Price Analysis 1

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Version: DevTreks 2.1.4

A. Introduction

This reference explains how to start to collect, measure, and analyze input and output price data (**1***). DevTreks believes that all price data, from the price for a carton of milk in the grocery store to an avocado growing in an orchard, has a story to tell and lessons to teach. Those lessons can only be learned when data about prices is collected, measured, aggregated, analyzed, explained, and saved in online knowledge banks. Full, uniform, and accurate analyses of the prices of food, medical supplies, crop inputs, construction materials, tractors, livestock, flood control devices, and widgets, should be one or two links away for everyone. If a business owner, lender, doctor, patient, government official, or citizen, needs to make a decision involving prices, they should have ready access to the best data available. This reference introduces another DevTreks way to build these knowledge banks.

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B. Data URLs

The *Construction Analysis 1, Health Care Analysis 1, Malnutrition Analysis 1, Ag Production Analysis 1*, and *Work Breakdown Structures*, tutorials demonstrate how basic price data can be structured to support the analyses shown in this reference.

The Analyzers demonstrated in this reference can be found in the references in their respective tutorials. The following URLs contain representative Input and Output Analyses (i.e. allowing for a software development firm's testing purposes).

Inputs URIs

https://www.devtreks.org/buildtreks/preview/commercial/input/NPS 2011, Concrete Waste Factor 10 Percent/2147397457/none/

https://www.devtreks.org/buildtreks/preview/commercial/input/NPS 2011, Concrete Waste Factor 10 Percent/2147397457/none

https://www.devtreks.org/greentreks/preview/carbon/input/2014 Fertilizer, Orange, Conventional/2147397531/none

The M&E 1 analyses in the following dataset have been deprecated. Only the M&E 2 analyses are currently supported.

https://www.devtreks.org/hometreks/preview/farmworkers/input/2013 Food Package/2147397521/none

Outputs URIs

https://www.devtreks.org/buildtreks/preview/commercial/output/2011 NPS Visitor Hiker WTP/2141223450/none/

https://www.devtreks.org/greentreks/preview/carbon/output/Disaster Risk Management, Example 6/2141223485/none

http://localhost:5000/buildtreks/preview/commercial/output/2011 NPS Non-Visitor Trailhead WTP/2141223453/none
http://localhost:5000/buildtreks/preview/commercial/outputgroup/Life Cycle Examples/1936433768/none

C. Work Breakdown Structure (WBS)

The construction data analyzed in this reference uses the UNIFORMAT WBS. Some output data was able to use that WBS as well. The remaining data was classified using fictitious WBSs. All of the data used in these analyses were aggregated using these WBS Labels.

D. Net Present Value (NPV), Life Cycle (LCA), Resource Stock, and Monitoring and Evaluation (M&E) Analysis

DevTreks' NPV, LCA, Resource Stock, and M&E Analyzers can be used to carry out the analyses documented in this reference. Further information about each type of Analyzer can be found in the General Analyzer Tutorials on the site's home page. Unlike Operation, Component, Outcome, or Budget elements, NPV calculators are not run prior to completing an Input or Output price analysis.

Inputs have an Amount property that is usually set to 1 so that unit costs can be used in subsequent cost calculations. The Total Operating, Allocated Overhead, and Capital, Cost properties displayed in analyses result from multiplying their respective OC, AOH, or CAP, price by this amount. As a result, the numbers generated by NPV Input Analysis should usually be interpreted as non-discounted prices, rather than discounted costs. The exception is when the Input's Amount and Price properties have been calculated using a discounting calculator, such as a Machinery or Irrigation Calculator. The numbers generated by LCA Input Analysis derive from Life Cycle calculators and should be interpreted as life cycle costs, rather than input prices.

Base Outputs also have an Amount property, but it is often used to measure a "unit yield" from a production process, such as bushels of corn per acre (**2***). The numbers generated by NPV Output Analysis should usually be interpreted as non-discounted prices when the Amount property is not a "unit yield" and non-discounted benefits when the Amount property is a "unit yield". The numbers generated by LCA Output Analysis derive from Life Cycle calculators should be interpreted as life cycle benefits, rather than output prices.

The numbers generated by M&E Input and Output Analysis may contain prices, quantities, costs, and benefits. Standard indicators contain a Q1 Property that is often a quantity, and Q2 Property that is often a price, and a Total property that is often a cost or benefit. Each base element in an analysis can contain up to 15 indicators.

A Resource Stock Input or Output Total Analysis sums all of the Indicator "Qxs" in the analysis (i.e. Q1, Q2, Q3, Q4, Q5, QT, QTM, QTU, QTL, Score, ScoreD1, ScoreD2, ScoreM, ScoreL, and ScoreU). The remaining Statistics, Change By, and Progress Stock Analyzers only aggregate the QTM, ScoreM, ScoreL, and ScoreU properties. Each Input and Output element in an analysis can contain up to 15 indicators which, when analyzed, are displayed using up to 10 aggregate indicators.

E. Input and Output Properties (3*)

Base Element Input Properties:

InputPrice1Amount: operating cost amount

InputPrice1: operating cost price

InputUnit1: operating cost unit

InputUnit2: allocated overhead cost unit

InputPrice2: allocated overhead cost unit

InputUnit3: capital cost unit

InputPrice3: capital cost price

InputDate: date the input is expended

Base Element Output Properties:

OutputCompositionAmount: a multiplier for changing output revenues

OutputCompositionUnit: unit of measurement for the composition amount

OutputAmount1: quantity of the output

OutputPrice1: price of the output

OutputUnit1: unit of measurement for the output

OutputDate: date the output's revenue is received

F. Price Analysis Properties

Separate NPV, LCA, Resource Stock, and M&E analyzers are available for the base elements found in Inputs and Outputs (**4***). The *Calculator and Analyzer 1* reference documents how all Analyzers work. The Analysis Type property of Analyzers is used to specify the type of analysis to run.

Analysis Result Properties: The results of running analyses are displayed using the properties that are explained in the following references:

NPV Analysis Properties

Refer to the Net Present Value Calculation and Benefit Cost Analysis References

LCA Analysis Properties

Refer to the Life Cycle Calculation and Analysis References

M&E Analysis Properties

Refer to the Monitoring and Evaluation Calculation and Analysis References

Resource Stock Analysis Properties

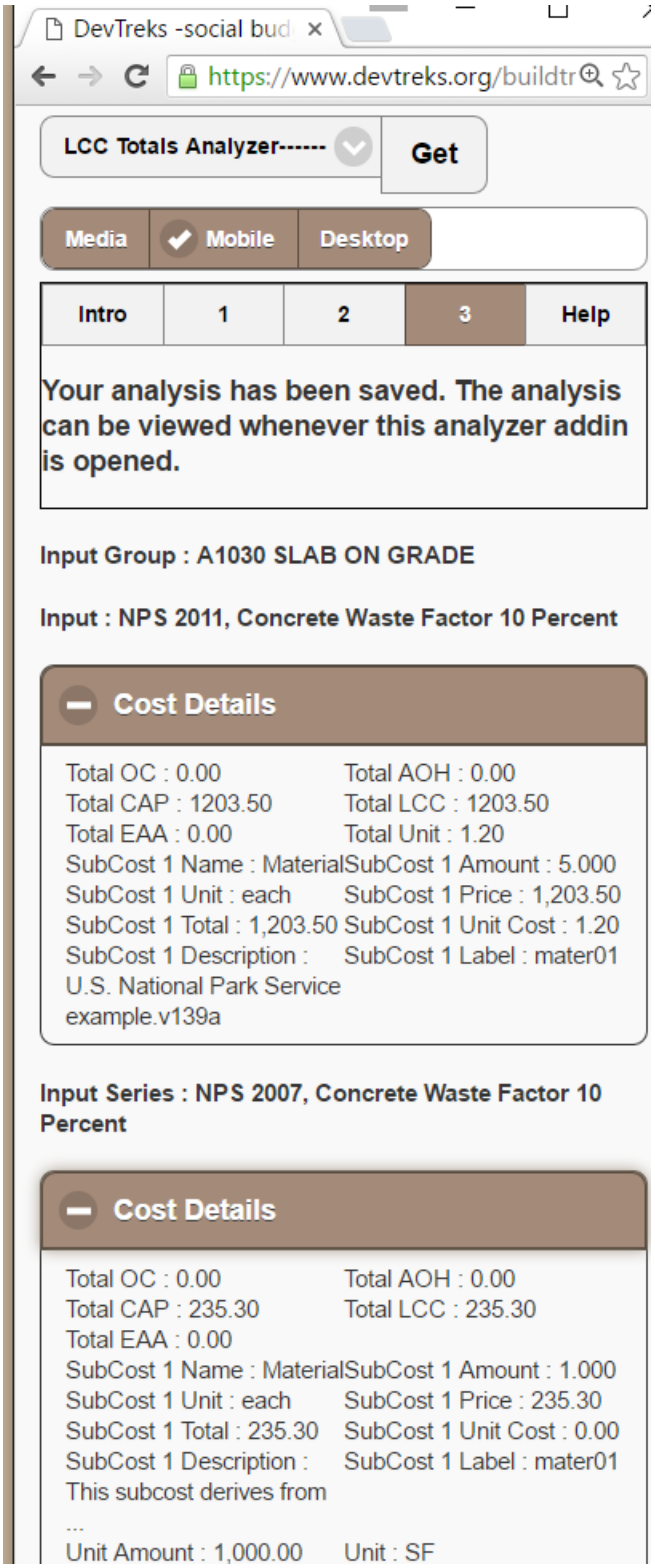
Refer to the Resource Stock Calculation and Analysis References

G. Total 1 Analysis

A *Totals Analysis* sums base elements for every base element in an analysis. All analyzers use the results of this analysis for each aggregated base element before carrying out additional calculations.

