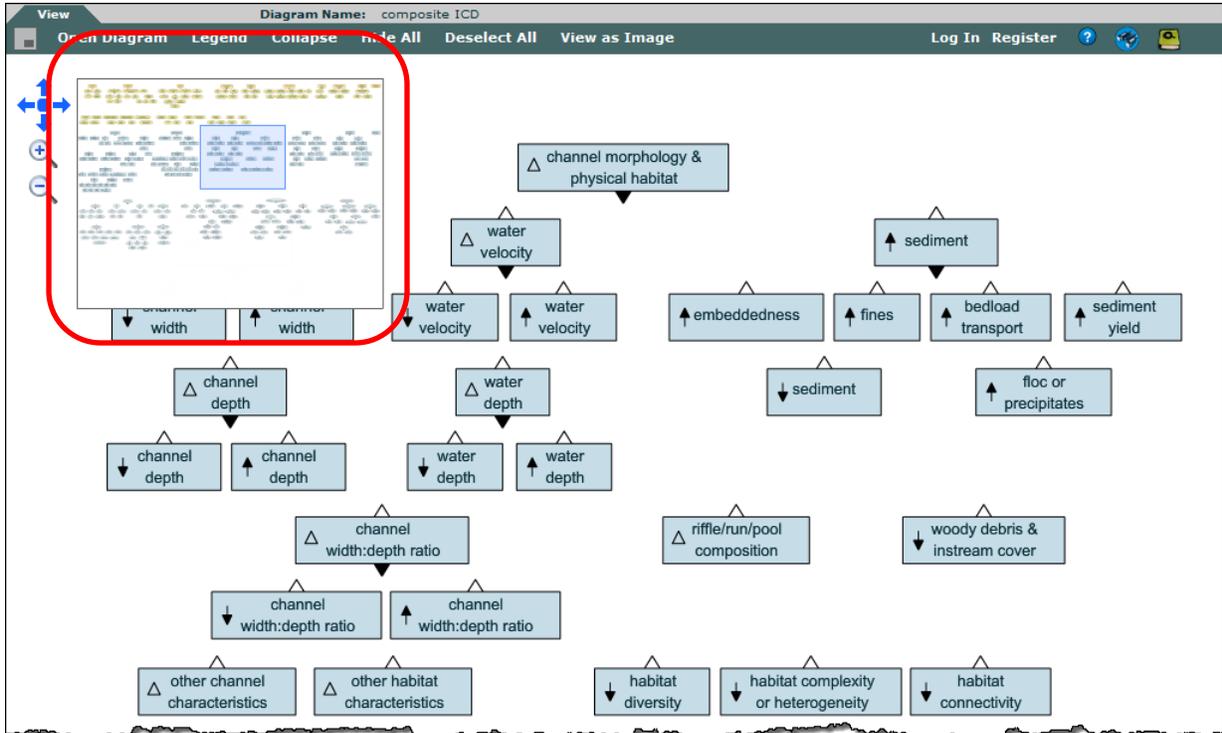


Figure 3: Diagram inset

You can pan around the diagram by clicking and dragging the light blue box within the diagram inset (Figure 4). If you try to zoom out when you are positioned at the edge of the diagram (i.e., the light blue box is touching the canvas border in the inset, as in Figure 5), you will see a message that says “You cannot zoom out any more. Please reposition the inset, center the diagram, or pan around.” Once the blue-highlighted portion of the inset is moved away from the canvas border, you will be able to resume zooming.

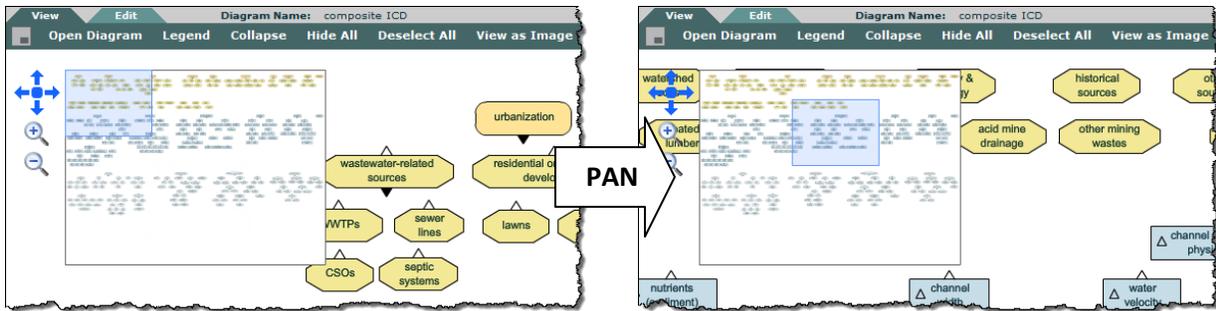


Figure 4: Using the inset to pan around the diagram

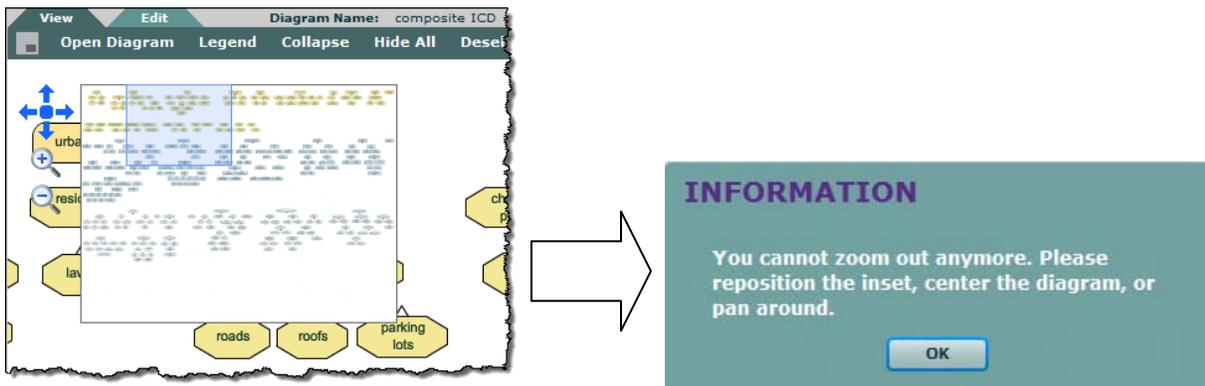


Figure 5: Zooming out when positioned at canvas edge

4 Getting Started

4.1 User Roles

There are three user roles in the ICD application (Table 7), which define the ICD functions each user can access and use. For example, public users are only able to access View mode of the ICD application, while all registered users can access and use Edit mode capabilities. Admin users are set by the U.S. EPA and have additional privileges (e.g., citation approval).

Table 7: Description of different user roles in the ICD application

User Role	Description	Accessible Modes/Functions
Public	Any user who has not registered in or logged into the ICD application	View mode
Registered	Any user who has registered in and logged into the ICD application	View mode and Edit mode
Admin	Any EPA user who has been granted administrative privileges	View mode and Edit mode, as well as administrative functions

4.2 Register & Log In

First time users who wish to become registered users of the ICD application need to self-register via the EPA Portal. Click the **Register** button to the right on the View mode toolbar (the toolbar displayed when you first enter the application) or go directly to the EPA Portal (<http://portal.epa.gov>) to bring up the EPA Portal Log In screen (Figure 6).

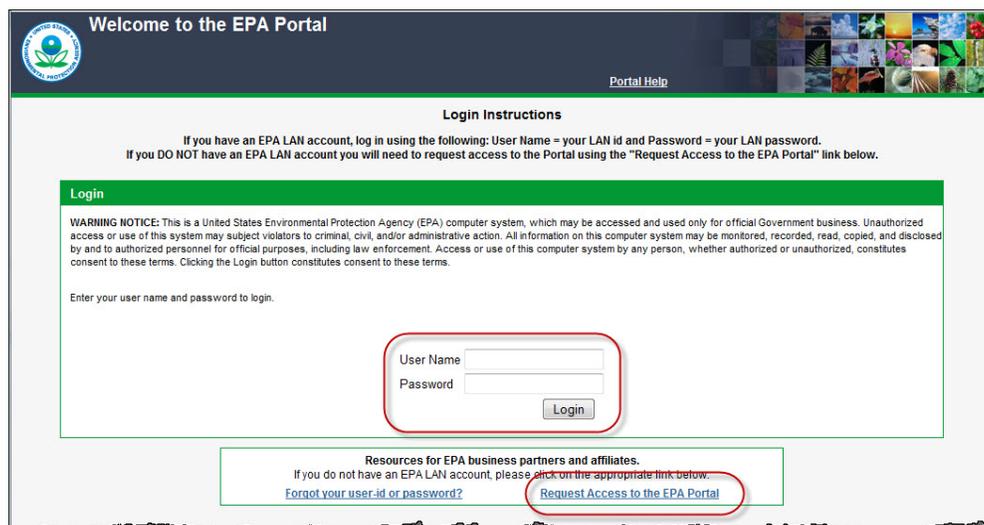


Figure 6: EPA Portal Log in screen

If you have an EPA LAN account, log in to the portal using your LAN id and password. You will need to request access to the CADDIS community to use the ICD application, so click Community Access >> Request Access to Communities (Figure 7). When the Select Groups list appears, check CADDIS and click Save Groups.

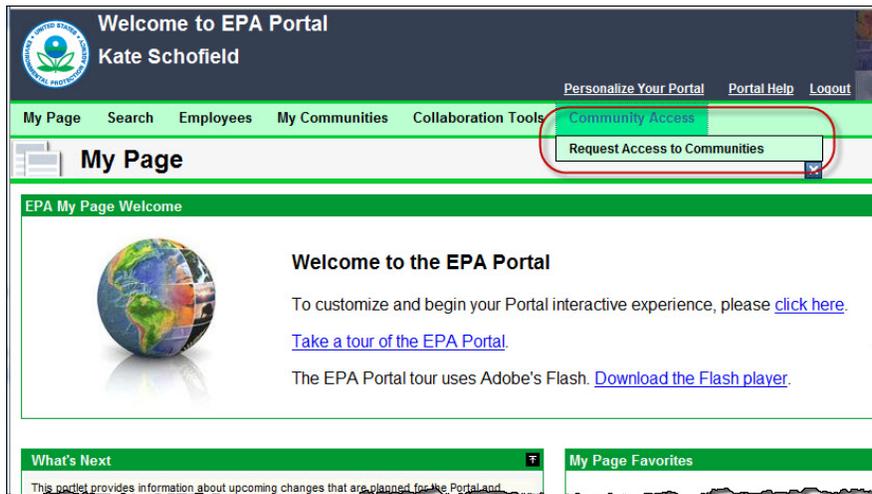


Figure 7: Requesting community access when you have an EPA LAN account

If you do not have an EPA LAN account, click the Request Access to the EPA Portal link (Figure 6). This will bring you to the Self-Registration form (Figure 8). Complete this form, using Kate Schofield as the EPA Contact Name, schofield.kate@epa.gov as the EPA Contact's Email Address, and (703) 347-8533 as the EPA Contact's Phone Number. Under Select the Community or Application for which you are requesting access, choose CADDIS; then accept the EPA Privacy & Security Notice and click Submit.

We will make every effort to approve users in a timely manner, but approval of access to the CADDIS community may take anywhere from hours to days—so please be patient. You will receive email notification once access has been approved, at which point you can log in to the ICD application.

Remember—you only need to register once. Once you have successfully registered (and been granted access to the CADDIS community), you can simply log in to the ICD application on all subsequent visits (see below).

To log in to the ICD application, click **Log In** to the right on the View mode toolbar to bring up the Log In screen. Enter the User Name and Password you provided during registration (again, this is your EPA LAN id and password, if you have an EPA LAN account) into the appropriate fields and click Log In. The system will display an Information message confirming successful user account authentication. Click OK and you will be logged in to the ICD application.

Click' and 'Submit' and 'Cancel' buttons."/>

Figure 8: Self-registration form in the EPA Portal

Note that once you have registered and logged in, you are considered a registered user; if you do not register or do not log in to a particular ICD session, you are considered a public user (i.e., you only will be able to access View mode, and view existing diagrams).

4.3 View Mode Toolbar

As mentioned previously, there are two modes in the ICD application: **View** and **Edit**. You enter the ICD application in View mode, as indicated by the highlighted View tab in the top left corner. Registered, logged in users are able to toggle between View and Edit modes by clicking the tabs at the top left of the toolbar (Figure 9). Public users (those not registered or registered but not logged in) will see only the View mode tab.

Figure 9 shows the View mode toolbar as it is displayed across the top of the ICD application; the function of each button or option on the toolbar is listed in Table 8. See Section 5 for more detailed discussion of View mode functions.



Figure 9: Toolbar in View mode

Table 8: Buttons on the toolbar in View mode

BUTTON / OPTION	FUNCTION
	Toggle the diagram inset, to pan around the diagram
Open Diagram	Open a diagram
Legend	Display legend listing conceptual diagram shapes and definitions
Collapse Expand	Vertically collapse the diagram to remove whitespace between tiers / Reset collapsed diagram to its original position, with vertical whitespace displayed
Show All Hide All	Display all hidden (child) shapes / Hide all displayed (child) shapes
Deselect All	Deselect all selected (highlighted) shapes in the diagram
View as Image	Save the current view of the diagram as an image in Portable Network
Log In Log Out	Log in to ICD / Log out of ICD
Register	Register to use the ICD (link to EPA Portal)
	Search the ICD User Guide for help
	Search all references in ICD database via text-based keyword search
	Toggle the References Panel (see Section 4.3)

4.4 References Panel

The **References** panel, located on the right side of the View mode toolbar, can be shown or hidden by clicking the book icon  on the toolbar. The panel consists of three sub-panels (Figures 10 and 11): **Selected Shapes**, **Selected Linkages**, and **Saved References**.

