IWR Planning Suite II

Test Plan

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IWR Planning Suite

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Purpose

The purpose of this document is to outline the available functions within the IWR Planning Suite application and their intended use.

Application Button Options

These options allow the user to create, open, delete, close, set a default location to save and save planning studies as well as export and print planning sets, optimize a planning study database and exit the application.

Create New Planning Study

This form allows the user to create new planning studies. The form is launched when the user clicks the application button and then selects New.

Study Name

Acceptable Values

Alphanumeric values not to exceed 255 characters.

Values Tested

Values that were tested included those that were less than 255 characters, exactly 255 characters and values that exceeded 255 characters. The tested values included letters, numbers and special characters.

Other Information

None.

Database Name

Acceptable Values

Alphanumeric values not to exceed 50 characters.

Values Tested

Values that were tested include those that were less than 50 characters, exactly 50 characters and values that exceeded 50 characters. If special characters or spaces are included in the database name when the user tabs off that field those characters are removed from the database name.

Other Information

The database is automatically named for the user based on the study name. If the study name exceeds 50 characters then the first 50 characters of the study name is used as the database name.

Since the database name becomes the directory name it is important to note that directory names can't exceed 248 characters and that the total path can't exceed 260 characters.

Current Project Directory

Acceptable Values

Any existing directories can be used for the project directory as long as the total path doesn't exceed 260 characters. The path may include spaces or special characters. The user can modify the Current Project Directory to a directory of their choosing by clicking the 'Choose Project Directory' button.

Values Tested

Values that were tested included those that were less than 255 characters, exactly 255 characters and values that exceeded 255 characters. The tested values included letters, numbers and special characters.

Other Information

By default the applications default project directory will be within their My Documents folder in a folder named based on the IWR Planning Suite II *version* they have installed for example IWR Planning Suite II (1.0.4.0) Studies. The user can click the 'Choose Project Directory...' button to modify the Current Project Directory listed. Any directory of any name can be used as long as the total path doesn't exceed the 260 character limit. If the user changes the path under either the Choose Project Directory option (or using the Select Default Directory option on the application button) the default directory will be updated to this location for all future planning studies created until the user explicitly modifies the path.

Open Planning Study

This form lists the planning studies that have been created or opened with the IWR Planning Suite II application. No text or date fields on this form are directly editable. If the user clicks the 'Add New' button then the Select an IWR Planning Study Database form will open and the user can select an existing planning study database file. This form is launched when the user clicks the application button and then selects Open.

File Name

Acceptable Values

Users can select any file with an extension of .sqlite.

Values Tested

Existing planning study databases were selected and opened.

Other Information

This functionality is intended to allow the user the ability to open a previously created planning study that were created on another user's machine but you would like to open and use or update in the IWR Planning Suite II or one that has moved locations on your machine and needs to be identified within the application. Note this is not intended to open planning studies created using prior versions of the application. This functionality was tested by copying existing .sqlite databases and putting a copy in another directory. The user can then navigate to this folder and select the copied .sqlite database and click Open.

Deleting an Existing Planning Study

This form allows the user to delete any planning studies that have been created or opened using the IWR Planning Suite II database. No text or date fields on this form are directly editable on this form. The user can select one or more planning studies they wish to delete. Deleting a planning study is a permanent

action and deletes the planning study database. The parent directory and other related files will remain unless specifically deleted by the user. Since the user could have saved this database directly in any location and possibly have other files placed in the same folder it was not considered good practice to automatically delete these other items.

Delete

Acceptable Values

The Delete field is either toggled on or off by checking the box beside each record in the Delete column.

Values Tested

The first test performed involved the deletion of one planning study. Then a few planning studies were selected at one time and then the 'Delete Selected' button was pressed. Pressing this button deletes the planning study from the displayed list and deletes the associated .sqlite database file. The final test performed was to select and delete all listed planning studies. After deleting the identified planning studies the 'Delete Selected' button becomes disabled once again since no studies selected for deletion. The deleted .sqlite databases are moved to the Recycle Bin unless they are too large for the Recycle Bin in which case they will be permanently removed.

Other Information

The 'Delete Selected' button will remain disabled until at least one planning study is marked for deletion.

Closing a Planning Study

Selecting Close from the application menu should close the planning study and leave the application in a state where a planning study is no longer opened and all ribbon options are disabled since they are related to a planning study. Only one planning study can be opened at a time within the application.

Save As

Selecting Save As from the application menu allows the user to save the current planning study to another directory.

File Name

The Save As dialog opens and the user is able to enter a file name. This creates a directory with this given name and inside that directory will be a .sqlite file with the same name that is a database file that contains all the information in the currently opened planning study.

After saving the planning study the user will receive a dialog verifying that the planning study was successfully saved. The user should click 'OK' to close this message and continue using the application. This will now be the currently opened planning study and any edits completed will only be updated in this planning study database.

This menu option is only enabled when the user has an open planning study.

Acceptable Values

Users can enter a file name composed of letters and spaces of up to 255 characters. If spaces are used those will be removed from the created directory and database file name.

Values Tested

Values up to 255 characters can be entered but if this causes the path length to exceed 260 characters the user will be asked to enter a shorter name. Spaces and special characters will not be used in the resulting file name.

Other Information

None.

Export to Excel Spreadsheet

The Export option on the application menu currently has one option, Excel Spreadsheet. If the user selects this option they will be prompted to enter a file name and select a location to save the file in the Save As dialog. This option will export the planning set selected in the Planning Sets Pane of the application to a spreadsheet. Once the export has completed the user will be prompted with a dialog requesting whether they would like to open the file for viewing at this time.

File Name

The Save As dialog opens and then the user is able to enter a file name. Once exported an .xlsx file with the user defined name will be inside the selected directory and it will contain all the information for the currently selected planning set.

The user will receive a dialog verifying that the file was created successfully. The user can either opt to open the file for viewing or close the dialog and continue using the application.

This menu option is only enabled when the user has an open planning study.

Acceptable Values

Users can enter a file name composed of letters and spaces of up to 255 characters.

Values Tested

Values up to 255 characters can be entered but if the entered file name causes the entire path length to exceed 260 characters the user will be asked to enter a shorter name.

Other Information

It is expected that software capable of opening an .xlsx file is installed and available on the machines being used for IWR Planning Suite II for opening and viewing the file. If the user does not have Microsoft Excel installed and selects 'Yes' they will receive a message, "Excel could not be started."

Optimize Database

Selecting the Optimize Database option from the application menu closes the database for the currently opened planning study and de-fragments, repairs and compacts the database and then reopens it within the IWR Planning Suite II application. When the process is complete the user will receive a dialog indicating that the optimization was completed successfully. When the user clicks 'OK' the planning study will be reopened in the application.

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Select Default Directory

The default directory is where all new planning studies will be created and stored. When the user selects the Select Default Directory option from the application menu then the user is prompted to browse and select a folder. The user can drill through existing folders or create a new folder using the Make New Folder option. Once the user selects the folder they would like to utilize as the default directory they can click the 'OK' button to continue. If the user elects not to modify the default directory for the application they can click the 'Cancel' button to exit the dialog.

Print Preview

The print preview functionality is available to demonstrate to the user what the printed paper itself will look like if Print was selected at this time. The currently selected planning set will be shown in the print preview window. The user has the option to print, zoom in, zoom out, zoom to 100%, page width, whole page, or two page view using the options available at the top of the print preview window.

Printing

Selecting Print from the application menu brings up the Print dialog where a user can select a printer and options to be used during printing. This is a standard windows print dialog and functions as such. After the user selected options have been set the user can click the 'Print' button to print the currently selected planning set.

Exit

Selecting Exit from the application button will close the application.

Home Ribbon

The Home Ribbon provides the user with options to create, modify and delete variables and attributes, set up variable sensitivity, turn on and off specific modules, view and modify properties of the planning set, delete planning set(s), create new user-entered sets and perform CE/ICA Analysis and view results of that analysis in the form of graphs and reports.

