IWR PLANNING SUITE II

PCoP WEBINAR SERIES

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US Army Corps of Engineers ®

WEBINAR TOPICS

- Background to IWR Planning Suite II
  - Purpose
  - Guidance
  - What's new?

- Role in planning

- Model components
  - Plan Generator, Annualizer, Cost-effectiveness & Incremental Cost Analysis, Uncertainty, Multi-Criteria Decision Analysis (MCDA), Watershed Wizard

- Where can I get the software?

- Training resources & help

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USACE CERTIFIED VERSIONS

- Version 1.0.11.1 – Plan Generator and CE/ICA

- Version 2.0.6.1 – Added the Annualizer Module

- **Version 2.0.9 (Recommended!)** – Added MCDA, Uncertainty and Watershed Modules

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WHAT EXPERIENCE DO YOU HAVE WITH IWR PLANNING SUITE?

I haven't used any version of the software.

I've used a previous version of the software.

I've used the latest version of the software.

PURPOSE OF IWR PLANNING SUITE II

- Assist with the formulation and comparison of alternative plans for Ecosystem Restoration and Mitigation Plans

- Cost effectiveness and incremental cost analyses (CE/ICA)

- Considering uncertainty of variables and its influence on CE/ICA analysis

- Calculation of:
  - Average annual National Ecosystem Restoration (NER) benefits
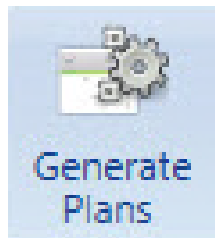 - Average annual equivalent National Economic Development (NED) costs and benefits

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RELATED GUIDANCE

- ## ER 1105-2-100 (PGN)
  - Provides instruction for NED and NER methodology
  - Provides instruction to use CE/ICA in selecting NER plan and for all recommended mitigation plans

- ## ECO-PCX's Implementation Guidance for IWR Planning Suite II
  - Ongoing studies with TSP not scheduled by 31 May 2018 should migrate to latest version of the software.
  - Studies electing use of MCDA should engage the ECO-PCX to develop a strategy for appropriate and policy compliant use of the module.

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WHAT'S NEW?

Modules from Prior Versions	New Modules
Plan Generation	Multi-Criteria Decision Analysis (MCDA)
CE/ICA	Uncertainty
Annualizer	Watershed Wizard
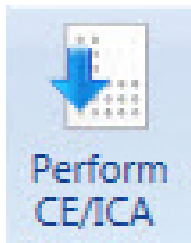
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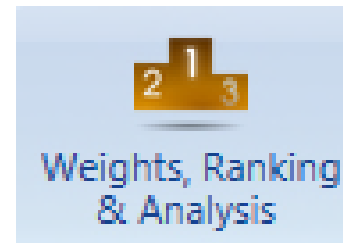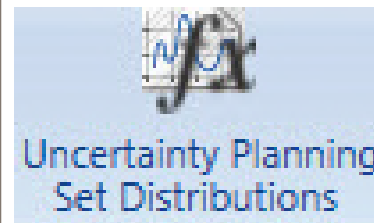
WHAT'S NEW – ROBUST DATABASE

- Previous versions limited the number of alternatives that could be generated necessitating work-arounds that introduced opportunities for errors.

- Just because you can generate 9,984 alternatives doesn't mean you should.
    - The software is a tool to help team make decisions not make decisions for them.
    - PDTs should think through screening and decision making criteria before using the software

