BACK TO THE FUTURE:
SCENARIO DEVELOPMENT FOR ECOSYSTEM SERVICES

WWF and Natural Capital Project, ACES Workshop

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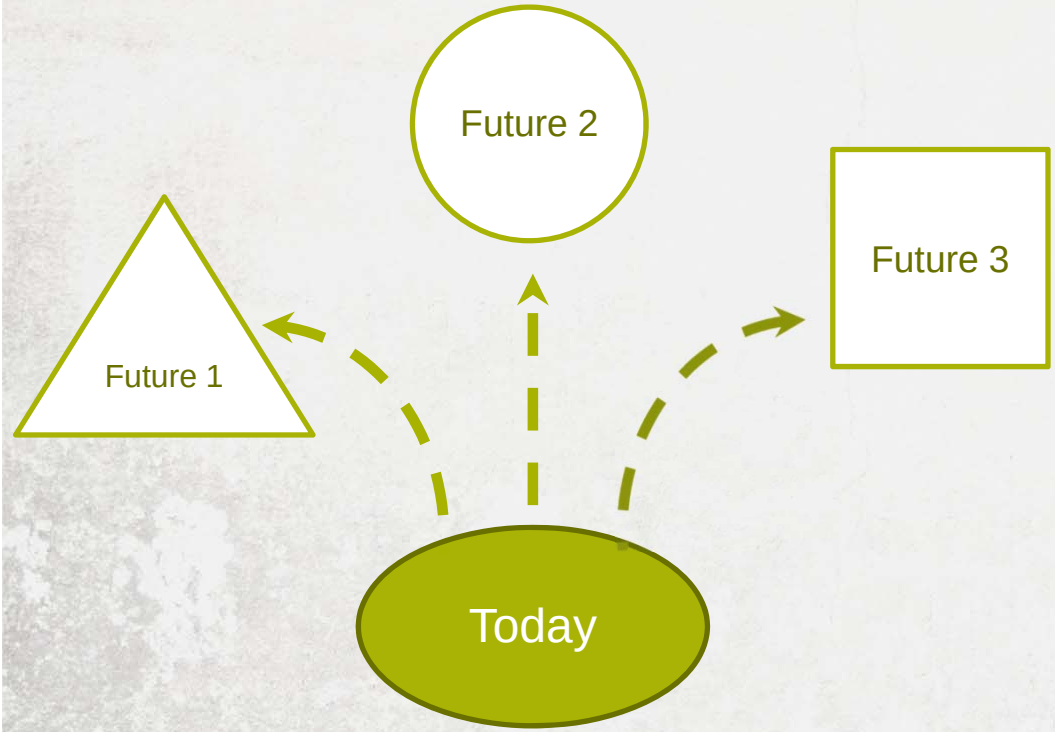
WHAT ARE SCENARIOS?

Scenarios for Ecosystem Services Analysis

SCENARIOS
TELL A STORY ABOUT THE FUTURE



- Simplified & plausible
- Explore future choices, uncertainties
- Spatially explicit (for ecosystem services)

WHY USE SCENARIOS?

- Explore uncertain changes
- Compare options
- Integrate stakeholder knowledge and preferences
- Visualize goals
- Foster communication, iteration and learning
- Consider new policies