Properties & Attributes

The properties and attributes form contains the planning study name and description as well as the attributes and variables to be used in this planning study. The user can launch this form by clicking on the Properties & Attributes button on the Home ribbon.

Name

Acceptable Values

Users can enter a name for the overall planning study composed of up to 255 alphanumeric characters.

Values Tested

Values up to 255 characters were entered and accepted even when those values contained numbers and special characters. If the user attempts to enter more than 255 characters then the information will stop being populated to the field after the maximum is reached.

Other Information

The planning study name is shown in the status bar. If the user enters a name that exceeds the space provided the user can hover over the name to see the entire contents. Information can be copied and pasted into this field using standard windows shortcuts (Ctrl+C to copy; Ctrl+V to paste).

Description

Acceptable Values

Values of up to 500 alphanumeric or special characters are accepted into this field.

Values Tested

Users can enter values of up to 500 alphanumeric or special characters into this field. If the user attempts to enter more than 500 characters then the information will stop being populated to the field after the maximum is reached.

Other Information

Information can be copied and pasted into this field using standard windows shortcuts (Ctrl+C to copy; Ctrl+V to paste).

Variables

Costs and outputs to be considered in this analysis can be entered as variables for a planning study. By default, a cost and output variable are available for each newly created planning study however these values can be modified or deleted. The user can add new variables using the 'Add' button located below the horizontal scroll bar for the variables section of the form. The user can delete variables by selecting a variable row by clicking on it once with the mouse and pressing the 'Delete' button on the keyboard. The user can modify all variable values until a planning set has been generated using those variables. Once a planning set has been generated using a variable the variable type can't be modified.

Variable Name

Acceptable Values

Values of up to 255 alphanumeric characters are accepted into this field.

Values Tested

Users can enter values of up to 255 alphanumeric or special characters into this field however special characters are eliminated when the user tabs off that field. If the user attempts to enter more than 255 characters then the information will stop being populated to the field after the maximum is reached.

Other Information

Information can be copied and pasted into this field using standard windows shortcuts (Ctrl+C to copy; Ctrl+V to paste). The variable name will be used as the column title for this variable in the Plan Editor following plan generation.

Variable Units

Acceptable Values

Values of up to 255 alphanumeric or special characters are accepted into this field.

Values Tested

Users can enter values of up to 255 alphanumeric or special characters into this field. If the user attempts to enter more than 255 characters then the information will stop being populated to the field after the maximum is reached.

Other Information

Information can be copied and pasted into this field using standard windows shortcuts (Ctrl+C to copy; Ctrl+V to paste).

Variable Description

Acceptable Values

Values of up to 500 alphanumeric or special characters are accepted into this field.

Values Tested

Users can enter values of up to 500 alphanumeric or special characters into this field. If the user attempts to enter more than 500 characters then the information will stop being populated to the field after the maximum is reached.

Other Information

Information can be copied and pasted into this field using standard windows shortcuts (Ctrl+C to copy; Ctrl+V to paste).

Variable Type

Acceptable Values

Only values available in the drop down list for variable type may be selected. The available types are Decimal, Integer, Binary, and Currency.

Values Tested

Users can select a value from the list to determine the type of value that is presented in the plan editor for this variable following plan generation.

Other Information

The variable type will determine the format of the values shown in the Plan Editor for a given variable following plan generation or during plan creation for user-entered sets.

Derived

Acceptable Values

The Derived checkbox can be enabled or disabled. If the user checks this checkbox it will cause the Formula Editor to appear with which to define the formula for computing a derived variable. The user cannot type variable or complex function information manually into the field but can enter numeric and simple operands manually if desired however buttons are available on the formula editor for numbers and simple operands. For variables the user must select (by clicking) functions and variables in sequence to define the derived variable formulation.

Values Tested

Values tested include enabling and disabling this checkbox.

Other Information

None.

Derived Function

Acceptable Values

This field is a display only field and doesn't accept direct user input. This field displays the formula created in the formula editor when the derived checkbox is enabled. The user can update a displayed formula by clicking the ellipses button and editing the formula through the formula editor.

Values Tested

Users can view the formula being used for a designated derived variable in this field. Users can enter any valid formula that the formula editor will accept. The formula editor will not accept invalid formulas that result in division by zero, attempts to calculate the root or natural log of a negative number, or any other math operations that might not result in a real number.

Other Information

None.

Variable Minimum

Acceptable Values

This field accepts whole number values between -999,999,999,999 and 999,999,999,999.

Values Tested

Users can enter any whole number in this range and the field will accept it.

Other Information

The minimum defined variable value will eliminate any plans that would be created with value for this variable that falls below the defined minimum value.

Variable Maximum

Acceptable Values

This field accepts whole number values between -999,999,999,999 and 999,999,999,999.

Values Tested

Users can enter any whole number in this range and the field will accept it.

Other Information

The minimum defined variable value will eliminate any plans that would be created with value for this variable that exceeds the defined maximum value.

Variable Visibility

Acceptable Values

The Visible checkbox can be enabled or disabled. Variables are created as visible by default. If the user unchecks this checkbox it will cause this variable to not be visible when a planning set is selected in the Plan Editor.

Values Tested

Users can disable variables so that the column for this variable does not display in planning sets. The visibility of a variable can be modified by the user at any time.

Other Information

If a derived variable is created after plan generation and made visible the values will be calculated for previously generated sets and displayed. If a visible non-derived variable is created after a plan is generated the variable will not display for automatically generated sets. Generating a new set after creating a new non-derived variable will calculate the values for this variable and make them displayed in the resulting planning set. If the variable is marked as not visible during plan generation the values for this variable will still be calculated and available for viewing if the user modifies the variable to be visible.

Attributes

An attribute identifies a characteristic that may change for a given alternative between different planning sets. By default, seven attributes are available for each newly created planning study. The default attributes can't be deleted however their visibility can be controlled by the user. The user can add new attributes using the 'Add' button located below the horizontal scroll bar for the attributes section of the form. The user can delete user added attributes by selecting an attribute row with the mouse and pressing the 'Delete' button on the keyboard. The user can modify all user created attribute values.

Attribute Name

Acceptable Values

Values of up to 255 alphanumeric or special characters are accepted into this field.

Values Tested

Users can enter values of up to 255 alphanumeric or special characters into this field. If the user attempts to enter more than 255 characters then the information will stop being populated to the field after the maximum is reached.

Other Information

Information can be copied and pasted into this field using standard windows shortcuts (Ctrl+C to copy; Ctrl+V to paste).

Attribute Type

Acceptable Values

Only values available in the drop down list for variable type may be selected. The available types are Yes/No, Text, Double, Integer, Date/Time, Image.

Values Tested

Users can select a value from the list to determine the type of value that is available for entry in the plan editor for this attribute for planning sets.

Other Information

None.

Attribute Description

Acceptable Values

Values of up to 500 alphanumeric or special characters are accepted into this field.

Values Tested

Users can enter values of up to 500 alphanumeric or special characters into this field. If the user attempts to enter more than 500 characters then the information will stop being populated to the field after the maximum is reached.

Other Information

Information can be copied and pasted into this field using standard windows shortcuts (Ctrl+C to copy; Ctrl+V to paste).

