Participatory Modelling - What, Why and How?

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Challenges and opportunities

- Systems are highly complex

- Does it mean that we need more details in our models?

- There is no one correct, value neutral solution

- Many more regulatory decisions end up in court

- How to make models that are used?

- Can local knowledge and iterative participatory interactions help?

Some history

- 1960's - Forrester's system dynamics: involve clients in model construction;

- 1960-70's - Collaborative Learning - learning through group communication;

- 1970's - "Sunshine Laws" adopted by the US federal and state governments, requiring meetings, decisions and records of the regulatory authorities to be made available to the public;

- 1970's - US Army Corps of Engineers - stakeholder participation in environmental decision making and assessment;

- 1980's - Participatory simulation - simulation games - Meadows' Fish Banks

Some history

- 1990's -

  ▸ Companion Modeling - CIRAD

  ▸ Shared Vision Planning - US ACE

  ▸ Group Model Building - Vennix et al.

- 2000's -

  ▸ Mediated Modeling - "Mediated Modelling Partners, LLC"

  ▸ HubNet - play games over the Internet

- Participatory Modeling

Participatory modeling

- Participatory modeling is the process of incorporating stakeholders, including the public and decision-makers, into the modeling process

- Soliciting information from stakeholders: integrating scientific knowledge with local knowledge

- Leveling the playing field: co-learning, co-understanding

- Goal driven: you know how the model will be used

- Creating models that stakeholders need

Types of participation

- Passive participation, in which the objective is just to inform people;

- Extracting information from people for the scientist who needs data;

- Participation to support the decisions, in which stakeholders are used to promote and articulate the chosen decisions;

- Interactive participation, where stakeholders share the diagnostic and analytical methods and tools or results;

- Self organisation, where the lessons from the participatory process are transformed into decisions by the stakeholders themselves.

After Pretty (1995)

Types of participation

- Extractive use, in which knowledge, values or preferences are synthesized by the extracting group and passed on as a diagnosis to a decision-making process;

- Co-learning, in which syntheses are developed jointly and the implications are passed to a decision-making process;

- Co-management, in which the participants perform the syntheses and include them in a joint decision-making process.

After Lynam (2007)

Software tools

- System dynamics

  ‣ Stella, Vensim, Powersim, Madonna, Simile or extendable tools, such as Extend, GoldSim, Simulink

- Fuzzy cognitive mapping

  ‣ FCMapper

- Bayesian networks

  ‣ Netica, Hugin, Analytica, DBLi

- Agent based

  ‣ Repast, NetLogo, Mason or Cormas
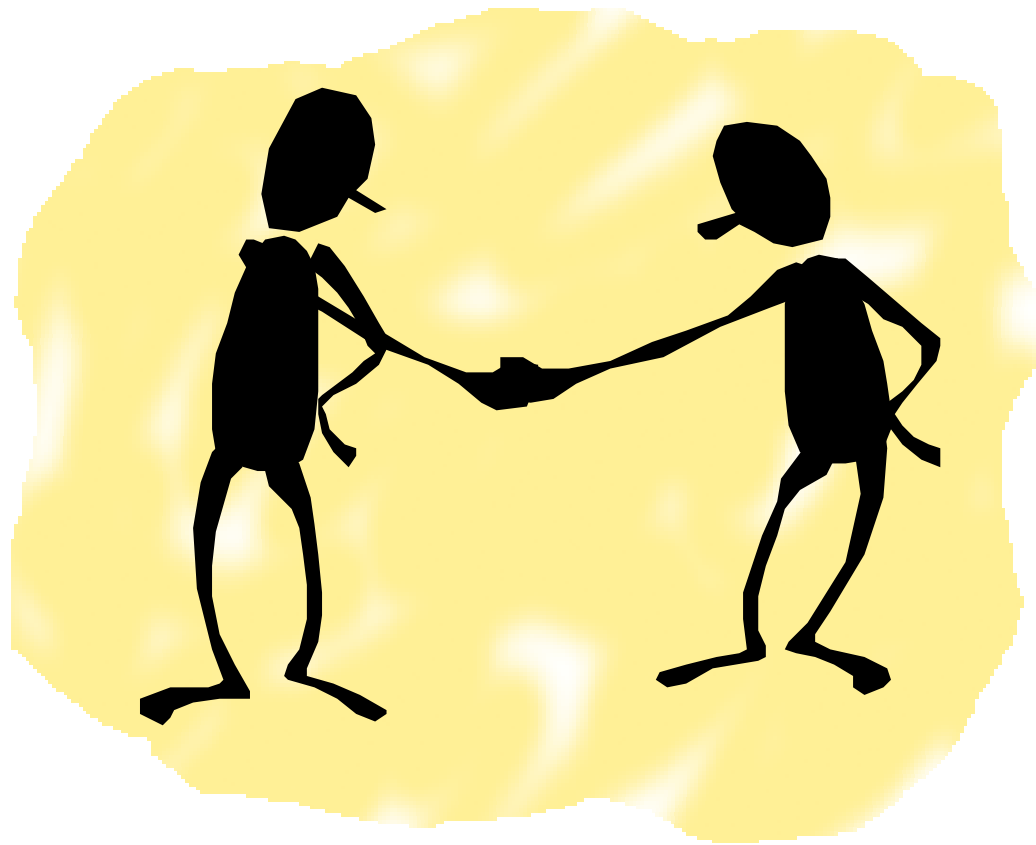
Participatory modeling

