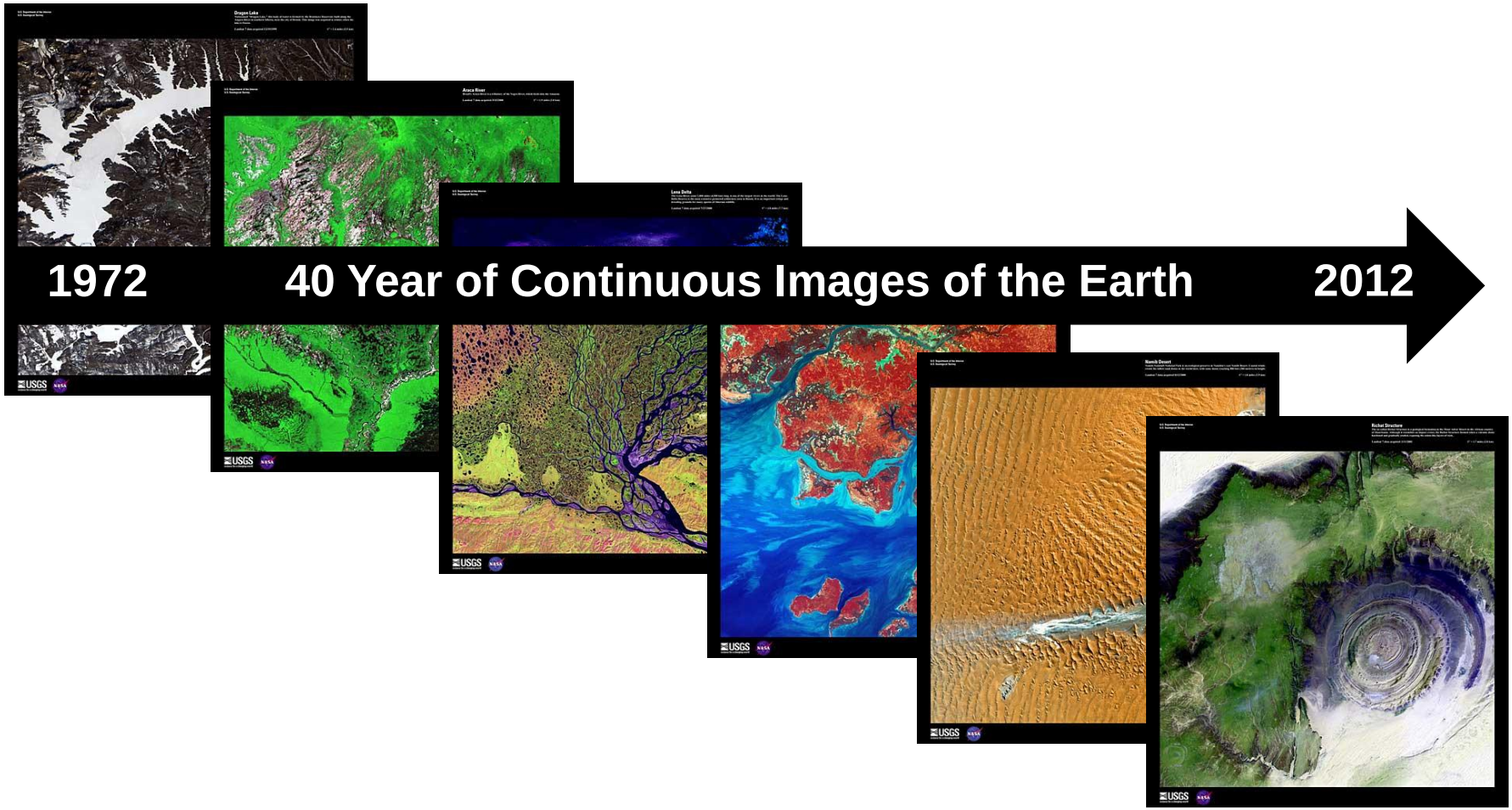
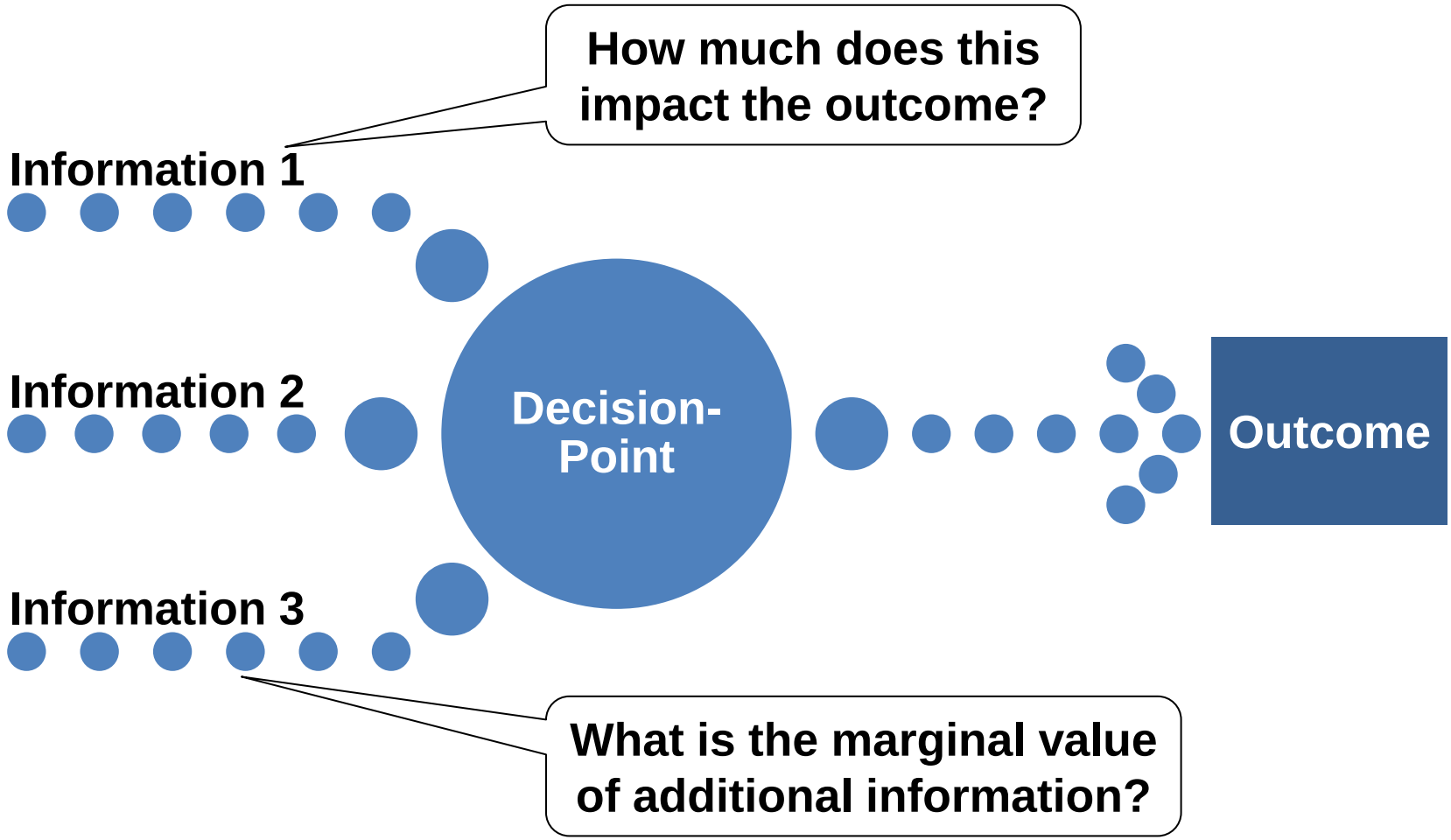
Improving the Way the Government Does Business