The following URLs and images demonstrate typical examples of this analysis. These images were generated using Version 2.0.0 with the Azure site.

LCA Input Totals


DevTreks -social bud
https://www.devtreks.org/buildtr
LCC Totals Analyzer------
Get
Media
Mobile
Desktop
Intro
1
2
3
Help
Your analysis has been saved. The analysis can be viewed whenever this analyzer addin is opened.
Input Group : A1030 SLAB ON GRADE
Input : NPS 2011, Concrete Waste Factor 10 Percent
Cost Details
Total OC : 0.00
Total AOH : 0.00
Total CAP : 1203.50
Total LCC : 1203.50
Total EAA : 0.00
Total Unit : 1.20
SubCost 1 Name : Material
SubCost 1 Amount : 5.000
SubCost 1 Unit : each
SubCost 1 Price : 1,203.50
SubCost 1 Total : 1,203.50
SubCost 1 Unit Cost : 1.20
SubCost 1 Description :
SubCost 1 Label : mater01
U.S. National Park Service example.v139a
Input Series : NPS 2007, Concrete Waste Factor 10 Percent
Cost Details
Total OC : 0.00
Total AOH : 0.00
Total CAP : 235.30
Total LCC : 235.30
Total EAA : 0.00
SubCost 1 Name : Material
SubCost 1 Amount : 1.000
SubCost 1 Unit : each
SubCost 1 Price : 235.30
SubCost 1 Total : 235.30
SubCost 1 Unit Cost : 0.00
SubCost 1 Description :
SubCost 1 Label : mater01
This subcost derives from
...
Unit Amount : 1,000.00
Unit : SF

NPV Input Totals

https://www.devtreks.org/buildtreks/search/commercial/input/no

NPV Total Analyzer------- Get

Media | Mobile | Desktop

Intro | 1 | 2 | 3 | Help

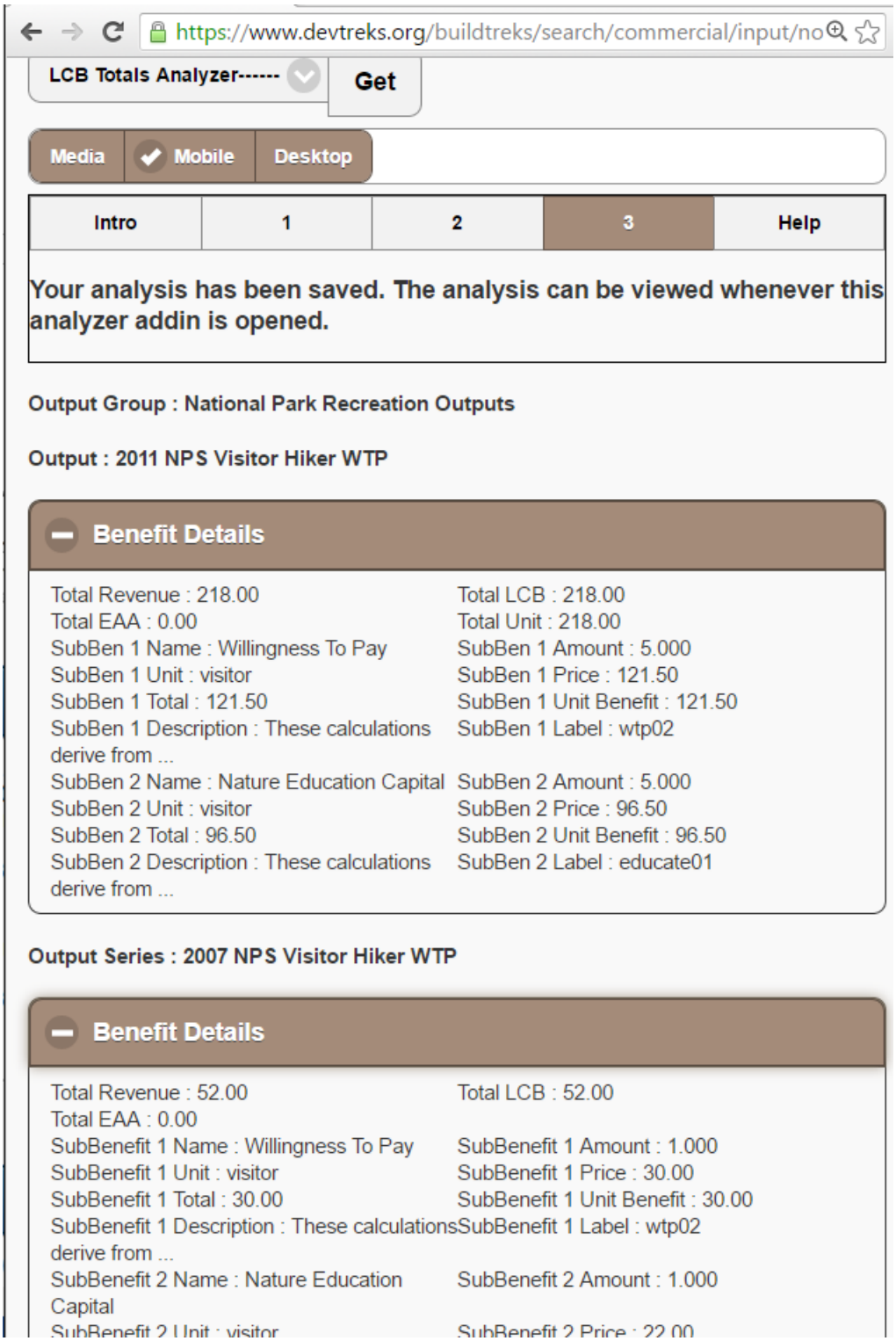
Your analysis has been saved. The analysis can be viewed whenever this analyzer addin is opened.

Input Group : A1030 SLAB ON GRADE							
Name	**TOC Unit**	**TOC Amount**	**TOC Price**	**TOC**	**TAOH**	**TCAP**	**TCost**
Input: NPS 2011, Concrete Waste Factor 10 Percent							
NPS 2011, Concrete Waste Factor 10 Percent	none	5.00	0.00	0.00	0.00	1,203.50	1,203.50
Input Series							
Name	**OC Unit**	**TOC Amount**	**TOC Price**	**TOC**	**TAOH**	**TCAP**	**TCost**
NPS 2007, Concrete Waste Factor 10 Percent	none	1.00	0.00	0.00	0.00	235.30	235.30
NPS 2008, Concrete Waste Factor 10 Percent	none	1.00	0.00	0.00	0.00	237.30	237.30
NPS 2009, Concrete Waste Factor 10 Percent	none	1.00	0.00	0.00	0.00	240.30	240.30
NPS 2010, Concrete Waste Factor 10 Percent	none	1.00	0.00	0.00	0.00	242.30	242.30
NPS 2011, Concrete Waste Factor 10 Percent	none	1.00	0.00	0.00	0.00	248.30	248.30

Feedback About commercial/input/NPS 2011, Concrete Waste Factor 10 Percent/2147397457/none

Dataset: NPS 2011, Concrete Waste Factor 10 Percent IRI This building construction cost estimate is computed using life cycle cycle input calculators and totals, statistics, incremental change, and progress analyzers.