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WHAT'S NEW – INTERFACE & USABILITY
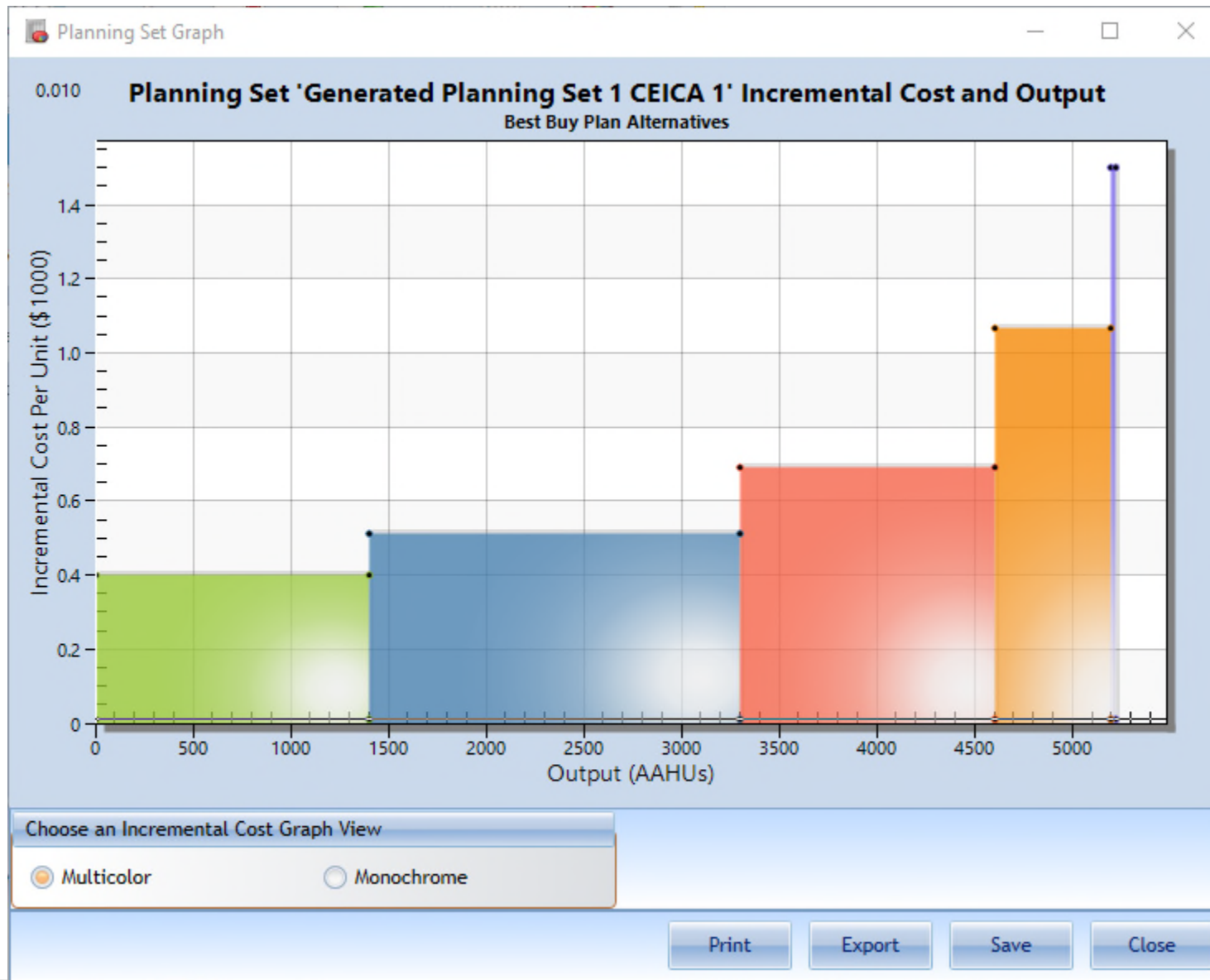
WHAT'S NEW – GRAPHING PACKAGE
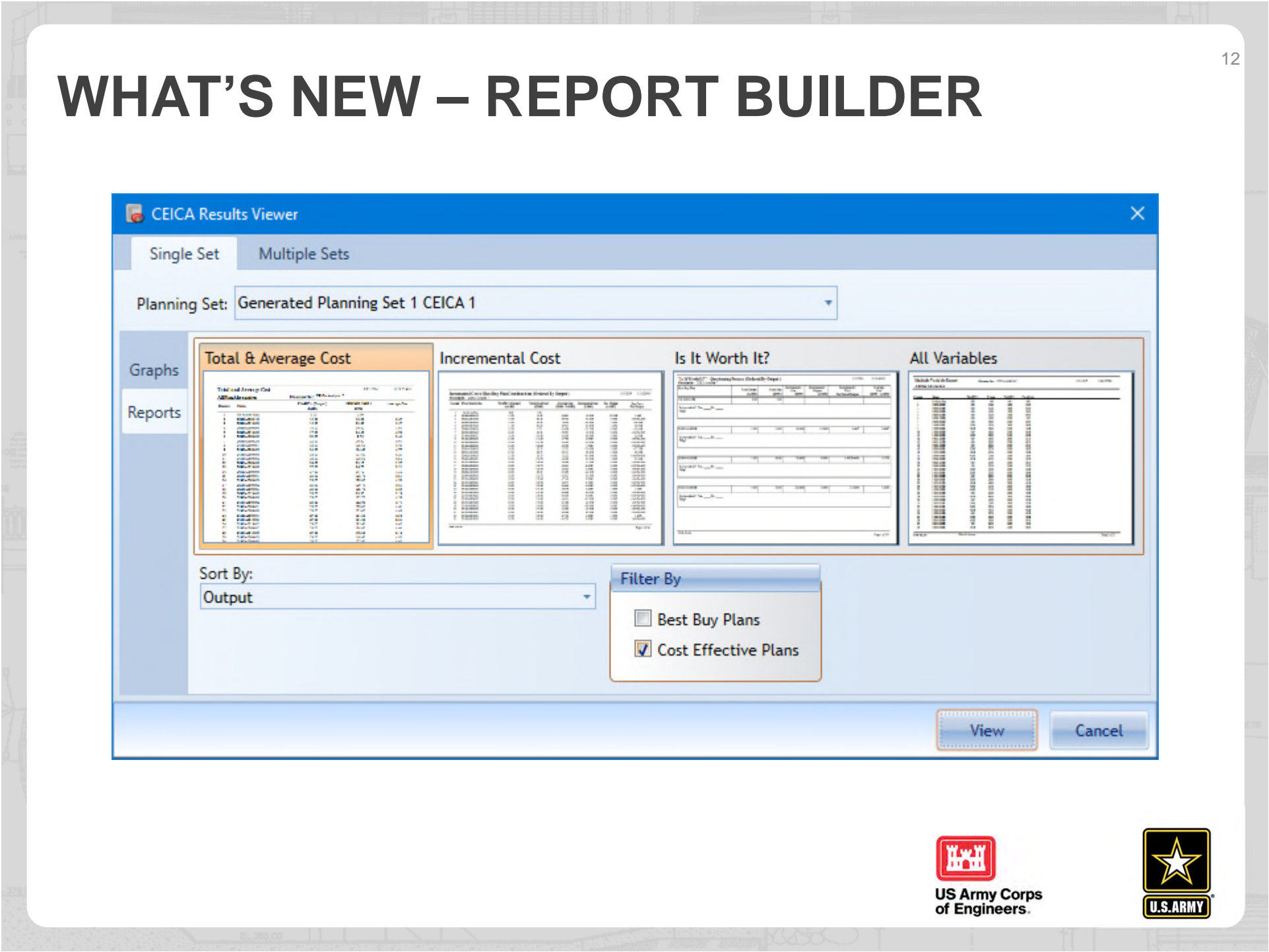
WHAT'S NEW – GRAPHING PACKAGE