Attribute Visibility

Acceptable Values

This field has a pick list and the user must select an available option from the pick list. The places where this attribute will be visible are determined by this value. The available options include:

- Always – This attribute will always be displayed

- Never – This attribute will never be displayed

- Plan Generator – This attribute will be displayed for generated sets

- CE/ICA Analysis – This attribute will be displayed for CE/ICA analysis sets

- Constrainer – This attribute will be displayed for constrained sets

- MCDA Ranked – This attribute will be displayed for ranked MCDA sets

- MCDA Imported – This attribute will be displayed for imported MCDA sets

- Uncertainty – This attribute will be displayed for uncertainty sets

- Uncertainty CE/ICA – This attribute will be displayed for CE/ICA uncertainty sets

- Uncertainty Parent – This attribute will be displayed for parent uncertainty sets

- Uncertainty CE/ICA Parent – This attribute will be displayed or CE/ICA parent uncertainty sets

- Watershed – This attribute will be displayed for all watershed sets

- Watershed (1 plan per site) – This attribute will be displayed for all 1-plan per site watershed sets

- Watershed (N plans per site) – This attribute will be displayed for all watershed sets where multiple plans per site exist

- Watershed (Generated per site) – This attribute will be displayed for all generated watershed sets

- Watershed CE/ICA (Generated per site) – This attribute will be displayed for all CE/ICA watershed sets

Values Tested

Users can select any available option so that the column for this attribute displays when the user expects to utilize this attribute. The visibility of an attribute can be modified by the user at any time.

Other Information

None.

Variable Sensitivity

Variable sensitivity allows the user to enter uniform coefficients for computing all high and low values for a given variable (for example, evaluate all cost estimates by +/- 20%).

Low and High Coefficients

Acceptable Values

Only values between -999,999,999,999.999 and 999,999,999,999.999 may be entered for low and high coefficients and the value for low coefficients may not be higher than the value for high coefficients however it should be noted that entering large values may cause the multiplied result to be too large for the application to properly calculate when generating planning sets. The default value for low and high coefficients for all variables is 1.

Values Tested

Users can enter any value in the acceptable range as long as the value for the low coefficient remains below the value for the low coefficient and the multiplied result.

Other Information

None.

Module Enabling/Disabling

The checkboxes in this section of the ribbon allow the user to turn on and off some of the ribbon and planning set options. If a user disables an option that ribbon will be hidden from the user's view along with that category of planning sets and all planning sets of that type. For instance, if the user unchecks the Generator checkbox then both the Generator ribbon and Generated Sets in the Planning Sets Pane of the application are hidden from view. If the user checks the box for that option the ribbon and generated sets will once again appear.

Properties

Planning set properties can be viewed by clicking on the 'Properties' button on the Home ribbon. The planning set properties form has information for the planning set name, description, HUC, number of plans, a parent set (where applicable), a control to determine whether geographic fields are displayed for the planning set along with any planning set parameters that were captured during generation of the planning set.

Name

Acceptable Values

Users can enter a name for the overall planning study composed of up to 255 alphanumeric or special characters.

Values Tested

Values up to 255 characters were entered and accepted even when those values contained special characters. If the user attempts to enter more than 255 characters then the information will stop being populated to the field after the maximum is reached.

Other Information

None.

Description

Acceptable Values

Values of up to 500 alphanumeric or special characters are accepted into this field.

Values Tested

Users can enter values of up to 500 alphanumeric or special characters into this field. If the user attempts to enter more than 500 characters then the information will stop being populated to the field after the maximum is reached.

Other Information

Information can be copied and pasted into this field using standard windows shortcuts (Ctrl+C to copy; Ctrl+V to paste).

HUC

Acceptable Values

Whole number values of up to 11 digits are accepted into this field.

Values Tested

Users can enter values of up to 11 digits into this whole number field. If the user attempts to enter more than an 11 digit whole number then the information will stop being populated to the field after the maximum is reached.

Other Information

Information can be copied and pasted into this field using standard windows shortcuts (Ctrl+C to copy; Ctrl+V to paste).

Show plan-specific geographic information

This field is either enabled or disabled by checking or unchecking the box. If the box is checked the geographic fields for the selected planning set are displayed in the Plan Editor. These fields include Latitude, Longitude, HUC and Location Description. This is an application wide setting and this field is either enabled or disabled for all planning sets.

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Constraints

The constraints form allows the user to filter a planning set to include only those plan alternatives that meet a set of predefined criteria. The criteria are minimum and maximum acceptable values for a particular variable. Note that constraints may not be applied to derived variables.

Minimum Value

Acceptable Values

Whole number values between -999,999,999 and 999,999,999 are accepted into this field.

Values Tested

Users can enter values between -999,999,999 and 999,999,999 into this field however there are validation checks completed when the user completes entry of data and clicks the 'Constrain' button to ensure that the minimum value doesn't exceed the maximum value. If it does the user will receive a message indicating the entered values are not valid.

Other Information

Information can be copied and pasted into this field using standard windows shortcuts (Ctrl+C to copy; Ctrl+V to paste).

Maximum Value

Acceptable Values

Whole number values between -999,999,999 and 999,999,999 are accepted into this field.

Values Tested

Users can enter values up to 999,999,999,999.99 into this field however there are validation checks completed when the user completes entry of data and clicks the 'Constrain' button to ensure that the minimum value doesn't exceed the maximum value. If it does the user will receive a message indicating the entered values are not valid.

Other Information

Information can be copied and pasted into this field using standard windows shortcuts (Ctrl+C to copy; Ctrl+V to paste).

Constrained Planning Set Name

Acceptable Values

Users can enter a name for the constrained planning set composed of up to 255 alphanumeric characters.

Values Tested

Values up to 255 alphanumeric and special characters were entered and accepted. If the user attempts to enter more than 255 characters then the information will stop being populated to the field after the maximum is reached.

Other Information

None.

Delete

This form allows the user to delete one or more planning sets. The user can check the checkbox beside each planning set they would like to delete. Deleting a planning set that has any child planning sets will automatically delete the child planning sets as well. Once the user selects which planning sets they would like to delete they can click the 'Delete' button and the planning sets will be removed and will no longer be listed as planning sets. Please note the 'Delete' button will remain disabled until a planning sets has been selected or deletion. Deleting a planning set is a permanent, irreversible action.

Create New User-Entered Set

Users can opt to enter their own pre-defined planning sets as opposed to having the application generate a set based on provided information. This process can be started by clicking the 'Create New User-Entered Set' button on the Home ribbon.

Name

Acceptable Values

Users can enter a name for the user defined planning set composed of up to 255 alphanumeric or special characters.

Values Tested

Values up to 255 alphanumeric or special characters were entered and accepted. If the user attempts to enter more than 255 characters then the information will stop being populated to the field after the maximum is reached.

Other Information

Once created the planning set name is displayed in the Planning Sets Pane under User-Entered Sets. Information can be copied and pasted into this field using standard windows shortcuts (Ctrl+C to copy; Ctrl+V to paste).

Perform CE/ICA

Cost effectiveness is a method of identifying least-cost solutions for different levels of outputs or benefits. It is utilized in planning situations where dollar values are not used to measure outputs. Incremental cost is the difference in cost between the costs of two plan alternatives. It is determined by subtracting the cost of the less expensive plan alternative from the cost of the more expensive plan alternative. Incremental output is the difference between the outputs of two plan alternatives. It is determined by subtracting the output of the smaller output plan alternative from the output of the larger plan alternative. Open the CE/ICA Analysis form now by clicking on the 'Perform CE/ICA' button on the Home ribbon to launch the Perform CE/ICA Analysis form.

Parent Set

The user should select an existing planning set in which they would like to perform the cost effective and incremental cost analysis against.

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Name

Acceptable Values

Users can enter a name for the CE/ICA planning set composed of up to 255 alphanumeric characters.

Values Tested

Values up to 255 characters were entered and accepted even when those values contained numbers and special characters. If the user attempts to enter more than 255 characters then the information will stop being populated to the field after the maximum is reached.

Other Information

The planning set name is displayed in the Planning Sets area of the application as a child set of the planning set in which this CE/ICA analysis was completed against. Information can be copied and pasted into this field using standard windows shortcuts (Ctrl+C to copy; Ctrl+V to paste).

Description

Acceptable Values

Values of up to 500 alphanumeric or special characters are accepted into this field.