The Value of Landsat Moderate Resolution Satellite Imagery in Improving Decision-Making

LANDSAT Moderate Resolution Earth Imagery



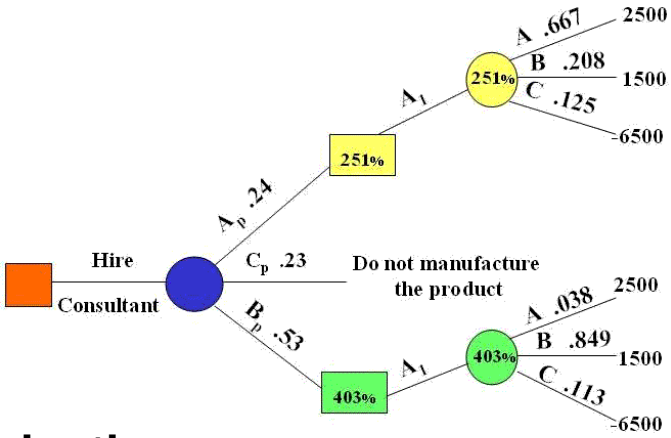
What is the Value of Information?



Methods for Estimating Economic Value

Price- and Cost-Based Derivation

Bayesian Network: Decision Tree Analysis



Contingent Valuation: Stated Preference

A Multi-Faceted Approach to the Estimate Benefits of Earth Imagery

Identify and Evaluate Benefit Categories

Specific benefits provided by satellite imagery are identified, classified, and evaluated

Decision Tree Analysis

Develop decision trees for benefits categories, identify possible actions, decision points, and value associated with each outcome