WHAT'S NEW – REPORT BUILDER

WHAT'S NEW – REPORT BUILDER

Total and Average Cost   7/20/2018   1:24:57PM

Cost Effective Plan Alternatives   **Planning Set:**   Generated Planning Set 1 CEICA 1

Count	Name	Action Alternatives	Output (AAHUs)	Cost ($1000)	Average Cost
1	No Action Plan		0.00	0.00	0.00
2	A0B1C0	B1	60.00	145.00	2.42
3	A0B0C1	C1	250.00	300.00	1.20
4	A0B1C1	B1C1	310.00	445.00	1.44
5	A0B0C2	C2	1,400.00	560.00	0.40
6	A0B1C2	B1C2	1,460.00	705.00	0.48
7	A1B0C0	A1	1,900.00	970.00	0.51
8	A2B0C0	A2	1,920.00	1,000.00	0.52
9	A1B1C0	A1B1	1,960.00	1,115.00	0.57
10	A2B1C0	A2B1	1,980.00	1,145.00	0.58
11	A0B0C4	C4	2,000.00	1,200.00	0.60
12	A1B0C1	A1C1	2,150.00	1,270.00	0.59
13	A2B0C1	A2C1	2,170.00	1,300.00	0.60
14	A1B1C1	A1B1C1	2,210.00	1,415.00	0.64
15	A2B1C1	A2B1C1	2,230.00	1,445.00	0.65
16	A0B3C2	B3C2	2,700.00	1,460.00	0.54
17	A1B0C2	A1C2	3,300.00	1,530.00	0.46
18	A2B0C2	A2C2	3,320.00	1,560.00	0.47
19	A1B1C2	A1B1C2	3,360.00	1,675.00	0.50
20	A2B1C2	A2B1C2	3,380.00	1,705.00	0.50
21	A1B0C3	A1C3	3,500.00	2,000.00	0.57
22	A2B0C3	A2C3	3,520.00	2,030.00	0.58
23	A1B1C3	A1B1C3	3,560.00	2,145.00	0.60
24	A1B0C4	A1C4	3,900.00	2,170.00	0.56
25	A2B0C4	A2C4	3,920.00	2,200.00	0.56
26	A1B2C2	A1B2C2	3,925.00	2,280.00	0.58
27	A2B2C2	A2B2C2	3,945.00	2,310.00	0.59
28	A1B1C4	A1B1C4	3,960.00	2,315.00	0.58
29	A2B1C4	A2B1C4	3,980.00	2,345.00	0.59

