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GETTING STARTED

With a Natural Capital Approach

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March 23, 2015

ECOSYSTEM SERVICE ASSESSMENTS (ESAS)

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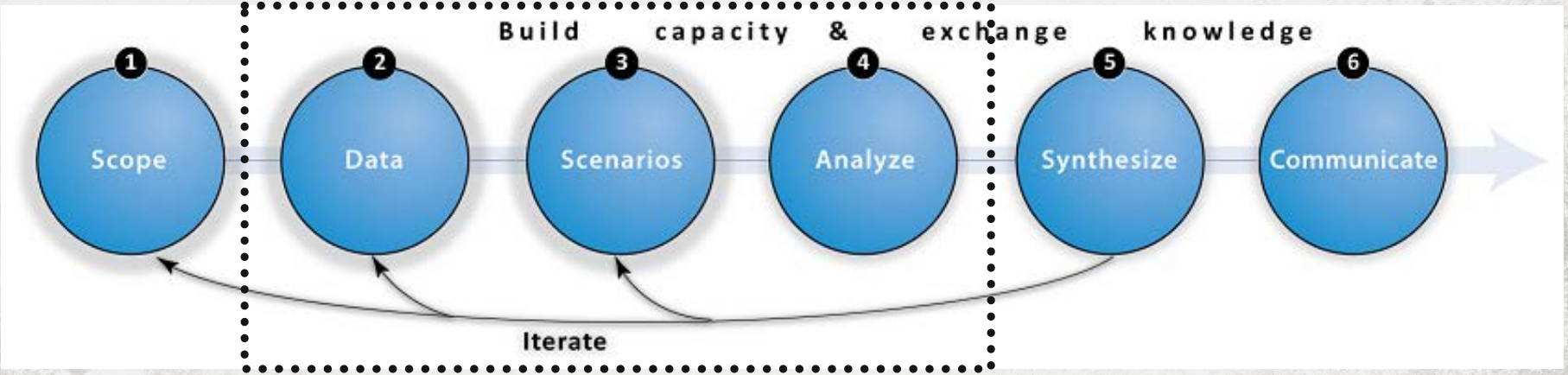
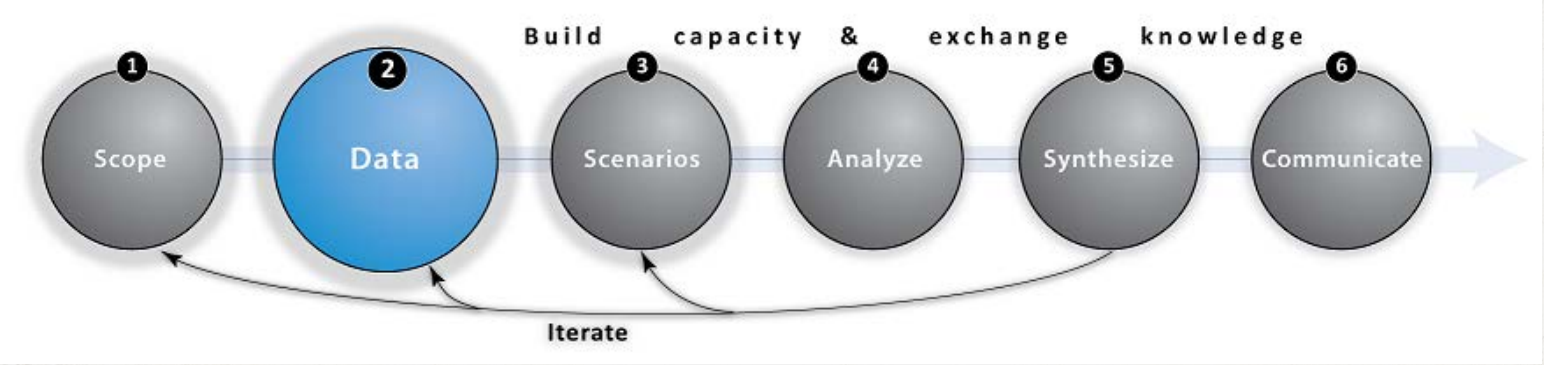
- Few guidelines exists for developing an ecosystem service assessment to inform a decision-making process
- Draws on lessons from the field and trainings
  - Belize, Borneo, Colombia, India, Sumatra, Water funds in Latin America
- High quality results that drive action
  - Iterative stakeholder engagement
  - Advance the science
  - Address policy needs
  - Build capacity throughout the process

