THE SAUSAGE-MAKING SESSION: HOW INVEST APPLICATIONS ARE MADE

Natural Capital Project, Annual Meeting 2014

Nirmal Bhagabati
nirmal.bhagabati@wwfus.org

Amy Rosenthal
Amy.rosenthal@wwfus.org

Spencer Wood
woodsp@stanford.edu

Leah Bremer
lbremer@stanford.edu

Jess Silver
jess.silver@stanford.edu

Liz Rauer
erauer@stanford.edu

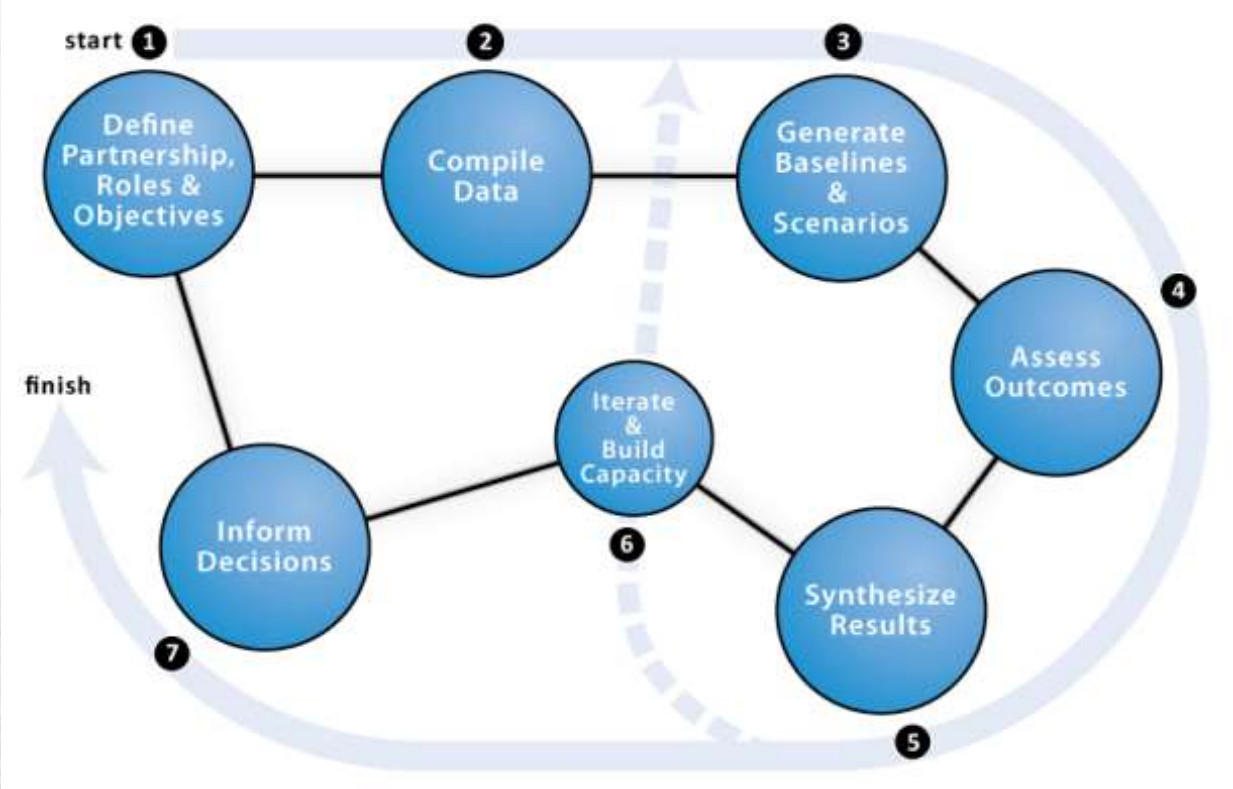
INVEST APPLICATIONS

OVER 20 DEMONSTRATIONS AROUND THE WORLD

INVEST FOR MANAGERS

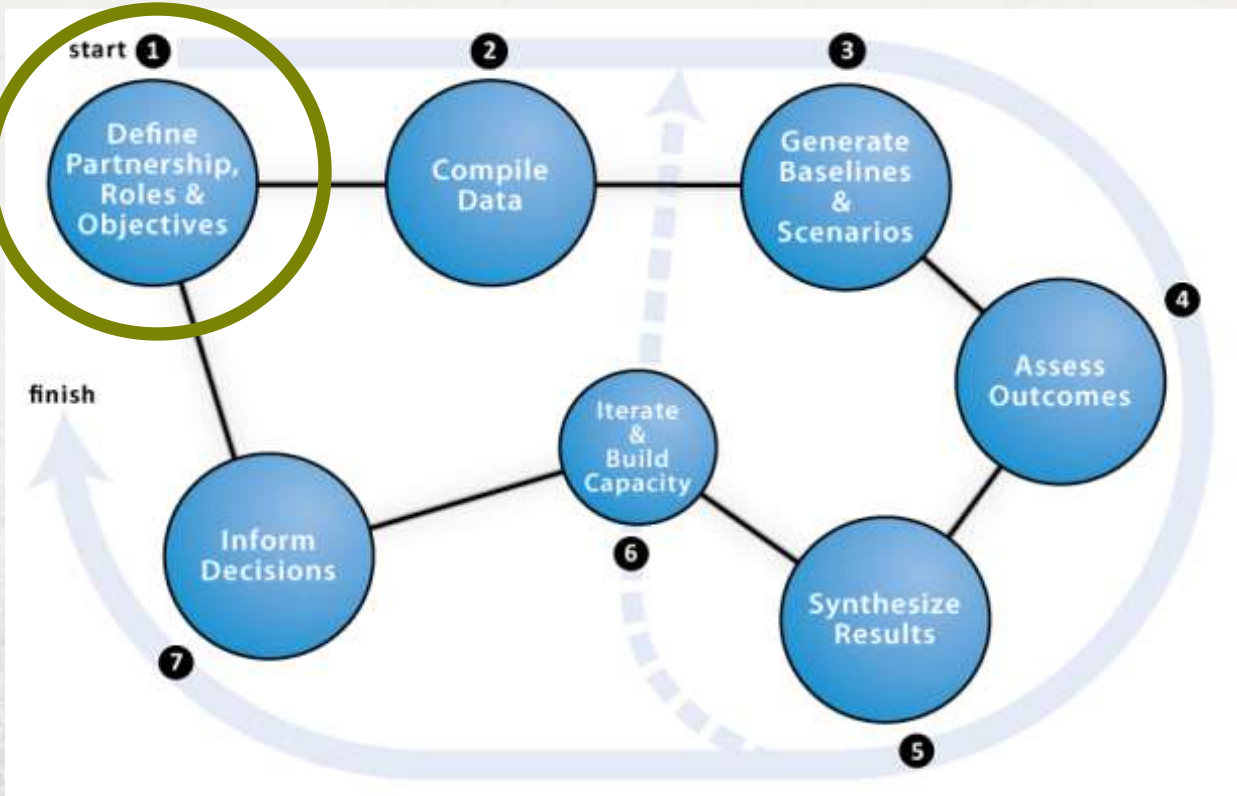
Applying InVEST to Decisions

THE NATURAL CAPITAL APPROACH
TO INTEGRATING NATURE'S VALUES INTO DECISIONS



TWO EXAMPLES
USING INVEST IN BELIZE AND INDONESIA

THE NATURAL CAPITAL APPROACH
TO INTEGRATING NATURE'S VALUES INTO DECISIONS



BELIZE PARTNERSHIP
AND 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 guidance for spatially explicit management of coastal resources for multiple uses, including coastal development, conservation, and fishing.

Guiding development and investment in Sumatra

Policy questions:
How can sustainable spatial planning be implemented and financed?