IWR Planning Suite   * Plan Of Interest   Page 1 of 2

IWR PLANNING SUITE'S ROLE IN THE PLAN FORMULATION PROCESS

Step 1: Specify Problems and Opportunities

Step 2: Inventory and Forecast

Step 3: Formulate Alternative Plans

Step 4: Evaluate Alternative Plans

Step 5: Compare Alternative Plans

Step 6: Plan selection
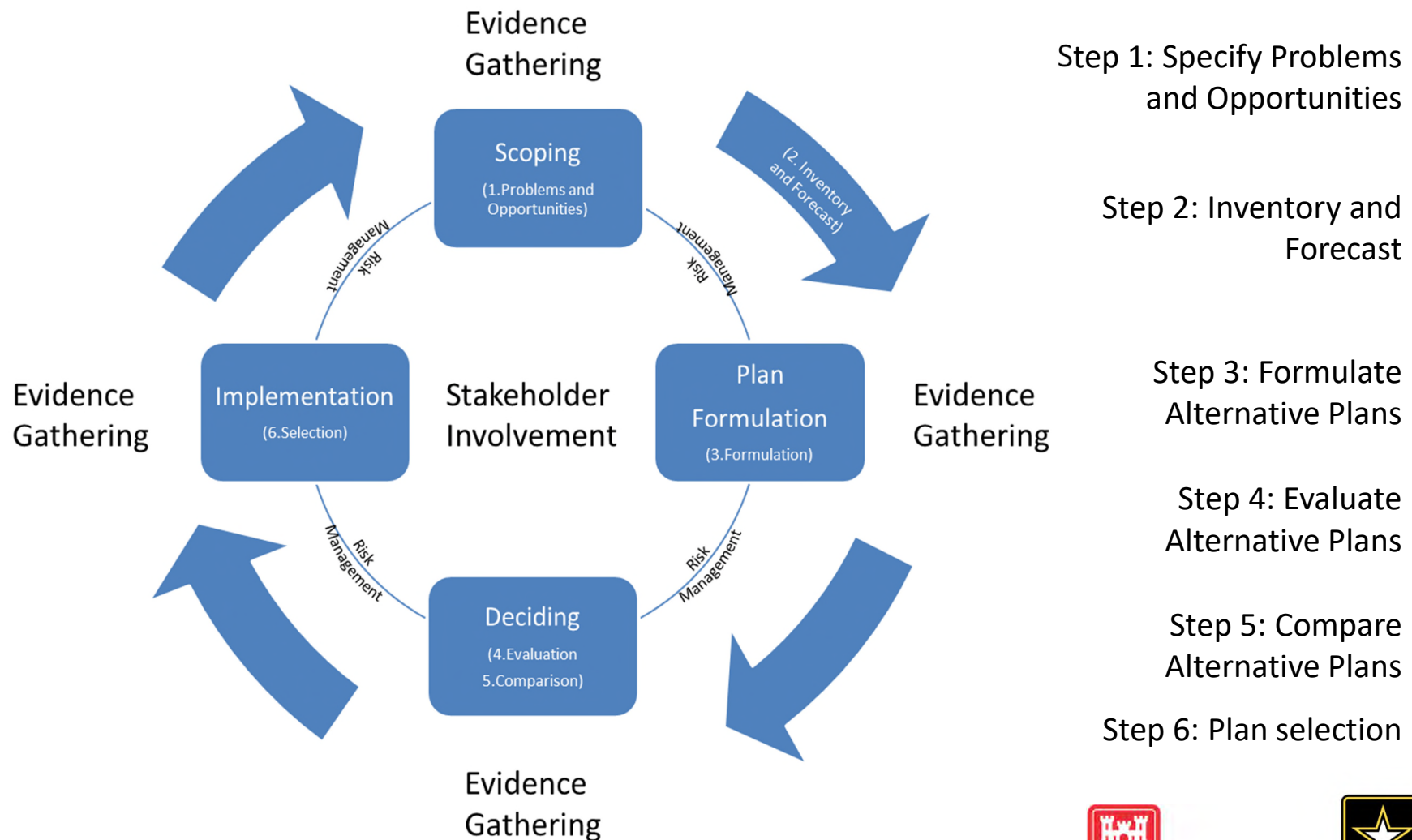
IWR PLANNING SUITE'S ROLE IN THE PLAN FORMULATION PROCESS

- IWR Planning Suite should be used as a **tool to support** plan formulation process.
  - Ecosystem Restoration (NER)
  - Mitigation

- Need to employ well-specified planning objectives in concert with plan generation

- Recommend starting with alternatives, or at least suites of management measures, that work together within a reach/area/sub-basin to meet planning objectives