Supplementary Analysis

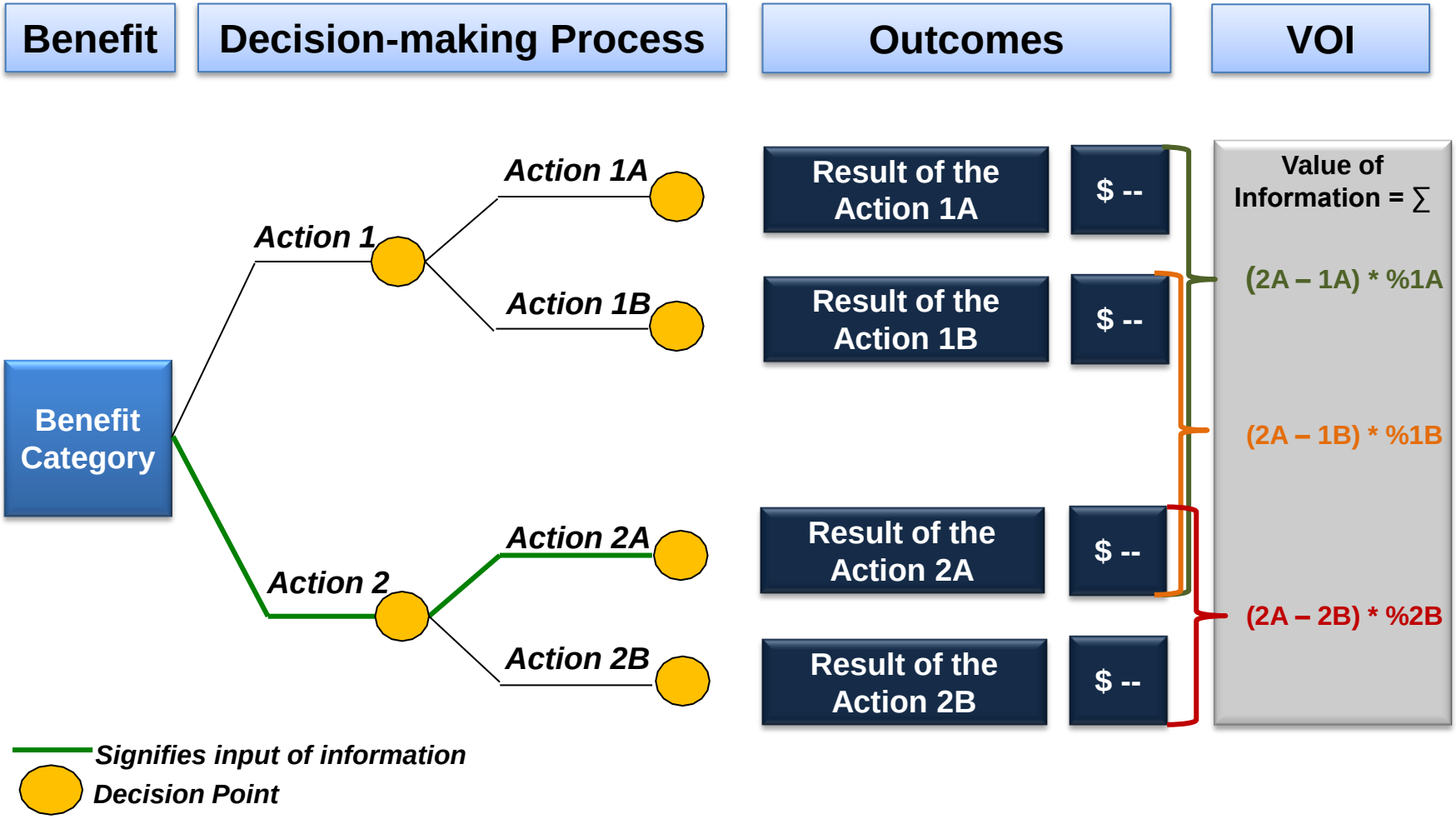
Additional valuation techniques utilized to supplement Bayesian Analysis; other tests including uncertainty, sensitivity, and distributional analyses may be conducted

Monetization of Benefits

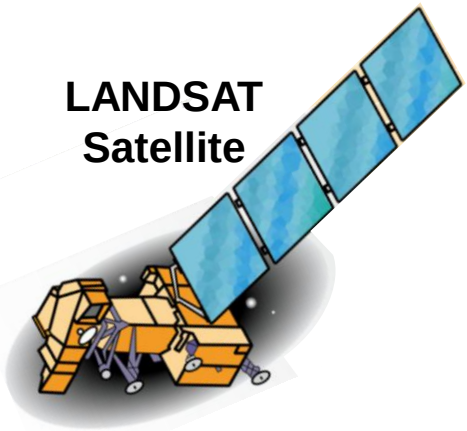
Summation of Benefits

Bayesian Network Decision Tree Analysis

Approach Captures the Direct, Indirect, and Ancillary Benefits



Case Study: LANDSAT Moderate Resolution Geospatial Data Provides Multiple, Extensive Benefits