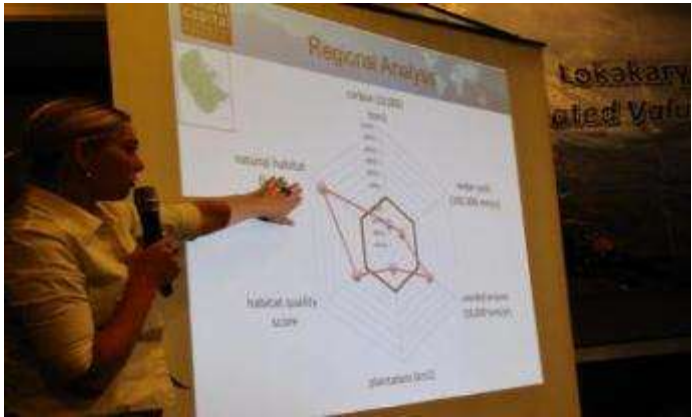
Where are cost-effective investments in ecosystem services advisable/possible?

Audience: District governments, investors

Partners: WWF-Indonesia, National and local Indonesian governments

Collaboration and complementary roles key to success

- **WWF Indonesia**
  - established policy context
  - Accessed local data
  - connected to key stakeholders
- **WWF US**
  - Led and conducted analysis (with Stanford)
  - Developed capacity in Indonesia
  - Connected Stanford and WWF Indonesia staff
  - Supported WWF Indonesia throughout
- **Stanford**
  - Helped frame analysis
  - Visited field site and communicated with local stakeholders
  - Applied and parameterized select InVEST models with prior knowledge and insights gathered from field visit



STEP 1
LESSONS FROM THE FIELD

Project design

Considerations:

- Team composition
- Resources
- Time

THE NATURAL CAPITAL APPROACH
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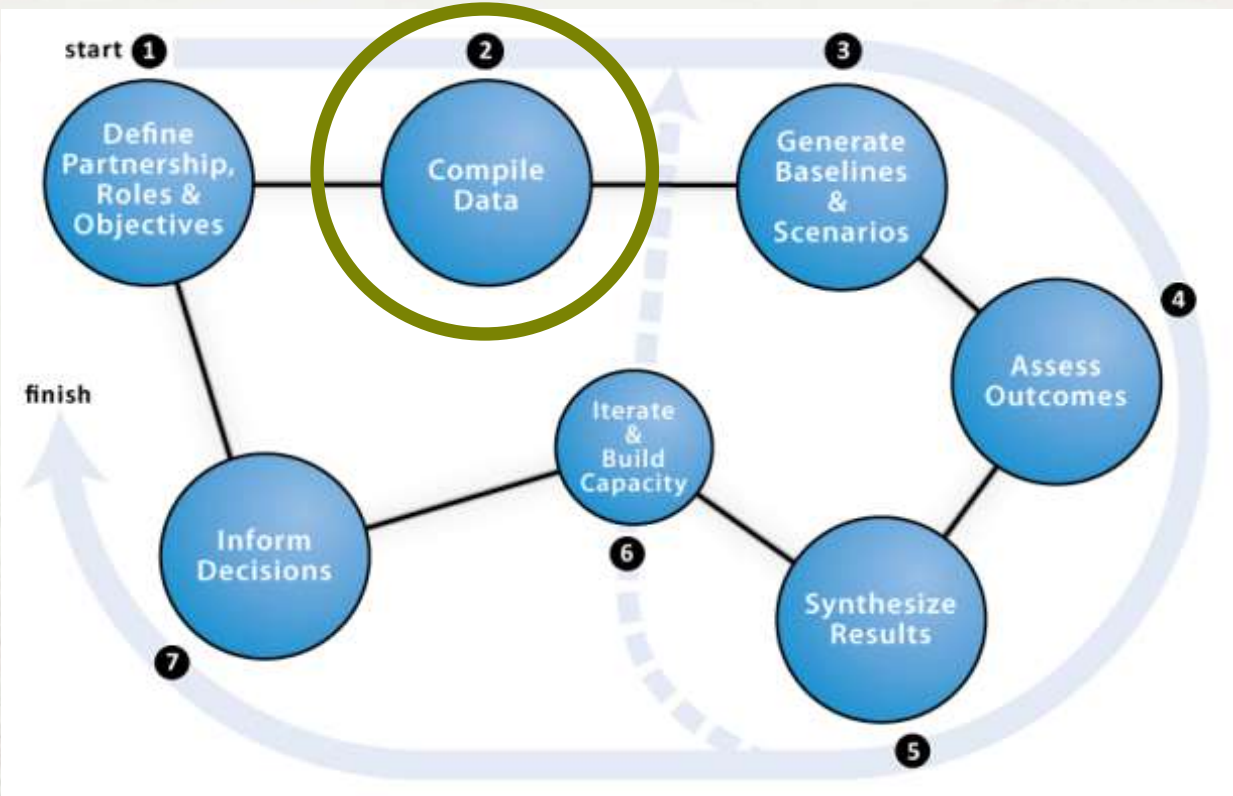
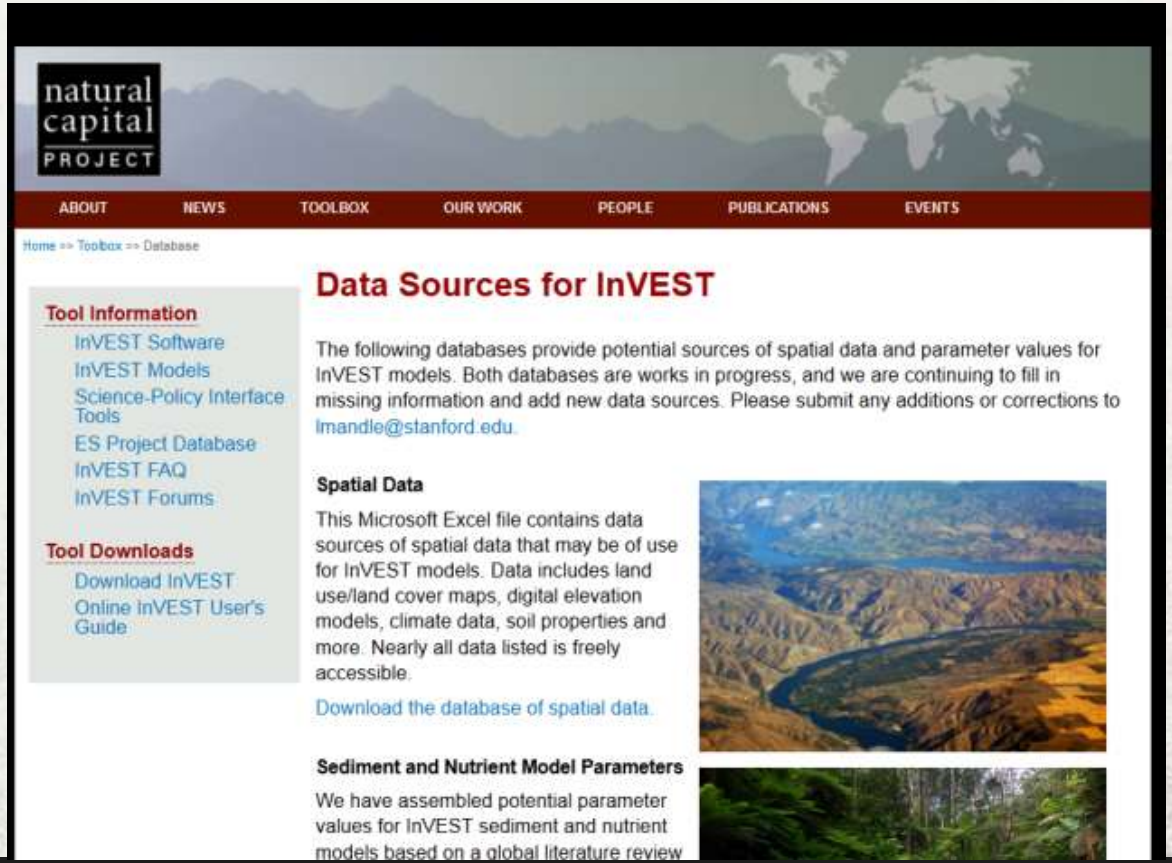