NATURAL CAPITAL APPROACH

ROSENTHAL ET AL. 2014 *IJBSESM*





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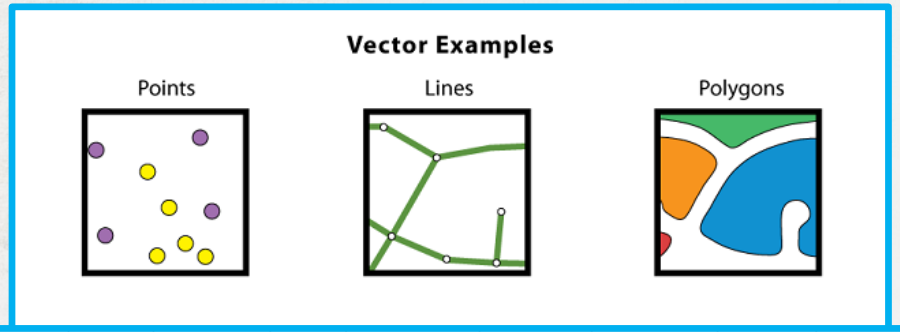
DATA



InVEST
integrated valuation of environmental services and tradeoffs

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HELPER TOOLS

	A	B	C	D	E	F	G	H	I	J	K	L
1	Habitat Quality	Carbon	Pollination	Annual Water Yield (Hydro power)	Monthly Water Yield (Hydropower/ Irrigation)	Peak Flow (Flood Mitigation)	Nutrient Retention (Water Purification)	Sediment Retention (Erosion Control)	**InVEST (v3.0.1) Data Inventory**		**Key:** **R = required** **O = optional biophysical** **V = optional valuation**	
2	Models								Data requirements	Type	Table name	Sources
36								R	Soil erodability	map		
37								R	Management Factor USLE (by LULC)	table	usle_p	
38								R	Crop Factor USLE (by LULC)	table	usle_c	
39								R	Sediment retention efficiency	table	sedret_eff	value between 0 (no filtering) -100 (total filtering)
40								R	Slope threshold	single value		recommend 75% and 90% as default values; check sensitivity
41								R	Reservoir dead volume (reservoir points of interest, by watershed)	table		
42								R	Allowed sediments load in rivers (TMDL, etc., by watershed)	table		
43	O								Protected status			
44		O							Carbon removed via timber harvest			
45		O							First year of timber harvest			
46		O							Harvest frequency			
47		O							Half life of harvested wood products			
48		O							Carbon density in harvested wood			
49		O							Biomass conversion expansion factor			
50		O							Future land use/land cover			
51		V							Value of sequestered carbon			
52		V		V			V	V	Discount rate			
53		V		V			V	V	Timespan			
54		V							Annual rate of change in price of carbon			

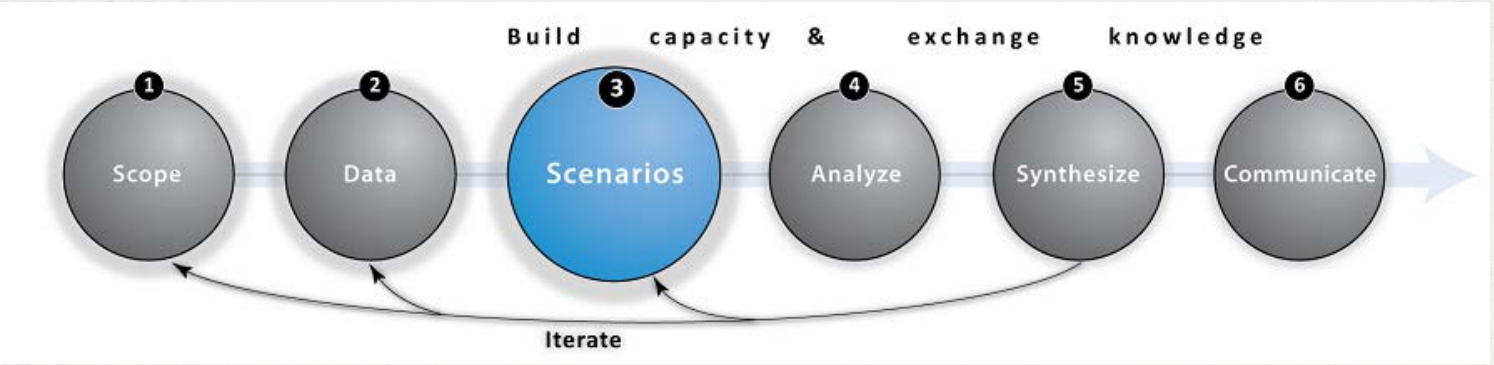
Model input	Description	Year	Format	Minimum Resolution/ Scale	Geographic coverage of source	Current Source / Status / Resolution
Coral reefs	A composite of best available data on corals that include locations of the following reef classifications: fore reef, patch reef, reef crest, and shallow Gorgonian beds	1998	Polygon Shapefile	National	Barbados	CZMU; Bng Marine Area habitat surveys (ea
Beaches / dunes	A composite of best available data for beaches and dunes	2011	Polygon Shapefile	National	Barbados	TNC; Digitized off Google Earth and Bing ae
Land cover	Land cover that indicates the presence of coastal-marine ecosystems providing services to people	1997	GeoTIF	National	Barbados	CZMU; based on 1997 ground-truthed aerial