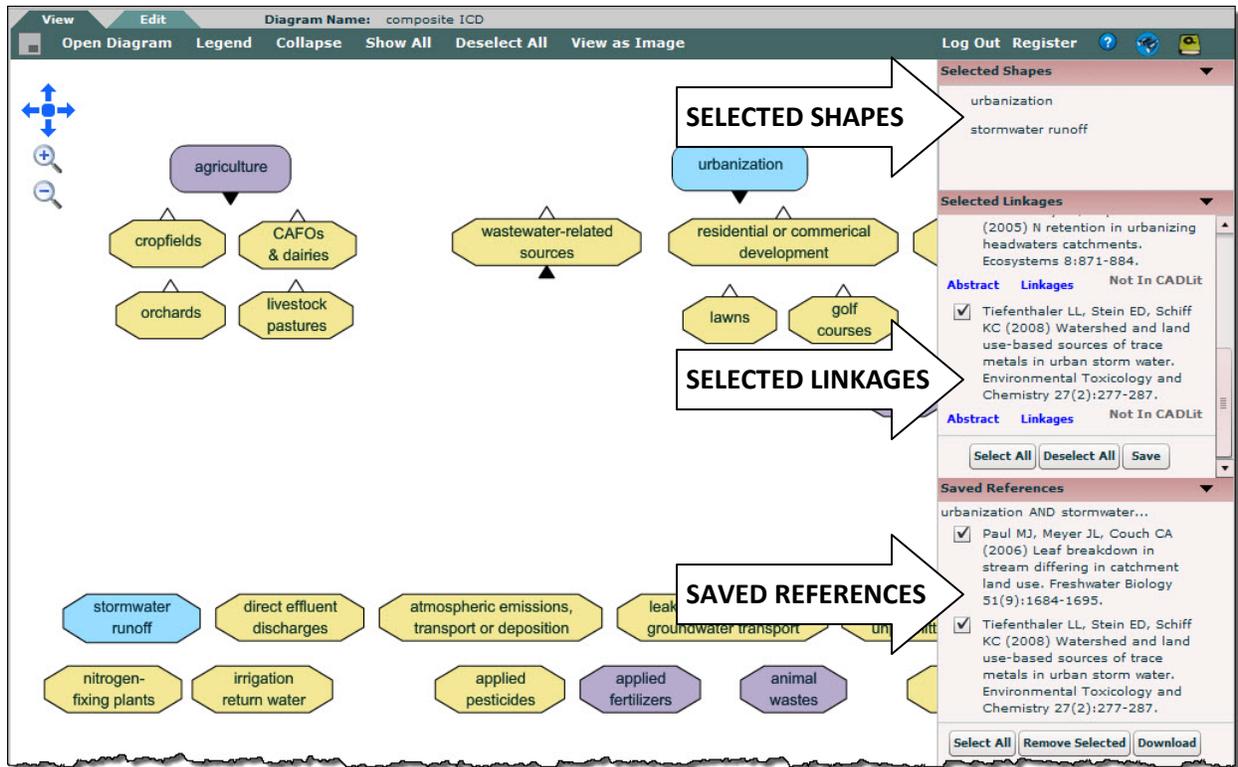


Figure 10: References panel with associated sub-panels

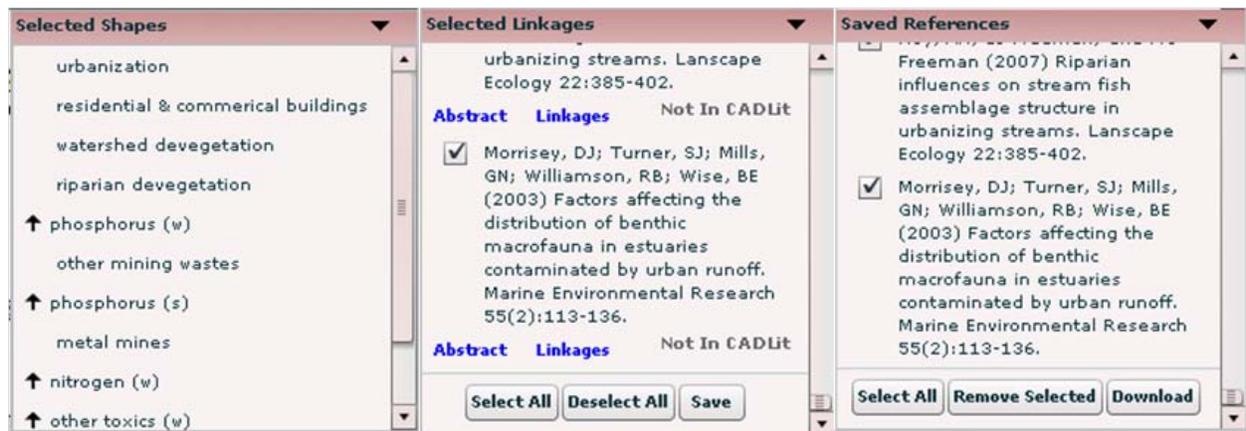


Figure 11: Selected Shapes, Selected Linkages, and Saved References sub-panels

The **Selected Shapes** sub-panel lists all shapes selected (i.e., clicked on and highlighted) in the open diagram. Any selected shape will automatically appear in this sub-panel.

The **Selected Linkages** sub-panel lists all the references supporting linkages among the selected shapes, organized according to linkage or shape pair combination. You can select, deselect, and save references

in the Selected Linkages sub-panel using buttons at the bottom of the sub-panel; saved references are transferred to the Saved References sub-panel.

The **Saved References** sub-panel lists all the references selected and saved in the Selected Linkages sub-panel, organized according to linkage or shape pair combination. You can select, remove, and download references in the Saved References sub-panel using buttons at the bottom of the sub-panel (see Section 5.6 for further details on downloading references).

Sub-panels are all expanded by default. You can expand or collapse each sub-panel by clicking the arrow at the right of each sub-panel heading (Figure 12).

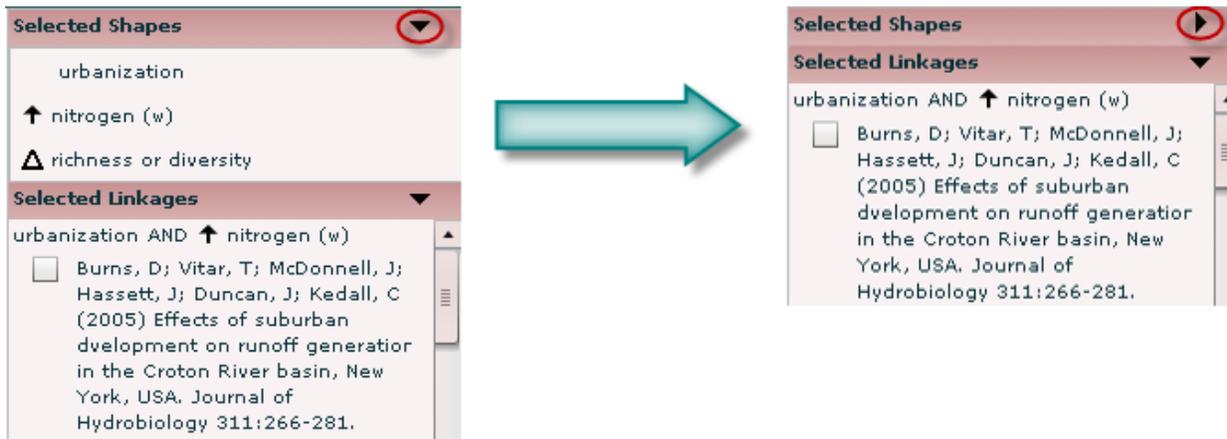


Figure 12: Expanding/collapsing sub-panels in the References panel

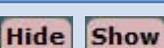
4.5 Toolbar in Edit mode

In Edit mode of the ICD application, users can modify and construct diagrams and link supporting references to those diagrams. Registered users who have logged in to the ICD application can get to Edit mode by clicking the Edit tab at the top left of the application (the Edit tab will not be visible for public users, or registered users who have not logged in). The Edit mode toolbar is shown in Figure 13, and the function of each button or option on the toolbar is listed in Table 9. See Section 6 for more detailed discussion of each Edit mode function.



Figure 13: Toolbar in Edit mode

Table 9: Buttons on the toolbar in Edit mode

BUTTON / OPTION	FUNCTION
	Toggle the diagram inset, to pan around the diagram
	Open the Home: Diagram Settings screen, from which you can create a new diagram, search for and open an existing diagram, and designate collaborators or modify other diagram settings for diagrams you create
	Save any changes made to the open diagram
	Save the open diagram as a new diagram
	Close the open diagram
	Add <i>Human Activity</i> shape to diagram
	Add <i>Source</i> shape to diagram
	Add <i>Stressor</i> shape to diagram
	Add <i>Response</i> shape to diagram
	Add <i>Modifying Factor</i> shape to diagram
	Add <i>Mode of Action</i> shape to diagram
	Add <i>Additional Steps</i> shape to diagram
	Add <i>Arrow</i> to diagram
	Add <i>Line</i> to diagram
	Hide all arrows and lines in diagram / Show all arrows and lines in diagram
	Open <i>Tiers Configuration</i> screen to select non-collapsible tiers
	Activate <i>Select Shapes</i> function, allowing you to select and move or delete multiple shapes simultaneously / Deactivate <i>Select Shapes</i> function
	Activate <i>Copy Shape</i> function, allowing you to copy a shape and all supporting information (e.g., parent-child relationships, supporting references) / Deactivate <i>Copy Shape</i> function
	Activate <i>Align Shapes</i> function, allowing you to select and vertically align multiple shapes/ Deactivate <i>Align Shapes</i> function
	Activate <i>Add Linkage</i> function, allowing you to select two or more shapes and link supporting references to those linkages / <i>Save Linkage</i> and proceed to the Save New Linkage screen
	Enter or view comments on the open diagram
	Search the ICD User's Manual for help

5 Viewing Diagrams

This section provides instructions for functions available in View mode of the ICD application (see Section 6 for functions available in Edit mode). Remember that public users only have access to View mode of the ICD application; registered users can move between View mode and Edit mode.

5.1 Open Diagram

To open a diagram from View mode, click the **Open Diagram** button on the View mode toolbar. If you already have a diagram open when you click the **Open Diagram** button, you will get a warning message asking you whether you want to save the diagram currently open before proceeding. Click **Yes** to save and close the current diagram; click **No** to close the current diagram without saving any changes.

The **Open Diagram** screen will pop up (Figure). The names of all saved diagrams that you can view, based on your assigned user role, will be displayed in the Diagram drop-down list; once you have selected one, diagram descriptors (keywords, site location, and/or narrative diagram description) will appear. Select a diagram from the drop-down list and click **Open**. Click **Cancel** or the X in the top right corner to close the **Open Diagram** screen without opening a diagram.

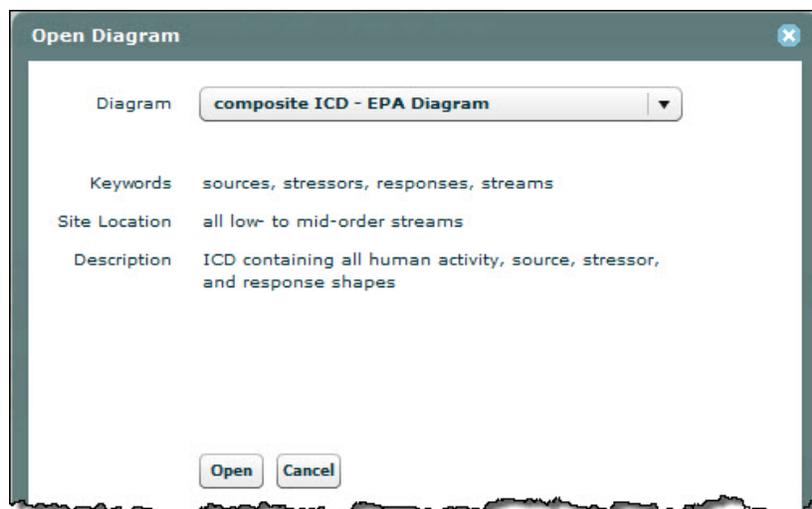


Figure 14: Open Diagram screen

A confirmation message will appear once the diagram is loaded successfully. Once a diagram has been opened, the name of that diagram is displayed above the toolbar (Figure); each user can have only one diagram open at any given time.

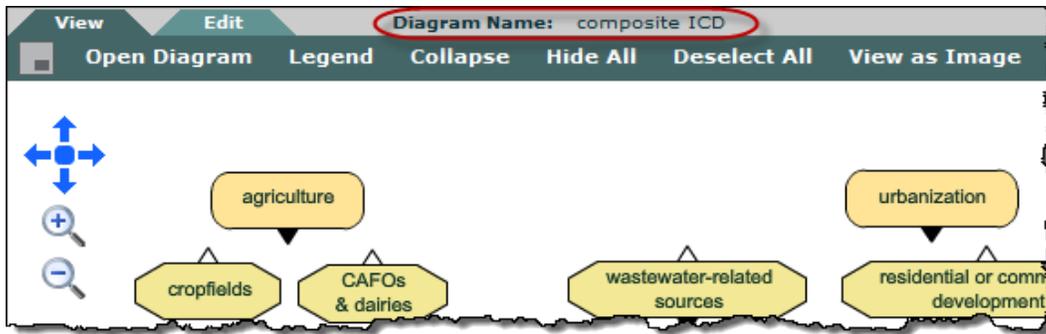


Figure 15: Diagram Name display

Note that how you open existing diagrams differs between View mode and Edit mode; see Section 6.3 for instructions on opening diagrams in Edit mode.