- ‘Future-proof’ policies
- Air conflicts, develop consensus

SCENARIOS
KEY ASPECTS

- Scenarios can take many forms
  - Narratives
  - Numbers
  - Drawings
  - Maps

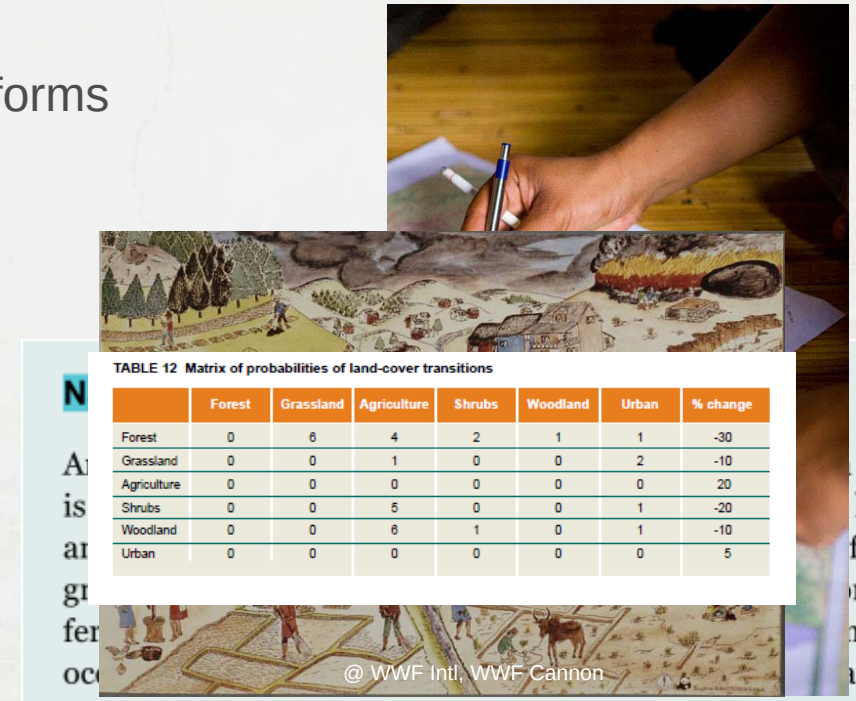


TABLE 12 Matrix of probabilities of land-cover transitions

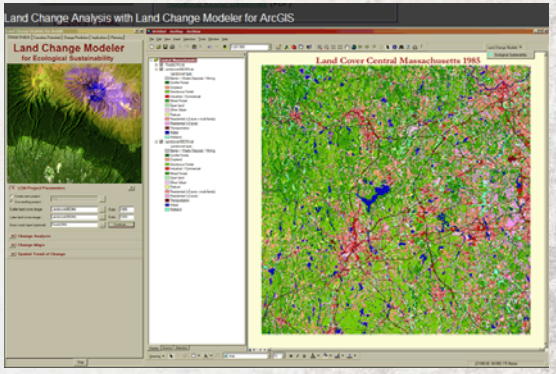
	Forest	Grassland	Agriculture	Shrubs	Woodland	Urban	% change
Forest	0	6	4	2	1	1	-30
Grassland	0	0	1	0	0	2	-10
Agriculture	0	0	0	0	0	0	20
Shrubs	0	0	5	0	0	1	-20
Woodland	0	0	6	1	0	1	-10
Urban	0	0	0	0	0	0	5

@ WWF Intl, WWF Cannon

GDP in the country
largest employer,
fast. Population
rtality and falling
illion. Growth
tion.

SCENARIOS
KEY ASPECTS

- Scenarios can be developed using various techniques
  - Modelling techniques
  - Participatory methods
    - Stakeholders
    - Technical experts
  - Or some combination



ENGAGING STAKEHOLDERS
ROLE OF STAKEHOLDERS IN SCENARIOS

Stakeholder roles:

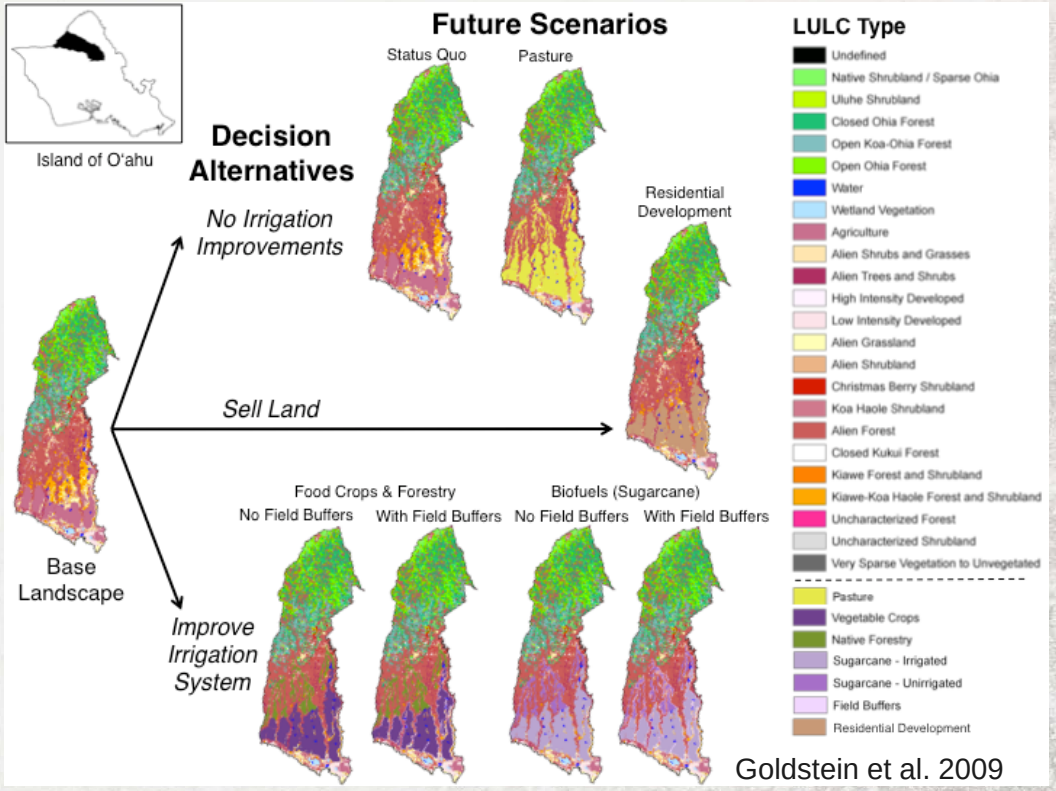
- Developing questions for analysis
- Providing local knowledge
- Acquiring data
- Validating assumptions, global data
- Ensuring relevance
- Using results

Stakeholder challenges:

- Legitimacy, equity
- Time & expense
- Quantifying qualitative info
- Conflict
- Consultation fatigue
- Replicability