STEP 2: DATA
LESSONS FROM THE FIELD

Data collection

Considerations:

- Expertise
- Data sharing
- Iteration
- Resolution & scale



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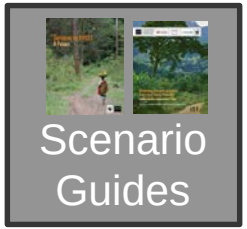
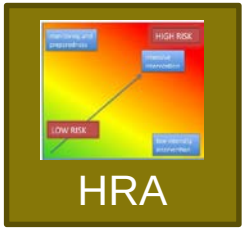
SCENARIOS

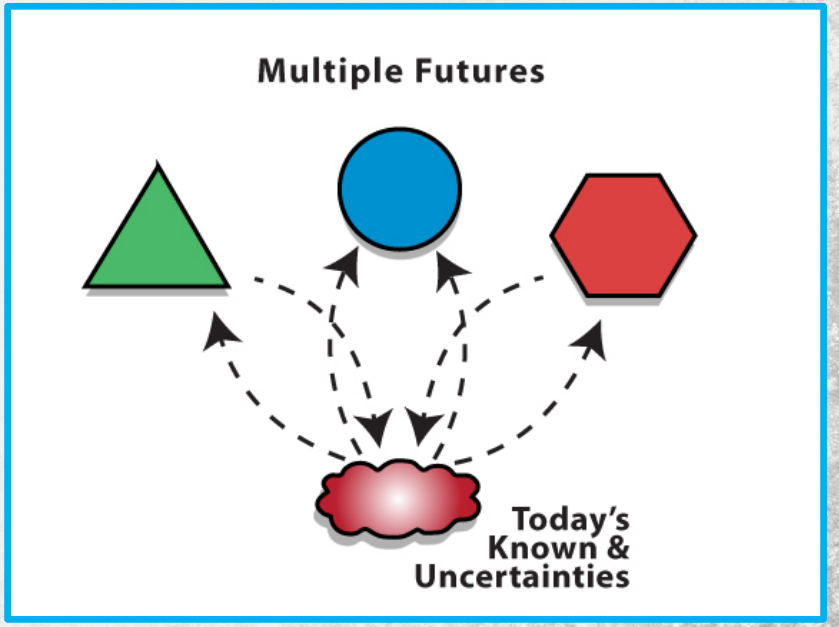