5.2 Show/Hide Child Shape(s)

When a diagram is first opened in View mode, all the child shapes will be hidden by default—only shapes that are not children of any other shapes will be displayed initially (see Section 3.2 for explanation of parent-child relationships among shapes).

A parent shape can be identified by the solid black triangle symbol (▲) at its bottom edge (Figure 16). If you click on the solid black triangle, the triangle will invert and its child shape(s), identified by the open triangle symbol (△) at their top edges, will be shown on the diagram. To hide the child shape(s), click the inverted triangle on the parent shape and its child shape(s) again will become hidden.

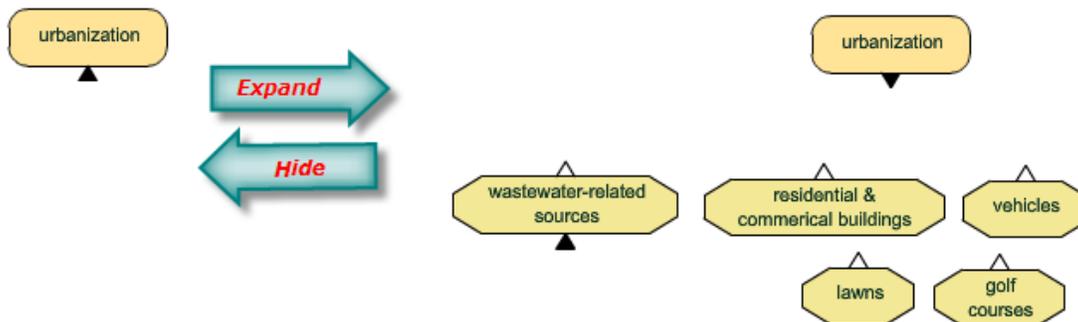


Figure 16: Show/Hide child shapes

You also can **display all shapes** in a diagram by clicking on the **Show All** button on the View mode toolbar (Figure 17). Once this button is clicked it will switch to **Hide All**; clicking on **Hide All** will hide all child shapes in the diagram.

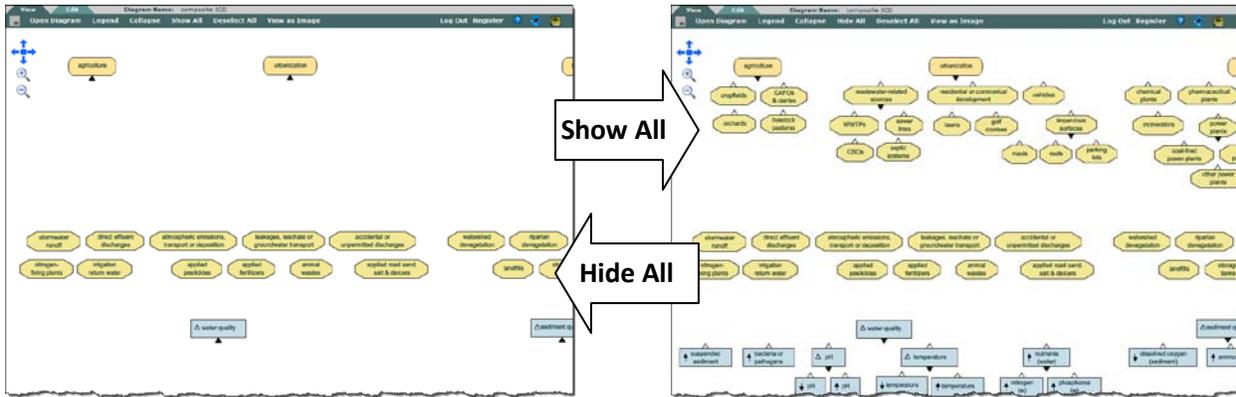


Figure 17: Using the Show All button to display and the Hide All button to hide child shapes

5.3 Collapse/Expand the Diagram

Because child shapes are hidden when you first open a diagram, there may be considerable whitespace on the canvas in View mode, making it more difficult to navigate around the diagram (in Edit mode, all shapes are always displayed; see Section 6.3). To improve diagram visibility and navigability, click the **Collapse** button to remove vertical whitespace (Figure 18). The Collapse button will automatically switch to an **Expand** button; clicking on this will reset the shapes to their original, expanded positions in the diagram. Note that all vertical whitespace may not disappear when the diagram is collapsed: any tiers designated as non-collapsible will remain expanded (see Section 6.14 for details on designated tiers non-collapsible in Edit mode).

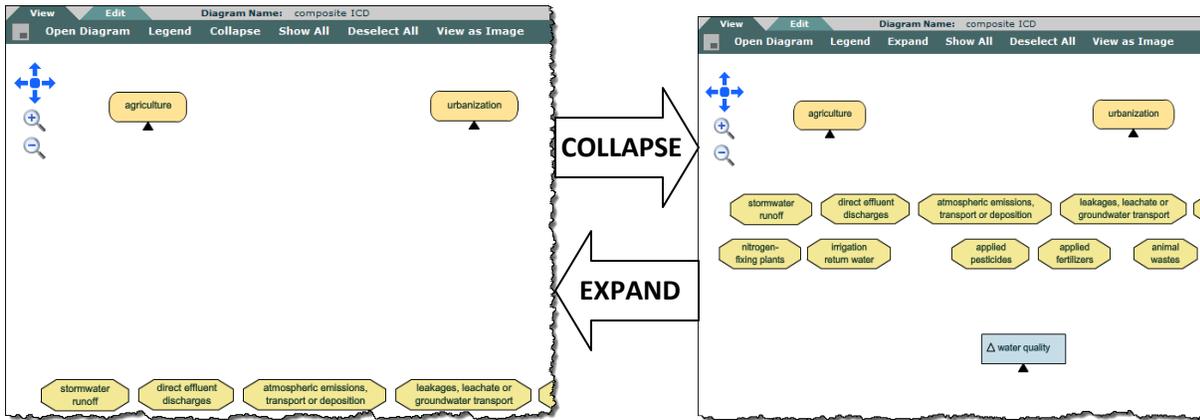


Figure 18: Collapse/Expand the diagram

5.4 Select/Deselect Shapes

In View mode, you can select two or more shapes and retrieve references that provide supporting evidence of linkages among those shapes. To select a shape, simply click on it and it will highlight blue

(Figure 19). If the References Panel is displayed (see Section 4.4), you will see the name of the selected shape appear in the Selected Shapes sub-panel.

If a reference supporting a linkage between the selected shape and another shape in the open diagram has been entered into the database, all those linked shapes will highlight in purple (Figure 19). If a linked shape is hidden (see Section 5.2), its parent shape will be outlined in orange (Figure 19, bottom panel) as a visual cue that you should show child shapes to see other shapes linked to the shape you selected; once the child shape is visible, the orange outline will disappear from the parent shape. You can select any purple shape by clicking it. The name of this shape will be added to the Selected Shapes sub-panel and this shape will highlight blue as well; all shapes linked to the most recently selected shape will highlight purple. In this manner, you can select as many shapes along a causal pathway as you would like.

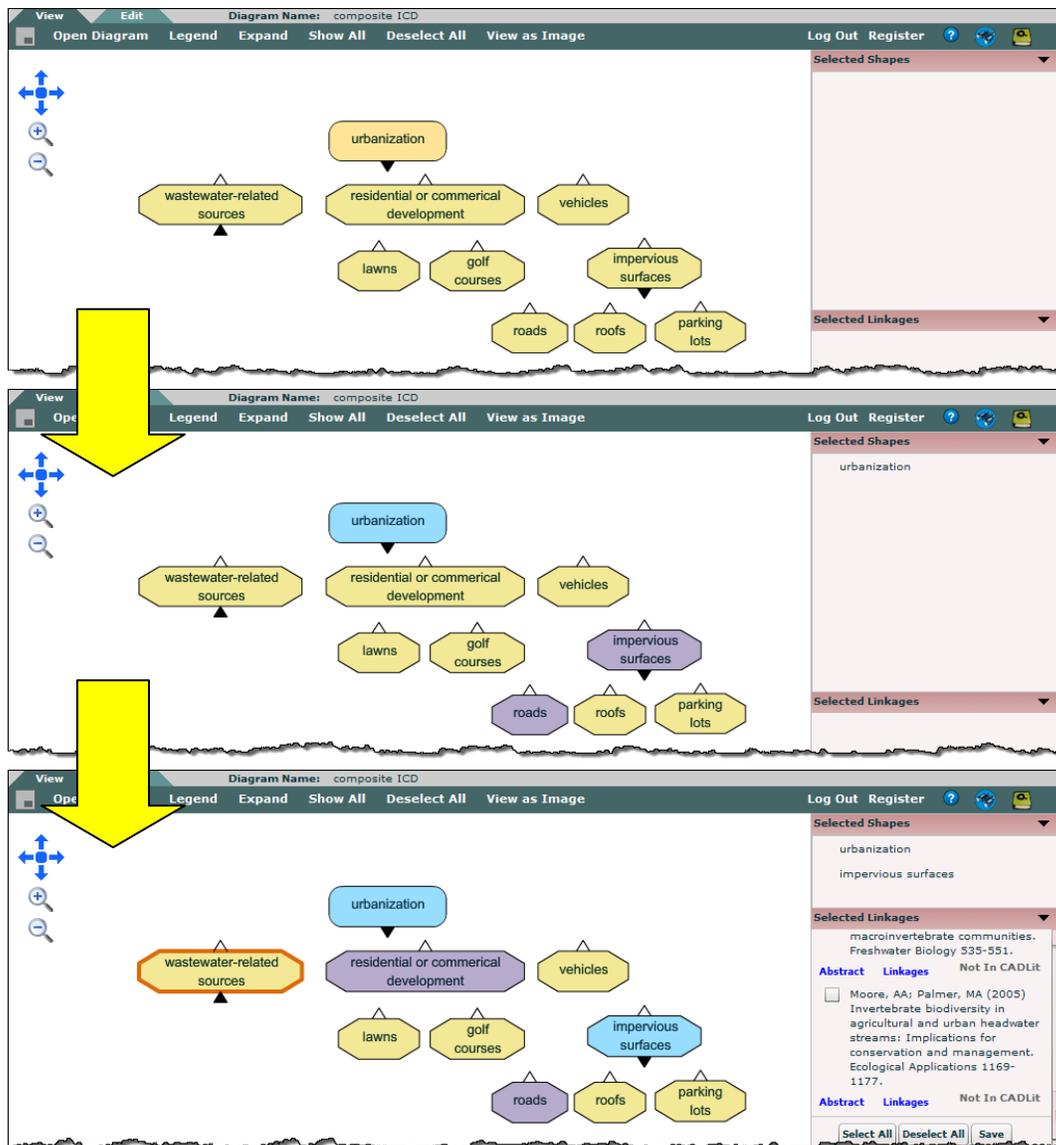


Figure 19: Selecting shapes (urbanization followed by impervious surfaces) in View mode

To deselect a shape, simply click on the shape you want to deselect. The shape will return to its original color (i.e., it will no longer be highlighted blue), it will disappear from the Selected Shapes sub-panel, and any linkages containing that shape will disappear from the Selected Linkages sub-panel. To deselect all previously selected shapes, click the **Deselect All** button on the View mode toolbar. Deselecting all shapes will clear all information from the Selected Shapes and Selected Linkages sub-panels.

5.5 View Linkages

Once two shapes linked by the literature are selected together, the linkage between them is automatically listed in the Selected Linkages sub-panel, with the references supporting that linkage listed below (Figure 20). Scroll down in the Selected Linkages sub-panel to view all references, for all selected linkages you have chosen.

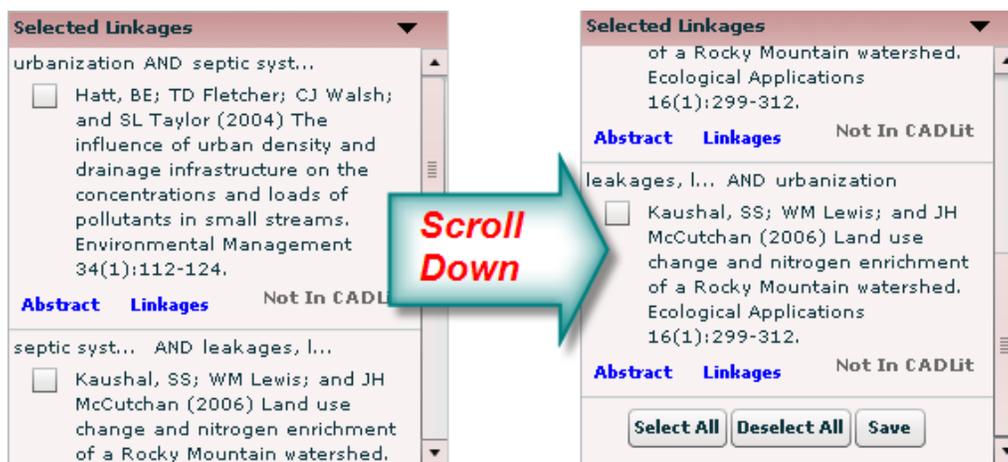


Figure 20: Supporting references displayed in Selected Linkages sub-panel

Basic citation information is provided for each supporting reference, along with the abstract, other linkages supported by the reference, and whether or not the reference is entered into CADLit, the CADDIS Literature Resource.