Values Tested

Users can enter values of up to 500 alphanumeric or special characters into this field. If the user attempts to enter more than 500 characters then the information will stop being populated to the field after the maximum is reached.

Other Information

Information can be copied and pasted into this field using standard windows shortcuts (Ctrl+C to copy; Ctrl+V to paste).

Cost Variable

The user selects a variable from the available list to use as the cost variable in the CE/ICA analysis that will be completed. The user can't use the same variable for costs and outputs.

Output Variable

The user selects a variable from the available list to use as the output variable in the CE/ICA analysis that will be completed. The user can't use the same variable for costs and outputs.

Graphs & Reports

On the initial view of the form the user is on the Single Set tab with Graphs selected. The user can select a planning set in which CE/ICA analysis has been completed from the Planning Set pick list and then select a graph and click 'View' to view the selected graph. The user will have different options for each graph and report depending on the graph or report selected. If the user selects the Reports option along the left side they will be presented with a set of reports that can be ran over the selected planning set. If the user selects the Multiple Sets tab along the top the user will need to select at least two planning sets in which CE/ICA analysis has been completed by clicking on the planning sets they wish to include in the graph or report. The user can determine whether a report or graph is created using the radio buttons under Display type and select options for the graph or report using the Options menu.

IWRPS Report Builder

The IWRPS Report Builder develops a comprehensive report concerning the selected planning set. The user can select a planning set in which CE/ICA analysis has been completed in order to run the report. The user has additional options that allow the user to include or not include different portions of the report along with filtering options.

Report Title

Acceptable Values

Users can enter a report title composed of up to 100 alphanumeric characters.

Values Tested

Values up to 100 characters were entered and accepted even when those values contained numbers and special characters. If the user attempts to enter more than 100 characters then the information will stop being populated to the field after the maximum is reached.

Other Information

The report name will be listed at the top of the report as well as in the report footer in the created report. The report will be generated and available in .pdf format.

Generator Ribbon

The Generator ribbon provides functionality for the user to define solutions and scales, define relationships amongst solutions, solution sensitivities, automated edits and generate planning sets.

Solutions & Scales

The solutions and scales form allows the user to define their solutions and their effects on each variable. The user can access this form by clicking on the 'Solutions & Scales' button on the Generator ribbon.

Solutions

The user can enter a solution and then click the 'Add New' button to add additional solutions.

Solution

Acceptable Values

Users can enter a solution name composed of up to 255 alphanumeric and special characters.

Values Tested

Values up to 255 characters were entered and accepted even when those values contained numbers and special characters. If the user attempts to enter more than 255 characters then the information will stop being populated to the field after the maximum is reached.

Other Information

Information can be copied and pasted into this field using standard windows shortcuts (Ctrl+C to copy; Ctrl+V to paste).

Code

Acceptable Values

Users can enter up to 10 letter characters to define the code for a given solution. The application will provide a default code for the solution using the first letter of the solution name however this may result in duplicate codes and the user will be required to correct those deficiencies before saving and closing the form.

Values Tested

Letter values up to 10 characters in length were entered and accepted as long as no duplicates existed. If the user attempts to enter more than 10 characters into this field then the information will stop being populated to the field after the maximum is reached.

Other Information

Information can be copied and pasted into this field using standard windows shortcuts (Ctrl+C to copy; Ctrl+V to paste). If an invalid value is entered a red asterisk will be shown in the field. If the user hovers the mouse over the red asterisk will provide the users with additional details on why the value is invalid.

 # Scales

Acceptable Values

Users can enter a value up to 19 to define the number of scales for a given solution in whole numbers.

Values Tested

Values up to 19 were entered and accepted. If the user attempts to enter a number outside the range 1-19 a red asterisk will indicate the value has failed validation checks.

Other Information

Information can be copied and pasted into this field using standard windows shortcuts (Ctrl+C to copy; Ctrl+V to paste). If an invalid value is entered a red asterisk will be shown in the field. If the user hovers the mouse over the red asterisk will provide the users with additional details on why the value is invalid.

Scaled Solution Effects on Variables

Name

Acceptable Values

Users can enter a name composed of up to 255 alphanumeric and special characters.

Values Tested

Values up to 255 characters were entered and accepted even when those values contained numbers and special characters. If the user attempts to enter more than 255 characters then the information will stop being populated to the field after the maximum is reached.

Other Information

Information can be copied and pasted into this field using standard windows shortcuts (Ctrl+C to copy; Ctrl+V to paste).

Variable Values

Values can now be defined for every variable and solution scale with the exception of the No Action Plan options. The format and values allowed are dependent on the variable type defined on the Properties & Attributes form for each variable.

Relationships

There are two types of rules that the user can define: combinability and dependency relationships. The set of rules regarding which solution and scale combinations are dependent upon one another is known as "dependency relationships" while "combinability relationships" occur between solutions when the implementation of one solution cannot be combined with the implementation of other solutions. The user first needs to define whether they would like to create a combinability or dependency relationships and select the appropriate radio button. Next the user will select the solutions where a relationship is being established and then the user can click the 'Create' button to create the relationship. The user may edit relationships that have been created by selecting the relationship shown in the bottom portion of the form, selecting the Edit Existing Relationship radio button and then modifying the relationship in the top portion of the form as needed. If no solutions are combinable the user can simply check the No solutions are Combinable checkbox and the needed relationships will be created. The user can also select a relationship and use the Delete key on the keyboard to delete a single relationship or click the 'Delete Relationships' button to delete all existing relationships.

Solution Sensitivities

The high and low values entered for solution sensitivity are uniform coefficients used for computing the high and low values for the selected solution combination. This creates a value range result for that solution. When a planning set is then generated high and low value variables are added for each variable of each plan alternative in the generated planning set.

Low and High Coefficients

Acceptable Values

Only values between -999,999,999,999.999 and 999,999,999,999.999 may be entered for low and high coefficients and the value for low coefficients may not be higher than the value for high coefficients. The default value for low and high coefficients for all variables is 1.

Values Tested

Users can enter any value in the acceptable range as long as the value for the low coefficient remains below the value for the low coefficient.

Other Information

None.

Automated Edits

Automated editing is a feature which allows the planner to automatically account for the fact that a group of plan effects to be generated may not be a matter of simple addition of solution effects. A mathematical function is entered to describe complex additive effects for a set of solution combinations. To define an automated edit, an edit group name, applicable variable, additive function and logical condition for application of the edit are entered in an automated edit group entry form.

Name

Acceptable Values

Users can enter a name that is composed of up to 255 alpha characters.

Values Tested

Values up to 255 characters were entered and accepted even when those values contained numbers and special characters however numbers, spaces and special characters are removed from the name if entered. If the user attempts to enter more than 255 characters then the information will stop being populated to the field after the maximum is reached.

Other Information

None.

Variable

The user should select a variable from the list. Only non-derived variables will be available for selection.

Coefficient

Acceptable Values

Only values between -999,999,999.999 and 999,999,999.999 may be entered for coefficient values. The default value for all coefficients for all solutions is 1.

Values Tested

Users can enter any value in the acceptable range -999,999,999.999 and 999,999,999.999.

Other Information

None.

Constant

Acceptable Values

Only decimal numbers between -999,999,999,999.999 and 999,999,999,999.999 may be entered for coefficient values.

Values Tested

Users can enter any decimal number in the acceptable range -999,999,999,999.999 and 999,999,999,999.999. Numbers with 12 digits before the decimal and 3 digits after the decimal are accepted.

Other Information

None.

Conditions

The default condition is displayed for the user. The user may use the 'Clear' button to clear the default Conditions and enter their own formula. No keyboard entry is allowed and the user must leverage the buttons shown to create the conditions. The user can click the 'Validate' button to validate the condition entered.

Generate Plans

This function allows the user to generate planning alternatives using the user provided information for variables, attributes, constraints, relationships, automated edits, and sensitivities.