Homeland Security

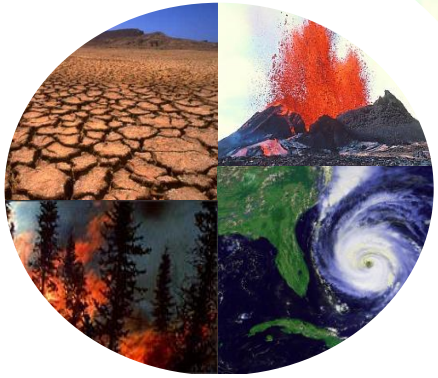
Wetland Protection

Agricultural Forecasting & Management

Climate Change Science

Water Resource Analysis & Management

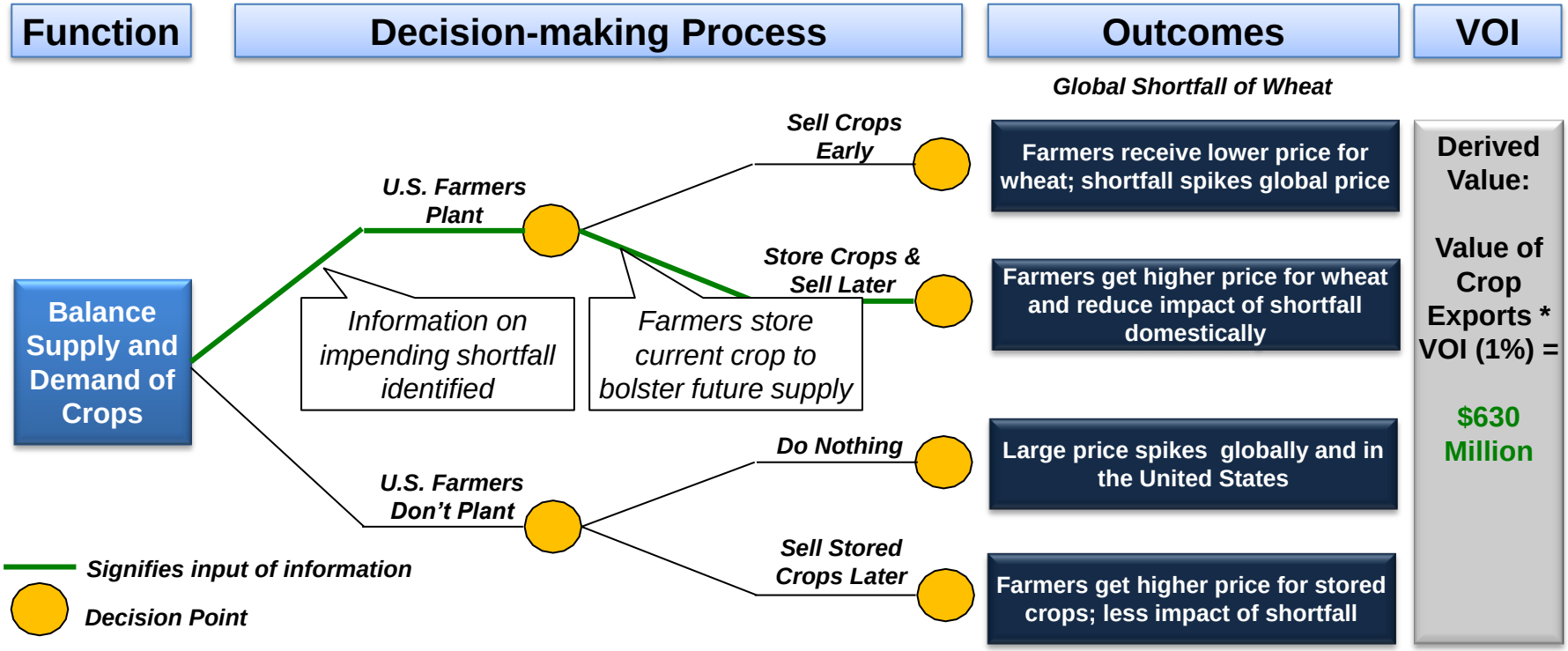
Disaster Management



Infrastructure Analysis

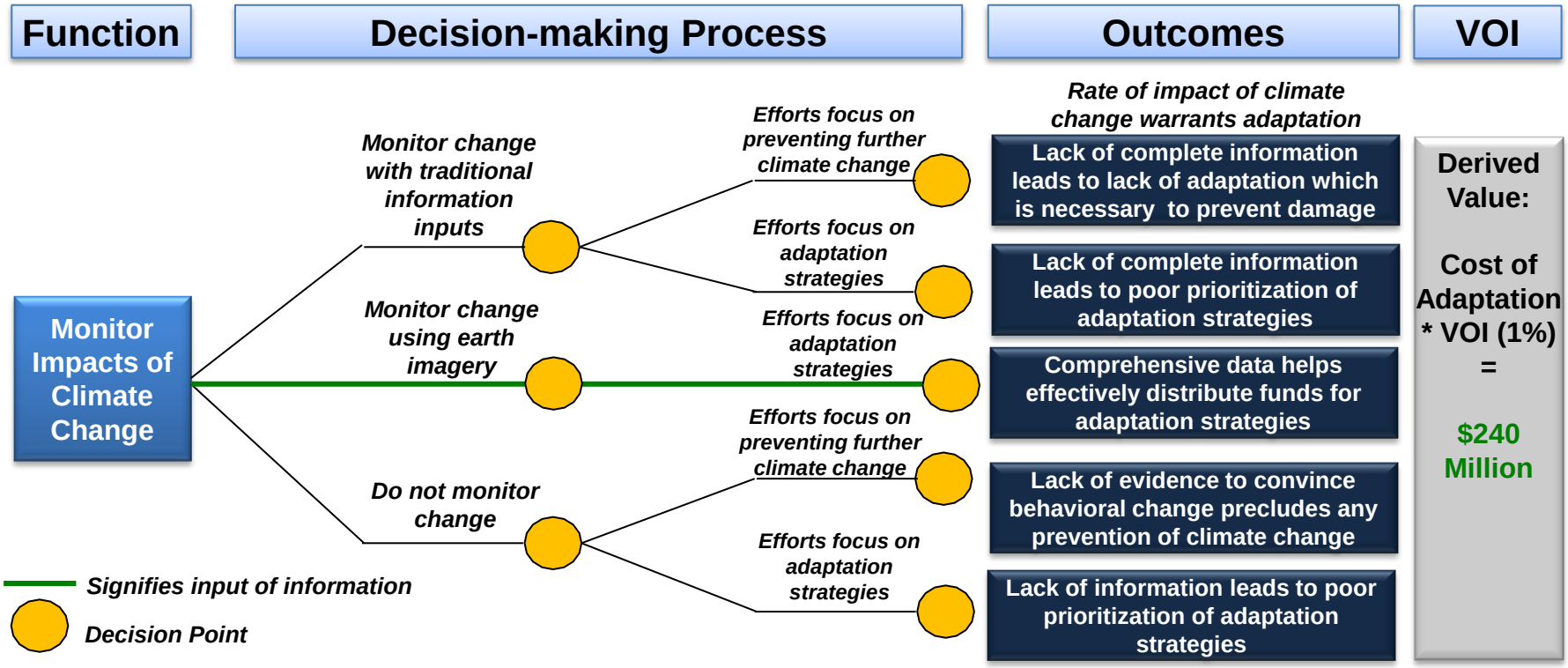
Agricultural Forecasting & Management