Click on the **Abstract** link below the citation to display the abstract in a pop-up screen. In some cases, a reference's abstract may not be entered into the database (e.g., abstracts often are not available electronically for older references); if a reference's abstract is not available in the ICD database, the Abstract pop-up screen will be blank.

Click the **Linkages** link below the citation to display the **Paper-Specific Linkages** pop-up screen, which has two different tabs. The **Diagrams** tab lists all the diagrams that the reference has been linked to (Figure 21); the **Linkages in open diagram** tab lists the specific linkages associated with the reference in the open diagram (Figure 22).

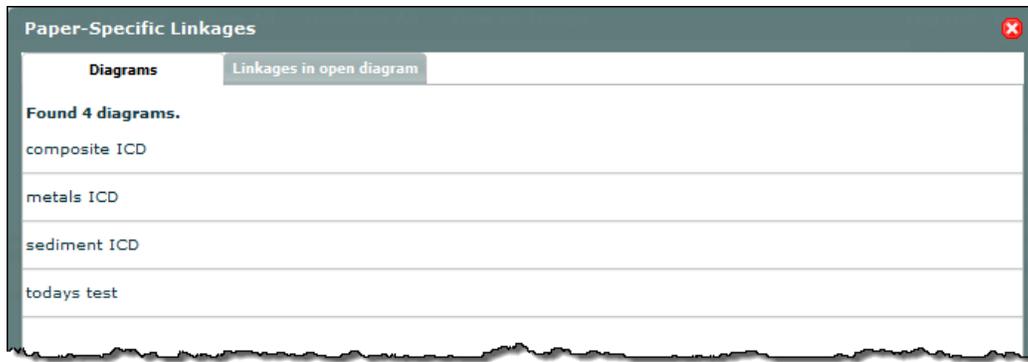


Figure 21: Paper-Specific Linkages screen, showing diagrams to which reference is linked

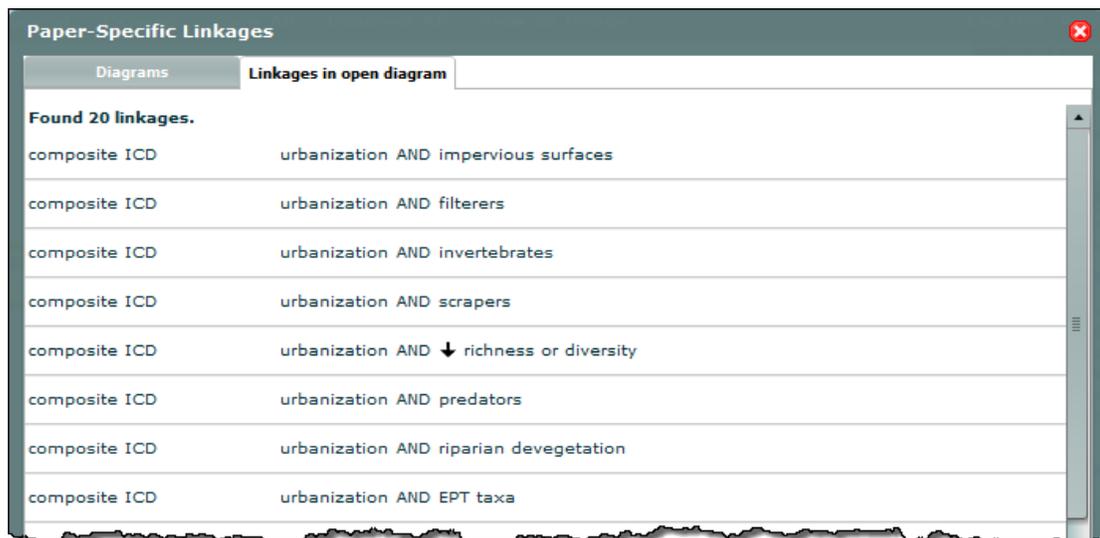


Figure 22: Paper-Specific Linkages screen, showing linkages within the open diagram

Next to the **Linkages** link under each citation are the words **In CADLit** or **Not in CADLit** (Figure 20). This indicates whether additional information about a given reference (e.g., study design, results of statistical tests, actual data) has been extracted and entered into the CADDIS Literature Resource, or CADLit. If this information is available, you can access it via the CADLit application. Many papers included in the ICD literature database have not yet been entered into CADLit (and vice versa), but we are working to increase overlap and compatibility between these databases.

5.6 Select, save, and download references via diagram-based queries

You can select, save, and download any reference listed in the **Selected Linkages** sub-panel. Select a reference by clicking the adjacent checkbox, or select all citations in the Selected Linkages sub-panel by clicking the **Select All** button (Figure 23). You can deselect references similarly, by either clicking the checkbox to deselect individual citations or clicking **Deselect All** to deselect all selected citations.

Selected references can be saved into the **Saved References** sub-panel by clicking the **Save** button in the **Selected Linkages** sub-panel.

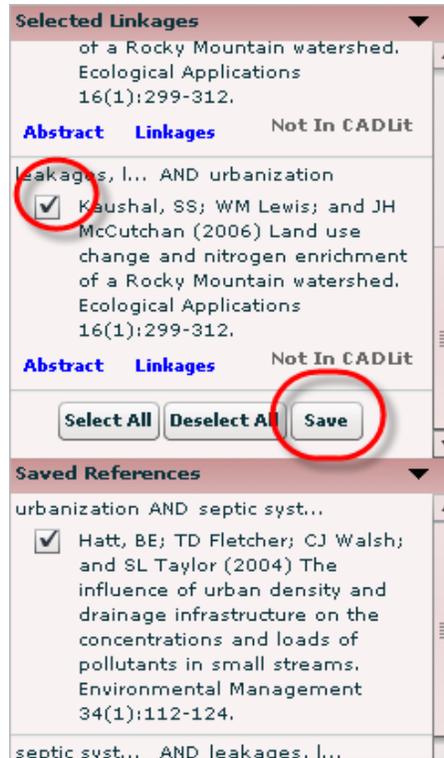


Figure 23: Selecting and saving references in the Selected Linkages sub-panel

All references saved from the **Selected Linkages** sub-panel are displayed in the **Saved References** sub-panel. Any saved references will remain in the **Saved References** sub-panel until you remove them from that sub-panel using the **Remove Selected** button (Figure 24). For example, you can clear any previously selected shapes and begin a new search, and any references you saved from previous searches will remain in the **Saved References** sub-panel, organized by linkage or shape pair combination.

You can select references to download from the **Saved References** sub-panel by checking the adjacent checkboxes and clicking the **Download** button. The **Reference Download** screen will appear (Figure 24), allowing you to select the types of information to include and the file format to download. Click on the **Download** button, and the system will prompt you to either open or save the download file. Make sure to turn off the pop-up blocker in your browser before using the **Reference Download** function, or your browser may block the pop-up screen to save the download file.

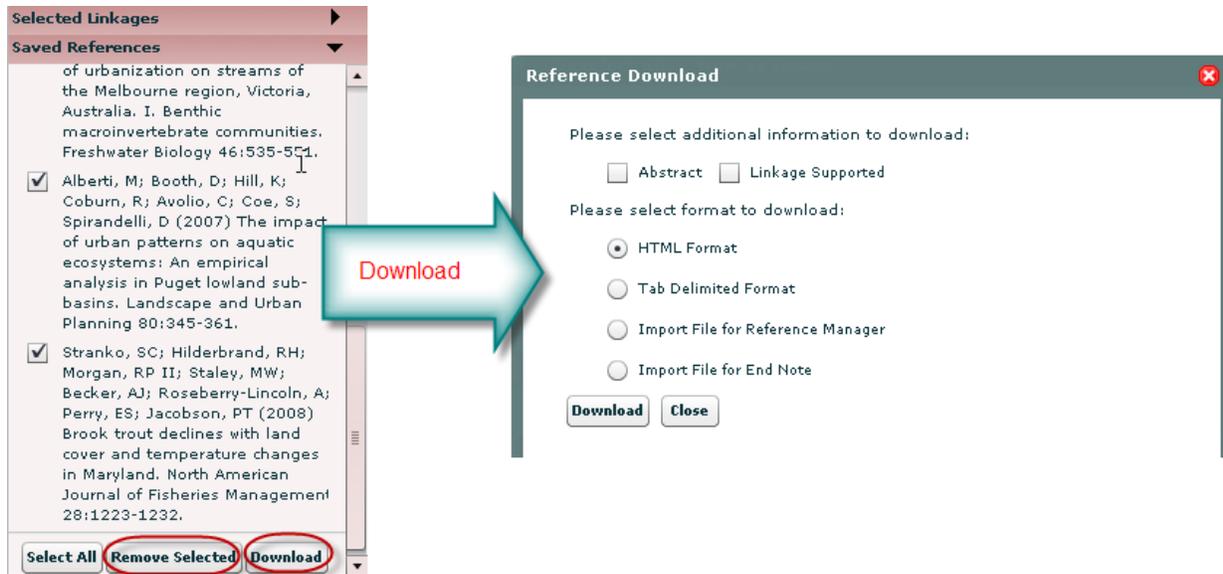


Figure 24: Downloading references from the Saved References sub-panel

5.7 Search, save, and download references via text-based queries

In addition to the diagram-based interface, you also can search for references using text-based keywords, by clicking the Search References icon  on the left side of the View mode toolbar (Figure 9). This brings up the Search References pop-up screen (Figure 25). Typing keywords into the text field and clicking Search will query the literature database and display all references that contain the selected keyword(s), or that are linked to a shape containing that keyword, on the Reference Download screen (Figure 26). The total number of references entered into the ICD literature database that contain the selected keyword(s) will be displayed at the top of the screen, followed by the citation and associated information for each reference.



Figure 25: Search References screen

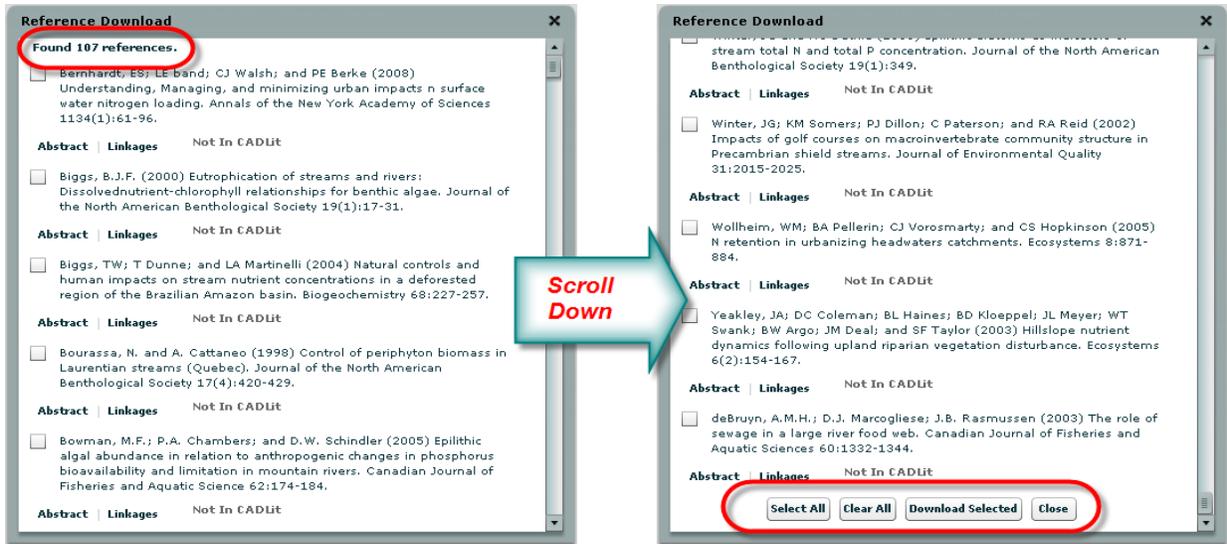


Figure 26: Reference Download screen accessed using text-based keyword search

As in the Saved References sub-panel (Section 5.6), you can select and download any reference listed in this screen by checking the adjacent checkbox and clicking the **Download Selected** button (Figure 26). The **Reference Download** screen will appear (Figure 27), allowing you to select whether to download abstracts and which file format to download. Click the **Download** button, and the system will prompt you to either open or save the download file. Again, make sure the pop-up blocker on your browser is turned off before downloading references.

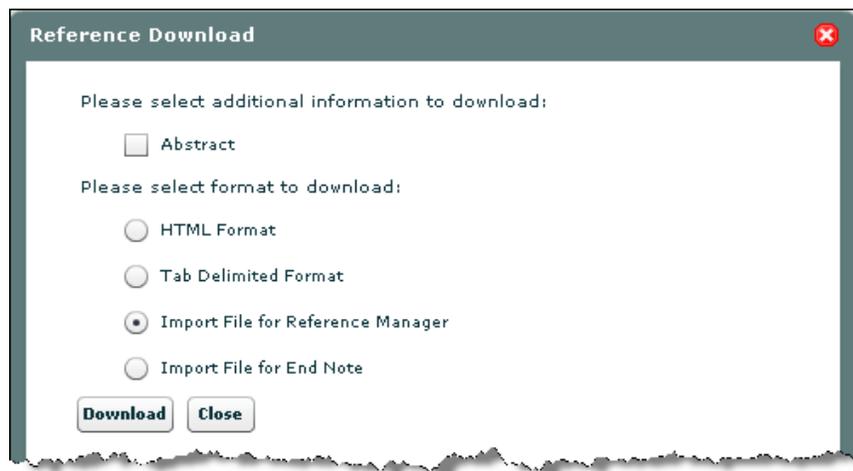


Figure 27: Reference Download screen accessed using text-based keyword search

5.8 View as Image

The **View as Image** function allows you to view or save the current view of the diagram as an image in Portable Network Graphics (PNG) format. The image will look like the view of the diagram you see on your screen in View mode: for example, child shapes that are hidden in View mode also will be hidden in the saved image.