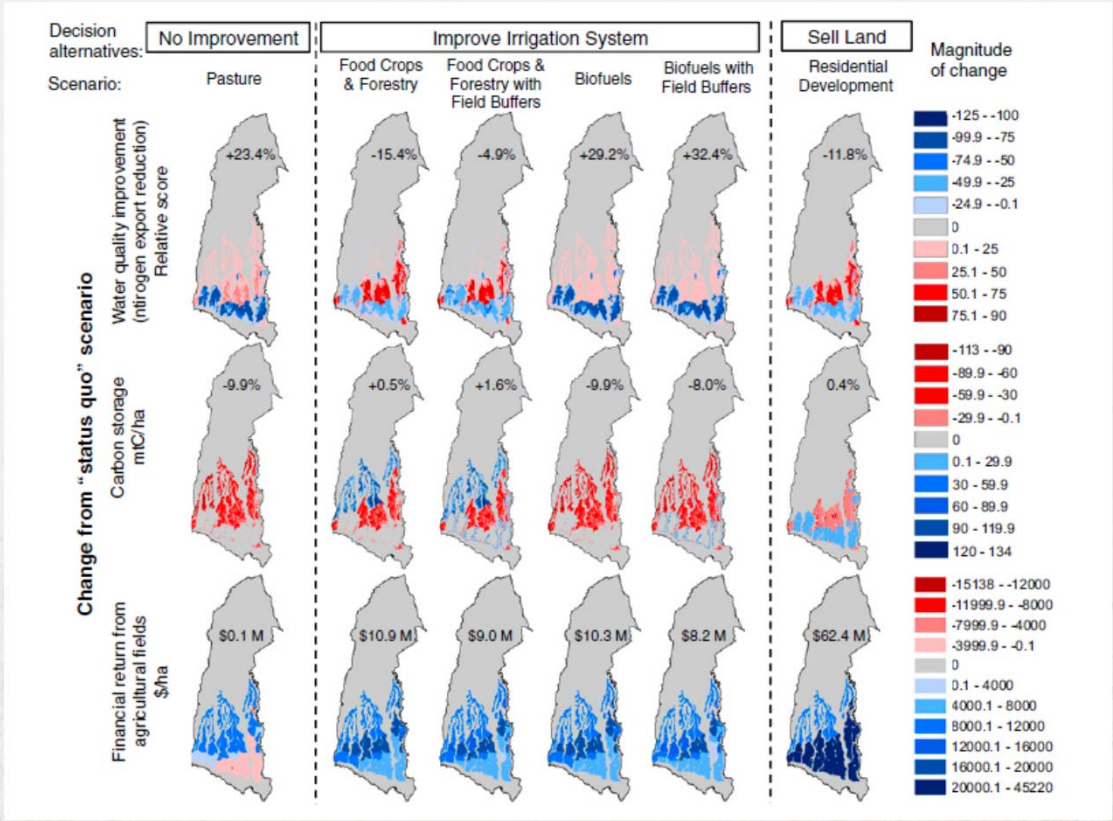
ONE EXAMPLE
OAHU, HAWAI'I

- Comparing multiple options
  - What future should we choose?
- With multiple goals
  - communicate with stakeholders
  - select among options
  - illustrate benefits



Goldstein et al. 2009

ECOSYSTEM SERVICE RESULTS



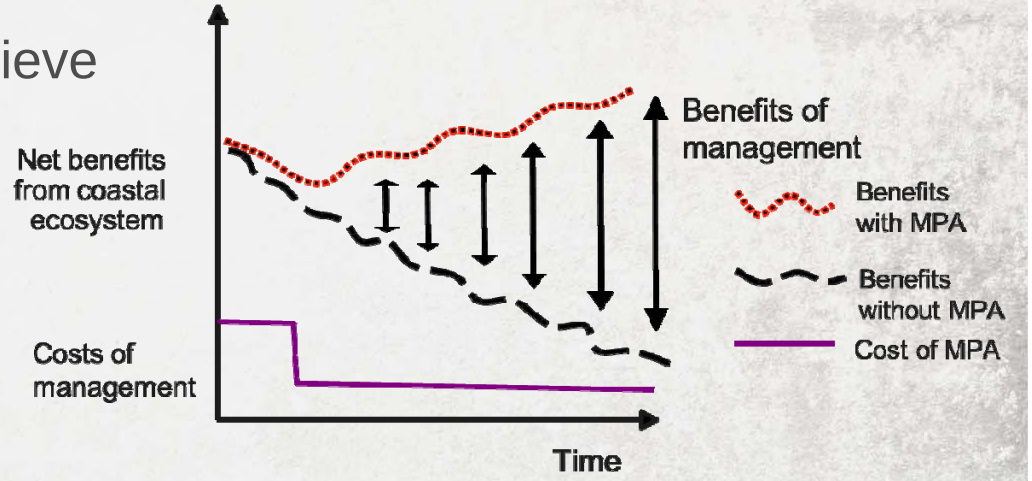
Goldstein et al. 2009

TYPES OF SCENARIOS

Questions and goals for scenarios

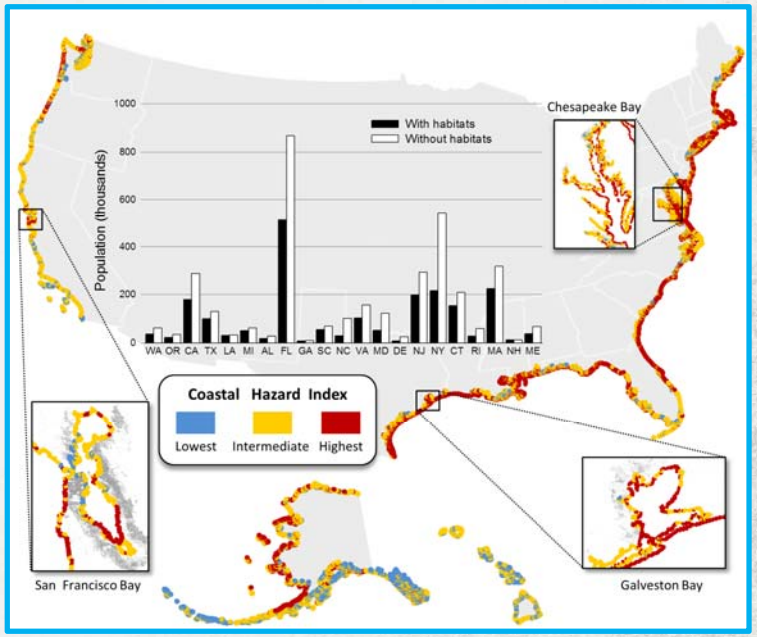
INTERVENTION SCENARIOS
DESIGNS FOR POLICIES, PLANS OR PROJECTS

- Typical question:
  - What are the best ways to achieve the future we want?
- Typical goals
  - Compare alternative options
  - Identify interventions that meet goals