SCENARIOS

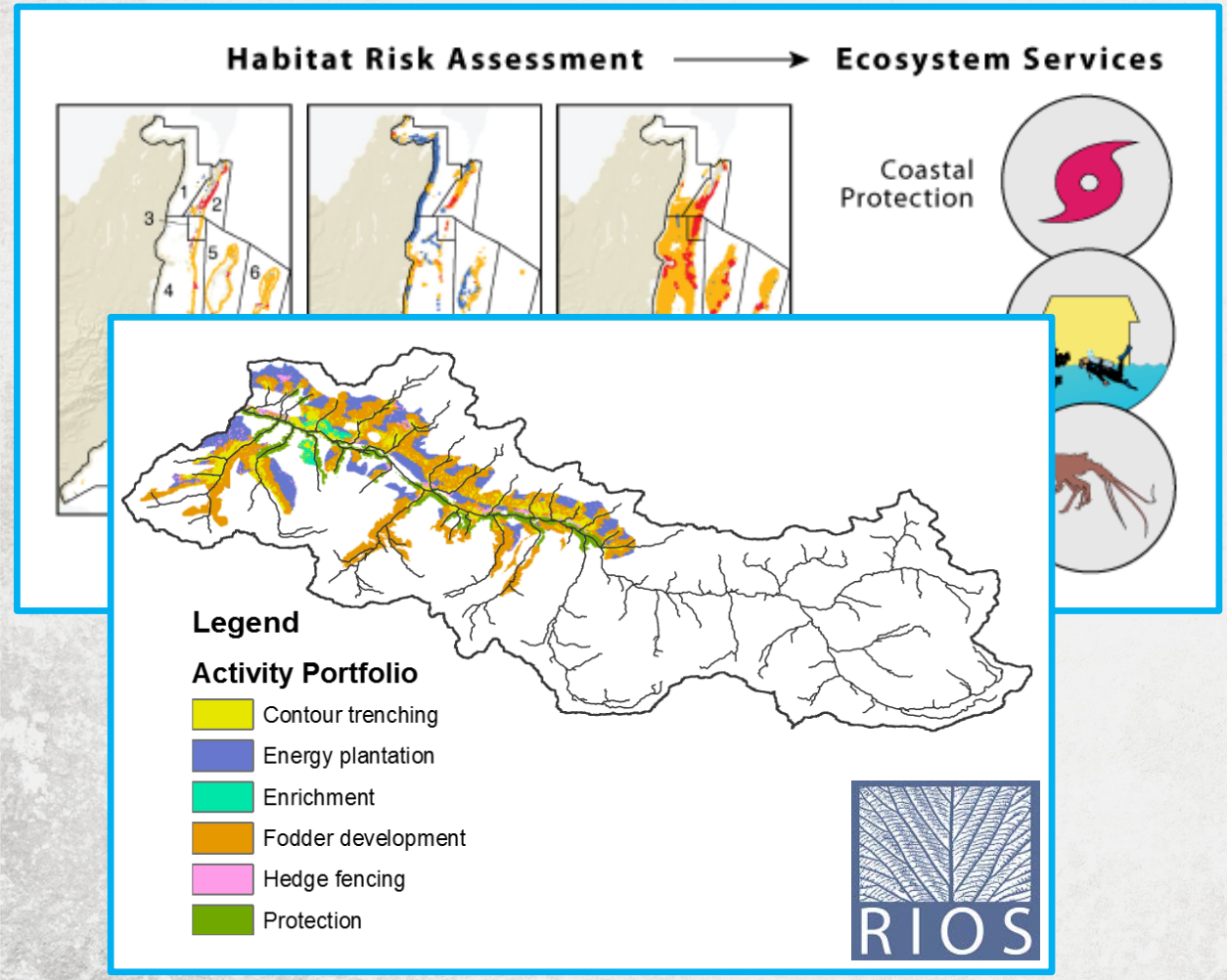
- Storylines that describe possible futures
  - Not predictions
  - Spatially-explicit scenarios are an important input to InVEST

RIOS









Drivers

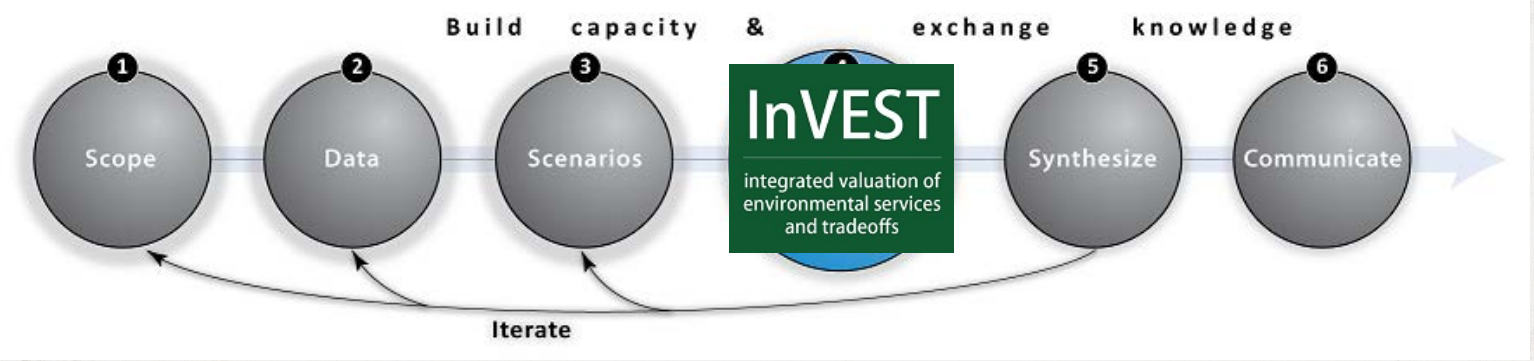
- Social and demographic
- Technological
- Economic
- Environmental
- Political