To view the diagram as an image, click the **View as Image** button on the View mode toolbar (Figure 9). The system will display a pop-up screen and prompt you to save or open the image. The pop-up screen is browser-specific, so it will look different in different web browsers, but in all browsers the screen should function similarly. Again, make sure the pop-up blocker on your browser is turned off before viewing the diagram as an image. Figure shows a diagram image opened in Windows Picture and Fax Viewer.

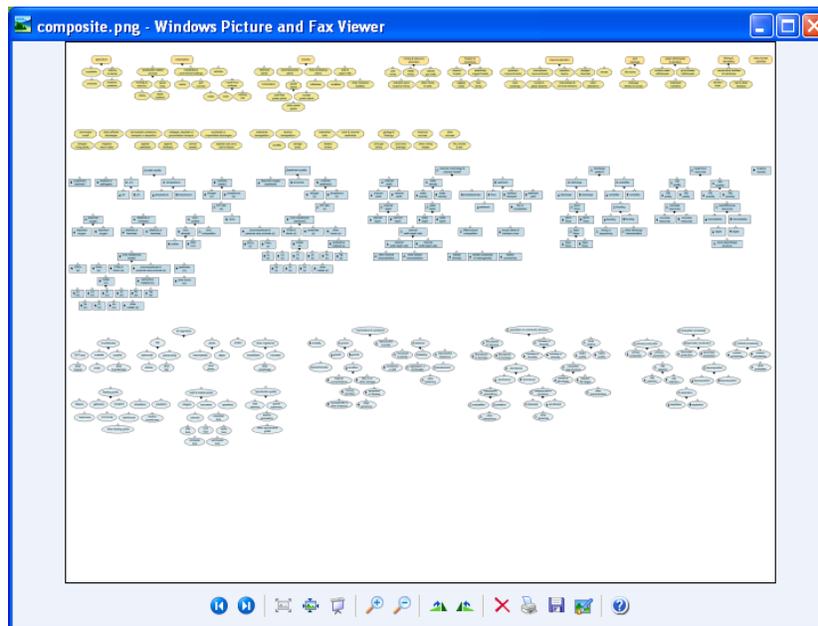


Figure 28: Image of diagram as viewed in Windows Picture and Fax Viewer

6 Adding & Editing Diagrams

Once a registered user logs in to the ICD application (see Sections 4.1 and 4.2), they will see the Edit tab on the ICD toolbar—which means they can access Edit mode to create and modify their own diagrams and link supporting literature to them. This section provides instructions for the functions available in Edit mode of the ICD application. To switch between View and Edit modes, click either tab at the top left of the ICD application.

6.1 Getting Started in Edit Mode

To open an existing diagram or create a new diagram, click the **Home** button on the Edit mode toolbar to open the **Home: Diagram Settings** screen (Figure 29). This is the screen which you will use to create new diagrams, open existing diagrams, and change diagram settings (e.g., name, keywords, collaborators, etc.) for any diagrams you create. If you move from View mode to Edit mode without a diagram already open, the **Home: Diagram Settings** screen will pop-up automatically. Sections 6.2 through 6.6 explain how to use the **Home: Diagram Settings** screen to access these capabilities.

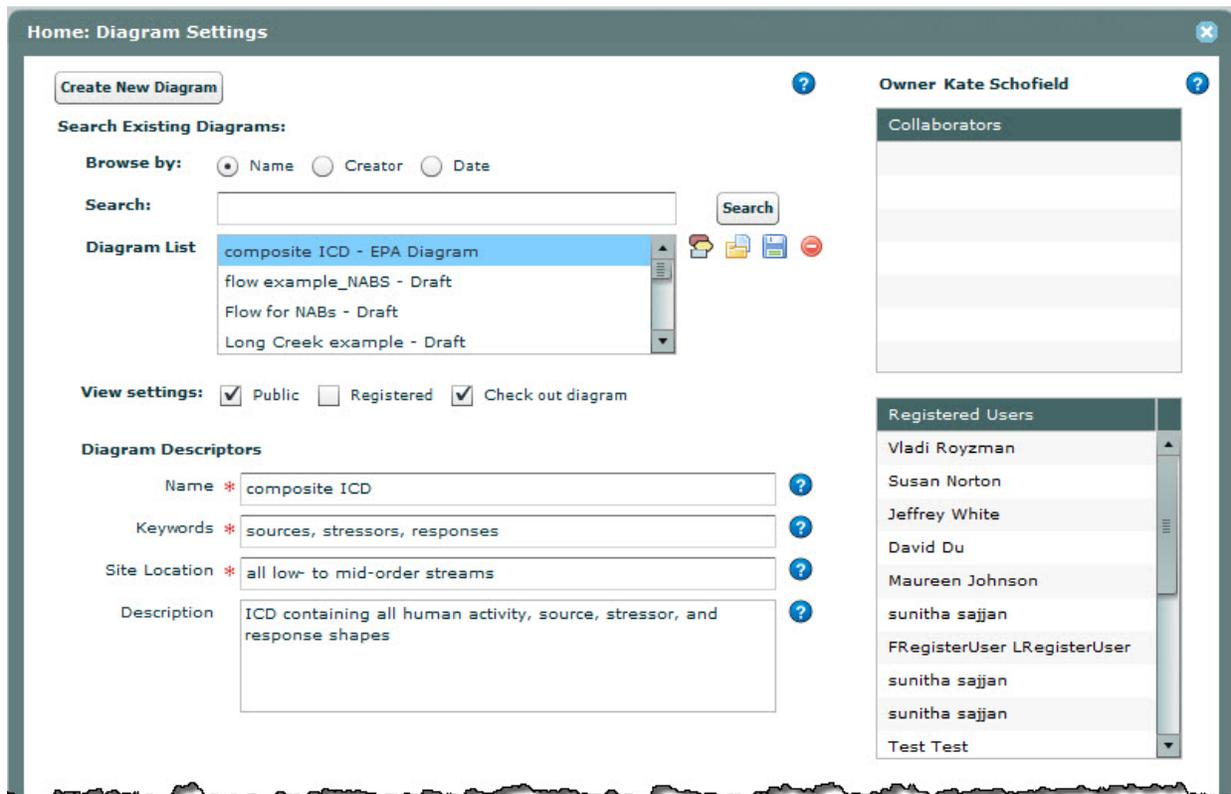


Figure 29: Home: Diagram Settings screen

6.2 Create New Diagram

To create a new diagram, click the **Create New Diagram** button at the top left of the **Home: Diagram Settings** screen (Figure 29) to display the New Diagram screen (Figure 30). Fill in the following required (denoted by red asterisks) and optional information fields for your new diagram:

- Diagram name (required): a brief but descriptive name that will make your diagram easily identifiable to you and your collaborators.
- Size (required): see Section 3.5 for information on canvas size and tiers.
- Keywords (required): important sources, stressors, and responses in your diagram, or any other key terms (separated by commas).
- Site location (required): sites, areas, or habitat types to which your diagram applies or may be applicable (e.g., Long Creek, ME; low- to mid-order streams in the Northeast US; coastal plain streams).
- Description (optional): a brief narrative description of what your diagram represents.

The screenshot shows a 'New Diagram' dialog box with the following fields and controls:

- Name ***: A text input field.
- Size (in pixels) ***: A dropdown menu currently showing '1024x768 (16 Tiers)'.
- Keywords ***: A text input field.
- Location ***: A text input field.
- Description**: A larger text area for optional input.
- Create** and **Cancel**: Buttons at the bottom of the dialog.

Figure 30: New Diagram screen

Once you have entered the required information, click the **Create** button. Each diagram in the ICD application has a unique name. If you enter a diagram name that already exists in the database, you will see a warning message asking you to choose a new name. Once your new diagram is successfully created, you will see a confirmation message. **At this point, the diagram has been created but is not yet saved into the ICD database (see Section 6.7 for instructions on saving your diagram).**

6.3 Open Diagram

To open an existing diagram from Edit mode, go to the **Home: Diagram Settings** screen, select a diagram from the **Diagram List** pull-down menu, and click the **Open Diagram icon**  (Figure 29). The **Diagram List** pull-down menu contains all of the diagrams currently saved in the ICD application, listed

by diagram name. When you click on a diagram in this menu, it will appear in the list window and any completed **Diagram Descriptor** fields will appear below (Figure 29; see Section 6.2 for additional information on these fields).

Note that how you open existing diagrams differs between View mode and Edit mode (see Section 5.1 for instructions on opening diagrams in View mode). The appearance of diagrams opened in View mode and Edit mode also differs: when a diagram is opened in View mode all child shapes are hidden by default (Figure 31), whereas in Edit mode all shapes are always displayed (Figure 32).

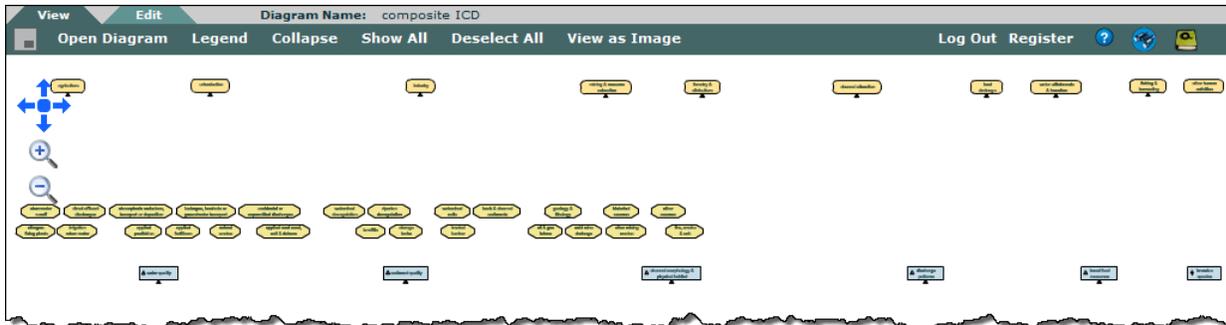


Figure 31: Diagram opened in View mode

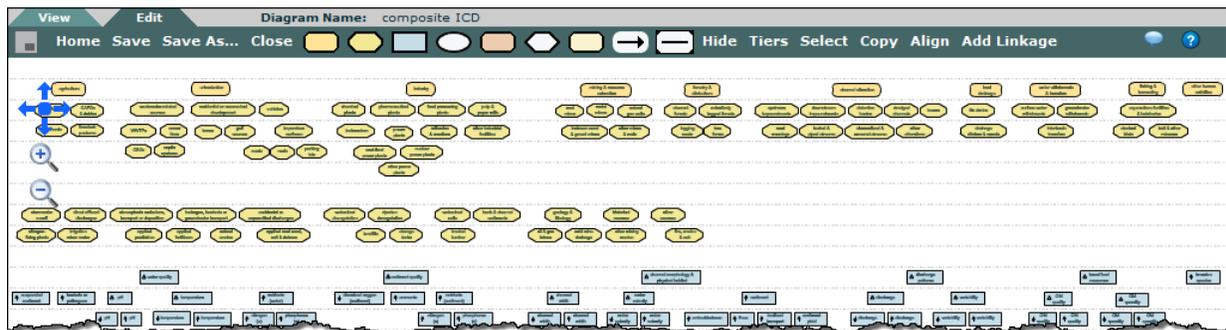


Figure 32: Diagram opened in Edit mode

If you already have a diagram open and wish to open a new one, click the Home button on the Edit mode toolbar (Figure 13). You will get a warning message asking you whether you want to save the diagram currently open before proceeding. Click **Yes** to save and close the current diagram; click **No** to close the current diagram without saving any changes. The **Home: Diagram Settings** screen will then appear, allowing you to choose a new diagram to open.

6.4 Search Diagrams

You can search the **Diagram List** to find specific diagrams of interest using the **Browse by** and **Search** functions on the **Home: Diagram Settings** screen (Figure 29). You can browse by diagram name, creator, or date created by selecting the appropriate radial button; diagrams will be listed in the Diagram List

according to the criterion you choose. You also can conduct a text-based search of the Diagram Descriptor fields by entering selected terms in the **Search** field and clicking **Search**.

6.5 Change Diagram Settings & View Diagram History

From the **Home: Diagram Settings** screen, you can change the diagram settings for any diagram you create. **Note that only the creator of a diagram (and in some cases designated collaborators) can make these settings changes:** if you select a diagram in the Diagram List for which you are not the creator or a collaborator, many of these options may be shaded out or may not appear at all on the screen.

Diagram settings include:

- View settings: settings that determine which users can view your diagram.
- Diagram descriptors: name, keywords, site location, and description.
- Collaborators: users you have granted permission to modify your diagram (see Section 6.6).