LCA Output Totals



NPV Output Totals

Output Group: **National Park Recreation Outputs**				
Name	**Unit**	**Total Price**	**Total Amount**	**Total Benefit**
Outputs				
2011 NPS Visitor Hiker WTP	each	218.00	5.00	218.00
Output Series				
Name	**Unit**	**Total Price**	**Total Amount**	**Total Benefit**
2007 NPS Visitor Hiker WTP	each	52.00	1.00	52.00
2008 NPS Visitor Hiker WTP	each	38.50	1.00	38.50
2009 NPS Visitor Hiker WTP	each	40.00	1.00	40.00
2010 NPS Visitor Hiker WTP	each	42.50	1.00	42.50
2011 NPS Visitor Hiker WTP	each	45.00	1.00	45.00
Feedback About commercial/output/2011 NPS Visitor Hiker WTP/2141223450/none				

Dataset: 2011 NPS Visitor Hiker WTP IRI This building construction benefit estimate is computed using life cycle cycle output calculators and totals, statistics, incremental change, and progress analyzers.

Search IRIs:
https://www.devtreks.org/buildtreks/linkedviews/commercial/output/2011 NPS Visitor Hiker WTP/2141223450/none

M&E 2 Totals

M&E 2 Starting Calculations

Input Series: 2012 Food Package

Type	Weight	Date	Math Type	Amount 1	Unit 1	Amount 2	Unit 2	Total	Unit
Indicator 1: Q1 Food Packages Purchased I122									
oc	1.000	04/01/2012	Q1_multiply_Q2	2000.000	packages	1.600	dollar cost	3200.000	dollar total cost
Description : This indicator tracks the Q1 amount and cost of food packages purchased.									
Indicator 2: Q2 Food Packages Purchased I122									
oc	1.000	07/01/2012	Q1_multiply_Q2	3500.000	packages	1.700	dollar cost	5950.000	dollar total cost
Description : This indicator tracks the Q2 amount and cost of food packages purchased.									
Indicator 3: Q3 Food Packages Purchased I122									
oc	1.000	10/01/2012	Q1_multiply_Q2	6000.000	packages	1.450	dollar cost	8700.000	dollar total cost
Description : This indicator tracks the Q3 amount and cost of food packages purchased.									
Indicator 4: Q4 Food Packages Purchased I122									
oc	1.000	01/01/2013	Q1_multiply_Q2	5500.000	packages	1.450	dollar cost	7975.000	dollar total cost
Description : This indicator tracks the Q4 amount and cost of food packages purchased.									

Input Series: 2013 Food Package

Type	Weight	Date	Math Type	Amount 1	Unit 1	Amount 2	Unit 2	Total	Unit
Indicator 1: Q1 Food Packages Purchased I122									
oc	1.000	04/01/2013	Q1_multiply_Q2	5000.000	packages	1.500	dollar cost	7500.000	dollar total cost
Description : This indicator tracks the Q1 amount and cost of food packages purchased.									
Indicator 2: Q2 Food Packages Purchased I122									

The M&E tutorial points out that descendent elements are not aggregated into ancestors. The Input did not aggregate its children Input Series in the following Totals Analysis.

Input Group								
M and E Malnutrition Food Delivery Group								
Input								
2013 Food Package								
Name	Label	Total	Unit	Q1 Total	Q1 Unit	Q2 Total	Q2 Unit	
Q1 Food Packages Purchased	I122	0.000	dollar total cost	0.000	packages	0.000	dollar cost	
Description : This indicator tracks the Q1 amount and cost of food packages purchased.								
Input Series: 2012 Food Package								
Name	Label	Total	Unit	Q1 Total	Q1 Unit	Q2 Total	Q2 Unit	
Q1 Food Packages Purchased	I122	2,582,500.000	dollar total cost	170,000.000	packages	62.000	dollar cost	
Description : This indicator tracks the Q1 amount and cost of food packages purchased.								
Input Series: 2013 Food Package								
Name	Label	Total	Unit	Q1 Total	Q1 Unit	Q2 Total	Q2 Unit	
Q1 Food Packages Purchased	I122	36,825.000	dollar total cost	26,000.000	packages	5.700	dollar cost	
Description : This indicator tracks the Q1 amount and cost of food packages purchased.								
Feedback About farmworkers/input/2013 Food Package/2147397521/none								

Dataset: 2013 Food Package IRI Each food package contains enough food to sustain a family of four for one day

Resource Stock Totals

https://www.devtreks.org/greentreks/search/waters

Input Group: LCA Nutrients, Organic Crops

Input : 2014 Fertilizer, Orange, Conventional

Indicators

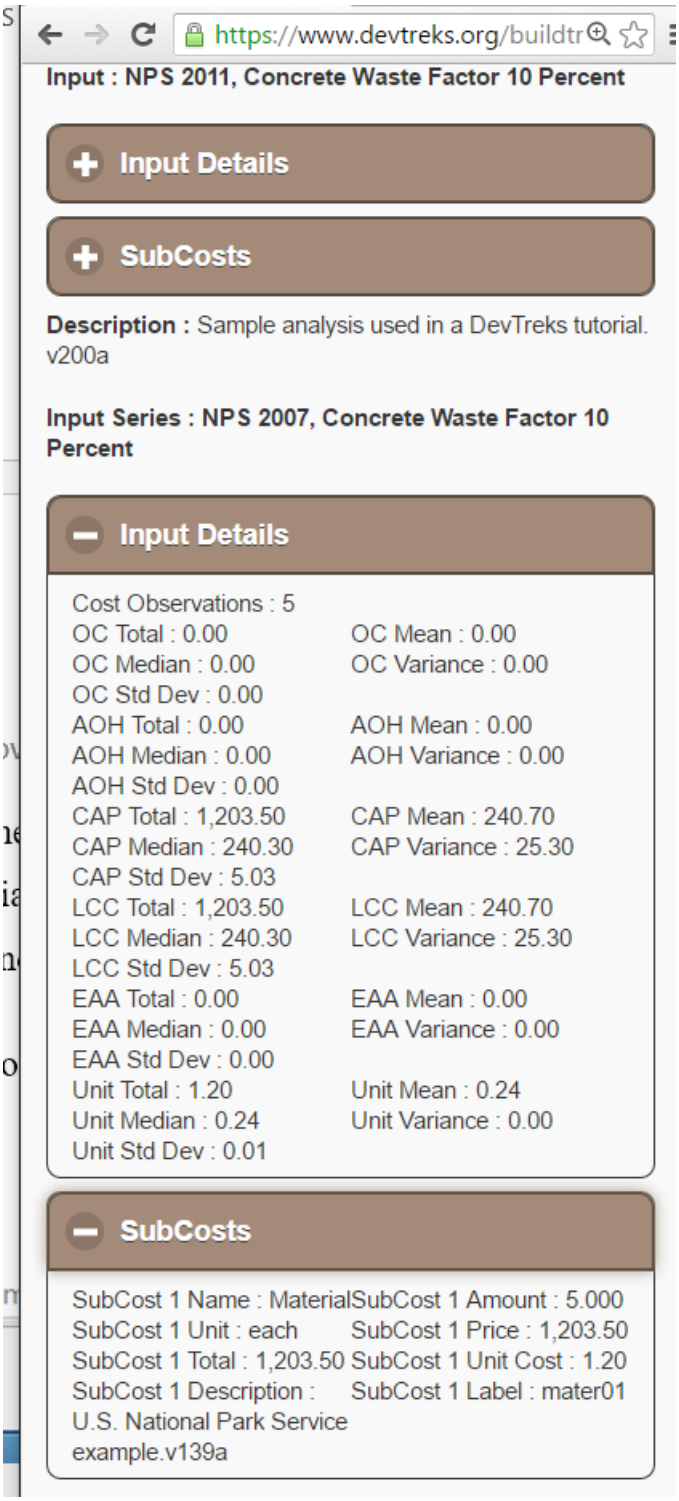
Math Expression: (I4.QTM+I5.QTM+I6.QTM+I7.QTM+I8.QTM)/5
Observations: 3.0
Score Amount: 45.1677
Score Unit: environmental performance
Score D1 Amount: 45.2000
Score D1 Unit: mean
Score D2 Amount: 4.6500
Score D2 Unit: sd
Distribution Type: normal
Math Type: algorithm1
Score Most Amount: 45.2289
Score Most Unit: mean
Score Low Amount: 45.1529
Score Low Unit: lower90% ci
Score High Amount: 45.3049
Score High Unit: upper90% ci
Iterations: 10000
Score Math Sub Type: subalgorithm1
Score Math Result: sampled descriptive statistics N,Total,Mean,Median,StdDev,Var,Min,Max 10000, 148093.3526, 14.8093, 14.8233, 1.4863, 2.2092, 9.0377, 20.0766, sampled cumulative density function 0.00,0.10,0.20,0.30,0.40,0.50,0.60,0.70,0.80,0.90,1.00 9.0377,12.9130,13.5503,14.0282,14.4398,14.8234,15.1917,15.6026,16.0625,16
Indic 1 Name: Nitrate Loss
Label: NO3
Date: 01/01/2014
Rel Label: CO2A, NO2A, SO2
Math Type: algorithm1
Dist Type: triangle
Q1 Amount: 366.0000
Q1 Unit: kg N / ha applied
Q2 Amount: 360.0000
Q2 Unit: kg N / ha total
Q3 Amount: 90.0000
Q3 Unit: kg N03-N / ha
Q4 Amount: 333.0000
Q4 Unit: kg N / ha applied
Q5 Amount: 0.0000
Q5 Unit: kg N03-N / ha
Math Express: ((I1.Q1/ I1.Q2) * I1.Q3) / I1.Q4
Math Operator: equalto
QT Amount: 0.8243
QT Unit: kg N03-N / ha
QT D1 Amount: 67.5000
QT D1 Unit: low
QT D2 Amount: 120.0000
QT D2 Unit: high
QT Most Amount: 40.5282
QT Most Unit: kg N03-N / ha
QT Low Amount: 40.0647
QT Low Unit: lower90% ci
QT High Amount: 40.9917
QT High Unit: upper90% ci
Math Sub Type: subalgorithm1
Base IO: none
Observations: 3.0
Indic 1 Description: Nitrate emissions derived from fertilizer. Measurement for field has been adjusted to NO3 emission per kg fertilizer applied, as follows: .25 kg NH3-N / ha : ((111 kg N per ha applied fertilizer / 120 kg N per ha total) 30 kg N03) / 111 kg N per ha ap
Indic 2 Name: Ammonia Loss
Label: NH3
Date: 01/01/2014
Rel Label: SO2A, SO2B