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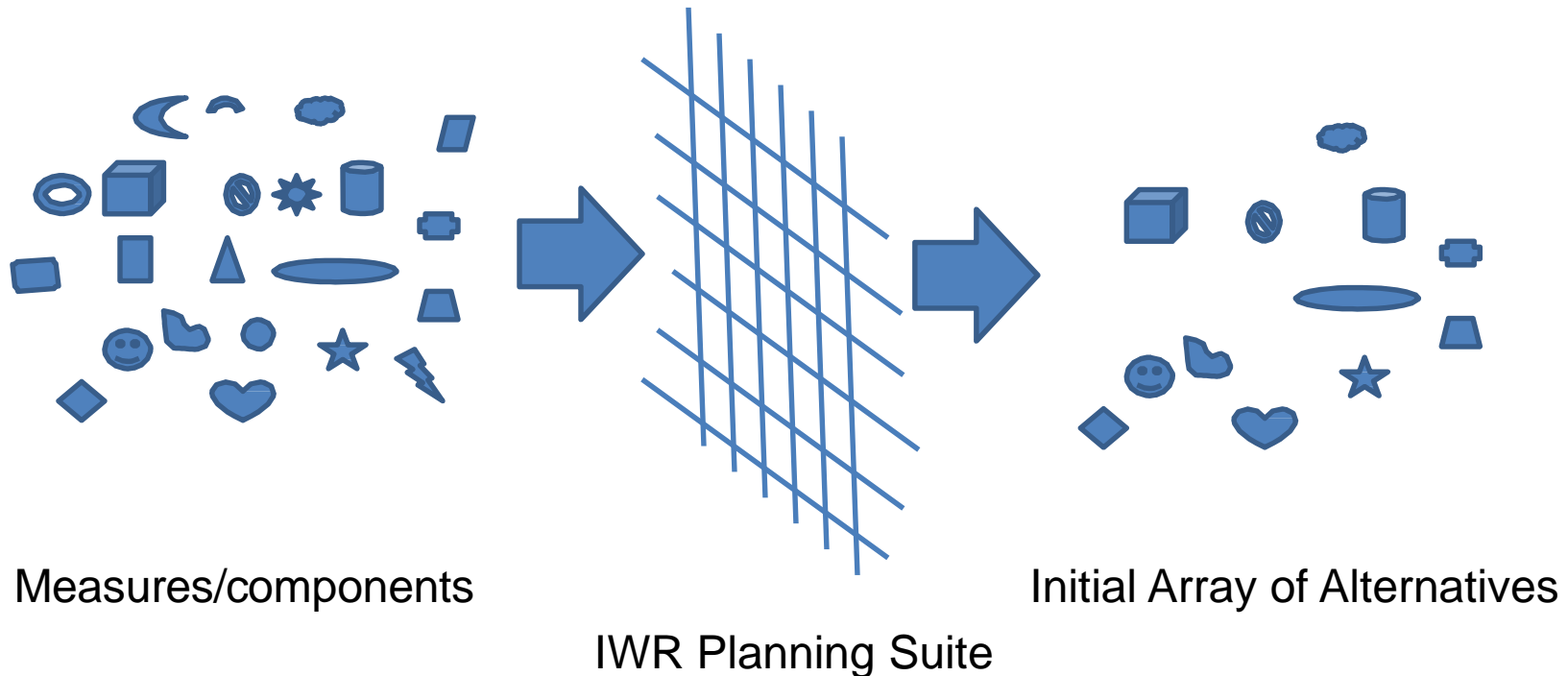# IWR PLANNING SUITE'S ROLE IN THE PLAN FORMULATION PROCESS

- There are two methods for analyzing alternatives in IWR Planning Suite:
  - Input pre-formulated alternatives
  - Input management measures and define relationships in order to generate alternatives