Planning Set Name

Acceptable Values

Users can enter a name for the planning set composed of up to 255 alphanumeric and special characters.

Values Tested

Values up to 255 characters were entered and accepted even when those values contained numbers and special characters. If the user attempts to enter more than 255 characters then the information will stop being populated to the field after the maximum is reached.

Other Information

The planning set name is shown in the Planning Sets Pane after create under Generated Sets.

Description

Acceptable Values

Values of up to 500 alphanumeric or special characters are accepted into this field.

Values Tested

Users can enter values of up to 500 alphanumeric or special characters into this field. If the user attempts to enter more than 500 characters then the information will stop being populated to the field after the maximum is reached.

Other Information

Information can be copied and pasted into this field using standard windows shortcuts (Ctrl+C to copy; Ctrl+V to paste).

Uncertainty Ribbon

The Uncertainty Ribbon has capabilities to develop uncertainty planning set distributions, generate uncertainty sets and perform CE/ICA analysis on these sets and to review output based on the results of this analysis.

Uncertainty Planning Set Distributions

"Uncertainty Planning Set Distributions" allows the user to create plans and to define values for the variables for these plans based on a distribution type as well as tolerance rules and to specify the correlation of study variables.

Name

Acceptable Values

Users can enter a name for the distribution set composed of up to 255 alphanumeric and special characters.

Values Tested

Values up to 255 characters were entered and accepted even when those values contained numbers and special characters. If the user attempts to enter more than 255 characters then the information will stop being populated to the field after the maximum is reached.

Other Information

The user should click the 'New' button to define a new distribution set.

Distribution Type

The user should select a listed option from the distribution type field. This selection will impact the number of P value fields made available.

P Values

P values are shown in a format based on the variable type. Depending on the distribution type selected a specified number of P fields will be enabled. The user should reference the distribution type information shown in the top of the form in order to properly define the P values given a specified distribution type. Currency values can range between 0 and 999,999,999,999.99 while non-currency values can range between 0 and 999,999,999,999.999.

Tolerance Rule Builder

Acceptable Values

Users should select an operand from the calculator for the "must be" field and then the next field should contain a numeric value not to exceed 999,999,999,999. For the at least field the user should enter a percentage and the user will not be allowed to enter a value that exceeds 100.

Values Tested

Values ranging to the maximum accepted were leveraged and accepted in the tolerance rule builder.

Other Information

The user can click the 'Create' button beside the variable in which they wish to create a tolerance rule to launch the Tolerance Rule Builder. After the user enters the information they can click the 'Validate' button to validate the tolerance rule.

Correlation Matrix Values

Acceptable Values

Users can enter values between -1 and 1 into the correlation matrix.

Values Tested

Values ranging between –1 and 1 were used in the correlation matrix and were accepted.

Other Information

The user can't alter the matrix where the variable references itself as all variables are perfectly correlated to themselves and that is represented by a value of 1 that can't be modified. The user can leverage the 'Validate Distributions & Matrix' button on the Distributions tab to ensure that the matrix established is valid.

Generate Uncertainty Sets

"Generate Uncertainty Set" allows the user to generate uncertainty sets based on the plans, distributions, tolerance rules and specified correlation between study variables. After the user selects the 'Generate Uncertainty Set' button the Build Uncertainty Planning Sets form will launch and the user can specify the distribution list, planning set name, descriptions, max iterations and seed to be utilized in development of the uncertainty set. Since uncertainty planning set information is stored in a separate database if the provided name causes the file path to exceed 260 characters the user will be asked to reduce the file name size in order to fall within that constraint.

Planning Set Name

Acceptable Values

Users can enter a name for the uncertainty planning set composed of up to 255 alphanumeric characters.

Values Tested

Values up to 255 characters were entered and accepted even when those values contained numbers and special characters. If the user attempts to enter more than 255 characters then the information will stop being populated to the field after the maximum is reached.

Other Information

The uncertainty planning set is shown in the Planning Sets Pane under the Uncertainty Sets category after creation with the name defined displayed as the planning set name.

Description

Acceptable Values

Values of up to 500 alphanumeric or special characters are accepted into this field.

Values Tested

Users can enter values of up to 500 alphanumeric or special characters into this field. If the user attempts to enter more than 500 characters then the information will stop being populated to the field after the maximum is reached.

Other Information

Information can be copied and pasted into this field using standard windows shortcuts (Ctrl+C to copy; Ctrl+V to paste).

Max Iterations

Acceptable Values

Users can enter values between 1 and 2,147,483,647 into the max iterations field.

Values Tested

Values ranging between 1 and 2,147,483,647 were entered into the max iterations field and were accepted. Values larger will turn the field border red to indicate an invalid value. If the user clicks OK while an invalid value is entered the user will receive a message telling them to enter a new number between 1 and 2,147,483,647.

Other Information

Note that the number of iterations selected will impact the run time of the simulation.

Seed

Acceptable Values

Users can enter values between 1 and 999,999,999,999 into the max iterations field.

Values Tested

Values ranging between 1 and 999,999,999,999 into the max iterations field and were accepted.

Other Information

None.

Perform CE/ICA

Cost effectiveness is a method of identifying least-cost solutions for different levels of outputs or benefits. It is utilized in planning situations where dollar values are not used to measure outputs. Incremental cost is the difference in cost between the costs of two plan alternatives. It is determined by subtracting the cost of the less expensive plan alternative from the cost of the more expensive plan alternative. Incremental output is the difference between the outputs of two plan alternatives. It is determined by subtracting the output of the smaller output plan alternative from the output of the larger plan alternative. Open the CE/ICA Analysis form now by clicking on the 'Perform CE/ICA' button on the Uncertainty ribbon to launch the Perform Uncertainty CE/ICA Analysis form.

Planning Set

The user should select an existing uncertainty planning set in which they would like to perform the cost effective and incremental cost analysis against.

Name

Acceptable Values

Users can enter a name for the CE/ICA uncertainty set composed of up to 255 alphanumeric or special characters.

Values Tested

Values up to 255 characters were entered and accepted even when those values contained numbers and special characters. If the user attempts to enter more than 255 characters then the information will stop being populated to the field after the maximum is reached.

Other Information

The planning set name is displayed in the Planning Sets area of the application as a child set of the uncertainty set in which this CE/ICA analysis was completed against. Information can be copied and pasted into this field using standard windows shortcuts (Ctrl+C to copy; Ctrl+V to paste).

Description

Acceptable Values

Values of up to 500 alphanumeric or special characters are accepted into this field.

Values Tested

Users can enter values of up to 500 alphanumeric or special characters into this field. If the user attempts to enter more than 500 characters then the information will stop being populated to the field after the maximum is reached.

Other Information

Information can be copied and pasted into this field using standard windows shortcuts (Ctrl+C to copy; Ctrl+V to paste).

Cost Variable

The user selects a variable to use as the cost variable in the CE/ICA analysis that will be completed. The user can't use the same variable for costs and outputs.

Output Variable

The user selects a variable to use as the output variable in the CE/ICA analysis that will be completed. The user can't use the same variable for costs and outputs.

Exclude plans in violation of tolerance rules

The user can turn on or off this option by checking and unchecking the box. If this option is selected then any plans that violate the tolerance rules will be filtered from the uncertainty sets created. This option is enabled by default.

Graphs & Reports

On the initial view of the form the user is on the Single Set tab with Graphs selected. The user can select an uncertainty set in which CE/ICA analysis has been completed from the Planning set groups pick list and then click on a graph to view the selected graph. The user will have different options for each report depending on the report selected. If the user selects the Reports option along the left side they will be presented with a set of reports that can be ran over the selected planning set group.