USDA monitors global crop supplies and stocks to forecast shortfalls or gluts of various crops on the market. Important function which benefits U.S. food security, economic security, and national security.



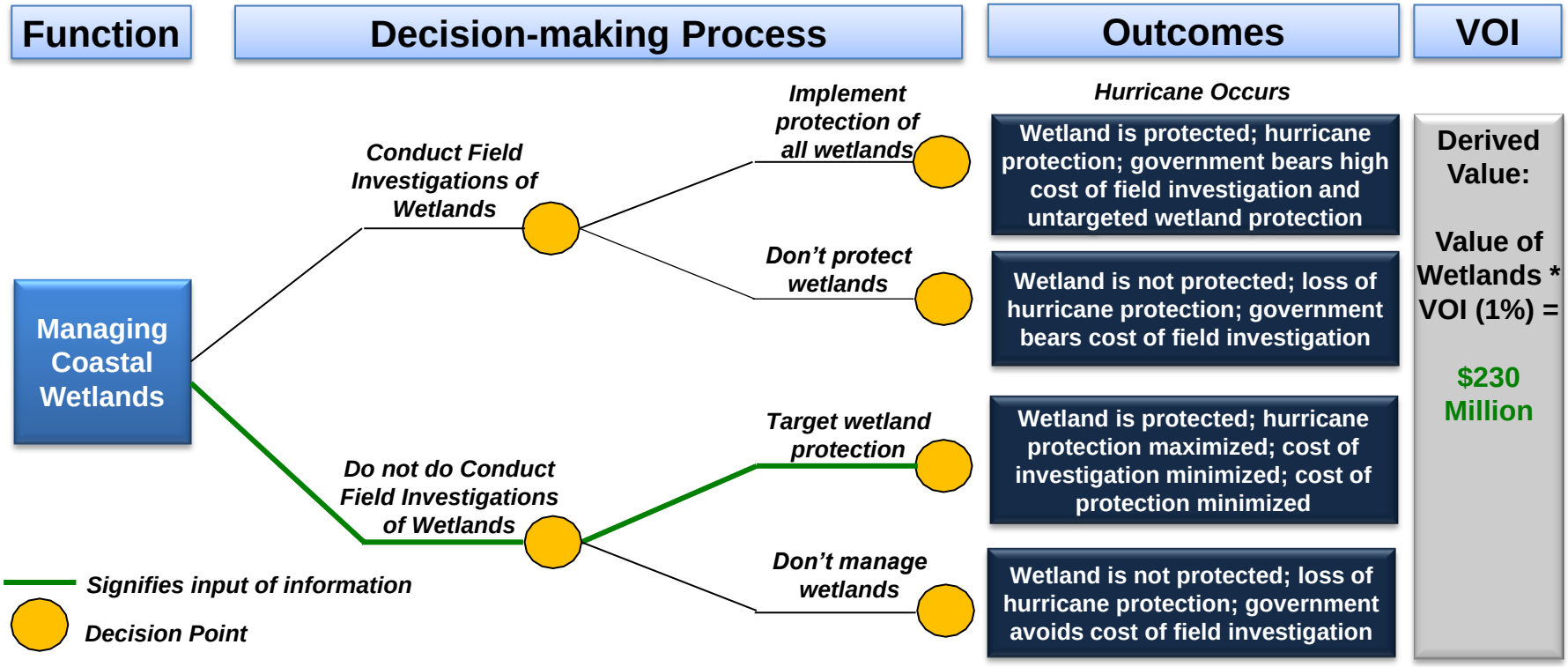
Climate Change Adaptation

Data is used to monitor impacts of global climate change on remote regions including glaciers, rainforests, and coral reefs.