To change the **View Settings** for a diagram you created, select that diagram in the **Diagram List** on the **Home: Diagram Settings** screen (Figure 29) and check one or more of the available **View Setting** options (unavailable options will be shaded out):

- The **Public** view setting means that both public and registered users can view the selected diagram. This option is only available to Admin users, and is always shaded out for all other registered users.
- The **Registered** view setting means that all registered users can view your diagram (and save it as a new file if they wish to; see Section 6.8). If you do not check Registered, the only users able to view your diagram will be any collaborators you select (see Section 6.6).
- The **Check out diagram** view setting means that you have checked out the selected diagram. By checking out the diagram, you disable the Save function for any of your designated collaborators, should they wish to use that diagram while you have it checked it out; this ensures that two users are not simultaneously making changes to the same diagram file.

To **change Diagram Descriptors** for a diagram you created or on which you are a collaborator, select that diagram in the **Diagram List** on the **Home: Diagram Settings** screen and make any changes directly in the Diagram Descriptor fields (Figure 29).

After making changes to View Settings or Diagram Descriptors, **you must click the Recategorize Diagram icon**  to the right of the **Diagram List** (Figure 29)—otherwise, your changes will not be saved.

To **delete a diagram**, select that diagram on the **Diagram List** of the **Home: Diagram Settings** screen and click the **Delete Diagram icon**  to the right of the Diagram List (Figure 29). You will get a warning

message, asking you if you really want to delete the diagram you have selected; click **Yes** to proceed with deletion, or click **Cancel** to keep the diagram and return to the **Home: Diagram Settings** screen.

When a diagram creator or collaborator makes changes to a diagram, the most recently updated file is listed in the **Diagram List**. However, all old versions of that diagram also are available. To view these older diagram versions, select a diagram on the **Diagram List** of the **Home: Diagram Settings** screen and click the **Diagram History icon**  to the right of the Diagram List (Figure 29). This will bring up the **Diagram History** screen (Figure 33), where you can access all previously created versions of the diagram and view all submitted comments (see Section 6.22).

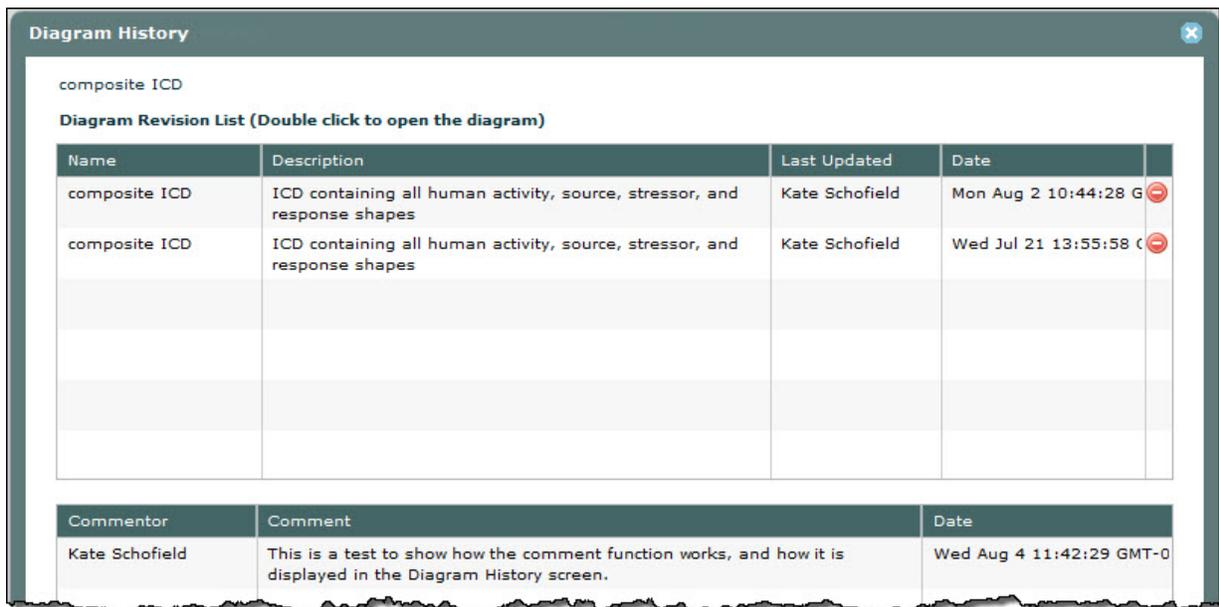


Diagram History				
composite ICD				
Diagram Revision List (Double click to open the diagram)				
Name	Description	Last Updated	Date	
composite ICD	ICD containing all human activity, source, stressor, and response shapes	Kate Schofield	Mon Aug 2 10:44:28 G	
composite ICD	ICD containing all human activity, source, stressor, and response shapes	Kate Schofield	Wed Jul 21 13:55:58 C	
Commentor	Comment	Date		
Kate Schofield	This is a test to show how the comment function works, and how it is displayed in the Diagram History screen.	Wed Aug 4 11:42:29 GMT-0		

Figure 33: Diagram History screen

6.6 Select Collaborators

The right side of the **Home: Diagram Settings** screen provides information on a diagram's owner and collaborators (Figure 29). The **owner** (or creator) is the user who originally created the diagram, and is listed in the top right corner of the screen. **Collaborators** are registered users that the diagram owner grants permission to make changes directly to that diagram. To designate collaborators for a diagram that you own (i.e., have created), first select that diagram in the **Diagram List** of the **Home: Diagram Settings** screen. The **Collaborators window** (right side of the **Home: Diagram Settings** screen) (Figure 41) lists all registered users designated as collaborators; the **Registered Users** window lists all registered users of the ICD application (Figure 29). You can **add users to the Collaborators window** by either clicking-and-dragging selected users from the **Registered Users** to the **Collaborators window**, or by double-clicking on a name in the **Registered Users** window. Any names you add should now appear in the **Collaborators window**.

An owner is not required to select collaborators for a diagram. If no users are selected as collaborators (i.e., the **Collaborators window** is empty), only the diagram owner will be able to save changes to the diagram without saving it as a new, renamed diagram. Even if no collaborators are set, however, the owner must **check out the diagram** (see Section 6.5) for the **Save** button to be enabled (i.e., for the **Save** button on the Edit mode toolbar to be active, rather than shaded out).

6.7 Save Diagram

Once you have opened a diagram, click the **Save** button on the Edit mode toolbar (Figure 13) to save any changes you make to it. If you are not authorized to save changes to a diagram (i.e., you are not the diagram's owner or an authorized collaborator), the **Save** button will be disabled, or shaded out. If you are authorized to make changes to a diagram but the **Save** button is disabled, make sure to click the **Check out diagram** option on the **Home: Diagram Settings screen** (see Section 6.5).

After you click **Save**, a confirmation message will appear once the diagram is successfully saved. Remember that no changes are saved automatically—you must use the **Save** button to ensure any changes you make are kept.

6.8 Save Diagram As

To save an open diagram as a new file, click the **Save As...** button on the Edit mode toolbar (Figure 13). The system will display a warning message asking whether you want to save the diagram currently opened before proceeding. Click **Yes** to save the currently opened diagram (a confirmation message will display once the diagram is successfully saved); click **No** to close the currently opened diagram without saving.

After you either save or choose not to save any changes to the open diagram, the **Save Diagram As screen** appears (Figure 34). Enter the new diagram name, specify the new canvas size, enter new diagram descriptors (see Section 6.2), and then click **Save As**. A confirmation message will appear once the diagram is successfully saved, and the system will open the newly created diagram on your screen.

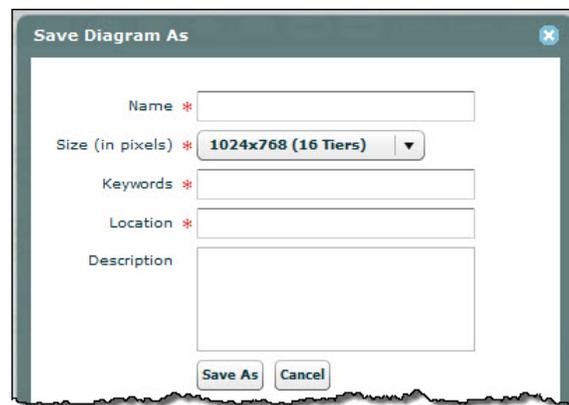


Figure 34: Save Diagram As screen

If you save an existing diagram as a new diagram with a smaller canvas size, a warning message appears that explains any content outside the new canvas boundaries will be lost (Figure 35). Either click **Yes** to proceed, or click **No** to save the diagram with a larger canvas size (i.e., a higher diagram resolution).

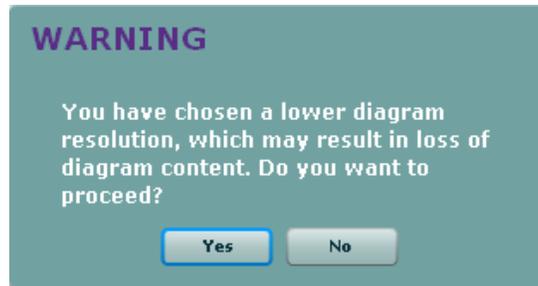


Figure 35: Warning message when saving diagram at a lower resolution (or smaller canvas size)

The **Save As** function provides an easy way of using larger, pre-existing diagrams to create smaller diagrams more specific to a particular area or topic. Use **Save As** to save a pre-existing diagram as a new diagram file. Delete and add shapes and other features as desired, with shapes arranged down and to the right from the top left corner of the canvas. To delete extra canvas area at the right and bottom sides of the new diagram, use the **Save As** function again to save the diagram with a smaller-sized canvas.

6.9 Close Diagram

To close a diagram, click the **Close** button on the Edit mode toolbar (Figure 13). A warning message will appear, asking whether you want to save the diagram currently opened before proceeding. Click **Yes** to save and close the diagram (you will see a message confirming the diagram was successfully saved); click **No** to close the opened diagram without saving it.

6.10 Add Shape

To add a new shape to a diagram, click on any **shape icon** in the Edit mode toolbar (Figure 13) and then click the location on the canvas where you want to place the shape. A **Shape Attributes screen** will appear (Figure 36), which allows you to assign attributes to your newly created shape (see Section 6.21 for a description of the Shape Linkages button on this screen). Enter the following information for your shape (see Section 3.2 for additional detail):

- Label (required): the text you want to appear inside the shape
- Direction (optional): the directional symbol (change in, increasing, or decreasing) modifying the shape's label the change in, increasing, or decreasing)
- Parent (optional): the shape's parent shape (typically a broader category) **[note: we recommend that you leave the parent field blank for all shapes in your diagram]**

Once you have entered this information, click **Save**. The newly created shape will appear on the canvas at the location you selected, with the shape label displayed in the shape.

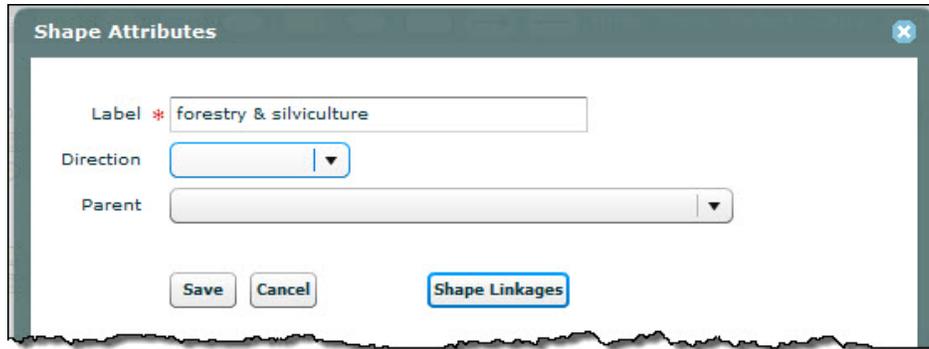


Figure 36: Shape Attributes screen for adding shapes

6.11 Change Shape Attributes

To change the attributes of any shape, double-click on that shape to bring up the **Shape Attributes screen** (Figure 36). Make any changes to the Label, Direction, or Parent fields, and click **Save** to save your changes. **Note that you cannot change shape linkages in this way—if you change a shape’s label or direction, it will still be linked to the previously linked citations—so use care when changing shape attributes.**

6.12 Move Shape

To move a shape, move the cursor over the shape so that four blue dots are displayed on the sides of the shape (Figure 37). Drag the shape and drop it in a different location on the canvas.

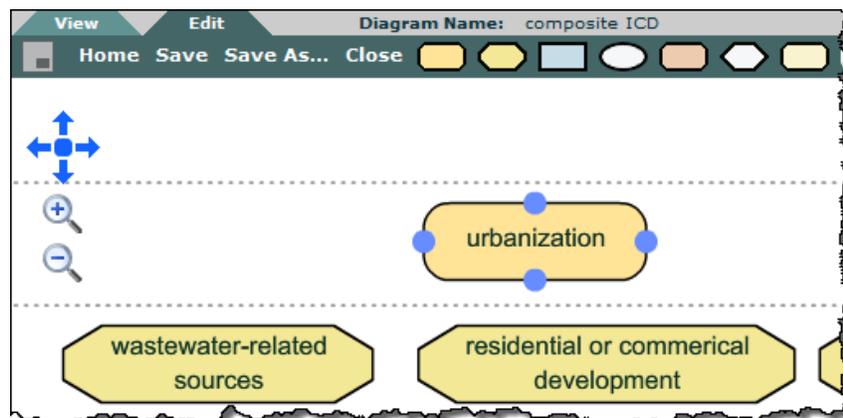


Figure 37: Appearance of shape when you move cursor over it

6.13 Select/Move a Group of Shapes

Click the **Select** button on the right side of the Edit mode toolbar (Figure 13). The **Select** button will switch to the **End** button; all other buttons except the **Home** button will be disabled. Click and drag the cursor on the canvas to select a group of shapes. A blue rectangle will appear on the canvas to indicate the area you select, and four blue dots will appear on the sides of every shape inside the blue rectangle (Figure 38). To move your selected shapes, drag them as a group to any location on the canvas. Select any additional groups of shapes you wish to move similarly. Once you have moved all the shapes you wish to, click the **End** button to end the Select function. The **End** button will switch back to the **Select** button, and the other toolbar options will be enabled.