- Open and transparent modeling process is a way to avoid potential conflict, misunderstanding and even litigation

- A model as a tool for deliberations and consensus

- Helps to deal with uncertainties

- The process is more important than the result

The Process
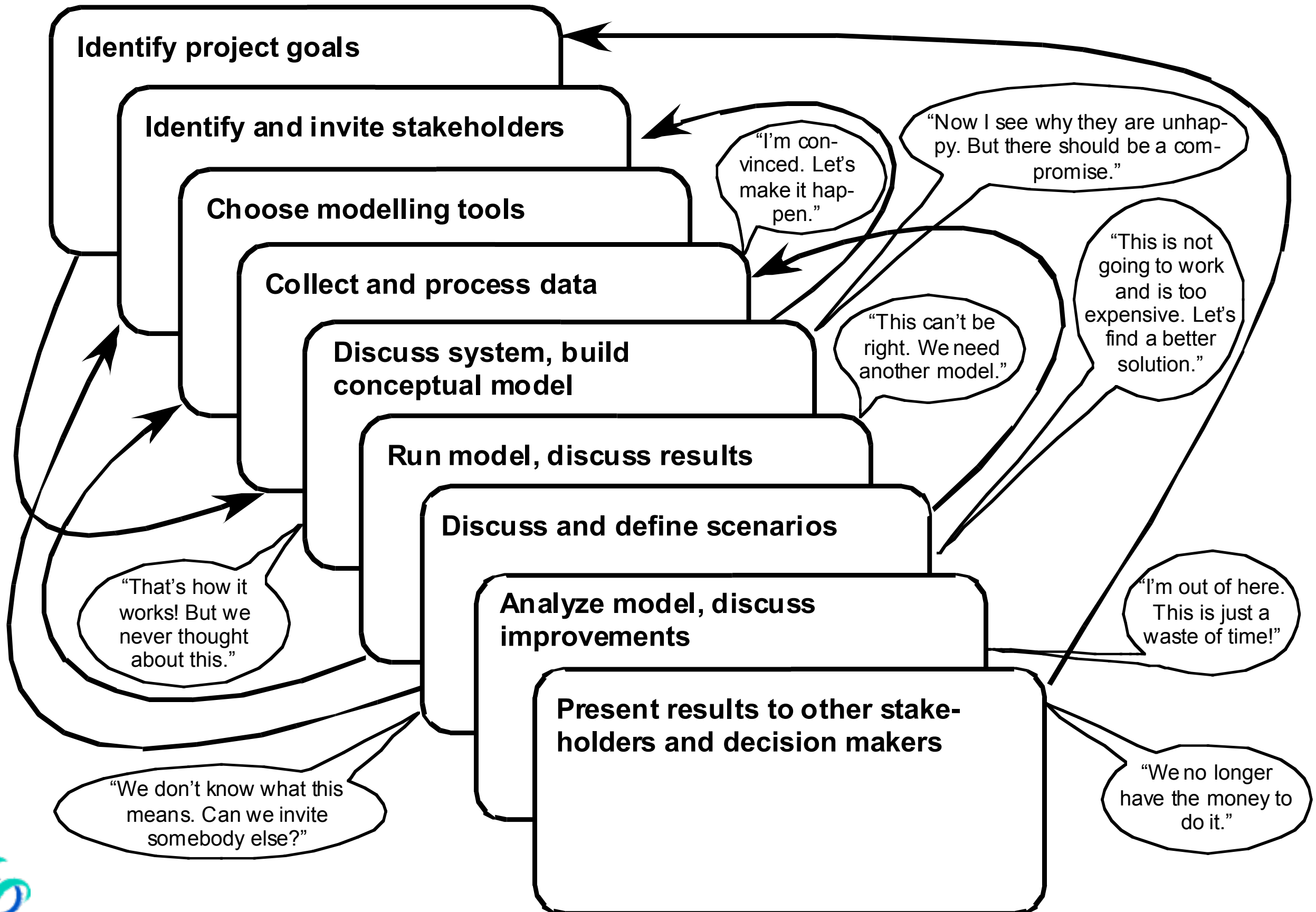
Good practice of participatory modeling