EXPLORATION SCENARIOS

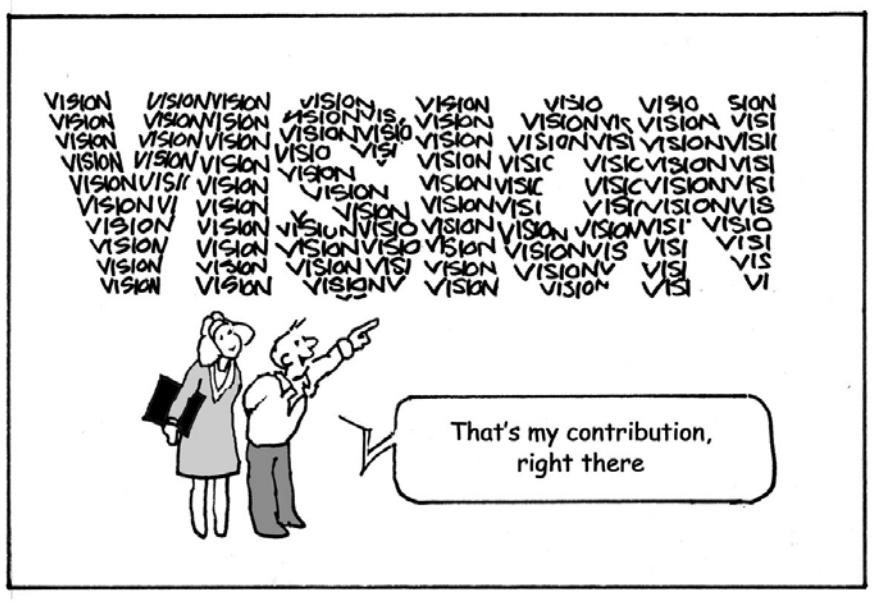
- Typical questions
  - Where might the future take us?
  - What can we do to prepare?
- Typical goals
  - Anticipate unexpected future circumstances
  - Make / choose policies robust in face of future change



Arkema et al. 2013

VISION SCENARIOS

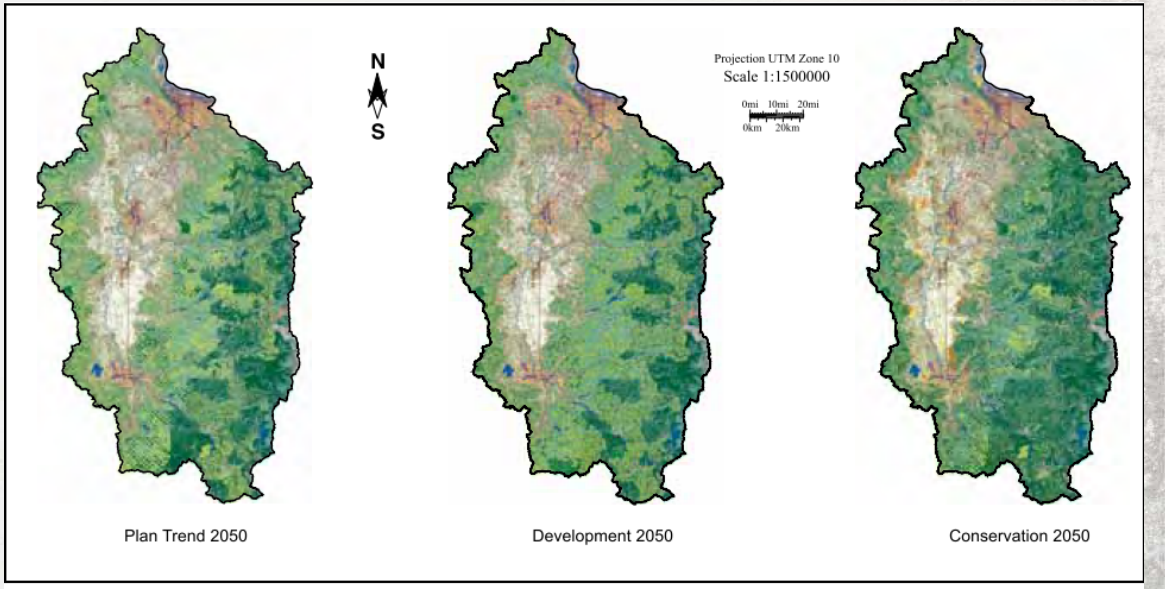
- Typical questions
  - What future do we want?
  - What goals do we share?
- Typical goals
  - Develop shared vision
  - Resolve / clarify conflicts and differences