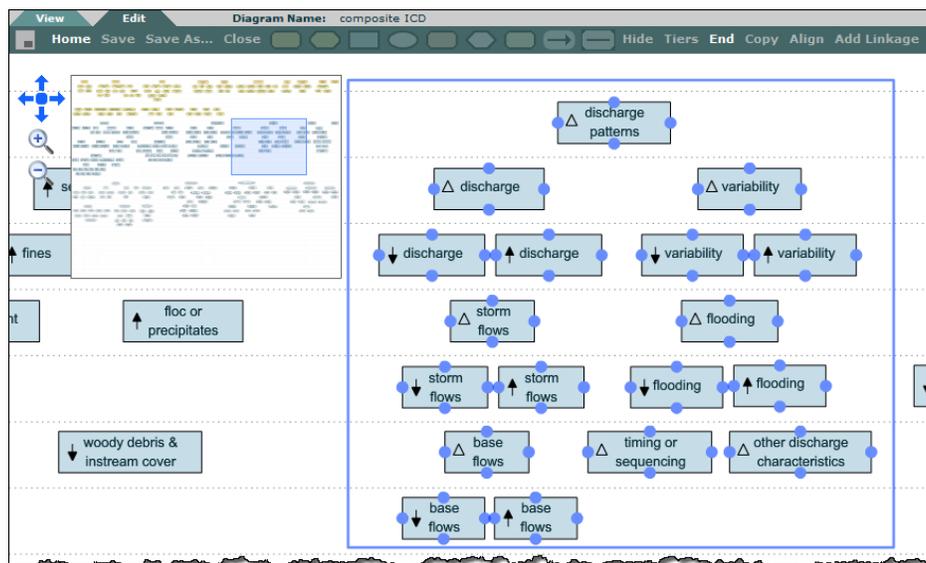


Figure 38: Selecting a group of shapes

6.14 Select Non-Collapsible Tiers

In Edit mode, the diagram canvas is divided into visible tiers, or horizontal layers (see Section 3.5). The **Collapse/Expand** function (see Section 5.3) basically allows you to temporarily remove empty tiers when viewing the diagram in View mode, for improved diagram visibility and navigability. By default, each tier is collapsible unless there are shapes on it. If you don't want a certain tier to be collapsible, you can set it as non-collapsible by clicking the **Tiers** button on the Edit mode toolbar (Figure 13).

The **Tiers Configuration screen** (Figure 39) appears once the **Tiers** button is clicked. By default, every tier is selected to be collapsible. Uncheck the checkboxes for any tiers you wish to make non-collapsible and click the **Save** button at the bottom of the **Tiers Configuration screen**. To make those tiers collapsible again, simply re-check them in the **Tiers Configuration screen** and click **Save**.

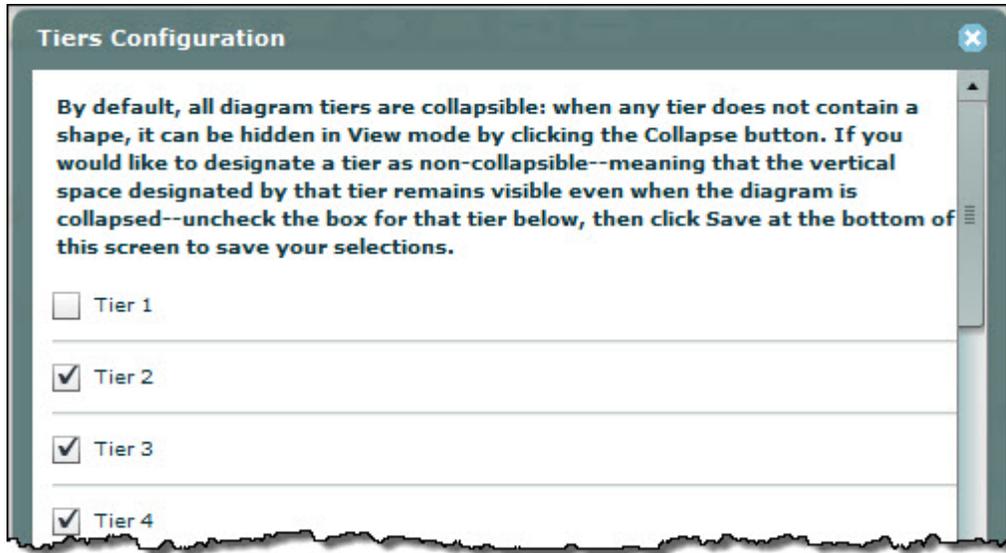


Figure 39: Tiers Configuration screen

6.15 Copy Shape

To copy a shape and all of its characteristics (e.g., its label, linked references, and assigned parent), click the **Copy** button on the Edit mode toolbar (Figure 13). The **Copy** button will switch to the **End** button and all other toolbar options except the **Home** button will be disabled. Click on the shape you want to copy and four blue dots will appear on the sides of the shape. Click any location on the canvas to create a copy of the shape in that location; click on any other locations on the canvas to create additional copies. Select and place any other shape you wish copy similarly. Once you have copied all the shapes you wish to, click the **End** button to end the **Copy** function. The **End** button will switch back to the **Copy** button, and the other toolbar options will be enabled.

6.16 Delete Shape

To delete a shape, move the cursor over the shape. Four blue dots will appear on its sides, indicating that the shape has been selected. Press the **Delete** key on the keyboard and the selected shape will be deleted from the canvas. You also can delete multiple shapes at one time, using the **Select** button on the Edit mode toolbar: simply select a group of shapes (Section 6.12), then press the **Delete** key.

6.17 Align Shapes

The **Align** feature allows you to vertically align multiple shapes. Click the **Align** button on the Edit mode toolbar (Figure 13). The **Align** button will switch to the **End** button, and all other toolbar options except the **Home** button will be disabled. Click the shapes you want to align one by one; four blue dots will appear on the sides of every shape you select. Click the **End** button once you finish selecting all the shapes you want to align, and the shapes you selected will be vertically aligned (Figure 40).

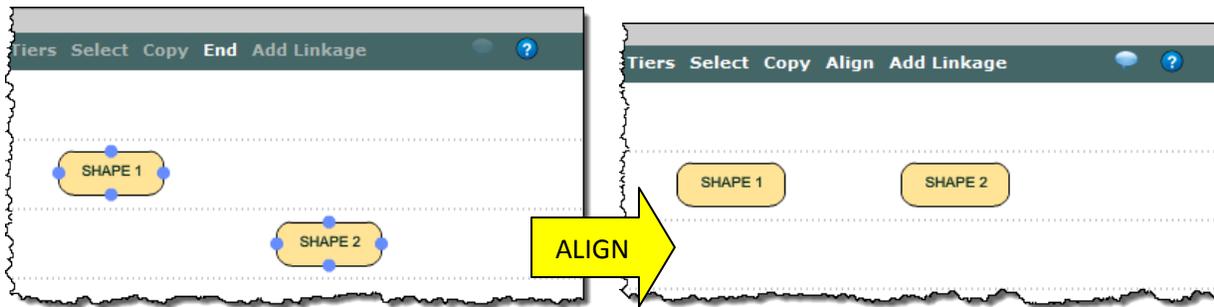


Figure 40: Align shapes

6.18 Add/Merge/Delete Arrows & Lines

To **add an arrow or a line** to a diagram, click either the **Arrow or Line icon** (to the right of the Shape icons) on the Edit mode toolbar (Figure 13). Four blue dots will appear on the sides of all shapes on the canvas. Click on a blue dot on any shape and move the cursor away from that shape; an arrow/line will form as the cursor moves away from the point of origin. As you move your cursor around the diagram, the end point of the arrow/line follows the position of your cursor. Clicking another point on the canvas will create a pivot point on the arrow/line. Continue to click points on the canvas as you choose. To end the arrow/line, click on one of blue dots on any shape (Figure 41).

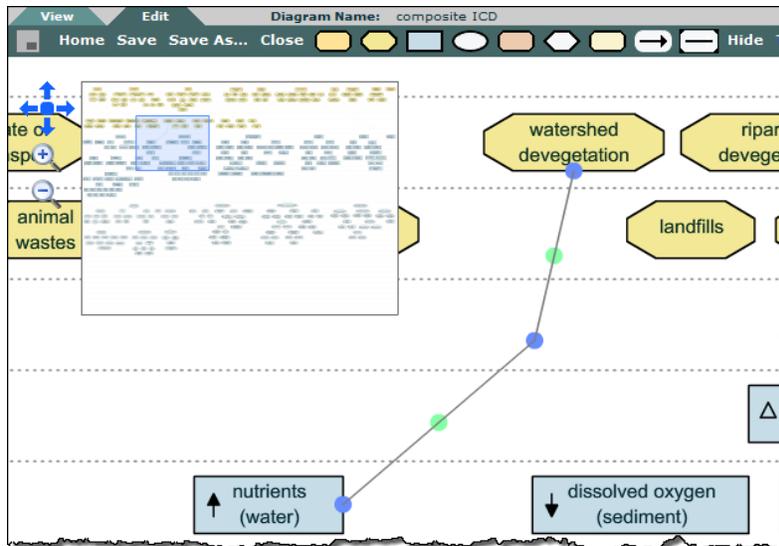


Figure 41: Adding an arrow/line between two shapes

You can add arrows/lines that are not attached to the blue dots on any shape, by clicking anywhere on the canvas to start an arrow/line and double-clicking anywhere to end it. However, arrows/lines that are attached to shapes at the blue dots move with those shapes—if you move the starting or ending shape, the arrow/line between them will be maintained.

You also can **merge two arrow/line segments** into one, to condense an arrow/line. Move the cursor to one of two end points on an arrow/line. Two blue dots appear on the end of each line segment within the arrow/line, and one green dot appears on the middle of each arrow/line segment within the arrow/line. Drag one of the blue dots to the position of an adjacent blue dot to merge the arrow/line segments into one segment (Figure 42).

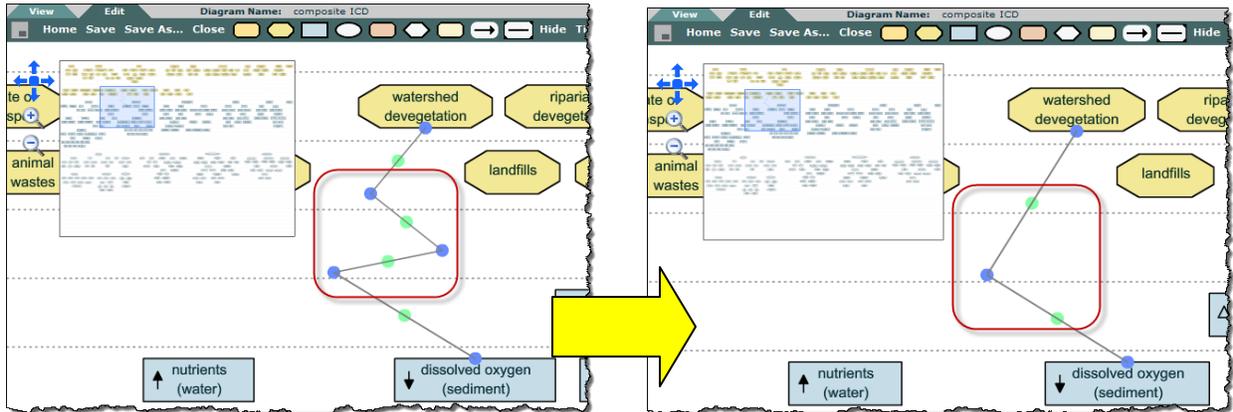


Figure 42: Merging two adjacent arrow/line segments into one arrow/line segment

To **delete an arrow/line**, move the cursor to the middle or end of an arrow/line segment. Two blue dots appear at the ends of the arrow/line segment and a green dot appears in the middle of the segment. Keeping the cursor in this position, remove the arrow/line by pressing the Delete key on the keyboard.

6.19 Add Linkage

To link shapes with a supporting reference, click the **Add Linkage** button on Edit mode toolbar (Figure 13). The **Add Linkage** button will switch to the **Save Linkage** button and all other toolbar options except the **Home** button will be disabled. Select any shape on the diagram; once the shape is selected, four blue dots will appear on the shape’s sides. When these dots appear, select one or more additional shapes (Figure 43) and then click the **Save Linkage** button.