1. Identify a clear problem and lead stakeholders

2. Engage stakeholders as early and often as possible

3. Create an appropriately representative working group

4. Gain trust and establish neutrality as a scientist

5. Know your stakeholders and acknowledge conflict

6. Select appropriate modeling tools to answer questions that are clearly identified. Keep it simple

7. Gain acceptance of modeling methodology before presenting model results

8. Incorporate all forms of stakeholder knowledge

9. Engage stakeholders in discussions regarding uncertainty

10. Develop scenarios that are both politically feasible and most effective

11. Interpret results in conjunction with stakeholders, facilitate development of new policy and management ideas, engage stakeholders in reporting results

12. Treat the model as a process

Voinov, A., Gaddis, E.J.B., Lessons for successful participatory watershed modeling: A perspective from modeling practitioners, Ecol. Model.(2008), doi:10.1016/j.ecolmodel.2008.03.010

Some generic principles of good participatory modelling

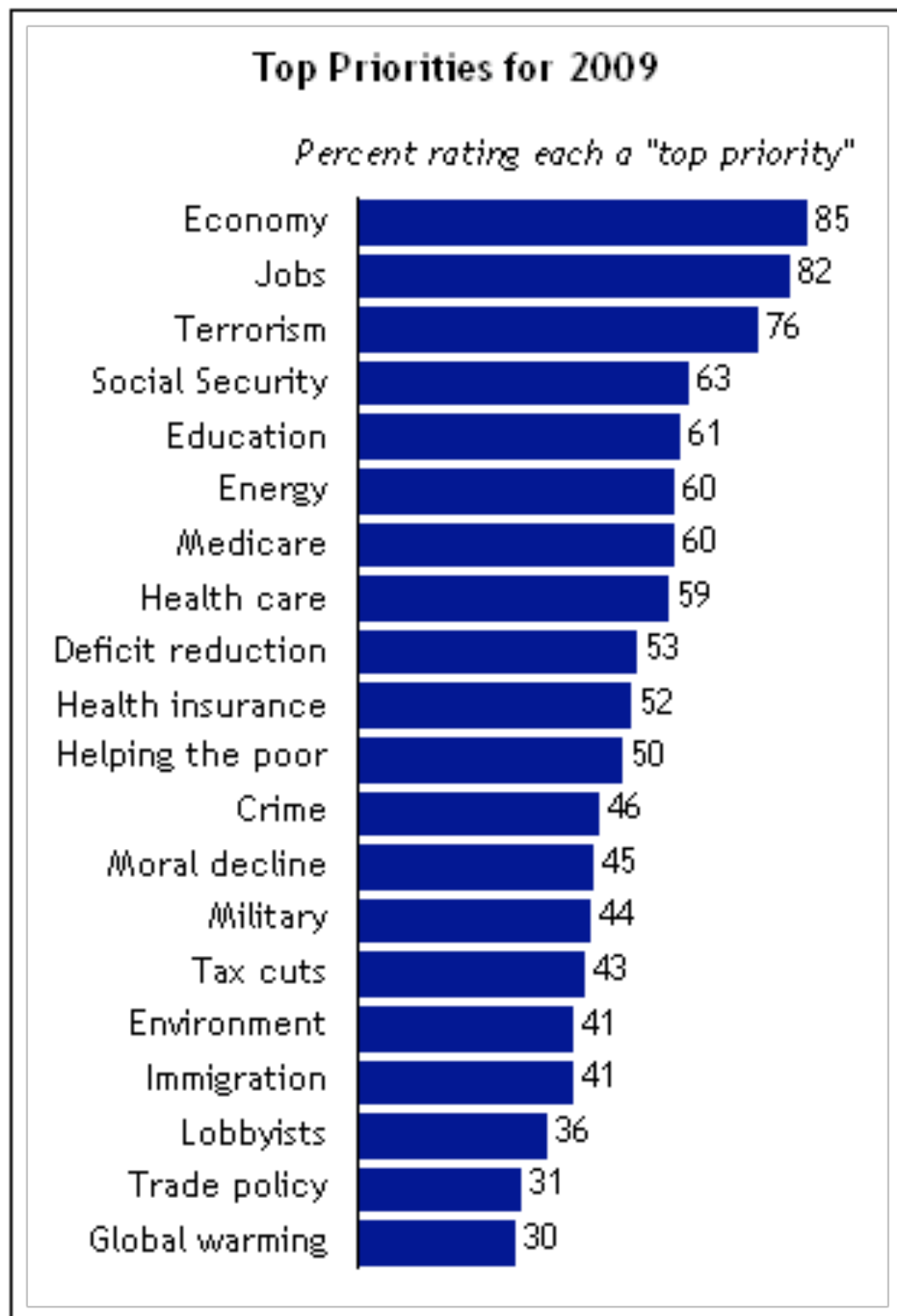| |
|---|
| Keep it flexible and focus on the process rather than the product |
| Environmental systems are open in time and space: make the process that deals with them also open and evolving. Promote adaptive management, adaptive modelling and adaptive decision making |
| Maintain societal and scientific openness, and transparency of methods and models. Rely on collaborative research, and open source models |
| Mind the people. Always be aware of social and group dynamics, special interests, power and hierarchies |
| Facilitate and encourage learning - learn from each other and the process |
| Go in circles and branch out - go back, reiterate, refine |
| Accept a different kind of uncertainty - be certain about uncertainty |
| Accept untraditional metrics of success - group validation and verification |
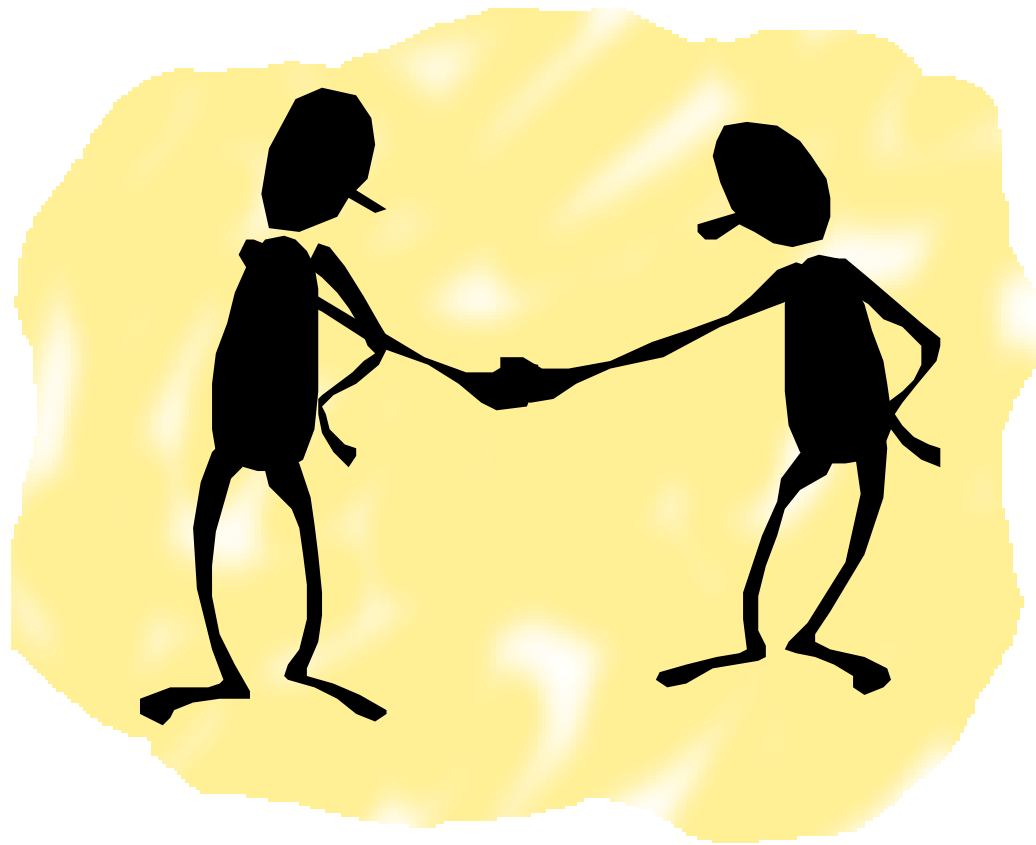
Participatory modeling