Export to CSV

"Export to CSV" allows the user to export the uncertainty planning set to CSV formula after selecting a location and file name for the file. This export will create both a detailed and a summary file. These files will both be located in the directory designated by the user with the name the user designated with the word Details and Summary appended to the file name. The summary csv file contains the final planning set developed and viewable within the IWR Planning Suite II application. The detail csv file contains all planning sets created for each iteration completed during the Monte Carlo Simulation. Note this option will not be available until CE/ICA analysis has been completed on at least one uncertainty set.

Planning Set

Users should select an uncertainty planning set from the list of available uncertainty sets.

Export File

Acceptable Values

Users can enter a file name composed of letters and spaces of up to 255 characters.

Values Tested

Values up to 255 characters can be entered but if the entered file name causes the entire path length to exceed 260 characters the user will be asked to enter a shorter name.

Other Information

It is expected that software capable of opening a .csv file is installed and available on the machines being used for IWR Planning Suite if the user anticipates opening the resulting file. Only uncertainty planning sets will be available in the list of available planning sets.

Decision Making Ribbon

This ribbon includes functions that allow the user to score and rank planning alternatives and run graphs and reports to view the results of that analysis.

Weights, Ranking & Analysis

"Weights, Ranking & Analysis" allows the user the ability to complete multi-criterion decisions making. When the user selects the 'Weights, Ranking & Analysis' button the Multi-Criterion Decision Analysis form opens. This tool helps the decision maker balance a set of criteria (acres of wetland restored, habitat units created and number of jobs created) against a given set of solutions. It gives the decision maker a way to quantify how each alternative considered meets a set of existing criteria.

Planning Sets

The user should select an existing planning set in which they would like to perform the multi-criteria decision analysis against.

MCDA Scenario

Acceptable Values

Users can enter a name for the MCDA scenario composed of up to 255 alphanumeric and special characters.

Values Tested

Values up to 255 characters were entered and accepted even when those values contained numbers and special characters. If the user attempts to enter more than 255 characters then the information will stop being populated to the field after the maximum is reached.

Other Information

The user should click the 'Create/Manage' button to create an MCDA scenario. Following creation the MCDA scenario name is now available in the MCDA Scenario pick list for selection.

New Planning Set Name

Acceptable Values

Users can enter a name for the planning set composed of up to 255 alphanumeric and special characters.

Values Tested

Values up to 255 characters were entered and accepted even when those values contained numbers and special characters. If the user attempts to enter more than 255 characters then the information will stop being populated to the field after the maximum is reached.

Other Information

The planning set name is displayed in the Planning Sets Pane of the application as a child set of the planning set in which this multi-criteria decision analysis was completed against.

Min/Max

Users should select whether each variable should be minimized or maximized. For instance, typically the user would want to minimize costs so minimize would be selected for the costs variable but outputs would typically want to be maximized so maximize would be selected in those instances. The user may only select Minimize or Maximize from the list of values for Min/Max. By default, all variables are set to Maximize.

Weights

Acceptable Values

Users cannot alter the default value for Weight on the Ranking tab of the Multi-Criteria Decision Analysis form but these values can be altered on the Weights tab. Values up to 999,999,999,999.999 are accepted into the Weight column for each variable listed.

Values Tested

Values up to 999,999,999,999.999 were entered and accepted.

Other Information

The planning set name is displayed in the Planning Sets Pane of the application as a child set of the planning set in which this multi-criteria decision analysis was completed against.

Normalized Value

This value cannot be modified by the user but is calculated based on the weight entered on the Weights tab.

Graphs & Reports

Graphs and reports related to completion of a multi-criteria decision analysis are available by clicking the Graphs & Reports button on the Decision Making ribbon. On the initial view of the form the user is on the Single Set tab with Graphs selected. The user can select a planning set in which multi-criteria decision analysis has been completed from the Planning Set pick list and then click on a graph and click 'View' to view the selected graph. The user will have different options for each graph and report depending on the graph or report selected. If the user selects the Reports option along the left side they will be presented with a set of reports that can be ran over the selected planning set. If the user selects the Multiple Sets tab along the top the user will need to select at least two planning sets in which CE/ICA analysis has been completed by clicking on the planning sets they wish to include in the graph or report. The user can determine whether a report or graph is created using the radio buttons under Display type and select options for the graph or report using the Options menu.

Tools Ribbon

The Tools ribbon has options to utilize the annualizer tool or complete a watershed analysis using the watershed wizard.

Annualizer

Annualizing ecosystem costs and outputs is required by U.S. Army Corps of Engineers (Corps) planning guidance. Response rates over the period of analysis are compared to future without project conditions to estimate the "lift" or "benefit" provided by project alternatives. The annualizer utility allows users to interpolate NED and NER benefits and costs over the period of analysis.

The utility also estimates average annual equivalent NED costs and benefits and net present values, and estimates the average annual NER outputs. While there are many interpolation techniques for non-monetary units of cost and benefit, the NER annualizer provides users with options for estimating values between point measurements. The two options presently available to users of the annualizer module include linear interpolation, rate of growth, and user input at each point.

Annualization Set

Acceptable Values

Users can enter a name for the annualization set up to 255 alphanumeric or special characters.

Values Tested

Values up to 255 characters were entered and accepted that included alphanumeric and special characters.

Other Information

The user should start by clicking the 'Create/Manage' button to create an annualization set.

Base Year

Acceptable Values

The base year should be entered as a four digit year between 1900 and 2500.

Values Tested

Various four digit years in the acceptable range were entered and accepted into this field.

Other Information

The base year will default to the current year.

Period of Analysis

Acceptable Values

Users can enter a period of analysis in up to 200 in whole numbers.

Values Tested

Values up to 200 were entered and accepted. The user is not allowed to enter values outside this range.

Other Information

The default value for period of analysis is 50.

Discount Rate

Acceptable Values

Users can enter values up to 100% into the discount rate.

Values Tested

Values up to 100% were entered and accepted.

Other Information

By default the discount rate is set to 0.0%. In order to use the IDC Calculation the user will be required to enter a discount rate greater than 0.0%.

Cost tab

Total Initial Cost

The total initial cost is calculated for the user based on the information entered into the Construction, Real Estate, Monitoring and Other costs entered into the Total Initial Cost section.

Construction

Acceptable Values

Users can enter currency amounts ranging from $0.00 to $999,999,999,999.99.

Values Tested

Values up to $999,999,999,999.99 were entered and accepted.

Other Information

None.

Real Estate

Acceptable Values

Users can enter currency amounts ranging from $0.00 to $999,999,999,999.99.

Values Tested

Values up to $999,999,999,999.99 were entered and accepted.

Other Information

None.

Monitoring

Acceptable Values

Users can enter currency amounts ranging from $0.00 to $999,999,999,999.99.

Values Tested

Values up to $999,999,999,999.99 were entered and accepted.

Other Information

None.

Other

Acceptable Values

Users can enter currency amounts ranging from $0.00 to $999,999,999,999.99.

Values Tested

Values up to $999,999,999,999.99 were entered and accepted.

Other Information

None.

Total Investment Cost

Total Investment Cost is calculated from summing the Total Initial Cost, PED, and IDC. This total can't be altered directly by the user.

PED

Acceptable Values

Users can enter currency amounts ranging from $0.00 to $999,999,999,999.99.

Values Tested

Values up to $999,999,999,999.99 were entered and accepted.

Other Information

None.

IDC

Acceptable Values

Users can enter currency amounts ranging from $0.00 to $999,999,999,999.99.

Values Tested

Values up to $999,999,999,999.99 were entered and accepted.

Other Information

The user can enter the IDC costs or use the calculator to calculate the IDC costs by clicking the ellipses button. In order to launch the IDC calculator the discount rate must be greater than zero. Once on this calculator the user can enter the Cost per Construction Period and the IDC will be calculated. The Costs per Construction period should not exceed $999,999,999,999.99. The user can export the IDC Calculator information to Excel for later use by clicking the 'Export Table to Excel' button following entry of the information on the IDC calculator.