- Software can and should be used to optimize fully formulated alternatives

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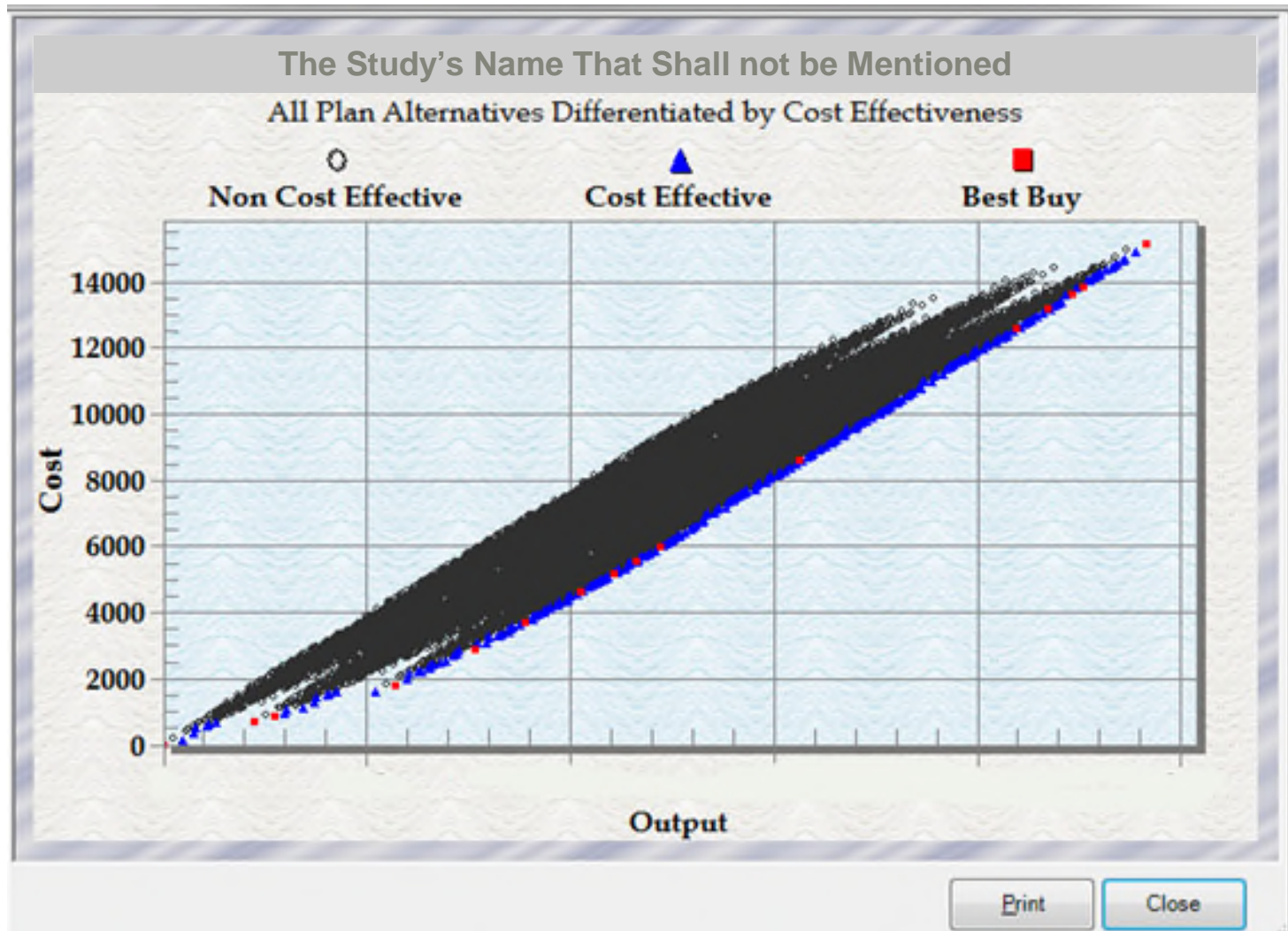
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IWR PLANNING SUITE'S ROLE IN THE PLAN FORMULATION PROCESS

Measures/components

IWR Planning Suite

Initial Array of Alternatives

- Plan Formulation Strategies can help teams structure their measures **before** utilizing the Planning Suite Software.

IWR PLANNING SUITE'S ROLE IN THE PLAN FORMULATION PROCESS

So we can avoid this…

MODEL COMPONENTS

PLAN GENERATOR

- Generates all possible combinations of solutions and determine the effects associated with each combination.
  - Unit costs/benefits are assumed additive by default.
  - Relationships can be modified or overridden by user.

- Each plan is based on solutions and their relationships to one another.
  - Solutions (type of activity or structure)
  - Number of scales for each solution (magnitude of activity or size of structure)
  - Unit cost, unit output, other variables
  - Solution relationships (combinability or dependency)

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PLAN GENERATOR

ANNUALIZER

- Interpolates NER benefits over the period of analysis

- Annualizes NED benefits and project costs

- Estimates:
  - Average annual equivalent NED costs and benefits
  - Net present values
  - Average annual NER outputs

- The only USACE certified tool for annualizing NER outputs.

- Helps users understand the timing of expected returns on investment.