Monitoring Coastal Wetlands

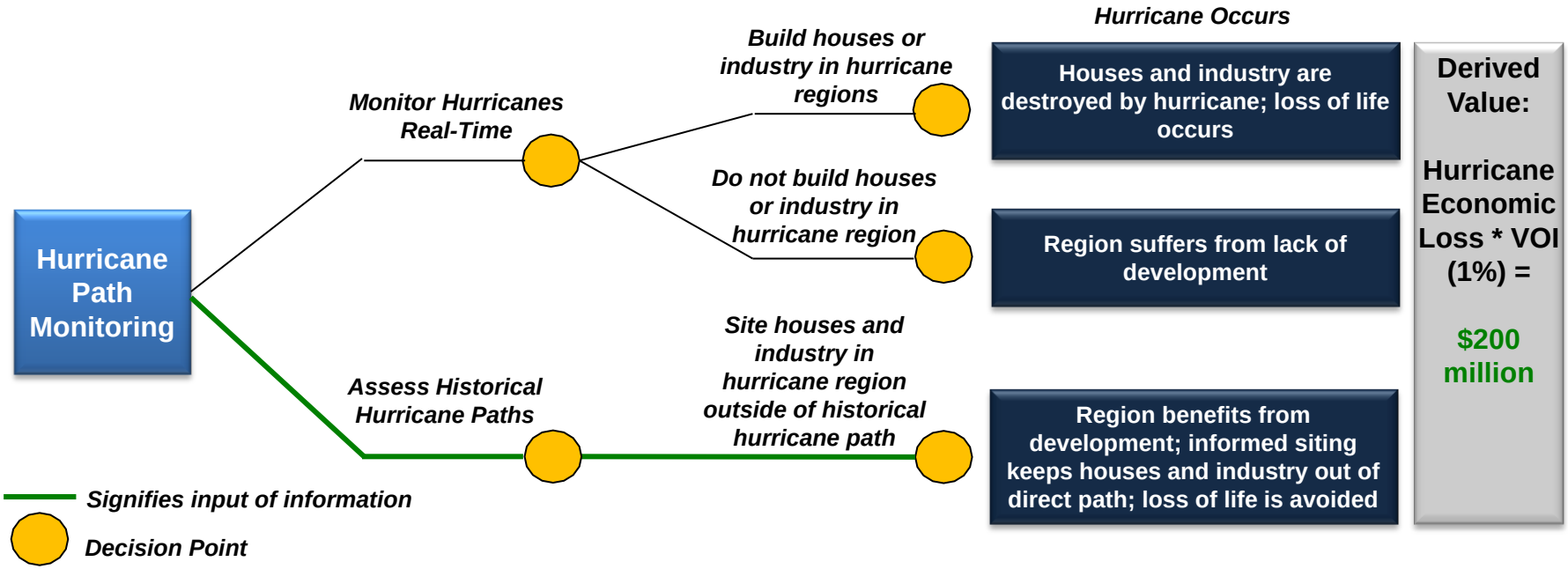
Observe and track impacts of natural and human impacts on coastal wetlands. Continual monitoring using earth imagery allows scientists to better manage, protect, and recover coastal wetlands. Value of wetlands has been estimated for their protection against hurricanes.



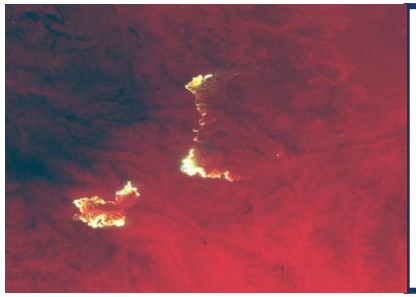
Emergency/Disaster Management - Hurricanes

Imagery is used to map and analyze hurricane paths to predict future occurrence paths and minimize economic damage and loss of life.