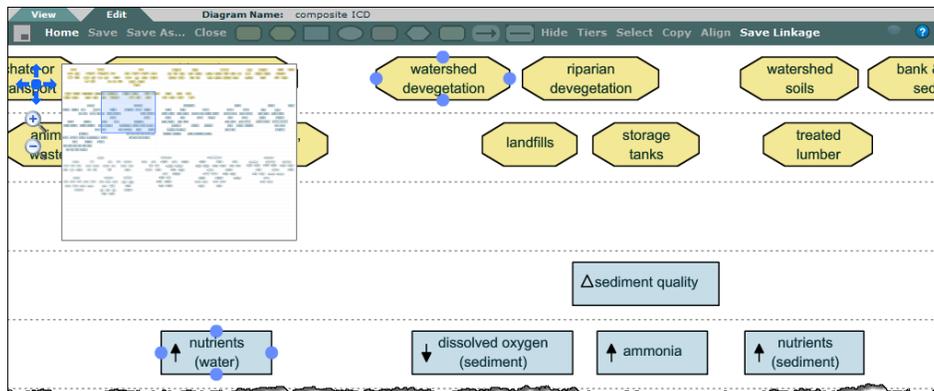


Figure 43: Selecting shapes to add linkage [watershed devegetation and ↑ nutrients (water)]

This will bring you to the **Save New Linkage** screen (Figure 44). The shapes you selected are displayed in the **Selected Shapes** field. If more than two shapes are selected, you must choose the **Linkage Type**: **all linkage pairs** means that every possible pairing of the selected shapes will be linked, whereas **all primary shape pairs** means that the first shape you selected will be linked to every subsequent shape (the name of the first shape you selected, or the primary shape, will be displayed in parentheses). For example, if you selected Shapes A, B, and C, selecting all linkage pairs will create linkages for Shape A-Shape B, Shape A-Shape C, and Shape B-Shape C; selecting all primary shape (A) pairs will create linkages for Shape A-Shape B and Shape A-Shape C.

Figure 44: Save New Linkage screen

The rest of the **Save New Linkage screen** deals with selecting references to support the linkages you have chosen. To search for a citation in the ICD literature database, enter a keyword into the **Find Citation field** and click **Search** (or press **Enter**); citations containing this keyword will appear in the **Existing Citations window** (Figure 44).

You can edit existing citations in the database by selecting the citation in the **Existing Citations window** (it will highlight in blue), then clicking the **Edit citation** button (to the top right of the **Existing Citations window**, next to the **Upload new citation(s)** button). This will display the **Edit Citation screen** (Figure

45). Make any changes in the information provided, and submit those changes by clicking the **Save** button at the bottom of the screen (you will need to scroll down in the **Edit Citation** screen to do this). A message confirming that your changes have been saved will appear.

The screenshot shows the 'Edit Citation' form with the following data:

Field	Value
Publication Type *	JOURNAL ARTICLE
Author(s) *	Moore AA, Palmer MA
Year *	2005
Title *	Invertebrate biodiversity in agricultural and urban headwater streams: Implications for c
Journal *	Ecological Applications
Volume *	15
Issue	4
Start Page *	1169
End Page *	1177
Keyword(s)	
URL Exit Disclaimer	<input type="checkbox"/>
URL	
Abstract	The urbanization of agricultural lands is currently one of the dominant patterns of land use change in developed countries. In the United States and parts of Europe, this has led to the implementation of agricultural land preservation programs and riparian protection and replanting efforts along urban streams. The ecological benefits of such programs for the conservation of freshwater biodiversity have yet to be fully explored. We designed a study to investigate the patterns of stream
Annotation	

Figure 45: Edit Citation screen for making changes to existing citations in the ICD database

To avoid re-entering a citation into the database that is already there, we recommend that you search for the citation of interest before entering a new citation. If you do not find the citation you want to link to your selected shapes, you can enter it into the database. Click the **Enter new citation** button on the **Save New Linkage** screen (to the right of the **Find Citation** field) to display the **Add New Citation** screen (Figure 46). Enter information for the new citation (required fields are marked with a red asterisk) and click **Save**. A message will appear, confirming that your citation has been added; it should now appear in the **Existing Citations** window when you use the **Find Citation** feature.

The screenshot shows a web-based form titled "Add New Citation". At the top, there is a dropdown menu for "Publication Type" which is currently set to "JOURNAL ARTICLE". Below this are several input fields, some of which are highlighted with red borders: "Author(s)", "Title", and "Journal". Other fields include "Year", "Volume", "Issue", "Start Page", and "End Page". There is also a "Keyword(s)" field, a "URL Exit Disclaimer" checkbox, a "URL" field, an "Abstract" text area, and an "Annotation" text area. The form is presented in a window with a standard OS-style title bar and a scrollbar on the right side.

Figure 46: Add New Citation screen for entering new citations

To link a citation to a pair of shapes, you must select it in the **Existing Citations window** and move it to the **Selected Citations window** (Figure 44). To do this, either double-click on a citation in the **Existing Citations window** or drag-and-drop a citation from the **Existing Citations window** into the **Selected Citations window**. You can add multiple citations to the **Select Citations window** at one time. To remove a citation from the **Selected Citations list** (e.g., if you accidentally select the wrong citation to link), select the citation and press the **Delete** key. Once you have selected a citation to link, click the **Save** button to complete the Add Linkage process.

6.20 Upload New Citation(s)

You also can upload multiple citations at one time from your reference management software: both EndNote and Reference Manager export files are supported, provided the export file is in 'xml' format (i.e., the export file should have the file extension .xml). Click on the **Upload new citation(s)** button on the **Save New Linkage screen** to display the **Upload References screen** (Figure 47).

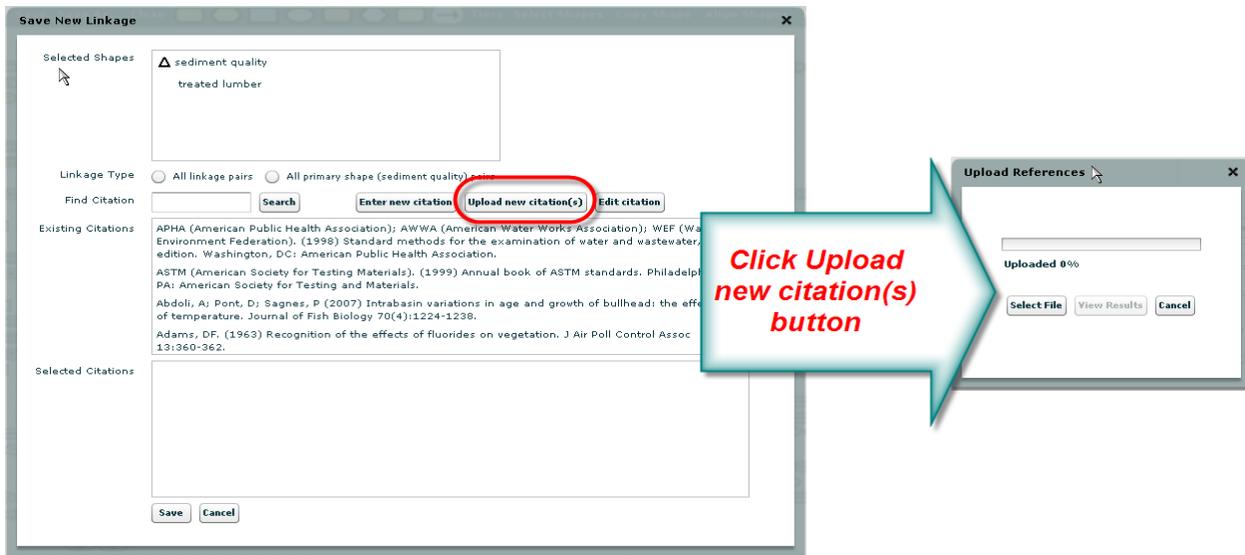


Figure 47: Upload References screen, accessed from the Save New Linkage screen

Click the **Select File** button, and the system will prompt you to select a file from your directory. Select the export file that was created when you exported citations from your reference manager software and click OK. The system will begin to upload references and display a progress bar for the upload. Once the upload is complete, the system will display a confirmation message; click OK to close the confirmation message. Click the **View Results** button in the **Upload References screen** to view a list of uploaded references and whether or not they were successfully opened. Note that your file will not be uploaded if there is an issue with even one citation in your file. If this happens, view the error report to see what reference caused the problem, fix that entry, and then re-upload your file.

6.21 View/Delete Shape Linkages

To view or delete linkages associated with any shape, double-click on a shape in Edit mode to open the **Shape Attributes screen**. Clicking on the **Shape Linkages** button at the bottom right of this screen brings up the **Shape Linkages screen**, where all the linkages associated with this shape in the open diagram are listed (Figure 48). To delete linkages between the shape you selected and any of the shapes listed in the **Shape Linkages screen**, select the checkbox associated with the shapes of interest and click the **Delete Linkage(s)** button at the bottom of the screen. **Remember—this will delete all linkages, for all citations, between these two shapes.** Click the **Close** button to exit the **Shape Linkage screen** and return to the **Shape Attributes screen**.

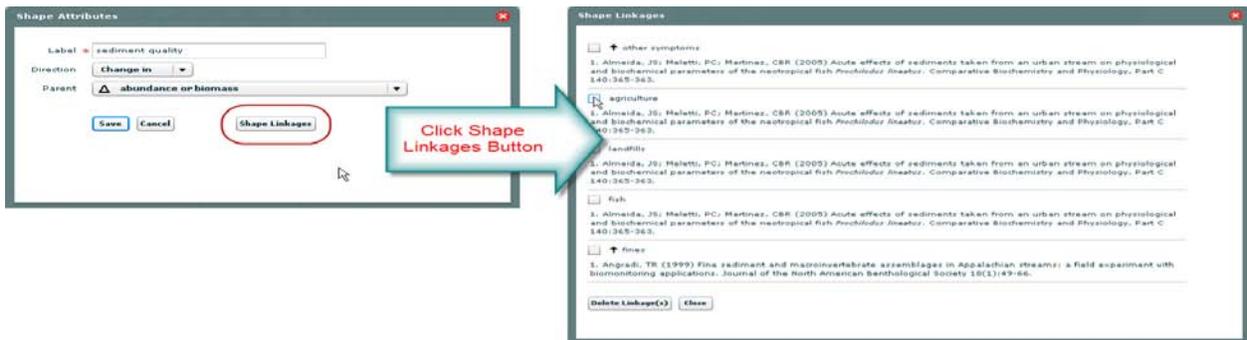


Figure 48: View/Delete shape linkages using the Shape Linkages screen

6.22 View/Make Comments

To comment on any diagram to which you have access—that is, any diagram for which you are the owner or a designated collaborator, or for which the diagram’s creator has set its view setting as Registered (see Section 6.5)—click the **Comment** icon  on the Edit mode toolbar (Figure 13). This will bring up the **View Comments** screen (Figure 49), which lists all previous comment made on the diagram, who made them, and when they were made. To add a new comment, click the **New Comment** button on the top-right of the **View Comments** screen. The **New Comment** screen (Figure 50) will appear; simply type in your comment and click **Save** to add your thoughts. **Remember: assume that your comments will be viewable by all registered users of the ICD application.** Even if a diagram does not currently have a Registered view setting (see Section 6.5), any collaborator can change that setting and allow any registered user viewing access.

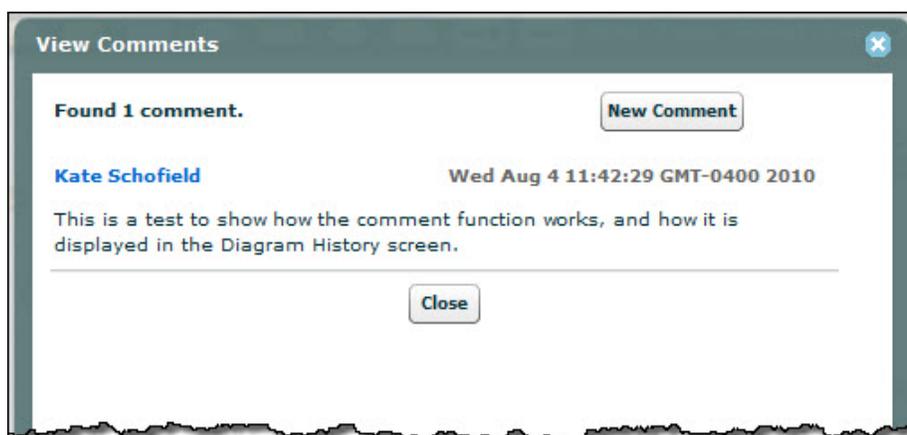


Figure 49: View Comments screen

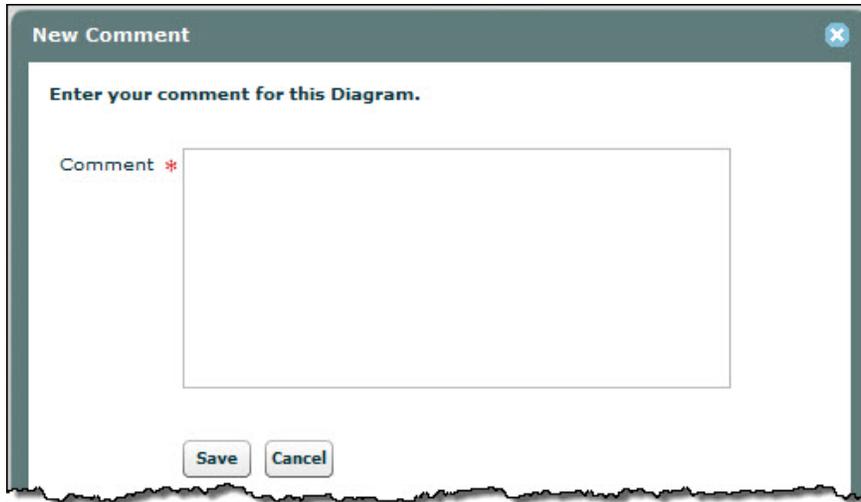


Figure 50: New Comment screen