But:

- Long, expensive, and unpredictable modeling process;

- Hard to replicate and generalize;

- Who are the stakeholders?

Who are the stakeholders?

- Democracies poorly handle emergencies

Top Priorities for 2009

Percent rating each a "top priority"

Priority	Percent
Economy	85
Jobs	82
Terrorism	76
Social Security	63
Education	61
Energy	60
Medicare	60
Health care	59
Deficit reduction	53
Health insurance	52
Helping the poor	50
Crime	46
Moral decline	45
Military	44
Tax cuts	43
Environment	41
Immigration	41
Lobbyists	36
Trade policy	31
Global warming	30

Protecting Environment Declines as Top Priority

% rating environmental protection as a 'top priority'

	Jan 2008 %	Jan 2009 %	Change
Total	56	41	-15
Men	55	39	-16
Women	57	43	-14
18-34	55	43	-12
35-49	58	41	-17
50-64	56	35	-21
65+	57	45	-12
College grad	46	35	-11
Some college	58	36	-22
HS or less	61	48	-13
Republican	39	20	-19
Independent	56	41	-15
Democrat	67	54	-13
Mod/Cons Dem	63	54	-9
Liberal Dem	74	57	-17

Pew Research Center: http://people-press.org/report/485/economy-top-policy-priority

Who are the stakeholders?