Initial Investment

The initial investment is calculated for the user using the Total Investment Cost, PV Factor and Present Value. None of these values are directly modifiable by the user.

Cost Annualizer

The Cost Annualizer allows the user to enter Total Future Costs per construction year and then the PV Factor and Present Value are calculated for the user. The user can't directly alter the values of PV Factor and Present Value.

Total Future Costs

Acceptable Values

Users can enter currency amounts ranging from $0.00 to $999,999,999,999.99.

Values Tested

Values up to $999,999,999,999.99 were entered and accepted.

Other Information

None.

Net Totals

The values in the Net Totals area are not directly modifiable by the user. These are all calculated values.

NED Benefits tab

Benefit

Acceptable Values

Users can enter currency amounts ranging from $0.00 to $999,999,999,999.99.

Values Tested

Values up to $999,999,999,999.99 were entered and accepted.

Other Information

None.

Net Totals

All Net Total values are calculated and not directly modifiable by the user.

NER Outputs tab

Variable

Acceptable Values

Users can enter a variable name that doesn't exceed 255 alphanumeric or special characters.

Values Tested

Values up to 255 characters were entered and accepted and values included both alphanumeric and special characters.

Other Information

The user can click on the 'Manage…' button to create or select an existing variable.

CDM
Smith

Linear Interpolation

Max Output (units)

Acceptable Values

Users can enter a value that doesn't exceed 999,999,999,999.999.

Values Tested

Values up to 999,999,999,999.999 were entered and accepted.

Other Information

None.

Control Points

The user can check the control point checkbox for any given year. This allows the user to define a specific value for output for years where the output values are known. Linear interpolation is automatically employed to reconfigure the in-between years.

Output

Acceptable Values

Users can enter a value that doesn't exceed 999,999,999,999.999.

Values Tested

Values up to 999,999,999,999.999 were entered and accepted.

Other Information

None.

Growth Rate

Control Points

The user can check the control point checkbox for any given year. This allows the user to define a specific value for output for years where the output values are known. Growth rate calculations are automatically employed to reconfigure the in-between years.

Output

Acceptable Values

Users can enter a value that doesn't exceed 999,999,999,999.999.

Values Tested

Values up to 999,999,999,999.999 were entered and accepted.

Other Information

None.

Growth Rate %

Acceptable Values

Users can enter a value that doesn't exceed 100%.

Values Tested

Values between 0% and 100% were entered and accepted.

Other Information

None.

Print

This feature will print an image of the graph shown above related to annual output.

Export

This feature will export an image of the year and output amount per year to .xlsx format. The user will be prompted to select a location and name for the resulting file. Values up to 255 characters can be entered for the file name but if this causes the path length to exceed 260 characters the user will be asked to enter a shorter name. After creation the user will be asked whether they would like to open the file at this time.

Save

This feature saves a copy of the graph in image format. The user will be prompted to select a location and name for the resulting file. Values up to 255 characters can be entered for the file name but if this causes the path length to exceed 260 characters the user will be asked to enter a shorter name.

Export Table to Excel

This feature will print information related to the current tab selected on the Annualization Calculator form to .xls format. The user will be prompted to select a location and name for the resulting file. Values up to 255 characters can be entered for the file name but if this causes the path length to exceed 260 characters the user will be asked to enter a shorter name.

View & Print Report

This feature creates a report that displays the information from the Annualizer that is based on the tab of the Annualizer form currently selected whether it be Cost, NED Benefits, or NER Outputs. The report will open in a new window for viewing and the user will have options at the top of the report for printing, refresh, save, copy, find text in the report and page navigation.

Watershed Wizard

This wizard allows users to create planning sets based on multiple locations. When the user initially selects Watershed Wizard on the Tools ribbon they will be prompted with a question concerning whether they are completing a watershed analysis with multiple locations. If the user selects, "Yes" they will enter the watershed wizard. If the user selects, "No" the user will exit out of the watershed wizard. Assuming the user is completing a watershed analysis with multiple locations and selects, "Yes" the wizard will begin leading users through entry of the information.

The first screen the user encounters asks them to define whether they will be entering one plan per site, more than one plan per site, or generating plans for each site. The user should select the appropriate radio button and then click the 'Next' button to continue. Note the 'Next' button will remain disabled until the user selects an option.

On the next screen the user will be prompted to enter their locations. If the user selected option A or B they will also enter the variable values for each plan. If the user selects option C they will be prompted on the next screen to enter their solutions and related values.

Location Name

Acceptable Values

Users can enter a location name composed of up to 255 alphanumeric and special characters.

Values Tested

Values up to 255 characters were entered and accepted even when those values contained numbers and special characters. If the user attempts to enter more than 255 characters then the information will stop being populated to the field after the maximum is reached.

Other Information

None.

Code

Acceptable Values

Users can enter a code up to 10 special or alpha characters, no numbers are accepted.

Values Tested

Values up to 10 alpha or special characters were entered and accepted. If the user attempts to enter more than 10 characters then the information will stop being populated to the field after the maximum is reached.

Other Information

None.

Plans

Acceptable Values

For option A, the # Plans field is not editable since the user selected the option to only enter one plan per location. For option B, the # Plans can be between 1 and 19. This field is not available for option C.

Values Tested

Values up to 19 were entered and accepted when option B was selected. The user will not be able to enter values larger than 19 into this field.

Other Information

None.

Description

Acceptable Values

Values of up to 500 alphanumeric or special characters are accepted into this field.

Values Tested

Users can enter values of up to 500 alphanumeric or special characters into this field. If the user attempts to enter more than 500 characters then the information will stop being populated to the field after the maximum is reached.

Other Information

Information can be copied and pasted into this field using standard windows shortcuts (Ctrl+C to copy; Ctrl+V to paste).

Latitude

Acceptable Values

Values for latitude are entered in decimal degrees and can range in values between -90 and 90 with up to three decimal places defined.

Values Tested

Users can enter values between -90 and 90 into this field. The field will not accept entry of values outside the acceptable range.

Other Information

Information can be copied and pasted into this field using standard windows shortcuts (Ctrl+C to copy; Ctrl+V to paste).

Longitude

Acceptable Values

Values for latitude are entered in decimal degrees and can range in values between -180 and 180 with up to three decimal places defined.

Values Tested

Users can enter values between -180 and 180 into this field. The field will not accept entry of values outside the acceptable range.

Other Information

Information can be copied and pasted into this field using standard windows shortcuts (Ctrl+C to copy; Ctrl+V to paste).

Following entry of the specified locations and solutions the user will be asked if they would like to define any relationships between the solutions. If the user selects 'Yes' the relationships form will be displayed so the user can define the needed relationships between solutions. If the user selects 'No' they will move to the next screen in the wizard.

Following entry of any relationships that are necessary the user will be asked if the defined solutions behave independently of one another. If the user selects 'No' the automated edits form will be displayed so the user can define the interdependencies amongst solutions. If the user selects 'Yes' they will move to the next screen in the wizard.

CDM Smith

At this point the user is prompted to generate a planning set using the supplied information. The user can define a Planning Set Name, Description, select whether inefficient plans should be removed during generation along with option for solution sensitivity and excluding solutions.

Planning Set Name

Acceptable Values

Users can enter a name for the planning set composed of up to 255 alphanumeric and special characters.

Values Tested

Values up to 255 characters were entered and accepted even when those values contained numbers and special characters. If the user attempts to enter more than 255 characters then the information will stop being populated to the field after the maximum is reached.

Other Information

The planning set name is shown in the Planning Sets Pane after create under Generated Sets.

Description

Acceptable Values

Values of up to 500 alphanumeric or special characters are accepted into this field.

Values Tested

Users can enter values of up to 500 alphanumeric or special characters into this field. If the user attempts to enter more than 500 characters then the information will stop being populated to the field after the maximum is reached.