NATCAP DATA PAGE

HTTP://WWW.NATURALCAPITALPROJECT.ORG/DATABASE.HTML



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	Wind Energy	Wave Energy	Recreation	Habitat Risk Assessment	Finfish Aquaculture	Blue Carbon	Coastal Vulnerability (T0)	Coastal Protection (T1)	Overlap Analysis	Aesthetic Quality	**InVEST (v2.5) Data Inventory**				
2	Models										Data Group/Category	Data requirements	Type	Table name	Sources
3	R	R	R	R	R	R	R	R	R	R	Coastline	outline of mainland above sea level (coastline)	polygon		
4			O	R		R	O	O	O		Marine Habitat	Marine and coastal habitat maps (kelp, seagrass, rocky bottom, sandy bottom, etc.)	polygon		global datasets available, see the user gu Habitats (http://www.searchmesh.net/de UKSeaMap 2010 - predictive mapping of s http://jncc.defra.gov.uk/page-211 (
5			O			R					Land Use	Terrestrial land-use, land-cover map	polygon or raster		
6							O	O			Regional Boundaries	Map delineating regional boundaries	polygon		
7							O	O		O	Municipalities	Names of cities, towns and villages	point		
8							O	O		O	Populations	Number of people in cities and villages	point		
9							O	O			Populations	number of people per administrative district	polygon		
10							O	O		O	Urban Areas	outlines of urbanized land	polygon		
11							R	R		R	Land Topography	Digital elevation model (DEM)	raster map		Global: World Wildlife Fund (90m)- http://www.worldwildlife.org/freshwa processed version of NASA provide DEM data at http://asterweb.jpl.nas
12							O	R			Bathymetry	DEM (bathymetry)	raster map		
13	R	R									Renewable Energy Operations	device operation specifics	table		some device information provided in mode
14	R	R	O						O	O	Renewable Energy Operations	Grid Access Points	point		

marine | terr_FW | value

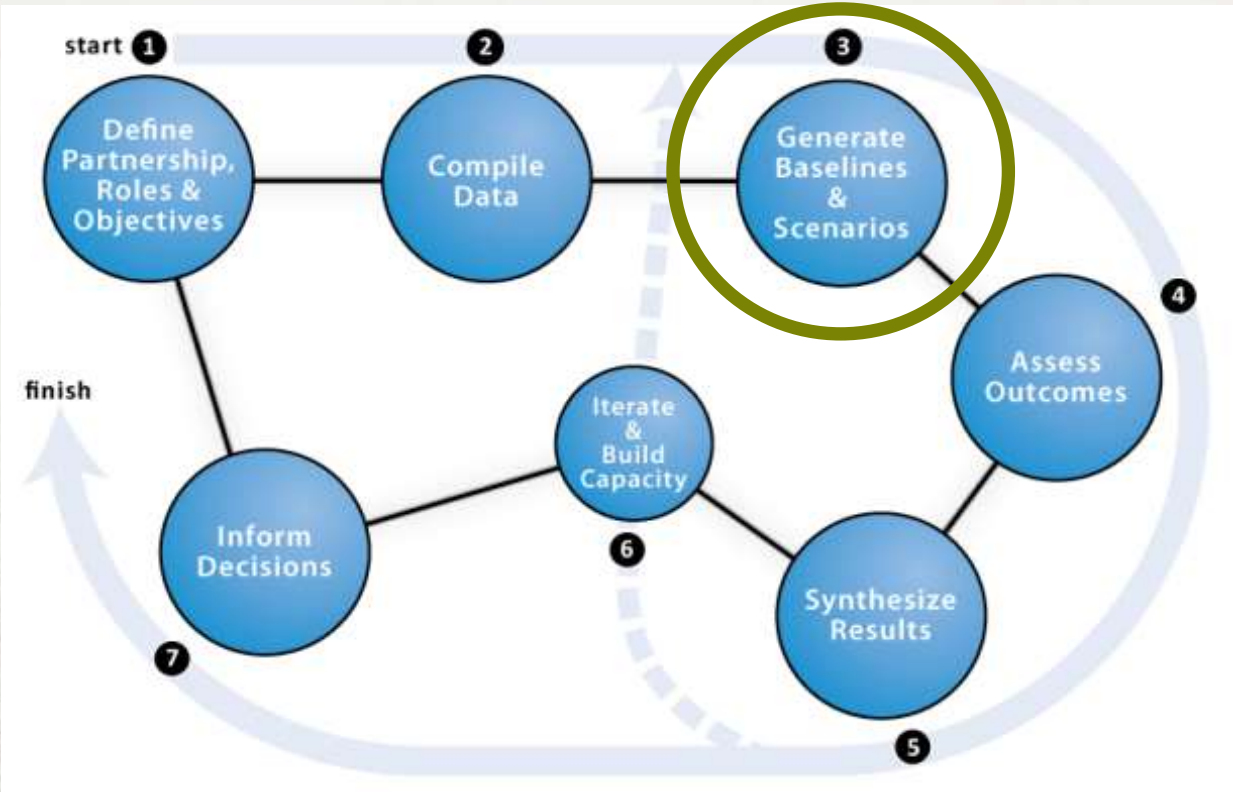
STEP 2
LESSONS FROM THE FIELD

Data collection

Considerations:

- Data sharing
- Resolution & scale
- Iteration

THE NATURAL CAPITAL APPROACH
TO INTEGRATING NATURE'S VALUES INTO DECISIONS

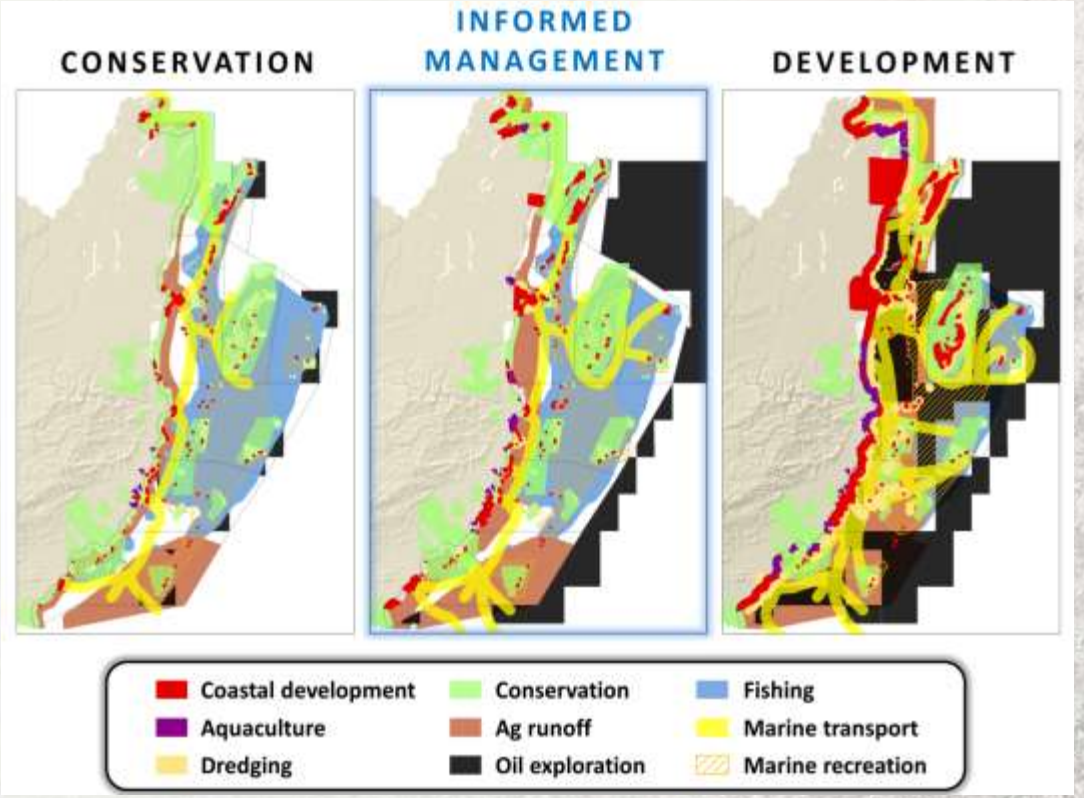


COASTAL ZONE PLANNING
DESIGNING ALTERNATIVE SCHEMES

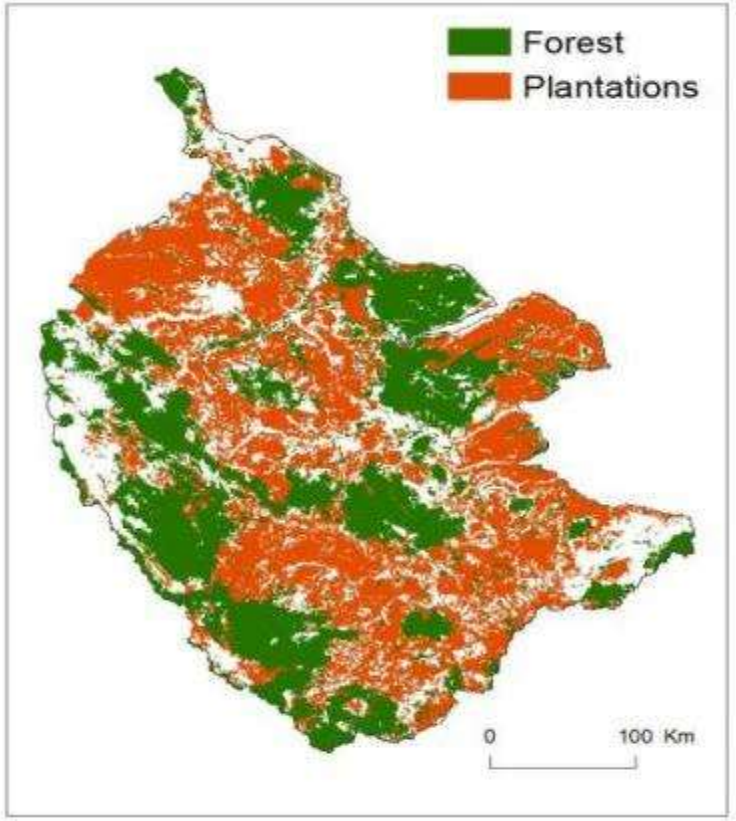
COASTAL ZONE PLANNING
DESIGNING ALTERNATIVE SCHEMES

Options for coastal use & zoning in Belize

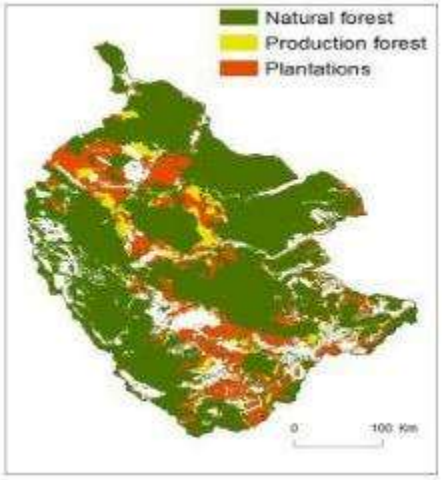
- 3 alternatives
- 9 zones
- 2010-2025



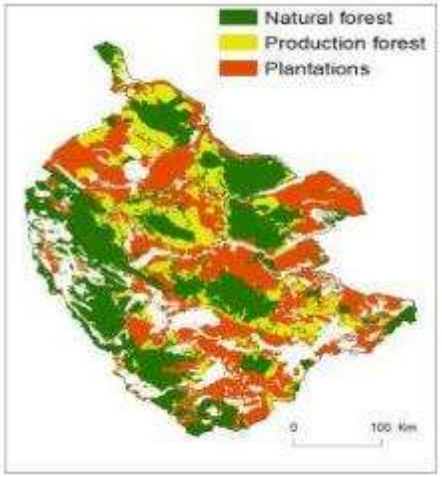
What might the future look like?



Central Sumatra Today



Sumatra Ecosystem Vision
(60% more forest than 2008)



Government spatial plan

Same amount of natural forest as 2008 (but likely worse)

NATCAP SCENARIO TOOLS

HTTP://WWW.NATURALCAPITALPROJECT.ORG/DECISIONS/SCENARIOS.HTML

ABOUT NEWS TOOLBOX OUR WORK PEOPLE PUBLICATIONS EVENTS

Home >> Toolbox >> Science-Policy Interface Tools

Scenarios

- Scenarios for InVEST
- Resources for Developing Scenarios
- Contact

Downloads

- Scenarios for InVEST: A Primer
- Developing Scenarios to Assess Ecosystem Service Tradeoffs: Guidance and Case Studies for InVEST Users
- Belize Case Study
- Borneo Case Study
- Hawaii Case Study
- Oregon Case Study
- Sumatra Case Study
- Tanzania Case Study
- Vancouver Island Case Study

InVEST

Scenarios for InVEST

Scenarios describe what the future could look like. They can be critically useful for ecosystem service assessments that aim to inform decisions. When used to assess alternative scenarios, InVEST provides information about the change in ecosystem services in different possible futures. It can thereby inform real choices and involve stakeholders in a powerful learning process.

Why use Scenarios

Scenarios can increase the impact of environmental service analyses on decisions. They enable proactive, forward-looking, comparative assessments. Scenarios can frame studies to explore the potential impacts of uncertain changes that may occur in the future. Scenarios can also frame studies to understand the likely consequences of alternative decisions, policies and plans. Through scenarios, one can elucidate how the many drivers of environmental change interact.

Resources for Developing and Using Scenarios

To enable those conducting environmental service assessments to develop policy-relevant and robust