Environment Less of a Priority
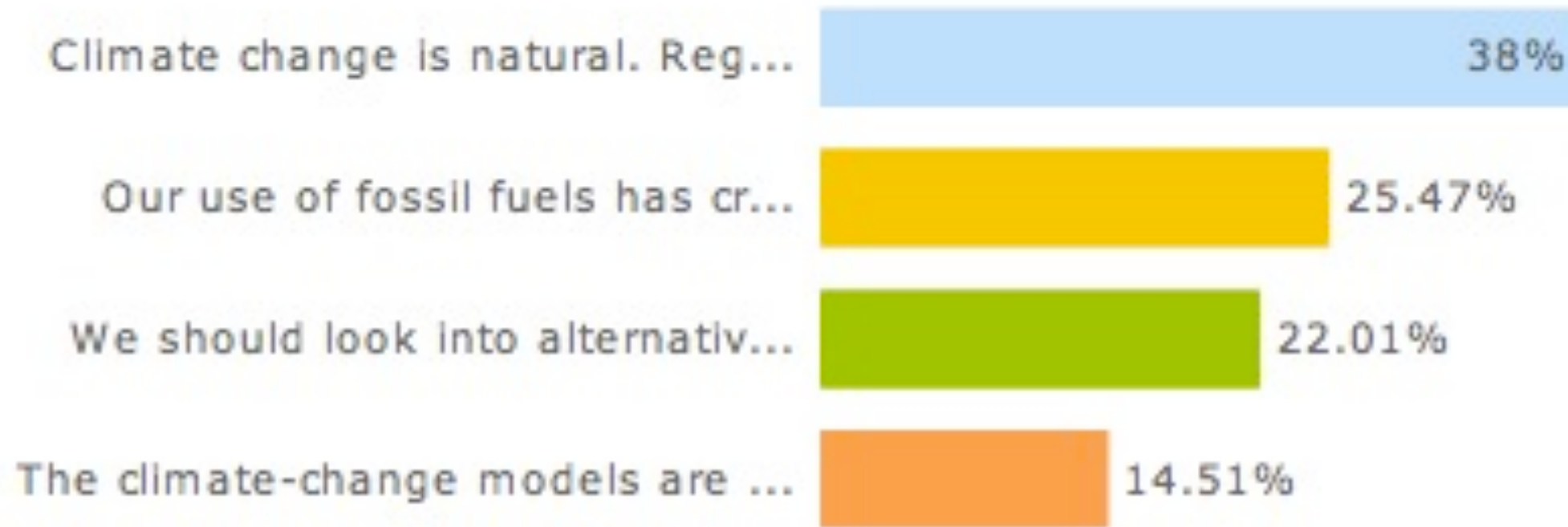*Percent rating the issue a "top priority"*
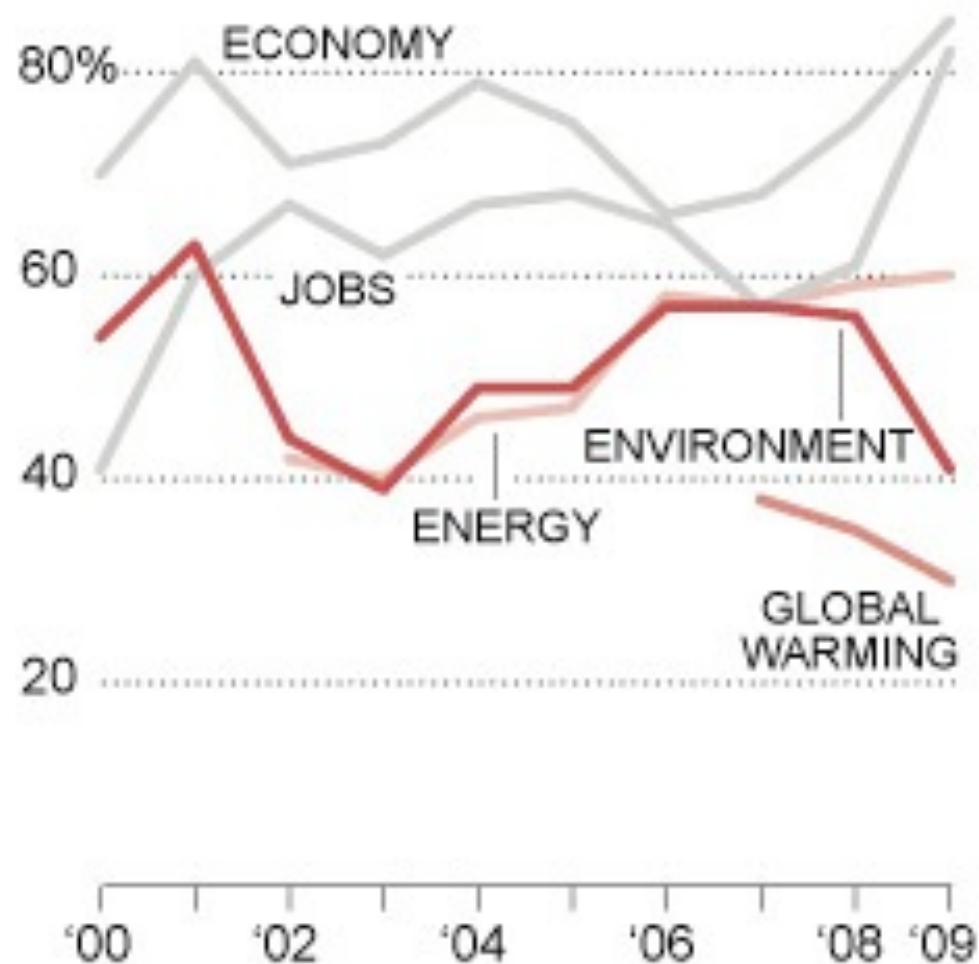
Source: Pew Research Center