Function	Decision-making Process	Outcomes	VOI

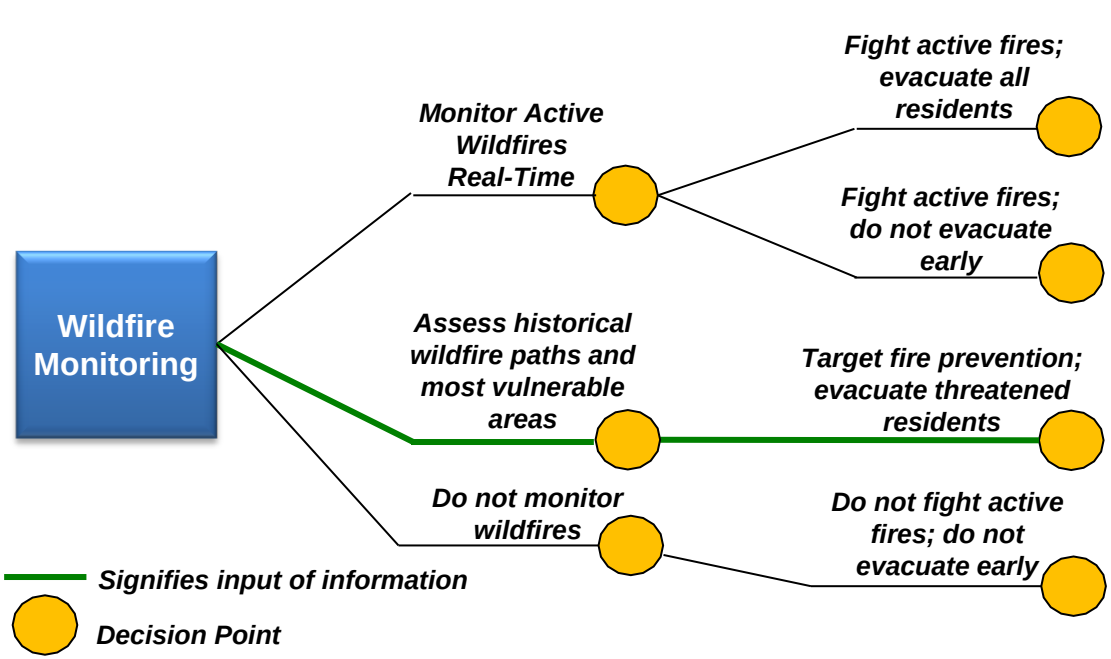


Wildfire Analysis and Management



Imagery is used to monitor active wildfires and assess historical fires to improve and target management practices; preventative measures such as reducing understory are more effective and efficient than fire fighting.

Function	Decision-making Process	Outcomes	VOI



Wildfire Occurs

Loss of life avoided; cost of monitoring is high; over-evacuation leads to loss of productivity; economic losses due to lack of prevention

Loss of life incurred; cost of monitoring high; economic losses due to lace of prevention

Loss of life is avoided; low cost associated with imagery to predict event; evacuation minimized; economic losses minimized due to targeted fire prevention

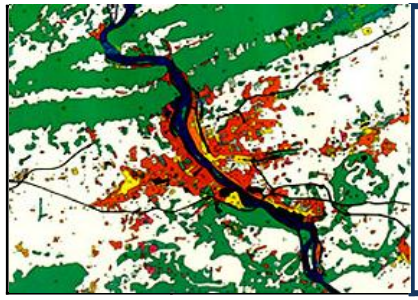
Loss of life incurred; economic losses due to lack of fire prevention or firefighting

Derived Value:

Wildfire Economic Loss * VOI (1%) =

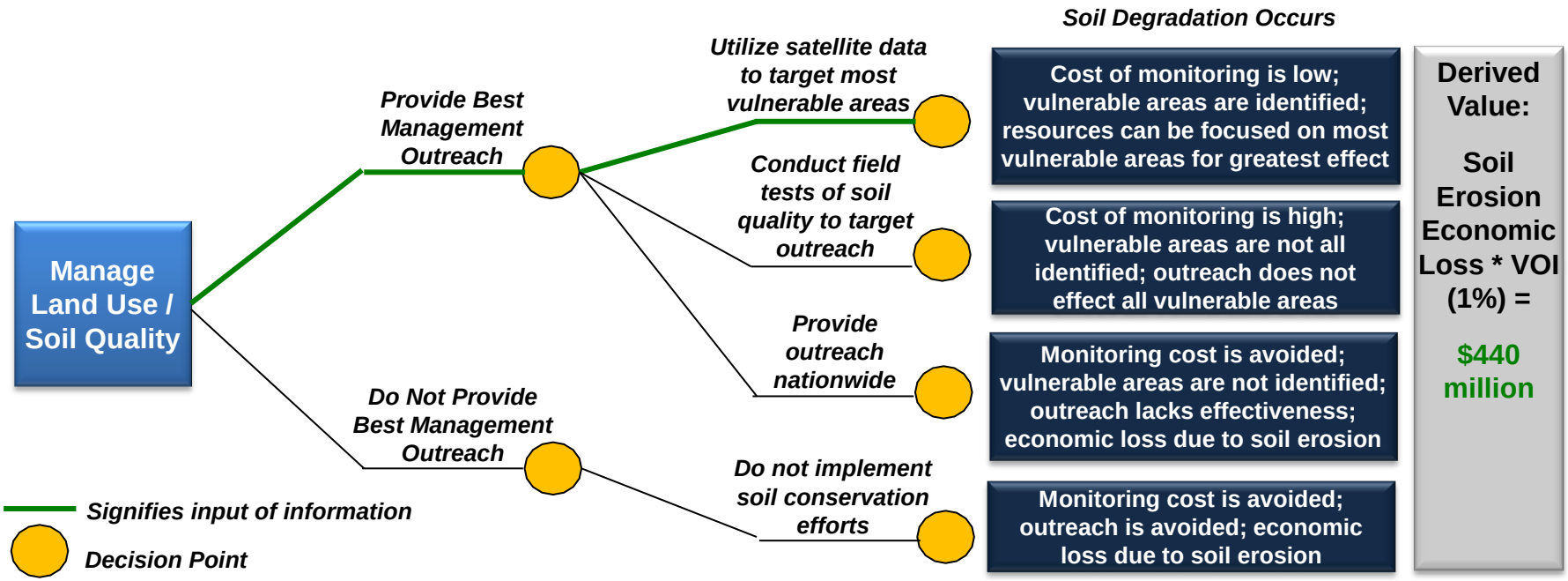
$15 million

Monitoring Land Use Change

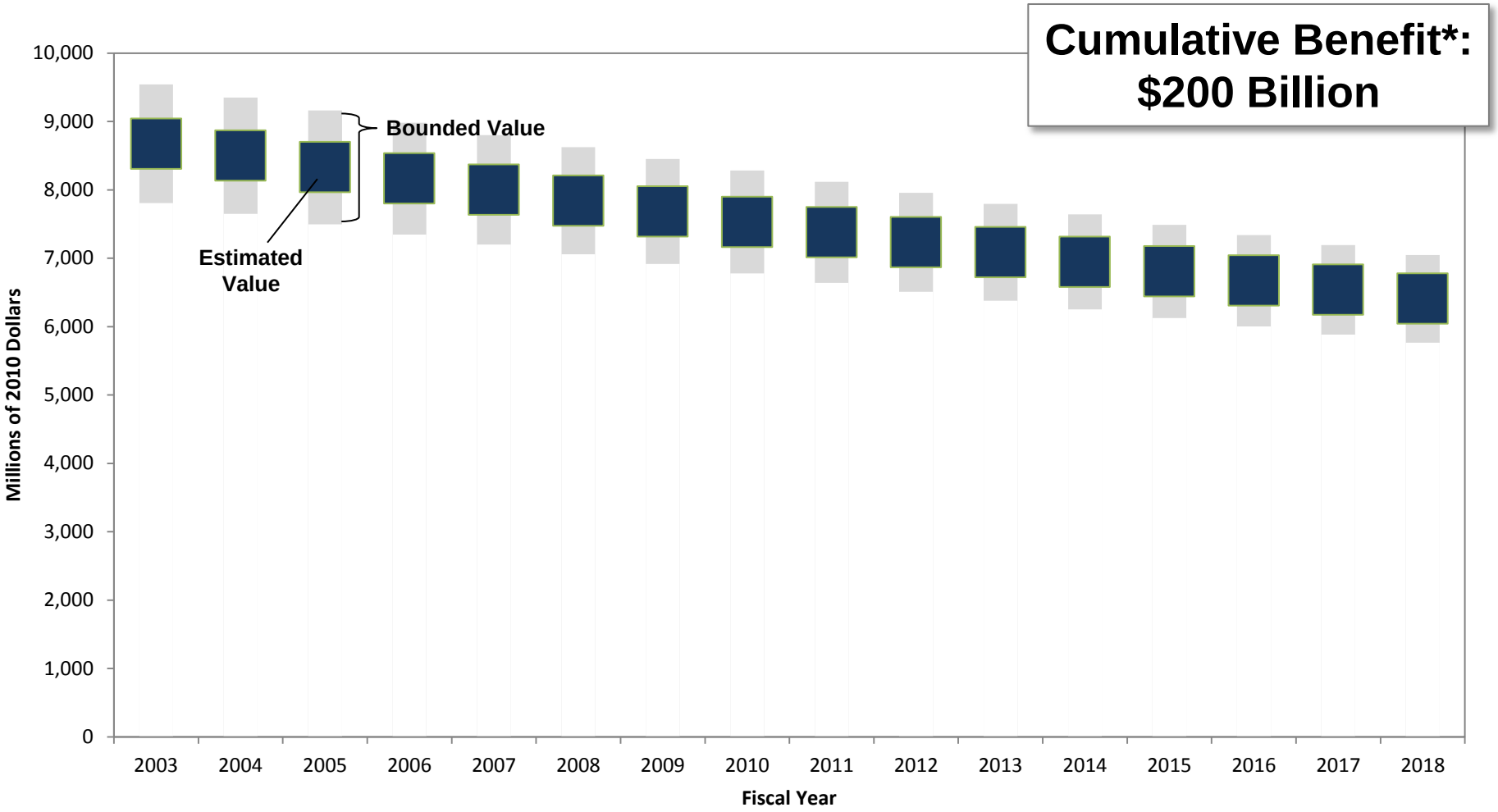


The USDA Natural Resource Conservation Service identifies land use change and soil erosion; implement best management practices to preserve soil quality and target most vulnerable regions.

Function	Decision-making Process	Outcomes	VOI



Estimated Annual Benefits of Landsat Data



*Net Present Value

Why Evaluate the Benefits of Geospatial Information?

'Value of Information' Significance

- Benefits estimation supports:
  - Congressional Budgetary Requests
  - Program Justification
  - Performance Measurement
  - CPIC IT Exhibit 300 Processes
- Underestimating the value of information can lead to:
  - Loss of Funding and/or Support
  - Program Cutbacks and Associated Loss of Program & Ancillary Benefits

Decrease in geospatial data could lead to devastating impacts worldwide:

Critical Infrastructure Vulnerability

Illegal Logging

Land Use Change

Undetected Sea Ice Melt

Contact Information

- For more information on Booz Allen's 'Value of Information' Approach, please contact:

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