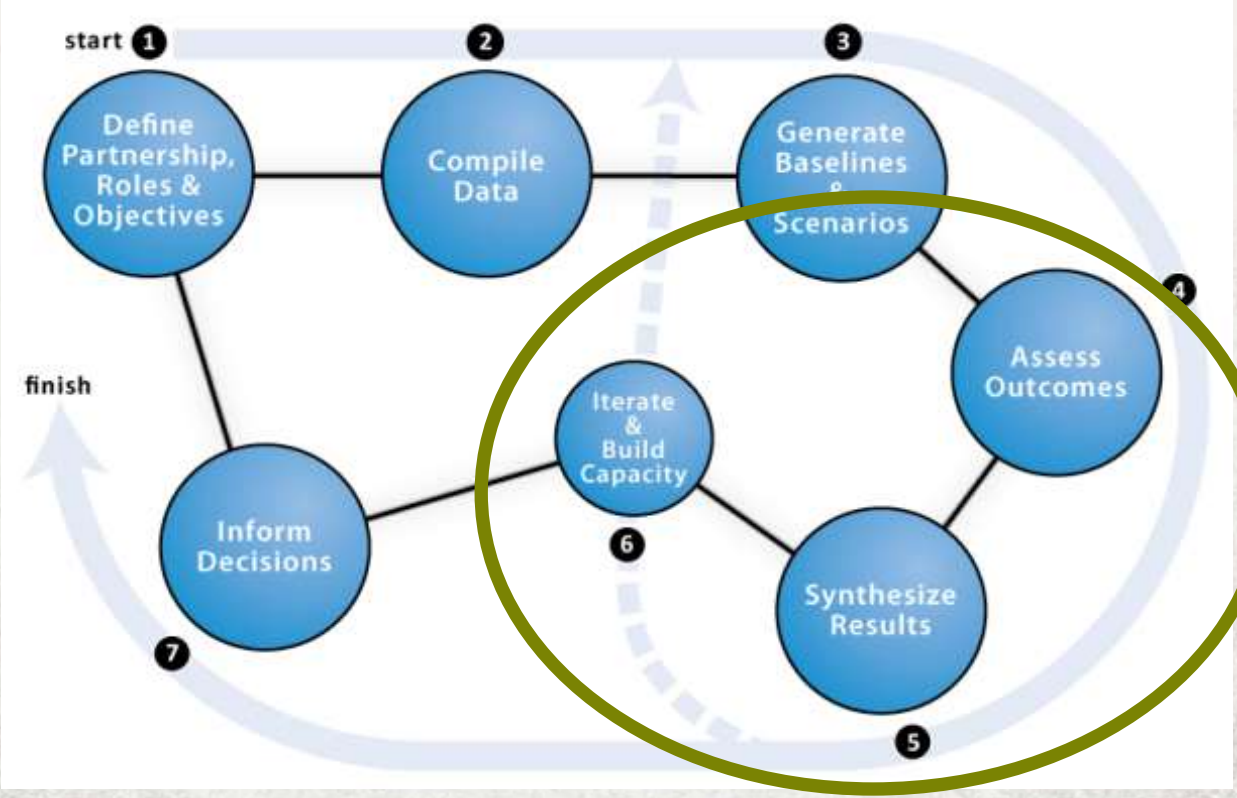
STEP 3
LESSONS FROM THE FIELD

Scenario development

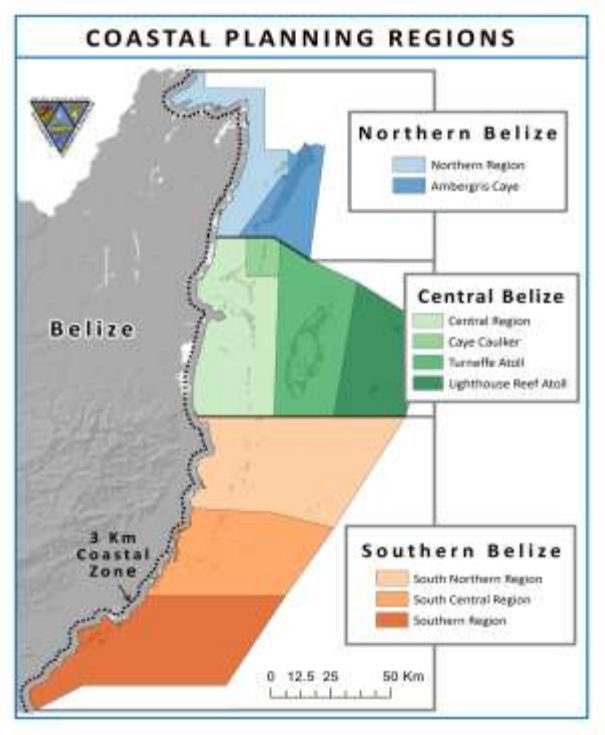
Considerations:

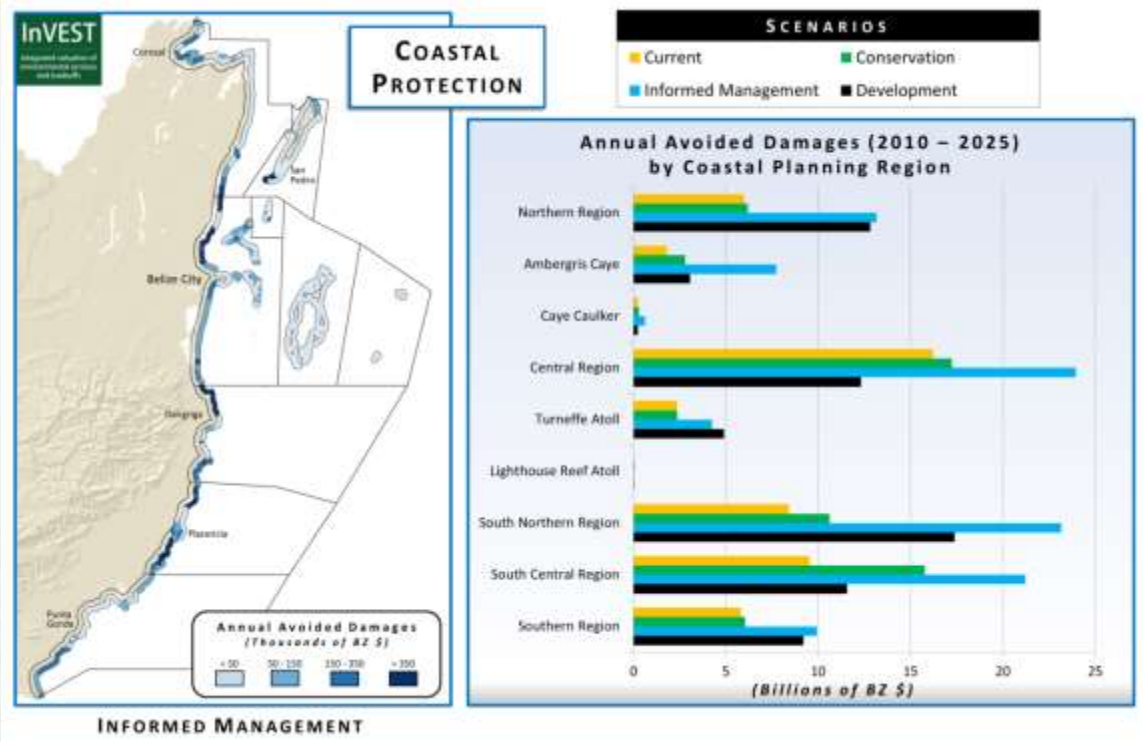
- Learning curve & iteration
- Stakeholders
- Time
- Tools