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ANNUALIZER

CE/ICA

- Identifies the least cost solution for each possible level of output

- Compares monetary costs and non-monetary outputs (AAHUs)

- Required for all mitigation and ecosystem restoration projects

- Does not give you a single correct answer, but helps you to better understand and compare your alternatives
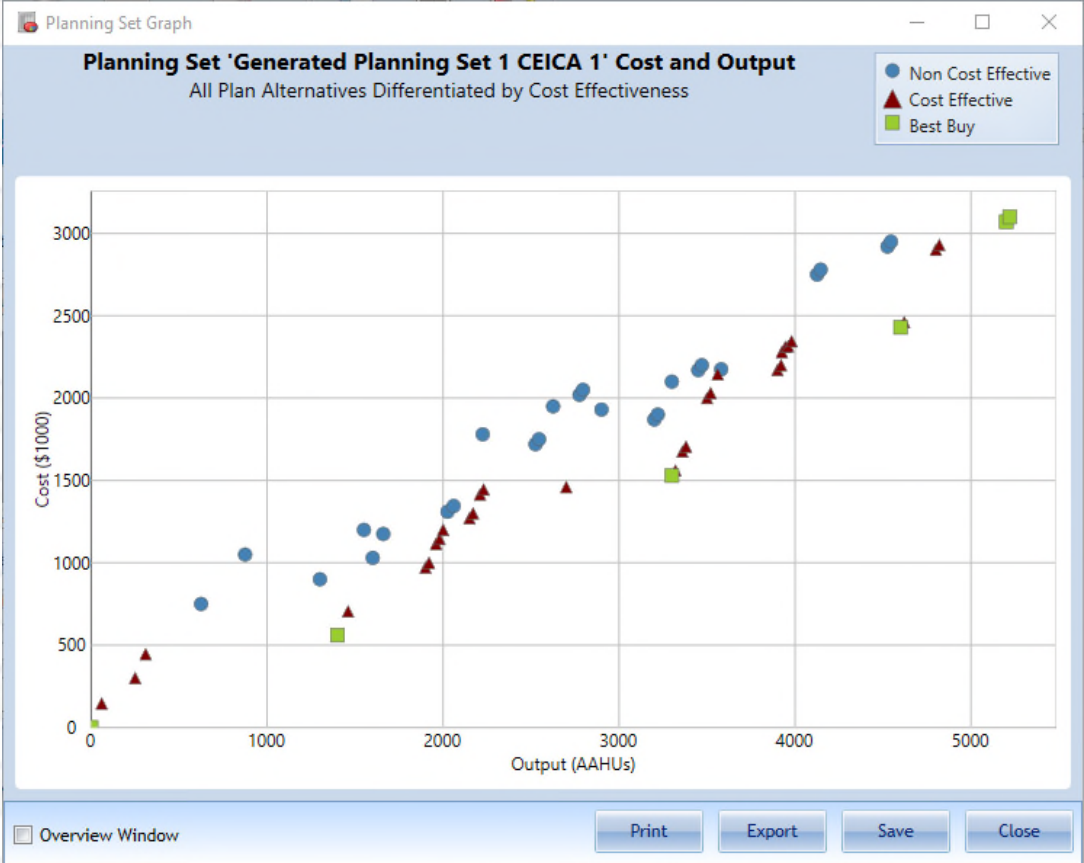
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CE/ICA

Plan	Cost	Output	Cost Effective
No Action Plan	$0.00	0	Best Buy
A1B0C0	$970.00	1,900	Cost Effective
A2B0C0	$1,000.00	1,920	Cost Effective
A0B1C0	$145.00	60	Cost Effective
A0B2C0	$750.00	625	Non-Cost Effective
A0B3C0	$900.00	1,300	Non-Cost Effective
A1B1C0	$1,115.00	1,960	Cost Effective
A2B1C0	$1,145.00	1,980	Cost Effective
A1B2C0	$1,720.00	2,525	Non-Cost Effective
A2B2C0	$1,750.00	2,545	Non-Cost Effective
A1B3C0	$1,870.00	3,200	Non-Cost Effective
A2B3C0	$1,900.00	3,220	Non-Cost Effective
A0B0C1	$300.00	250	Cost Effective
A0B0C2	$560.00	1,400	Best Buy
A0B0C3	$1,030.00	1,600	Non-Cost Effective
A0B0C4	$1,200.00	2,000	Cost Effective
A1B0C1	$1,270.00	2,150	Cost Effective
A2B0C1	$1,300.00	2,170	Cost Effective
A1B0C2	$1,530.00	3,300	Best Buy
A2B0C2	$1,560.00	3,320	Cost Effective
A1B0C3	$2,000.00	3,500	Cost Effective
A2B0C3	$2,030.00	3,520	Cost Effective

Planning Set Graph

Planning Set 'Generated Planning Set 1 CEICA 1' Cost and Output
All Plan Alternatives Differentiated by Cost Effectiveness

- Non Cost Effective
- Cost Effective
- Best Buy

Overview Window   Print   Export   Save   Close

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UNCERTAINTY

- Users can provide additional information relating to variability/uncertainty surrounding the costs and outputs of each solution.