Other Information

Information can be copied and pasted into this field using standard windows shortcuts (Ctrl+C to copy; Ctrl+V to paste).

Remove inefficient plans during plan generation

Acceptable Values

This checkbox can be enabled or disabled. If the user checks this checkbox it will cause the user to be presented with options to select a Cost and Output variable. The user should select a Cost and Outputs variable to use in their analysis.

Values Tested

Values tested include enabling and disabling this checkbox.

Other Information

None.

Solution Sensitivity

Acceptable Values

These checkboxes can be enabled or disabled. By default the Expected' checkbox is selected. The user must have at least one solution sensitivity option selected in order to generate a set. If the user checks the Low

or High checkbox additional planning sets will be created based on the low and high sensitivity values entered for this planning study.

Values Tested

Values tested include enabling and disabling these checkboxes and ensuring the expected planning sets were created. One planning set should be created for each solution sensitivity option selected.

Other Information

None.

Exclude Solutions

Acceptable Values

These checkboxes can be enabled or disabled. By default all checkboxes are disabled. If the user selects a checkbox for one of the listed solutions then that solution will be excluded during plan generation. No plans where this solution is used will be available in the created planning set.

Values Tested

Values tested include enabling and disabling these checkboxes and ensuring the expected solutions were not utilized. The user can verify a given solution wasn't utilized by ensuring that the code for that solution always has a 0 next to it indicating the solution was not implemented in the plan.

Other Information

None

Planning Sets Pane

This pane shows the possible categories of planning sets that can be created and any planning sets in existence within those sets underneath the appropriate category in a hierarchical manner where child sets are displayed within the parent set. The user can expand and collapse the tree. When a hierarchy is expanded the user will see all child planning sets displayed. When the hierarchy is collapsed to its fullest extend only the categories of planning sets will be displayed.

Planning Set Properties

Planning set properties identify the name, description, HUC, plan count, parent set (when applicable) and an option for enabling and disabling the geographic fields. This information can be updated by the user and saved using the 'Save Changes' button available in the Plan Editor.

Name

Acceptable Values

Users can enter a name for the planning set composed of up to 255 alphanumeric and special characters.

Values Tested

Values up to 255 characters were entered and accepted even when those values contained numbers and special characters. If the user attempts to enter more than 255 characters then the information will stop being populated to the field after the maximum is reached.

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Other Information

The planning set name is shown in the status bar in brackets. If the user enters a name that exceeds the space provided the user can hover over the name to see the entire contents. Information can be copied and pasted into this field using standard windows shortcuts (Ctrl+C to copy; Ctrl+V to paste).

Description

Acceptable Values

Values of up to 500 alphanumeric or special characters are accepted into this field.

Values Tested

Users can enter values of up to 500 alphanumeric or special characters into this field. If the user attempts to enter more than 500 characters then the information will stop being populated to the field after the maximum is reached.

Other Information

Information can be copied and pasted into this field using standard windows shortcuts (Ctrl+C to copy; Ctrl+V to paste). Note that if a planning study has not been created and a planning set is not selected then this pane will not display any information.

HUC

Acceptable Values

Whole number values of up to 11 digits are accepted into this field.

Values Tested

Users can enter values of up to 11 digits into whole number field. If the user attempts to enter more than an 11 digit whole number then the information will stop being populated to the field.

Other Information

Information can be copied and pasted into this field using standard windows shortcuts (Ctrl+C to copy; Ctrl+V to paste). This HUC value is meant to represent the HUC of the entire planning set however the user can enter this HUC and then click the 'Apply' button to update the HUC value for all planning set alternatives with this value in the Plan Editor.

Plan Count

This is a count of the number of planning set alternatives included in this planning set. This information is for display purposes only and can't be updated by the user.

Parent Set

This displays the name of the parent planning set if one exists. This information is for display purposes only and can't be updated by the user.

Show plan-specific geographic information

This option allows the user to turn on and off the display for the geographic information fields in the Plan Editor. The geographic information fields include latitude, longitude, HUC, and location description.

Plan Editor

The plan editor displays the planning set currently selected in the Planning Sets Pane of the application. Users may alter the values of listed plans for any values in black font. Those values shown in gray font are not editable by the user. The user can save changes made in the Plan Editor or Planning Set Properties by clicking the 'Save Changes' button in the bottom right corner of the Plan Editor. To discard all changes since the last save the use should clicks the 'Discard All Changes' button in the lower left corner of the Plan Editor.

Plan

Acceptable Values

Users can view the name for the plan composed of up to 255 alphanumeric or special characters. The user may not alter the name of the plan for generated, uncertainty or watershed planning sets but users may alter the plan names for user-entered sets.

Values Tested

Values up to 255 characters can be entered and accepted for user-entered sets even when those values contained numbers and special characters. If the user attempts to enter more than 255 characters then the information will stop being populated to the field after the maximum is reached.

Other Information

Information can be copied and pasted into this field using standard windows shortcuts (Ctrl+C to copy; Ctrl+V to paste).

Description

Acceptable Values

Values of up to 500 alphanumeric or special characters are accepted into this field.

Values Tested

Users can enter values of up to 500 alphanumeric or special characters into this field. If the user attempts to enter more than 500 characters then the information will stop being populated to the field after the maximum is reached.

Other Information

Information can be copied and pasted into this field using standard windows shortcuts (Ctrl+C to copy; Ctrl+V to paste). The user may alter the description of the planning set for all plans except the No Action Plan.

Geographic Information Fields

Users will see Latitude, Longitude, HUC and Location Description fields for each plan shown in the Plan Editor if the 'Show plan-specific geographic information' checkbox is checked in the Planning Study Properties or Properties form.

Latitude

Acceptable Values

Values for latitude are entered in decimal degrees and can range in values between -90 and 90 with up to three decimal places defined.

Values Tested

Users can enter values between -90 and 90 into this field. The field will not accept entry of values outside the acceptable range.

Other Information

Information can be copied and pasted into this field using standard windows shortcuts (Ctrl+C to copy; Ctrl+V to paste).

Longitude

Acceptable Values

Values for latitude are entered in decimal degrees and can range in values between -180 and 180 with up to three decimal places defined.

Values Tested

Users can enter values between -180 and 180 into this field. The field will not accept entry of values outside the acceptable range.

Other Information

Information can be copied and pasted into this field using standard windows shortcuts (Ctrl+C to copy; Ctrl+V to paste).

HUC

Acceptable Values

Whole number values of up to 11 digits are accepted into this field.

Values Tested

Users can enter values of up to 11 digits into whole number field. If the user attempts to enter more than an 11 digit whole number then the information will stop being populated to the field after the maximum is reached.

Other Information

Information can be copied and pasted into this field using standard windows shortcuts (Ctrl+C to copy; Ctrl+V to paste).

Location Description

Acceptable Values

Values of up to 500 alphanumeric or special characters are accepted into this field.

Values Tested

Users can enter values of up to 500 alphanumeric or special characters into this field. If the user attempts to enter more than 500 characters then the information will stop being populated to the field after the maximum is reached.

Other Information

Information can be copied and pasted into this field using standard windows shortcuts (Ctrl+C to copy; Ctrl+V to paste).

Variables

Variable values are user defined for user-entered sets or calculated upon generation of the planning set for generated, uncertainty and watershed sets however the values for these variables are modifiable by the user. The only exception is derived variable values where the values are calculated based on other entered values. If the value for a variable used in the derived variable calculation is updated the value of the derived variable is also updated.

Status Bar

The status bar lists the currently opened planning study with the currently selected set name shown in brackets. If no planning set is selected in the Planning Studies Pane only the planning study name will be displayed in the status bar. This information is the left aligned in the status bar. The right side of the status bar lists the version of IWR Planning Suite II currently installed and being used by the user along with the current date. This information is for display purposes only and can't be modified by the user.