H. Statistical 1 Analysis

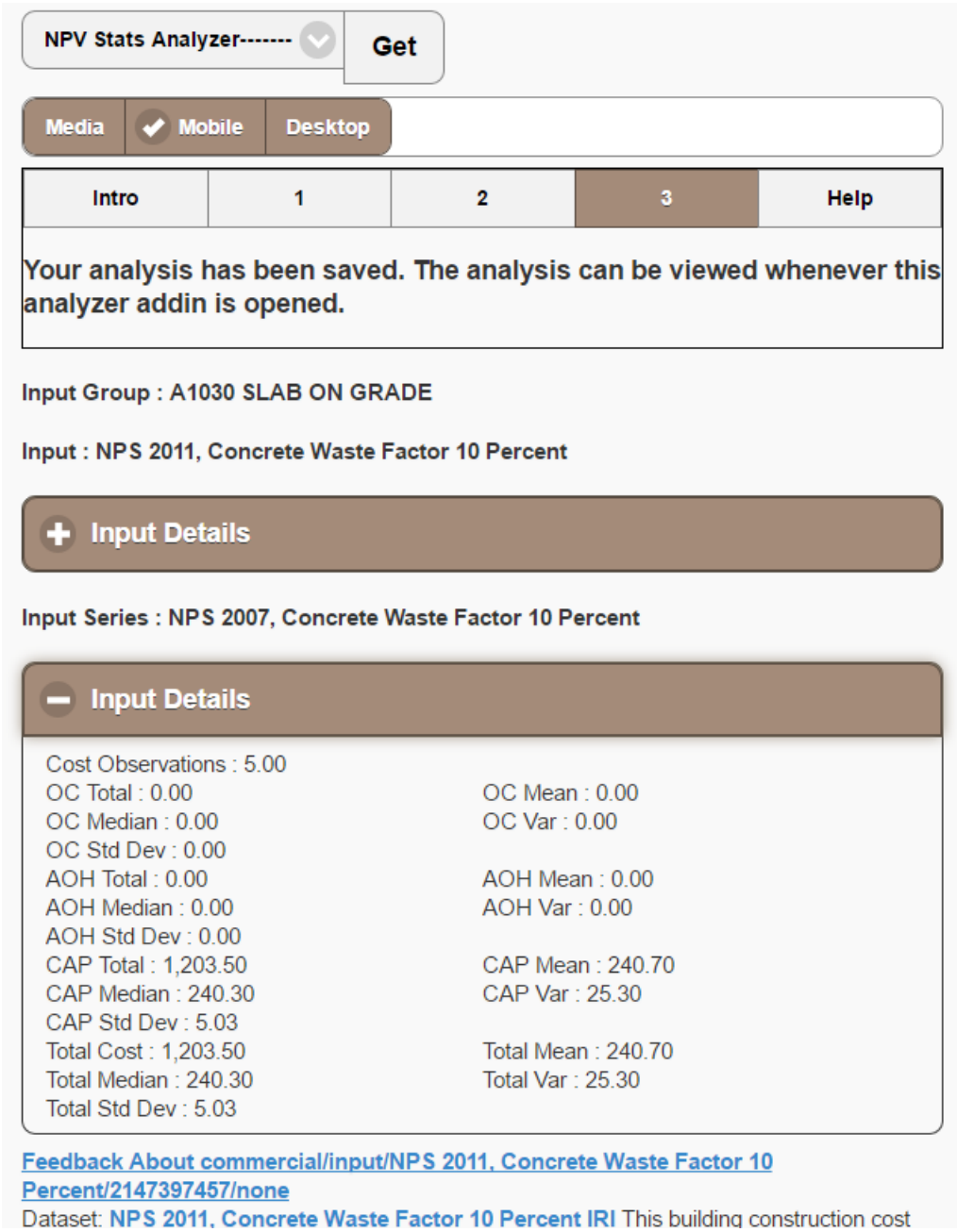
A *Statistics Analysis* uses the Totals calculations to measure basic statistical properties of aggregated base elements. Total, Median, Mean, Variance, and Standard Deviation statistics are generated for all of the base elements that use the standard aggregators.

The following images demonstrate typical examples of this analysis:

LCA Input Stats



NPV Input Stats



LCA Output Stats

https://www.devtreks.org/buildtreks/search/commercial/input/no

Output Group : National Park Recreation Outputs

Output : 2011 NPS Visitor Hiker WTP

Output Details

SubBenefits

Description : Sample data set used in a DevTreks tutorial. v200a

Output Series : 2007 NPS Visitor Hiker WTP

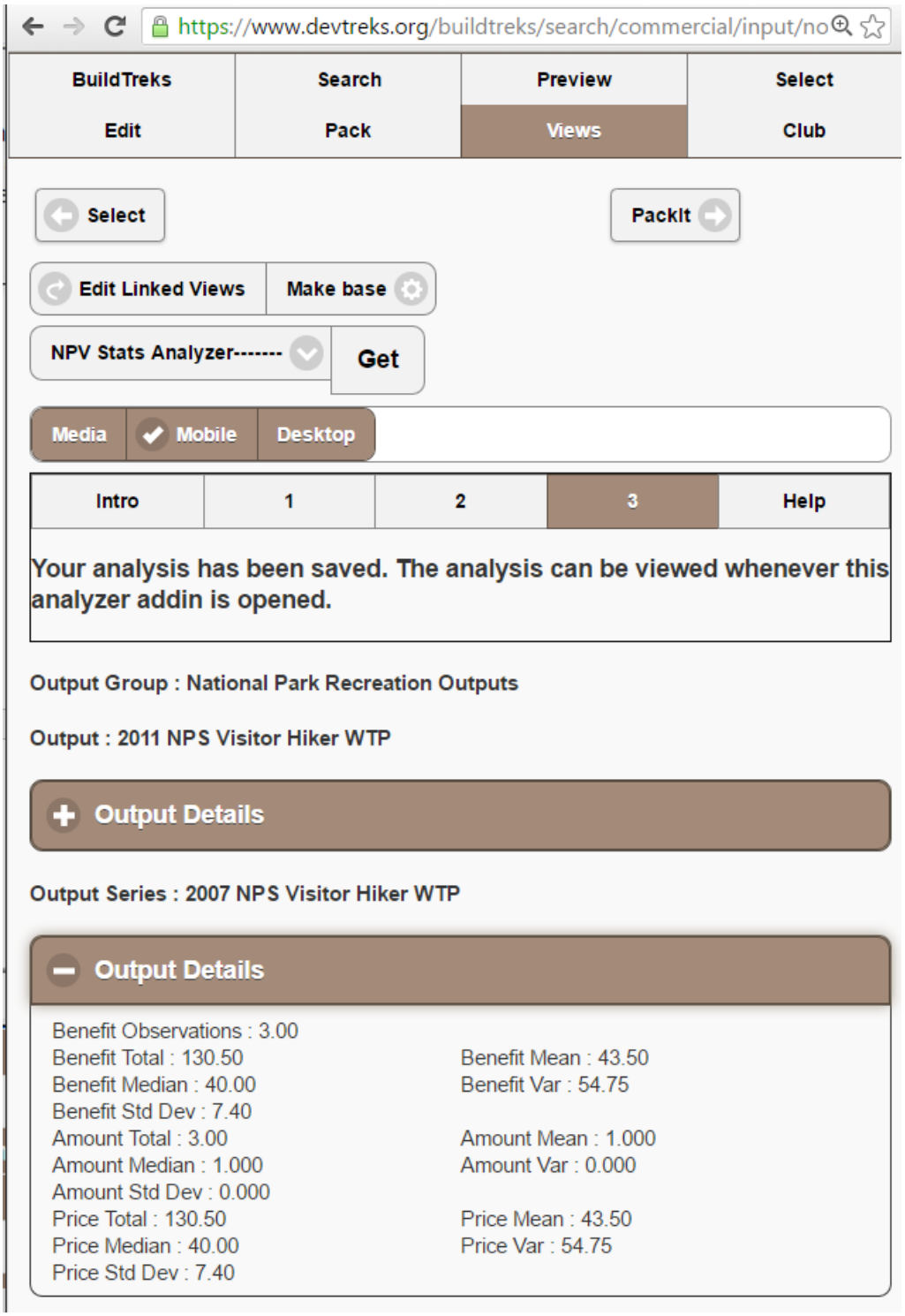
Output Details

Benefit Observations : 3.00	
Benefit Total : 130.50	Benefit Mean : 43.50
Benefit Median : 40.00	Benefit Variance : 54.75
Benefit Std Dev : 7.40	
LCB Total : 130.50	LCB Mean : 43.50
LCB Median : 40.00	LCB Variance : 54.75
LCB Std Dev : 7.40	
EAA Total : 0.00	EAA Mean : 0.00
EAA Median : 0.00	EAA Variance : 0.00
EAA Std Dev : 0.00	
Unit Total : 130.50	Unit Mean : 43.50
Unit Median : 40.00	Unit Variance : 54.75
Unit Std Dev : 7.40	

SubBenefits

SubBen 1 Name : Willingness To Pay	SubBen 1 Amount : 3.000
SubBen 1 Unit : visitor	SubBen 1 Price : 73.00
SubBen 1 Total : 73.00	SubBen 1 Unit Benefit : 73.00
SubBen 1 Description : These calculations derive from ...	SubBen 1 Label : wtp02
SubBen 2 Name : Nature Education Capital	SubBen 2 Amount : 3.000
SubBen 2 Unit : visitor	SubBen 2 Price : 57.50
SubBen 2 Total : 57.50	SubBen 2 Unit Benefit : 57.50
SubBen 2 Description : These calculations derive from ...	SubBen 2 Label : educate01

NPV Output Stats


https://www.devtreks.org/buildtreks/search/commercial/input/no
BuildTreks
Search
Preview
Select
Edit
Pack
Views
Club
Select
PackIt
Edit Linked Views
Make base
NPV Stats Analyzer-------
Get
Media
Mobile
Desktop
Intro
1
2
3
Help
Your analysis has been saved. The analysis can be viewed whenever this analyzer addin is opened.
Output Group : National Park Recreation Outputs
Output : 2011 NPS Visitor Hiker WTP
Output Details
Output Series : 2007 NPS Visitor Hiker WTP
Output Details
Benefit Observations : 3.00
Benefit Total : 130.50
Benefit Mean : 43.50
Benefit Median : 40.00
Benefit Var : 54.75
Benefit Std Dev : 7.40
Amount Total : 3.00
Amount Mean : 1.000
Amount Median : 1.000
Amount Var : 0.000
Amount Std Dev : 0.000
Price Total : 130.50
Price Mean : 43.50
Price Median : 40.00
Price Var : 54.75
Price Std Dev : 7.40

M&E 2 Stats

Input Series : 2012 Food Package

Indicator Totals

Indicator 1 Name : **Q1 Food Packages Purchased**	Label : I122
Observations : 4	
Total : 2,582,500.000	Unit : dollar total cost
Mean : 645,625.000	Median : 696,250.000
Variance : 60,668,229,166.667	Std Dev : 246,309.215
Q1 Total : 170,000.000	Q1 Unit : packages
Q1 Mean : 42,500.000	Q1 Median : 45,000.000
Q1 Variance : 341,666,666.667	Q1 Std Dev : 18,484.228
Q2 Total : 62.000	Q2 Unit : dollar cost
Q2 Mean : 15.500	Q2 Median : 15.750
Q2 Variance : 1.500	Q2 Std Dev : 1.225

Description : This indicator tracks the Q1 amount and cost of food packages purchased.

Input Series : 2013 Food Package

Indicator Totals

Indicator 1 Name : **Q1 Food Packages Purchased**	Label : I122
Observations : 4	
Total : 36,825.000	Unit : dollar total cost
Mean : 9,206.250	Median : 9,600.000
Variance : 1,370,156.250	Std Dev : 1,170.537
Q1 Total : 26,000.000	Q1 Unit : packages
Q1 Mean : 6,500.000	Q1 Median : 6,750.000
Q1 Variance : 1,166,666.667	Q1 Std Dev : 1,080.123
Q2 Total : 5.700	Q2 Unit : dollar cost
Q2 Mean : 1.425	Q2 Median : 1.425
Q2 Variance : 0.007	Q2 Std Dev : 0.087

Description : This indicator tracks the Q1 amount and cost of food packages purchased.

Feedback About farmworkers/input/2013 Food Package/2147397521/none
Dataset: 2013 Food Package IRI Each food package contains enough food to sustain a family of four for one day.

Resource Stock Stats

https://www.devtreks.org/greentreks/search/watershed/input/none/0/none

Input Group								
LCA Nutrients, Organic Crops								
Input								
2014 Fertilizer, Orange, Conventional								
Observations	Score Most Likely	Unit	Score Mean	Score Median	Score Variance	Score Std Dev	Score Low Unit	Score High Unit
Score Low	Score Low Mean	Score Low Median	Score Low Variance	Score Low Std Dev	Score High	Score High Mean	Score High Median	Score High Variance
3.0	45.2289	mean	15.0763	14.8093	0.5442	0.7377	lower90% ci	upper90% ci
45.1529	15.0510	14.7848	0.5421	0.7363	45.3049	15.1016	14.8338	0.5463
Observations	Name	Label	Total	Unit	Mean	Median	Variance	Std Dev
3.0	Nitrate Loss	NO3	40.5282	kg N03-N / ha	13.5094	13.5094	0.0002	0.0144
3.0	Ammonia Loss	NH3	17.7102	kg N03-N / ha	5.9034	5.9034	0.2500	0.5000
3.0	Nitrous Oxide Emissions	N2O	4.4227	kg N2O-N / ha	1.4742	1.4709	0.0156	0.1250
3.0	Global Warming	CO2A	213.5401	kg CO2 equivs	71.1800	70.0467	8.2533	2.8729
3.0	Acidification	SO2A	2.9718	kg SO2 equivs	0.9906	0.9706	0.0103	0.1015
3.0	Eutrophication	NO3A	5.6633	kg N03 equivs	1.8878	1.8611	0.0405	0.2013
3.0	Eutrophication	NO3B	2.4218	kg N03 equivs	0.8073	0.9606	0.2385	0.4884
3.0	Acidification	SO2B	1.2409	kg SO2 equivs	0.4136	0.5003	0.0585	0.2419
Input Series : 2012 Fertilizer, Orange, Conventional								
	Score Most		Score	Score	Score	Score	Score	Score

I. Change 1 Analyses

The *Change 1 Analyses* use the Totals calculations to measure incremental changes in aggregated base elements. The NIST 135 reference demonstrates how to use these types of measurements to make decisions based on benefits and costs. A *Change by Year Analysis* measures incremental changes between aggregated base elements that have different Years. A *Change by Id Analysis* measures incremental changes between base elements that have different Ids. A *Change by AlternativeType Analysis* measures incremental changes between aggregated base elements that have different AlternativeTypes. Changes are analyzed in ascending order (Id = 1,2,3; Year = 2000, 2001, 2002; AlternativeType = A, B, C). The first member of the sequence will be used as a "Base" element to make comparisons. The sibling sequence member immediately before the current sequence member will be used as an "x-1" element to make comparisons. Gaps in the sequence, such as a missing Year, will be ignored.

Further documentation about these analyses can be found in the *Change Analysis 1* reference.

NPV Input and Output Analyzers include a selection list for setting the Alternative Type property that is used in the *Change by Alternative Analysis*. These analyzers can be copied into their descendants and then that property can be set appropriately in each descendant (**6***). LCA Input and Output Analyzers don't include this selection list because the property is set using LCA calculators.