STEP 3: SCENARIOS
LESSONS FROM THE FIELD

Scenario development

Considerations:

- Time
- Learning curve & iteration
- Stakeholders
- Tools



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ANALYZE

COMPLEXITY VS. DATA

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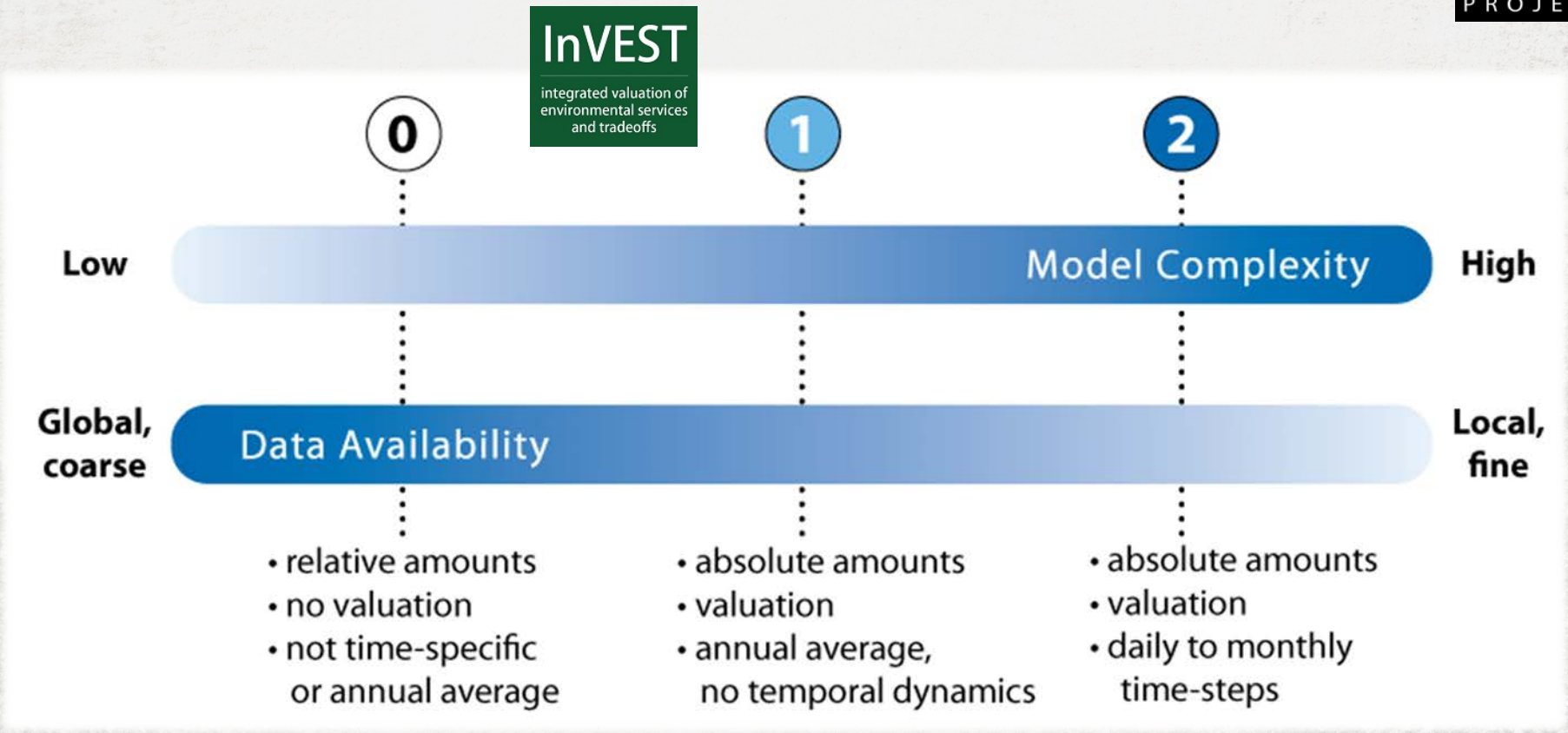