Coupleontherun.com

PROJECTIONS

- Typical question
  - What future do we expect?
- Typical goal
  - Evaluate consequences of current policies
  - Baseline to compare with other scenarios



Land use/land cover of alternative futures for the year 2050. *Figure 2 in Hulse et al. (2004) Ecological Applications.*

HOW DO I CREATE SCENARIOS?

Approaches and Tools

DEVELOPING SCENARIOS

THE FIVE STEPS TO CREATE YOUR SCENARIO

KNOW WHY

DECIDE HOW

REACH OUT

GET DATA

REFINE RESULTS

SETTLING WITH COMPROMISE. Scenario development is as much art as science. There are many options available. It helps to accept that there are no perfect scenarios; it will always be a compromise.

WHAT MAKES A SCENARIO?
KEY ELEMENTS

Drivers

- any natural or human-induced factor that directly or indirectly causes a change in an ecosystem

Rules

- principles or conditions that prescribe how changes will occur in the future

Others

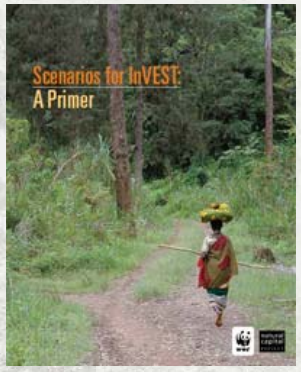
- timeframe
- spatial scale and extent

WHAT MAKES A USEFUL SCENARIO?

KEY CHARACTERISTICS

- **Relevant:** Do the scenarios align with the problems and questions of interest to stakeholders and decision-makers?
- **Participatory:** Are stakeholders involved meaningfully in the process of developing scenarios?
- **Legitimate:** Does the scenario development process include diverse stakeholder views and beliefs?
- **Plausible:** Do the scenarios tell coherent stories that could conceivably happen?
- **Understandable:** Are the scenarios accessible to the target audience?
- **Distinct:** Are the scenarios sufficiently dissimilar to show contrasting ecosystem service impacts?
- **Scientifically credible:** Are scenario storylines and maps scientifically robust and credible?
- **Comprehensive:** Do the scenarios consider all relevant drivers?
- **Iterative:** Are the scenarios refined and revised on the basis of stakeholder input and emerging trends?
- **Surprising:** Do the scenarios challenge assumptions and broaden perspectives about unexpected developments?

SCENARIO GUIDANCE
GUIDE AND CASE STUDIES



Step 1: Understand scenarios	Sections 2 & 3
Step 2: Select the right scenario approach	Section 4
Step 3: Develop scenario storylines	Section 5
Step 4: Create scenario maps	Section 6
Step 5: Assess ecosystem service outcomes	InVEST User Guide
Step 6: Use and communicate results	Section 7