The following images demonstrate typical examples of these analyses:

LCA Input Change by Alternative

https://www.devtreks.org/buildtreks/search/commercial/input/no

Input Series	All	Alt. 0	Alt. 1	Alt. 2	Alt. 3	Alt. 4
Name		NPS 2007, Concrete Waste Factor 10 Percent	NPS 2008, Concrete Waste Factor 10 Percent	NPS 2009, Concrete Waste Factor 10 Percent	NPS 2010, Concrete Waste Factor 10 Percent	NPS 2011, Concrete Waste Factor 10 Percent
Label		03.30.53	03.30.53	03.30.53	03.30.53	03.30.53
Observations		1	1	1	1	1
Alternative		A	B	C	D	E
OC Total		0.00	0.00	0.00	0.00	0.00
OC AmountChange		0.00	0.00	0.00	0.00	0.00
OC PercentChange		0.00	0.00	0.00	0.00	0.00
OC BaseChange		0.00	0.00	0.00	0.00	0.00
OC BasePercentChange		0.00	0.00	0.00	0.00	0.00
AOH Total		0.00	0.00	0.00	0.00	0.00
AOH AmountChange		0.00	0.00	0.00	0.00	0.00
AOH PercentChange		0.00	0.00	0.00	0.00	0.00
AOH BaseChange		0.00	0.00	0.00	0.00	0.00
AOH BasePercentChange		0.00	0.00	0.00	0.00	0.00
CAP Total		235.30	237.30	240.30	242.30	248.30
CAP AmountChange		0.00	0.00	3.00	2.00	6.00
CAP PercentChange		0.00	0.00	1.26	0.83	2.48
CAP BaseChange		0.00	2.00	5.00	7.00	13.00
CAP BasePercentChange		0.00	0.85	2.12	2.97	5.52
LCC Total		235.30	237.30	240.30	242.30	248.30

NPV Input Change by Year

https://www.devtreks.org/buildtreks/search/commercial/input/no

Input Series	All	Alt. 0	Alt. 1	Alt. 2	Alt. 3	Alt. 4
Name		NPS 2007, Concrete Waste Factor 10 Percent	NPS 2008, Concrete Waste Factor 10 Percent	NPS 2009, Concrete Waste Factor 10 Percent	NPS 2010, Concrete Waste Factor 10 Percent	NPS 2011, Concrete Waste Factor 10 Percent
Label		03.30.53	03.30.53	03.30.53	03.30.53	03.30.53
Observations		1	1	1	1	1
Alternative						
OC Total		0.00	0.00	0.00	0.00	0.00
OC AmountChange		0.00	0.00	0.00	0.00	0.00
OC PercentChange		0.00	0.00	0.00	0.00	0.00
OC BaseChange		0.00	0.00	0.00	0.00	0.00
OC BasePercentChange		0.00	0.00	0.00	0.00	0.00
AOH Total		0.00	0.00	0.00	0.00	0.00
AOH AmountChange		0.00	0.00	0.00	0.00	0.00
AOH PercentChange		0.00	0.00	0.00	0.00	0.00
AOH BaseChange		0.00	0.00	0.00	0.00	0.00
AOH BasePercentChange		0.00	0.00	0.00	0.00	0.00
CAP Total		235.30	237.30	240.30	242.30	248.30
CAP AmountChange		0.00	0.00	3.00	2.00	6.00
CAP PercentChange		0.00	0.00	1.26	0.83	2.48
CAP BaseChange		0.00	2.00	5.00	7.00	13.00
CAP BasePercentChange		0.00	0.85	2.12	2.97	5.52
Total Total		235.30	237.30	240.30	242.30	248.30

LCA Output Change by Alternative

https://www.devtreks.org/buildtreks/search/commercial/input/none/

Output Series	All	Alt. 0	Alt. 1	Alt. 2	Alt. 3	Alt. 4
Name		2007 NPS Visitor Hiker WTP	2008 NPS Visitor Hiker WTP	2009 NPS Visitor Hiker WTP	2010 NPS Visitor Hiker WTP	2011 NPS Visitor Hiker WTP
Label		NPS10012	NPS10012	NPS10012	NPS10012B	NPS10012B
Observations		1	1	1	1	1
Alternative		A	B	C	D	E
Benefit Total		52.00	38.50	40.00	42.50	45.00
Benefit AmountChange		0.00	0.00	1.50	2.50	2.50
Benefit PercentChange		0.00	0.00	3.90	6.25	5.88
Benefit BaseChange		0.00	-13.50	-12.00	-9.50	-7.00
Benefit BasePercentChange		0.00	-25.96	-23.08	-18.27	-13.46
LCB Total		52.00	38.50	40.00	42.50	45.00
LCB AmountChange		0.00	0.00	1.50	2.50	2.50
LCB PercentChange		0.00	0.00	3.90	6.25	5.88
LCB BaseChange		0.00	-13.50	-12.00	-9.50	-7.00
LCB BasePercentChange		0.00	-25.96	-23.08	-18.27	-13.46
REAA Total		0.00	0.00	0.00	0.00	0.00
REAA AmountChange		0.00	0.00	0.00	0.00	0.00
REAA PercentChange		0.00	0.00	0.00	0.00	0.00
REAA BaseChange		0.00	0.00	0.00	0.00	0.00
REAA BasePercentChange		0.00	0.00	0.00	0.00	0.00
RUnit Total		52.00	38.50	40.00	42.50	45.00

NPV Output Change by Alternative

https://www.devtreks.org/buildtreks/search/commercial/input/none/

Output Group : National Park Recreation Outputs ; NPS101						
Output	All	Alt. 0				
Name		2011 NPS Visitor Hiker WTP				
Label		NPS10012				
Output Series	All	Alt. 0	Alt. 1	Alt. 2	Alt. 3	Alt. 4
Name		2007 NPS Visitor Hiker WTP	2008 NPS Visitor Hiker WTP	2009 NPS Visitor Hiker WTP	2010 NPS Visitor Hiker WTP	2011 NPS Visitor Hiker WTP
Label		NPS10012	NPS10012	NPS10012	NPS10012B	NPS10012B
Observations		1	1	1	1	1
Alternative						
Benefit Total		52.00	38.50	40.00	42.50	45.00
Benefit AmountChange		0.00	0.00	1.50	2.50	2.50
Benefit PercentChange		0.00	0.00	3.90	6.25	5.88
Benefit BaseChange		0.00	-13.50	-12.00	-9.50	-7.00
Benefit BasePercentChange		0.00	-25.96	-23.08	-18.27	-13.46
Output Q Total		1.00	1.00	1.00	1.00	1.00
Output Q AmountChange		0.00	0.00	0.00	0.00	0.00
Output Q PercentChange		0.00	0.00	0.00	0.00	0.00
Output Q BaseChange		0.00	0.00	0.00	0.00	0.00
Output Q BasePercentChange		0.00	0.00	0.00	0.00	0.00
R Price Total		52.00	38.50	40.00	42.50	45.00

M&E 2 Change by Year

https://www.devtreks.org/hometreks/search/farmw

Input Series	All	Alt. 0	Alt. 1
Name		2012 Food Package	2013 Food Package
Label		I122	I122
Alternative		A	B
Indicator 1		Q1 Food Packages Purchased	Q1 Food Packages Purchased
Change Type		none	none
Observations		4	4
Date		04/01/2012	04/01/2013
Label		I122	I122
Total Unit		dollar total cost	dollar total cost
Total		2,582,500.000	36,825.000
Total Amount Change		0.00	0.00
Total Percent Change		0.00	0.00
Total Base Change		0.00	-2,545,675.00
Total Base Percent Change		0.00	-98.57
Q1 Unit		packages	packages
Q1		170,000.000	26,000.000
Q1 Amount Change		0.00	0.00
Q1 Percent Change		0.00	0.00
Q1 Base Change		0.00	-144,000.00
Q1 Base Percent Change		0.00	-84.71
Q2 Unit		dollar cost	dollar cost
Q2		62.000	5.700
Q2 Amount Change		0.00	0.00
Q2 Percent Change		0.00	0.00