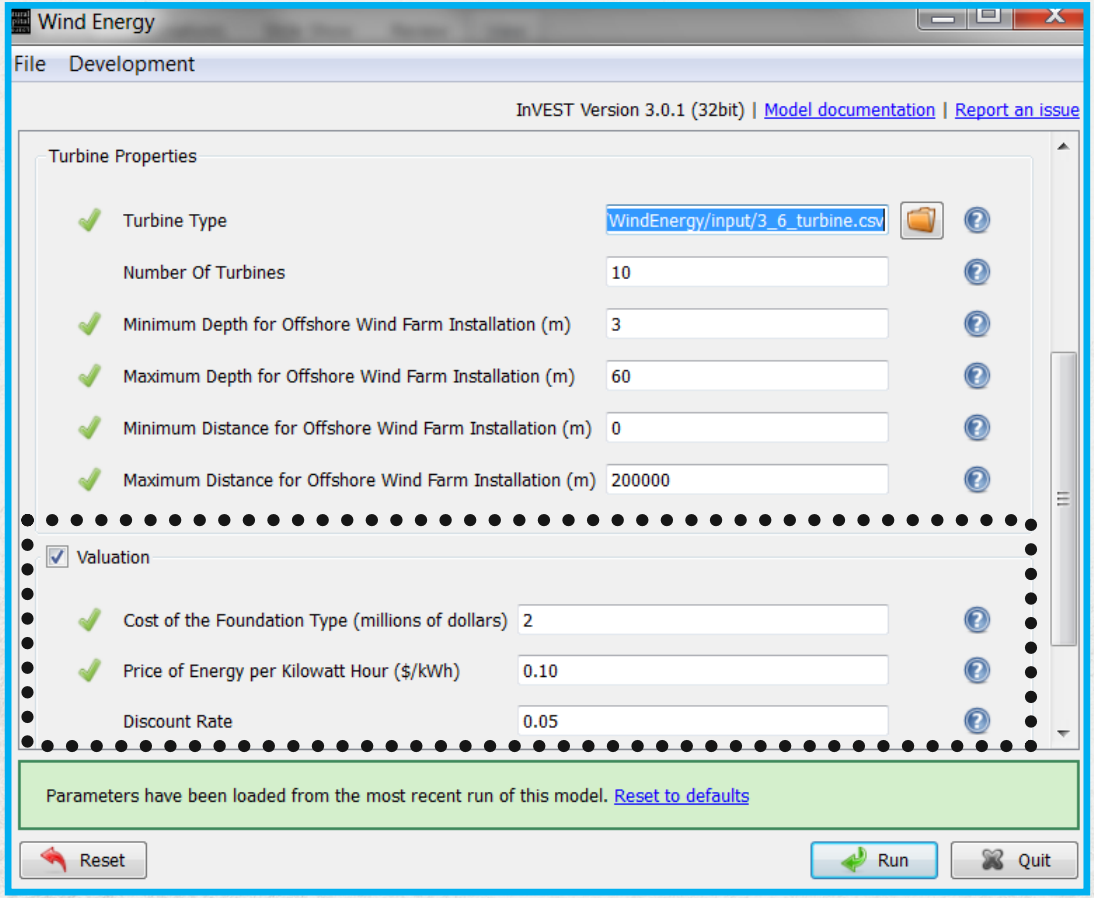

Value

Economic & social impacts

SCALE

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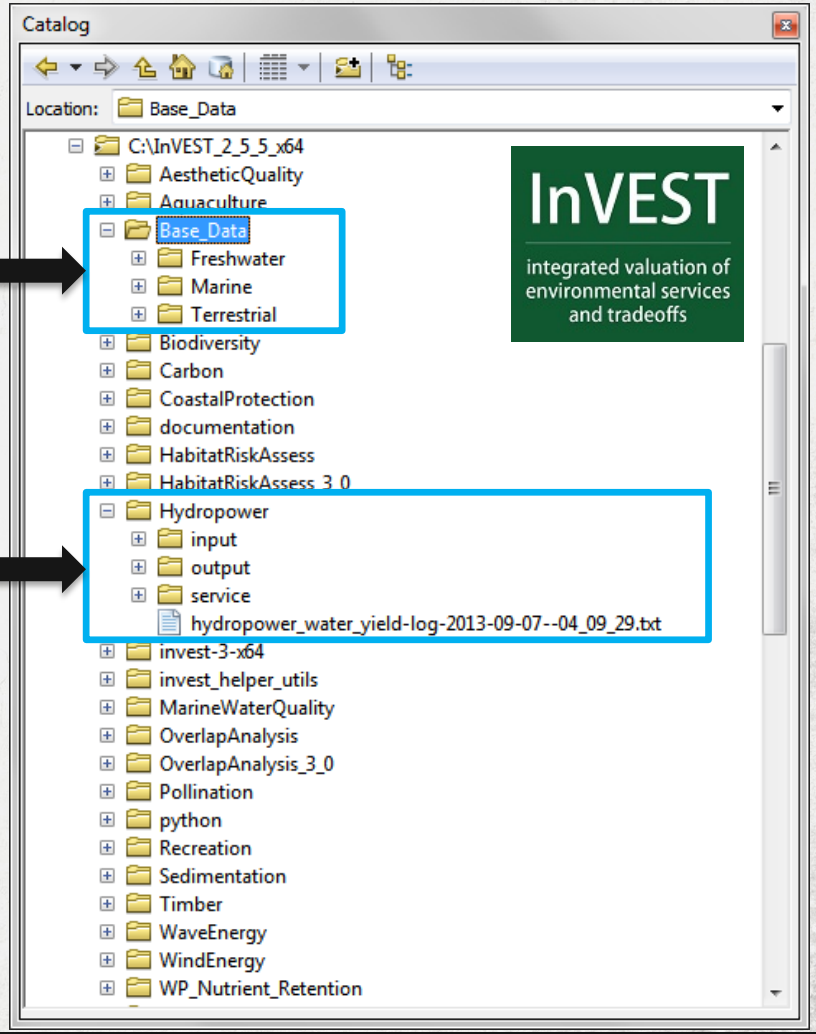
Marine InVEST Models	Scale		
	Global	Regional	Local
Habitat Risk Assessment			
Coastal Vulnerability			
Marine Water Quality			
Coastal Protection			
Recreation & Tourism			
Aquaculture			
Fisheries			
Scenic Quality			
Renewable Energy			
Coastal Blue Carbon			

INVEST
FOLDER STRUCTURE

Base data (common layers) for each toolset

Sample data for each model



STEP 4: ANALYZE
LESSONS FROM THE FIELD

InVEST analysis

Considerations:

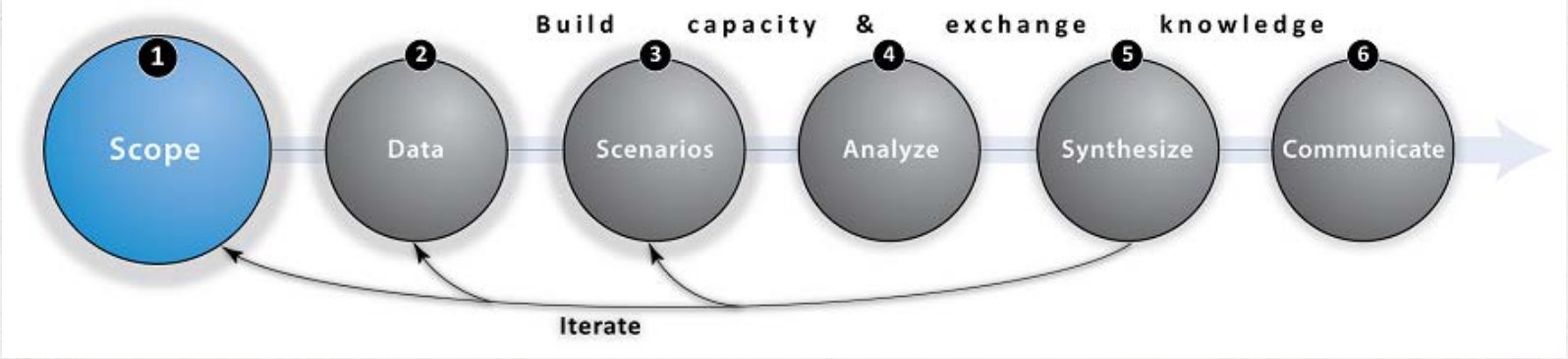
- Model choice
- Endpoints
  (e.g., $ + other units/metrics)
- Iteration
- Level of complexity

TRAINING TRACK SCHEDULE

	Monday	Tuesday	Wednesday
AM		InVEST in-depth (**Analyze**)	Hands-on (**Data**, **Scenarios**, **Analyze**, **Synthesize**)
PM	**Data** (in-depth)	**Scenario** Tools	

SANDBOX

Q&A



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SCOPING

COASTAL ZONE MANAGEMENT

Coastal and marine ecosystems provide important benefits to the Belizean people

- **Balanced and sustainable use** of the coastal and marine environment for the benefit of Belizeans
- How do **human activities affect the benefits Belizeans rely on** from coastal and marine ecosystems now and under different future zoning schemes?