THE NATURAL CAPITAL APPROACH
TO INTEGRATING NATURE'S VALUES INTO DECISIONS

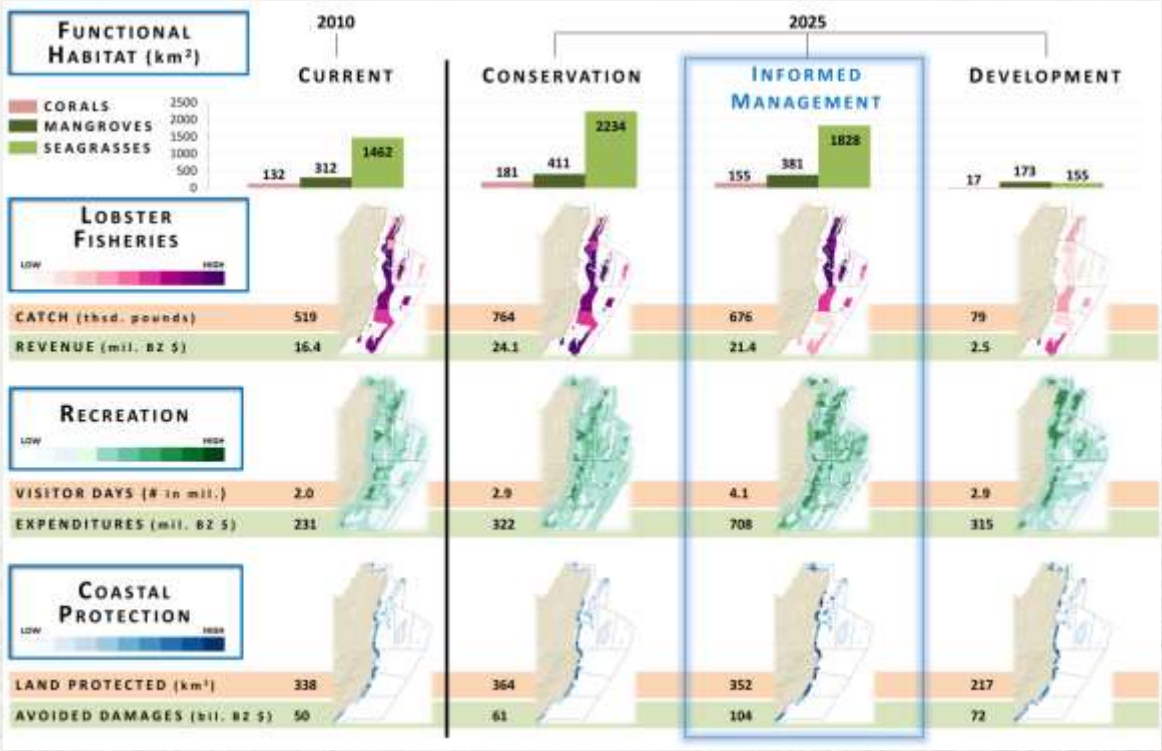


INVEST RESULTS BY REGION
COASTAL PROTECTION

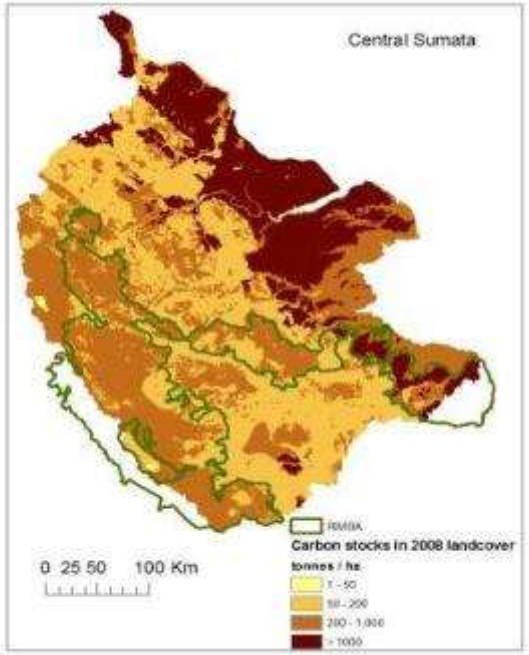




INVEST RESULTS BY SCENARIO
INFORMED MANAGEMENT SELECTED

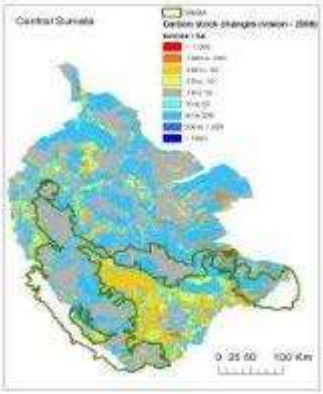


Gains and losses in carbon stocks from 2008 to 2058

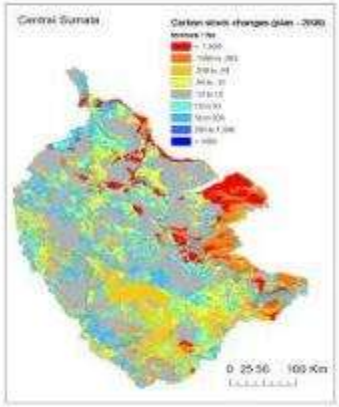


2008

Vision



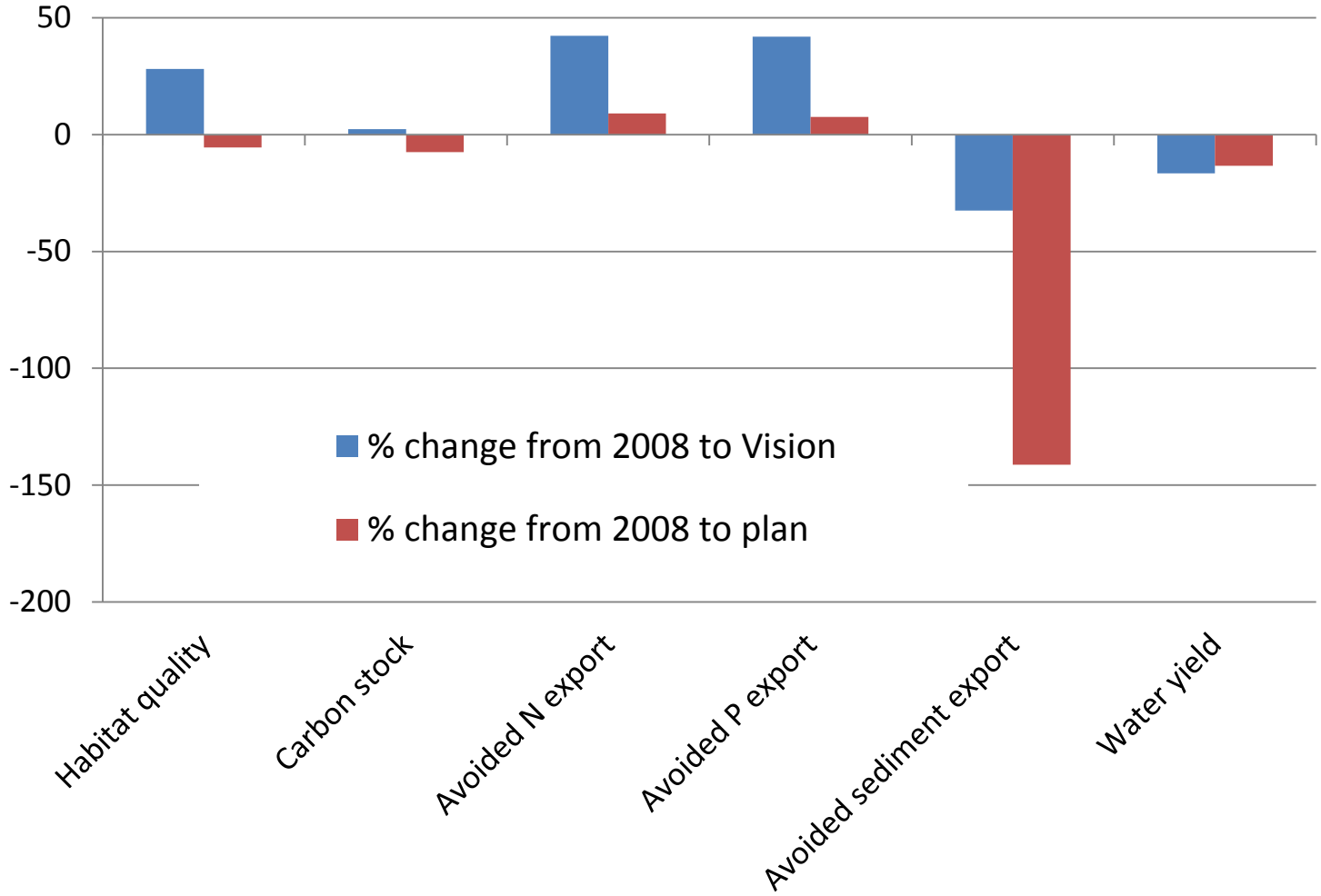
Plan



2058

Carbon gain

Carbon loss


50
0
-50
-100
-150
-200
% change from 2008 to Vision
% change from 2008 to plan
Habitat quality
Carbon stock
Avoided N export
Avoided P export
Avoided sediment export
Water yield

STEPS 4-6
LESSONS FROM THE FIELD

InVEST analysis

Considerations:

- Model choice
- Endpoints (e.g. $)
- Iteration
- Level of complexity

THE NATURAL CAPITAL APPROACH
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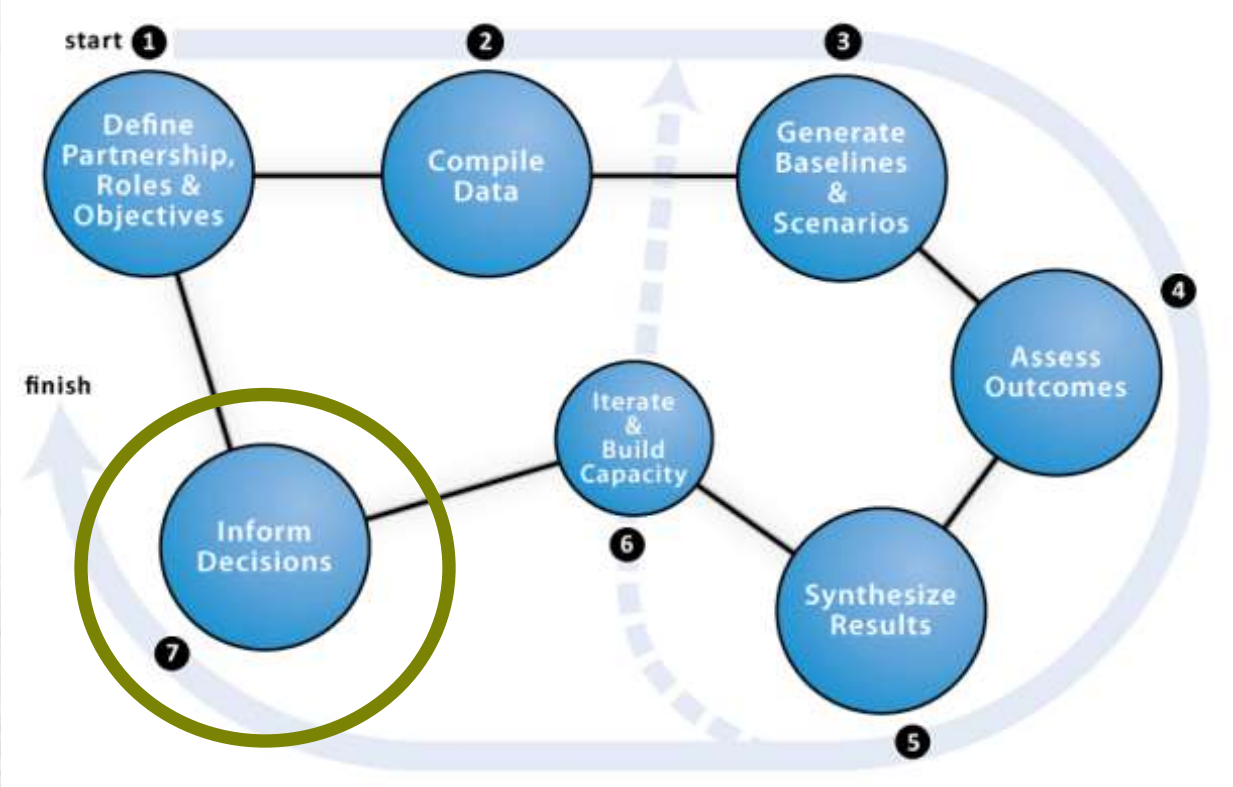


Belize Integrated Coastal Zone Management Plan

2013

Coastal Zone Management Authority and Institute

Ministry of Forestry, Fisheries, and Sustainable Development

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


Coastal and Marine Spatial Planning with InVEST

InVEST

In Practice

BELIZE ICZMP

NATIONAL COASTAL PLAN

Ecosystem service knowledge has been taken up by stakeholders and national policy. InVEST results helped design the plan's zoning scheme to provide better ecosystem service outcomes.

This plan is one of the first of its kind to explicitly take into account the values of nature. It is being used as a model in other countries, such as Mozambique, and by other decision-makers, such as the Inter-American Development Bank.

Application of results

Biological Conservation 169 (2014) 147–156

Contents lists available at ScienceDirect

Biological Conservation

journal homepage: www.elsevier.com/locate/biocon

Ecosystem services reinforce Sumatran tiger conservation in land use plans

Nirmal K. Bhagabati [a,*], Taylor Ricketts [b], Thomas Barano Siswa Sulistyawan [c], Marc Conte [d], Driss Ennaanay [e], Oki Hadian [c], Emily McKenzie [f], Nasser Olwero [a], Amy Rosenthal [a], Heather Tallis [g,1], Stacie Wolny [g]

[a] WWF US, Conservation Science Program, 1250 24th Street NW, Washington, DC 20037, USA
[b] Gund Institute for Ecological Economics, Rubenstein School of Environment and Natural Resources, University of Vermont, 617 Main Street, Burlington, VT 05405, USA
[c] WWF Indonesia, Gedung Graha Simatupang, Tower 2 Unit C lt. 7 – 11, Jl. Letjen. TB. Simatupang, Jakarta Selatan 12540, Indonesia
[d] Department of Economics, Fordham University, E-521 Dealy Hall, 441 E. Fordham Rd, Bronx, NY 10458, USA
[e] Riverside Technology, Inc., 2950 E. Harmony Road, Suite 390, Fort Collins, CO 80528, USA
[f] WWF UK, Panda House, Weyside Park, Godalming, Surrey GU7 1XR, United Kingdom
[g] The Natural Capital Project, Woods Institute for the Environment, Stanford University, Stanford, CA 94305, USA

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ABSTRACT

Ecosystem services have clear promise to help identify and protect priority areas for biodiversity. To leverage them effectively, practitioners must conduct timely analyses at appropriate scales, often with limited data. Here we use simple spatial analyses on readily available datasets to compare the distribution of five ecosystem services with tiger habitat in central Sumatra. We assessed services and habitat in 2008 and the changes in these variables under two future scenarios: a conservation-friendly Green Vision, and a Spatial Plan developed by the Indonesian government. In 2008, the range of tiger habitat overlapped substantially with areas of high carbon storage and sediment retention, but less with areas of high water yield and nutrient retention. Depending on service, location and spatial grain of analysis, there were both gains and losses from 2008 to each scenario; however, aggregate provision of each ecosystem service (except water yield) and total area of tiger habitat were higher in the Vision than the Plan,

Recommendations for more sustainable provincial and district spatial plans

Identifying locations for financing conservation

Jambi Province used ES information when conducting SEA to design spatial plan

MCC requires ecosystem services considered in funding proposals

Indonesia Compact Agreement ($600m)
Green Prosperity Project ($332.5m)

Aims to increase economic productivity and reduce land-based GHG emissions

STEP 7
LESSONS FROM THE FIELD

Inform decisions

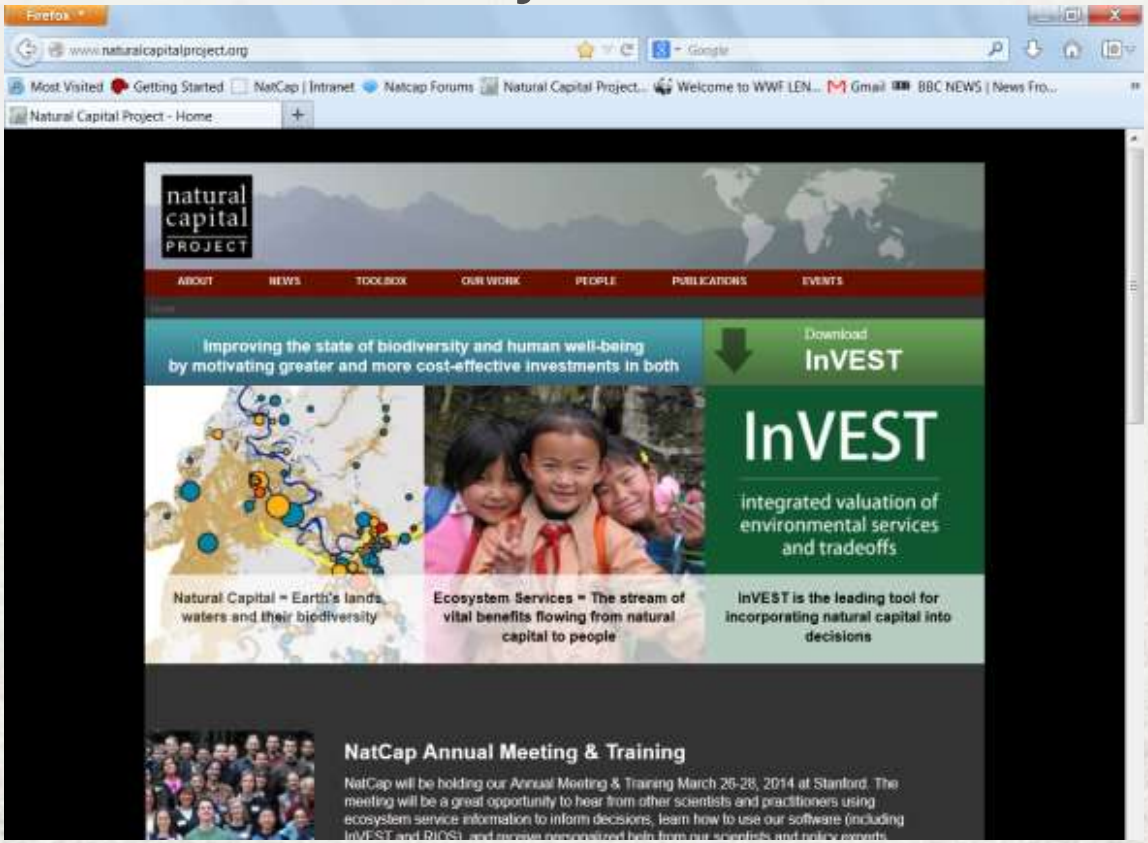
Considerations:

- Relevance to decision context
- Additional information
- Visualizing results
- Communication
- Knowledge use

ADDITIONAL STEPS
MONITORING & IMPACT EVALUATION

MORE RESOURCES

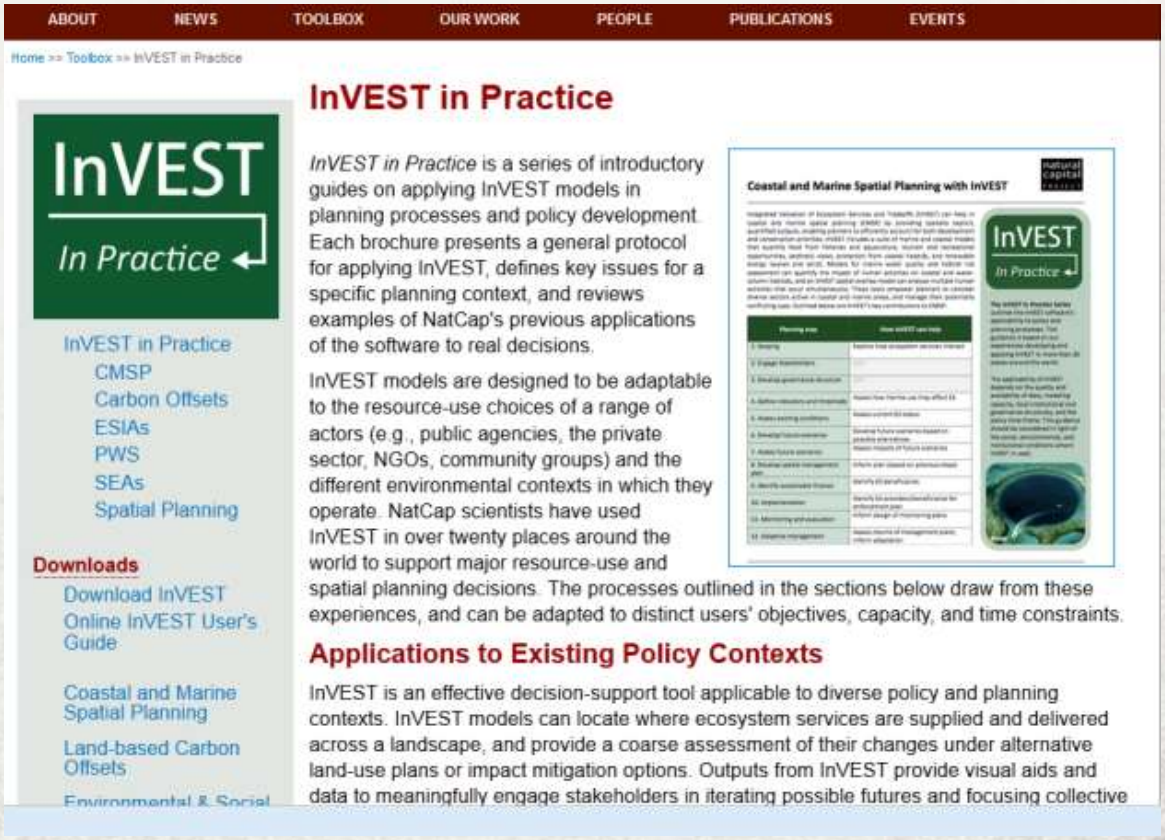
OUR WEBSITE
WWW.NATURALCAPITALPROJECT.ORG



NATCAP FORUMS

INVEST IN PRACTICE

HTTP://WWW.NATURALCAPITALPROJECT.ORG/POLICY_TOOLS.HTML



Q&A

EXTRA PAGES

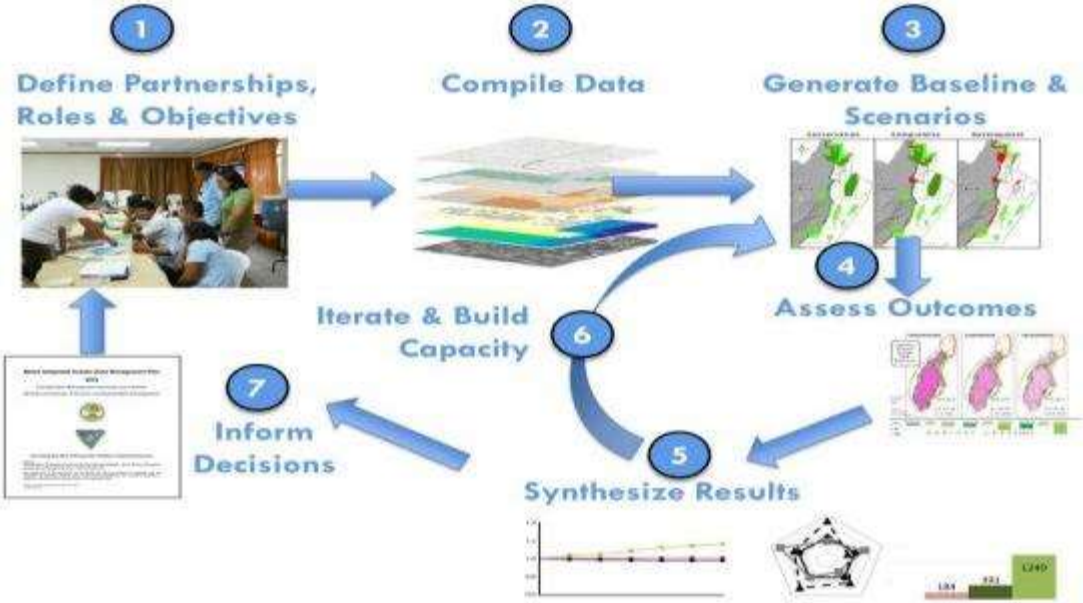
Title: The Sausage-Making Session: How InVEST Applications Are Made

Description: An interactive session based on the NatCap approach cycle. Using the NatCap Framework figure, we will show examples of how each step gets accomplished and spur discussion and brainstorms around each essential component (e.g. data collection, stakeholder engagement, etc.). We will include 'monitoring' in the cycle where appropriate. Examples will include both successes and challenges to learn from. Slides will be mostly pictures with links to useful NatCap tools, with substantial debate and Q&A with participants.

The session is 80 minutes, and we'll aim for our presentations to add up to no more than 60 minutes, so that there is sufficient time for robust debate and discussion.

NatCap “sausage-making ” session

- Spend <= 10 mins on each step
- Make very interactive, i.e, for each step, start by asking participants how they might do it
- Illustrate each step with lessons from one or more of our case studies (+ optional accompanying slides).
- Use different site examples for different steps (so all facilitators get to chime in, and more examples are presented).
- Question: Which is the best



InVEST for managers

- Applying InVEST to decisions!
- diagram

Two Cases: Sumatra/Belize

- Picture, decision context Sumatra
- Picture, decision context BZ

Step 1 – Define team, goals

- Picture of Sumatra/Belize
- Takeaway bullets:
  - $
  - time
  - Team composition

Step 2 – Compile data

- Picture of Sumatra/Belize
- Takeaway bullets:
  - Local v. global
  - Data-sharing/access

Step 3 – baseline & scenarios

- Picture/maps
- Takeaways:
  - Iteration
  - Stakeholders
  - Time: constraining choice
  - Learning curve
  - Tools: options

InVEST –Steps 4-6

- Sumatra/Belize
- Takeaways:
  - Model choice
  - End points ($ v. quantity, resolution)
  - Iteration
  - Simplicity v. complexity

Step 7 – inform decisions

- Sumatra/Belize
- Takeaways:
  - Visualizing results
  - Additional information
  - Communications
  - Decision context/SCL
  - Knowledge use