Resource Stock Change By Alt

https://www.devtreks.org/greentreks/search/watershed/input/none/0/none

Input Group : LCA Nutrients, Organic Crops ; A100				
Input	**All**	**Alt. 0**		
Name		2014 Fertilizer, Orange, Conventional		
Label		A1001C		
Input Series	**All**	**Alt. 0**	**Alt. 1**	**Alt. 2**
Name		2012 Fertilizer, Orange, Conventional	2013 Fertilizer, Orange, Conventional	2014 Fertilizer, Orange, Conventional
Label		A1001C	A1001C	A1001C
Indicators	**All**	**Alt. 0**	**Alt. 1**	**Alt. 2**
Alternative		A	B	C
Date		07/16/2012	07/16/2013	07/16/2014
Score Observations		1.0	1.0	1.0
Score Amount		15.9103	14.5093	14.8093
Score Unit		mean	mean	mean
Score Amount Change		0.0000	0.0000	0.3000
Score Percent Change		0.0000	0.0000	2.0676
Score Base Change		0.0000	-1.4010	-1.1010
Score Base Percent Change		0.0000	-8.8056	-6.9200
Score Low Amount		15.8833	14.4848	14.7848
Score Low Unit		lower90% ci	lower90% ci	lower90% ci
Score Low Amount Change		0.0000	0.0000	0.3000
Score Low Percent Change		0.0000	0.0000	2.0711
Score Low Base Change		0.0000	-1.3985	-1.0985

J. Progress 1 Analysis

A *Progress 1 Analysis* uses the Totals calculations to measure actual versus planned progress for aggregated base elements. The U.S. GAO (2009) emphasizes using Earned Value Management (EVM) best practices to ensure cost of work completed aligns with the value of work performed. A key requirement of EVM is to measure budget variances and scheduling variances. Budget variances measure the costs (and benefits) of work planned versus actual work completed. Scheduling variances measure the amount, quality, and timeliness of work planned versus actual work completed. EVM uses both variances to measure changes in the value of work planned versus actual work completed. A Progress 1 Analysis measures all of these variances. DevTreks' best practices extend EVM to include Outputs (work progress), Outcomes (technical performance), Benefits (earned value), and M&E and Stock indicators (performance effectiveness).

Further documentation about these analyses can be found in the *Earned Value Management Analysis 1* reference.

NPV Input and Output Analyzers include a selection list for setting the Target Type property that is used in this analysis. These analyzers can be copied into their descendants and then that property can be set appropriately in each descendant (5*). LCA Input and Output Analyzers don't include this selection list because the property is set using LCA calculators.

The following images demonstrate typical examples of this analysis:

LCA Input Progress

https://www.devtreks.org/buildtreks/search/commercial/input/no

BuildTreks	Search	Preview	Select
Edit	Pack	Views	Club

Select

PackIt

Edit Linked Views | Make base

LCC Progress Analyzer---- | Get

Media | Mobile | Desktop

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Your analysis has been saved. The analysis can be viewed whenever this analyzer addin is opened.

Input Group : A1030 SLAB ON GRADE ; A1030

Input	All	Alt. 0
Name		NPS 2011, Concrete Waste Factor 10 Percent
Label		03.30.53

Input Series	All	Alt. 0	Alt. 1	Alt. 2	Alt. 3	Alt. 4
Name		NPS 2007, Concrete Waste Factor 10 Percent	NPS 2008, Concrete Waste Factor 10 Percent	NPS 2009, Concrete Waste Factor 10 Percent	NPS 2010, Concrete Waste Factor 10 Percent	NPS 2011, Concrete Waste Factor 10 Percent
Label		03.30.53	03.30.53	03.30.53	03.30.53	03.30.53
Observations		1	1	1	1	1
Target		benchmark	actual	actual	actual	actual

CAP Plan Period	235.30	235.30	235.30	235.30	235.30
CAP Plan Full	235.30	235.30	235.30	235.30	235.30
CAP Plan Cumul	235.30	235.30	235.30	235.30	235.30
CAP Actual Period	0.00	237.30	240.30	242.30	248.30
CAP Actual Cumul	0.00	237.30	477.60	719.90	968.20
CAP Actual Period Change	0.00	2.00	5.00	7.00	13.00
CAP Actual Cumul Change	0.00	2.00	242.30	484.60	732.90
CAP Plan P Percent	0.00	100.85	102.12	102.97	105.52
CAP Plan C Percent	0.00	100.85	202.97	305.95	411.47
CAP Plan Full Percent	0.00	100.85	202.97	305.95	411.47
LCC Plan Period	235.30	235.30	235.30	235.30	235.30
LCC Plan Full	235.30	235.30	235.30	235.30	235.30
LCC Plan Cumul	235.30	235.30	235.30	235.30	235.30
LCC Actual Period	0.00	237.30	240.30	242.30	248.30
LCC Actual Cumul	0.00	237.30	477.60	719.90	968.20
LCC Actual Period	0.00	2.00	5.00	7.00	13.00

NPV Input Progress

https://www.devtreks.org/buildtreks/search/commercial/input/no

Input Group : Earned Value Management Examples ; EVM10				
Input	All	Alt. 0		
Name		2013 RR Track Cap Bud		
Label		EVM2		
Input Series	All	Alt. 0	Alt. 1	Alt. 2
Name		2011 RR Track Cap Bud	2012 RR Track Cap Bud	2013 RR Track Cap Bud
Label		EVM2	EVM2	EVM2
Observations		1	1	1
Target		benchmark	actual	actual
OC Plan Period		240,000.00	240,000.00	240,000.00
OC Plan Full		240,000.00	240,000.00	240,000.00
OC Plan Cumul		240,000.00	240,000.00	240,000.00
OC Actual Period		0.00	260,000.00	250,000.00
OC Actual Cumul		0.00	260,000.00	510,000.00
OC Actual Period Change		0.00	20,000.00	10,000.00
OC Actual Cumul Change		0.00	20,000.00	270,000.00
OC Plan P Percent		0.00	108.33	104.17
OC Plan C Percent		0.00	108.33	212.50
OC Plan Full Percent		0.00	108.33	212.50
AOH Plan Period		140,000.00	140,000.00	140,000.00
AOH Plan Full		140,000.00	140,000.00	140,000.00
AOH Plan Cumul		140,000.00	140,000.00	140,000.00
AOH Actual Period		0.00	160,000.00	150,000.00
AOH Actual Cumul		0.00	160,000.00	310,000.00
AOH Actual Period Change		0.00	20,000.00	10,000.00

LCA Output Progress

First glance at the following analysis suggests Alt 3 and 4 have wrong calculations. Second glance examined the Labels. Even simple analyses require close attention to detail –it really does require a scientific perspective.

https://www.devtreks.org/buildtreks/search/commercial/input/none/

Output Series	All	Alt. 0	Alt. 1	Alt. 2	Alt. 3	Alt. 4
Name		2007 NPS Visitor Hiker WTP	2008 NPS Visitor Hiker WTP	2009 NPS Visitor Hiker WTP	2010 NPS Visitor Hiker WTP	2011 NPS Visitor Hiker WTP
Label		NPS10012	NPS10012	NPS10012	NPS10012B	NPS10012B
Observations		1	1	1	1	1
Target		benchmark	actual	actual	actual	actual
R Plan Period		52.00	52.00	52.00	42.50	45.00
R Plan Full		52.00	52.00	52.00	0.00	0.00
R Plan Cumul		52.00	52.00	52.00	0.00	0.00
R Actual Period		0.00	38.50	40.00	42.50	45.00
R Actual Cumul		0.00	38.50	78.50	121.00	166.00
R Actual Period Change		0.00	-13.50	-12.00	0.00	0.00
R Actual Cumul Change		0.00	-13.50	26.50	121.00	166.00
R Plan P Percent		0.00	74.04	76.92	100.00	100.00
R Plan C Percent		0.00	74.04	150.96	0.00	0.00
R Plan Full Percent		0.00	74.04	150.96	0.00	0.00
LCB Plan Period		52.00	52.00	52.00	42.50	45.00
LCB Plan Full		52.00	52.00	52.00	0.00	0.00
LCB Plan Cumul		52.00	52.00	52.00	0.00	0.00

NPV Output Progress

All glances at the following analysis finds errors. Why is 2008, rather than 2007, the benchmark? Again, the errant Labels for 2010 and 2011 result in a bad analysis. Many tutorials emphasize not following the test datasets used by a software development firm. Follow the standards developed by professional, scientific, networks (**8***).