BELIZE PARTNERSHIP

OBJECTIVE

CZMAI

Policy lead, convening body for stakeholders, knowledge management

NATCAP

Model developer, lead analyst, mentoring & training role

WWF

Project facilitator, capacity-building role, science-policy bridge

Create an ecosystem-based plan that provides spatial guidance for the management of coastal resources for multiple uses, including coastal development, conservation, extraction and fishing.


Belize Integrated Coastal Zone Management Plan

2013

Coastal Zone Management Authority and Institute

Ministry of Forestry, Fisheries, and Sustainable Development

Promoting the Wise, Planned Use of Belize's Coastal Resources

BELIZE

NATIONAL COASTAL PLAN

Ecosystem service knowledge has been taken up by stakeholders and national policy.

InVEST results helped **design a zoning scheme that provides better ecosystem service outcomes**.

STEP 1: SCOPE
LESSONS FROM THE FIELD

Project design

Considerations:

- Resources
- Time
- Team composition

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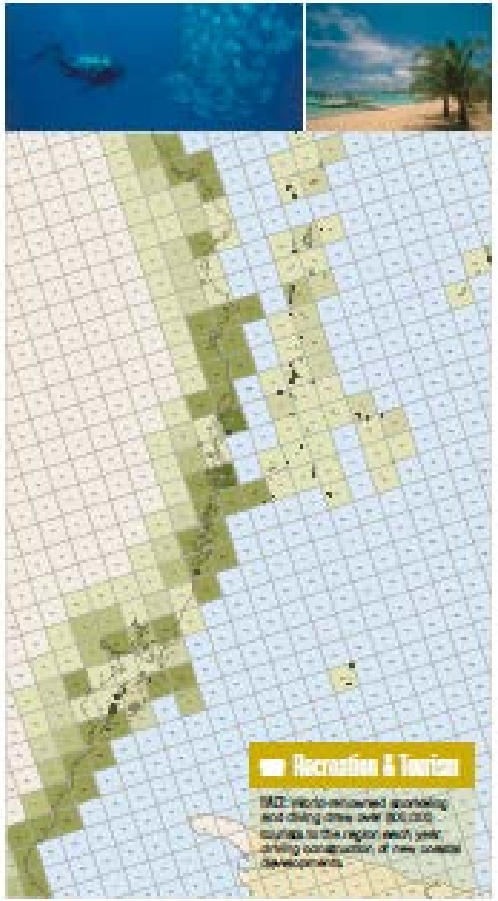
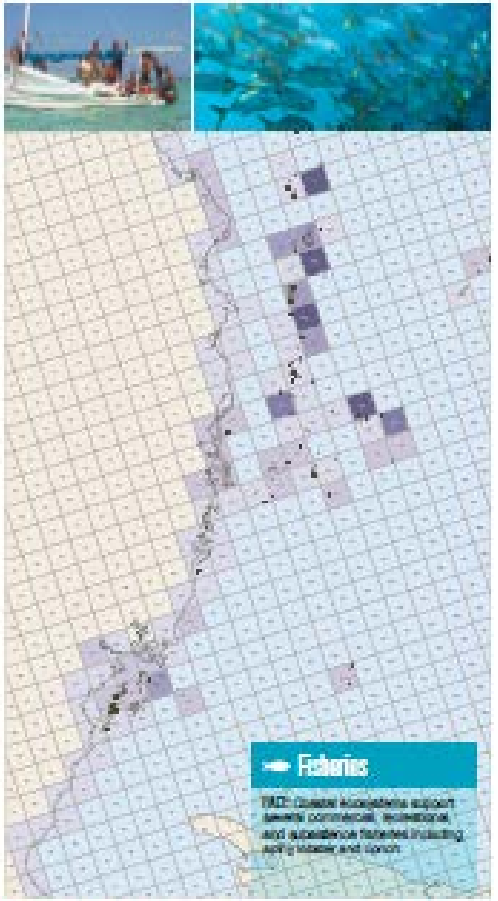
ROUND ONE





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SCORES
ROUNDS 1 & 2

	TEAM 1		TEAM 2		TEAM 3	
ROUND	1	2	1	2	1	2
Recreation & Tourism						
Fisheries						
Risk to Habitats						
Coastal Vulnerability						

NET SCORES
ROUNDS 1 & 2

Winner!

Smart Planning Award