- Users can assign a probability distribution that best represents the range of uncertainty around each variable for a given plan.

- The resulting set of information used in decision making is more robust and risk-informed.
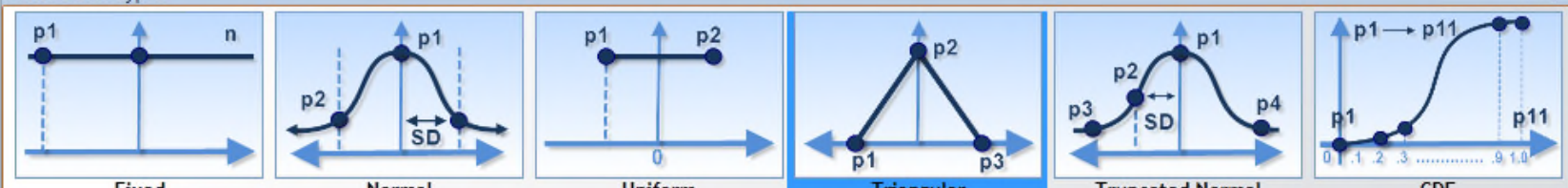
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UNCERTAINTY

MCDA

- Weight the criteria and choose the appropriate ranking and normalization methods.

- Create and save multiple weighting scenarios

- Helps the decision maker balance criteria (i.e., acres of wetland restored, jobs created) against a given set of solutions

- The process can be used to measure qualitative units such as socioeconomic factors or cultural resources with a user defined or a commonly accepted scale.

- Decision makers often use more than one criteria for decision making. MCDA provides a context for stakeholders to voice their opinions and potentially come to a consensus around decisions.

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MCDA

Multi-Criteria Decision Analysis

Planning Sets: Planning Set 1 (Generated) ▼   MCDA Scenario: MCDA Scenario 1 ▼ Create/Manage

Ranking | Weights

Rank Method

◉ Weighted Scoring   ○ Outranking   ○ Efficient Frontier   ○ Compromise Programming

Criterion	Weight	Min/Max
Cost	1	Minimized ▼
Output	1	Maximized ▼
SponsorSupport	3	Maximized ▼
NumberUtilityCrossings	1	Minimized ▼

Normalization Me

Discard All Chang

Perform MCDA

New Planning Se

Plan	Plan Description	Cost	Output	SponsorSupport	NumberUtilityCrossings	Rank	Score
A1B0		$100.00	3	☐	1	10	0.347
A2B0		$130.00	5	☑	1	3	0.599
A3B0		$145.00	8	☐	2	11	0.334
A0B1		$135.00	2	☑	1	5	0.556
A0B2		$270.00	8	☑	3	7	0.442
A1B1		$250.00	3	☑	2	8	0.436
A2B1		$160.00	5	☑	2	1	0.783
A3B1		$100.00	7	☑	3	4	0.565
A1B2		$300.00	15	☑	4	6	0.467
A2B2		$310.00	9	☑	4	2	0.632
A3B2		$215.00	10	☑	5	9	0.428

WATERSHED ANALYSIS

- The Watershed Wizard allows the user to complete a watershed analysis based on multiple calculations.

- Leads the user through a series of steps in which they can define locations, relationships, and additive effects between proposed plans in order to generate a set of plans to represent the scenario.

- The user can define one plan per site, more than one plan per site, or generate plans for each site based on their selections.

- Provides a more transparent framework for formulating multiple solutions and scales across multiple locations

- Users can then run CE/ICA on the generated watershed planning sets

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WATERSHED ANALYSIS

DOWNLOADING THE SOFTWARE

1. Make sure all previous versions of the IWR Planning Suite software have been uninstalled from your computer.

2. Request software from USACE App Portal.
   – "IWR Planning Suite 2.0.9 - April 30 2018"

3. Should install automatically within 24 hours of submitting your request.

Step-by-step instructions are available in the IWR Planning Assistance Library.
(https://publibrary.planusace.us/#/series/IWR%20Planning%20Suite)

TRAINING RESOURCES & HELP

- Links to the software, certification memo, and other related resources can be found at http://www.iwr.usace.army.mil/Missions/Economics/IWR-Planning-Suite/.

- Training materials that highlight IWR Planning Suite's capabilities, improvements and case study applications are available online at the IWR Planning Assistance Library.

- Customized or study-specific training is also available upon request.
  - Contact Laura Witherow (Laura.A.Witherow@usace.army.mil)

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Questions?

Type questions in the chat box.
We will answer as many
as time allows.

This webinar will be posted to the
Planning Community Toolbox:
http://www.corpsplanning.us

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