https://www.devtreks.org/buildtreks/search/commercial/input/none/

C or B Type	Plan Period	Plan Full	Plan Cumul	Actual Period	Actual Cumul	Actual Period Change	Actual Cumul Change	Plan P Percent ; Plan C Percent	Plan Full Percent
Output Series: 2007 NPS Visitor Hiker WTP									
Date : 01/01/2007 ; Observations: 1; Target : actual									
Ben	38.50	38.50	38.50	52.00	52.00	13.50	13.50	135.06 ; 135.06	135.06
Output Q	1.00	1.00	1.00	1.00	1.00	0.00	0.00	100.00 ; 100.00	100.00
Output P	38.50	38.50	38.50	52.00	52.00	13.50	13.50	135.06 ; 135.06	135.06
Output Series: 2008 NPS Visitor Hiker WTP									
Date : 01/01/2008 ; Observations: 1; Target : benchmark									
Ben	38.50	38.50	38.50	0.00	0.00	0.00	0.00	0.00 ; 0.00	0.00
Output Q	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00 ; 0.00	0.00
Output P	38.50	38.50	38.50	0.00	0.00	0.00	0.00	0.00 ; 0.00	0.00
Output Series: 2009 NPS Visitor Hiker WTP									
Date : 01/01/2009 ; Observations: 1; Target : actual									
Ben	38.50	38.50	38.50	40.00	92.00	1.50	53.50	103.90 ; 238.96	238.96
Output Q	1.00	1.00	1.00	1.00	2.00	0.00	1.00	100.00 ; 200.00	200.00
Output P	38.50	38.50	38.50	40.00	92.00	1.50	53.50	103.90 ; 238.96	238.96
Output Series: 2010 NPS Visitor Hiker WTP									
Date : 01/01/2010 ; Observations: 1; Target : actual									
Ben	42.50	0.00	0.00	42.50	134.50	0.00	134.50	100.00 ; 0.00	0.00
Output Q	1.00	0.00	0.00	1.00	3.00	0.00	3.00	100.00 ; 0.00	0.00

M&E 2 Progress

https://www.devtreks.org/hometreks/search/farmw

Input Series	All	Alt. 0	Alt. 1
Name		2012 Food Package	2013 Food Package
Label		I122	I122
Target Type		benchmark	actual
Indicator 1		Q1 Food Packages Purchased	Q1 Food Packages Purchased
Observations		4	4
Date		04/01/2012	04/01/2013
Label		I122	I122
Total Unit		dollar total cost	dollar total cost
Total Planned Period		2,582,500.000	2,582,500.000
Total Planned Full		2,582,500.00	2,582,500.00
Total Planned Cumulative		2,582,500.00	2,582,500.00
Total Actual Period		0.00	36,825.00
Total Actual Cumulative		0.00	36,825.00
Total Actual Period Progress		0.00	-2,545,675.00
Total Actual Cumul Progress		0.00	-2,545,675.00
Total Plan P Percent		0.00	1.43
Total Plan C Percent		0.00	1.43
Total Plan Full Percent		0.00	1.43
Q1 Unit		packages	packages
Q1 Planned Period		170,000.000	170,000.000
Q1 Planned Full		170,000.00	170,000.00
Q1 Planned Cumulative		170,000.00	170,000.00

Resource Stock Progress

https://www.devtreks.org/greentreks/search/watershed/input/none/0/none

Progress---------- Get

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Your analysis has been saved. The analysis can be viewed whenever this analyzer addin is opened.

Input Group : LCA Nutrients, Organic Crops ; A100				
Input	**All**	**Alt. 0**		
Name		2014 Fertilizer, Orange, Conventional		
Label		A1001C		
Input Series	**All**	**Alt. 0**	**Alt. 1**	**Alt. 2**
Name		2012 Fertilizer, Orange, Conventional	2013 Fertilizer, Orange, Conventional	2014 Fertilizer, Orange, Conventional
Label		A1001C	A1001C	A1001C
Indicators	**All**	**Alt. 0**	**Alt. 1**	**Alt. 2**
Target		benchmark	actual	actual
Date		07/16/2012	07/16/2013	07/16/2014
Score Observations		1.0	1.0	1.0
Score Plan Period		15.9103	14.5093	14.8093
Score Unit		mean	mean	mean
Score Plan Full		15.9103	15.9103	15.9103
Score Plan Cumul		15.9103	15.9103	15.9103
Score Actual Period		0.0000	14.5093	14.8093
Score Actual Cumul		0.0000	14.5093	29.3186
Score Actual Period Change		0.0000	0.0000	0.0000
Score Actual Cumul		0.0000	-1.4010	13.4083

K. Performance Measures

The reference, *Performance Analysis 1*, documents how Performance Measures, such as Net Savings, can be used to support decisions related to prices. The Social Performance Analysis tutorials document how more advanced techniques, that use custom algorithms and TEXT datasets, can be used to carry out more sophisticated input and output analysis, such as Impact Evaluation.

L. Knowledge Bank Standards

All price data should be entered into online knowledge banks (i.e. production servers as contrasted to development servers) that can be used to analyze prices (**7***). That structured evidence must be passed down to future generations. These knowledge banks aggregate and analyze all of the data in a network. Future references will discuss how these knowledge banks will evolve (i.e. semantic data, forecasts) to support future decision making needs. The flexibility offered by DevTreks in documenting prices means that networks need to develop "rules" explaining the "standards" that should be followed by clubs in their network. The "standards" make it possible to build knowledge banks.

Summary and Conclusions

Clubs using DevTreks can start to carry out the basic analysis of prices. Clubs can solicit help understanding prices better and share structured evidence explaining prices. Networks can build knowledge banks that explain prices and pass that knowledge down to future generations. The result may be farmers that get higher returns, patients that get treated less expensively, farmworkers who get paid fairly, conservationists who conserve natural resources more efficiently, governments that contract less wastefully, and people who improve their lives and livelihoods.

Footnotes

1. Analysts have developed a large number of techniques for analyzing prices. This reference introduces basic price analysis. Some of the more sophisticated techniques, involving custom algorithms, the storage of input and output data in TEXT datasets, and the use of mathematical and statistical libraries, are included in the Performance, Social Performance, and Technology Assessment, tutorials.
2. Output aggregations include Output Name, Unit, Amount, Price, Annual Total, Annual Incentive Adjusted Costs, and Composition Amount. These aggregations are specifically included in order to support Cost Effectiveness and Productivity Analyses. They only have meaningful aggregations when the Outputs being aggregated are the same (i.e. corn or hay). Input aggregations include Input Annual Operating Costs, Annual Allocated Overhead Costs, Annual Capital Costs, Annual Total Costs, and Annual Incentive Adjusted Costs. Inputs do not include Names, Prices, Units, or Amounts because most Inputs within an Operation or Component are uniquely different and can't be aggregated in any meaningful way. The LCA Analyzers have SubCosts and SubBenefits which allow for the aggregation of unique Input/Output Prices and Amounts. Those analyzers should be used to support Productivity Measures that rely on Input measurements such as Labor Amount per Unit Output, or Labor Cost per Dollar Revenue.
3. Inputs and Outputs that are children of Operations, Components, or Outcomes, have additional properties (such as Input.Times or Output.IncentiveAmount).
4. We assume that most Input and Output analyses are concerned about series data. Most of the testing with these analyzers took place using an Input or Output element that had multiple children series data.
5. The aggregated LCA element uses descriptive properties, such as name and description, from the first LCA element being aggregated. This can be a little misleading if the base LCA elements are described uniquely. For example, if the LCA element, Labor, is broken down into specific types of labor but aggregated using the same Label, the aggregated name reflects only the first type of labor. In addition, some of the aggregated numbers can be meaningless. For example, when two LCA elements, such as Materials, are

entered into separate base Components that use the same LCA element Label and base element Label, their aggregated Costs will be meaningful but their aggregated Amounts will be meaningless if the Materials are not the same. Use unique LCA element Labels to distinguish LCA elements that must have meaningful aggregated Amounts. This can be particularly important when Performance Measurements need to be measured using outputs (i.e. cost per unit output) or inputs (i.e. output per unit labor).

6. The standard Relations properties found in Analyzers can be used to copy a parent analyzer into its children. Refer to *the Calculators and Analyzers* reference. If the parent analyzer that has been copied into the children is later changed (i.e. from a Change by Year to a Change by Alt), make sure to update all the children to the new analyzer.
7. What about daily, weekly, or monthly prices? The current price structure found in DevTreks is designed primarily for collecting annual prices –those are the prices most likely to be used in budgets. If you need more temporal prices, store the data in TEXT files, as discussed in the Resource Stock and M&E tututorials.
8. Unfortunately, in the author's experience, conventional institutions only take the required action when governments throw money at them. And the governments only throw the money when certain people in government circles decide to run around putting out special interest-defined fires. Discussion of institutional reforms, including consequential digital activism, can be found in several tutorials, such as the Social Performance Analysis tutorials.

References

References for NPV, LCA, M&E, and Resource Stock analysis can be found in their respective tutorials.

References Note

We try to use references that are open access or that do not charge fees.

Improvements, Errors, and New Features

Please notify DevTreks (devtrekkers@gmail.com) if you find errors in these references. Also please let us know about suggested improvements or recommended new features.

Video tutorials explaining this reference can be found at:

https://www.devtreks.org/commontreks/preview/commons/resourcepack/Price Analysis 1/508/none/