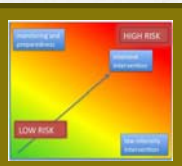
SCENARIO TOOLS
FROM THE INVEST TOOLKIT

natural capital PROJECT


Scenario Generator


InSEAM


Scenario Guide



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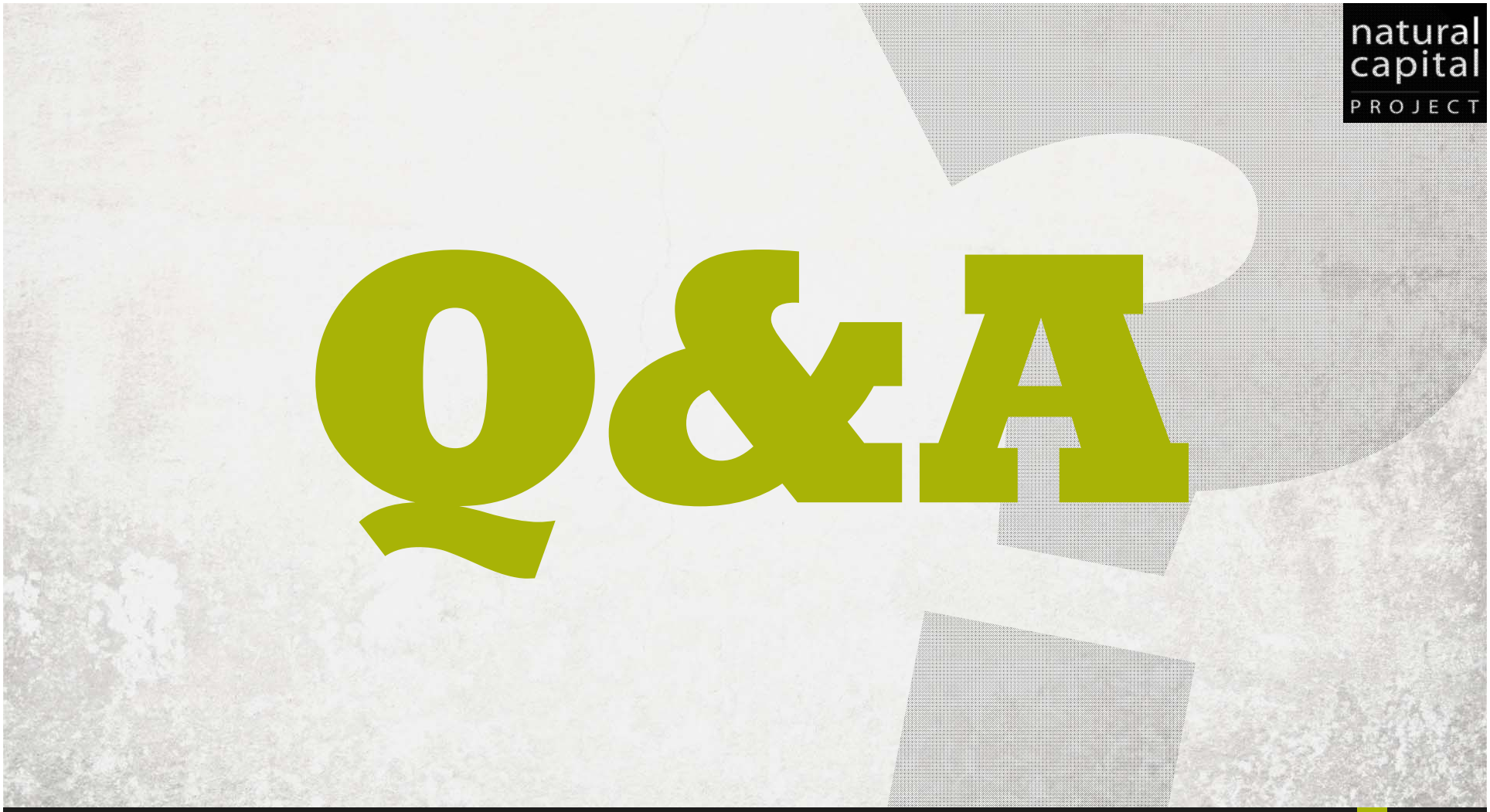
SCENARIO TOOLS. Many other tools are available, including Climate Wizard, Vensim and Land Change Modeler.


natural
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PROJECT
Q&A

SCENARIOS QUIZ

What have you learned?

HOW DO YOU DEFINE SCENARIOS?

WHAT ROLE CAN STAKEHOLDERS PLAY?

WHAT ARE 4 TYPES OF SCENARIOS?

NAME 3 CHARACTERISTICS OF USEFUL SCENARIOS.