THE NEW YORK TIMES

- Forty-four percent (44%) of U.S. voters now say long-term planetary trends are the cause of global warming, compared to 41% who blame it on human activity.

- Seven percent (7%) attribute global warming to some other reason, and nine percent (9%) are unsure

- In July 2006, 46% of voters said global warming is caused primarily by human activities, while 35% said it is due to long-term planetary trends.

Who are the stakeholders?

- American Society of Civil Engineers poll:

Climate change is natural. Reg...	38%
Our use of fossil fuels has cr...	25.47%
We should look into alternativ...	22.01%
The climate-change models are ...	14.51%

▪	Climate change is natural. Regulations will only benefit some companies and will hurt most of the rest of us.	38%
▪	Our use of fossil fuels has created a crisis. We need emission reduction regulations to halt climate change.	25.47%
▪	We should look into alternative energy sources, but climate change isn't as dire as some predict.	22.01%
▪	The climate-change models are so flawed, we have no idea what's really going on.	14.51%

Strategic Environmental Assessment

- Decisions will be taken with, or without, the information that we can provide.

- Decisions that matter are mostly informal, and it is those informal decisions that we should target.

- SEA is the process of influencing decisions in general

- SEA is a continuous process, instead of a one-stage reporting exercise.

'SEA' term - 1989

"The environmental assessments appropriate to policies, plans and programmes are of a more strategic nature than those applicable to individual projects and are likely to differ from them in several important respects….We have adopted the term 'strategic environmental assessment' (SEA) to describe this type of assessment."

Wood C, Djeddour M. Environmental assessment of policies, plans and programmes. Interim report to the Commission of European Communities. UK: EIA Centre, University of Manchester; 1989 (final report submitted 1990, Contract No B6617-571-572-89)

SEA effectiveness criteria in professional literature

- SEA should ensure that environmental aspects are given due consideration in policy, plan and program (PPP) making;

- SEA should be integrated and sustainability-led, supporting a pro-active planning process that is driven by clear goals and objectives; apart from environmental aspects, SEA should also consider economic and social aspects.

- SEA should be carried out with professionalism and those conducting it should be made accountable;

- SEA should document and justify how environmental and sustainability objectives are considered in PPP practices in a transparent and simple manner; in this context, quality control is said to be of great importance;

T.B. Fischer, P. Gazzola / Environmental Impact Assessment Review 26 (2006), p. 401

SEA effectiveness criteria in professional literature

- SEA should be stakeholder-driven, explicitly addressing the public's inputs and concerns, ensuring access to relevant information of the PPP making process;

- SEA should provide sufficient, reliable and usable information in a cost and time efficient manner;

- SEA should be iterative, being part of an ongoing decision cycle; it should inspire future planning through the potential amendment of strategic decisions; in this context, SEA needs to be applied in a tiered manner with effective project EIA within an established PPP framework;

- SEA should be flexible and adaptive to the PPP process

T.B. Fischer, P. Gazzola / Environmental Impact Assessment Review 26 (2006), p. 401

SEA criteria: methodology

- High degree of accountability and quality control,

- Process is stakeholder driven, focused, iterative, flexible

- Process is adaptable

- Process is transparent and open to the input of the general public

- Process is cost and time efficient in generation of sufficient, reliable and usable information on environmental baseline, impact and alternatives assessment.

Tuesday, March 30, 2010

Concerns

- Are there losers and winners? Who is empowered and who is disempowered?

- How to deal with the power issues?

- What is the future of the started process? What happens when the researchers go away?

- How to scale up and down? How to transfer knowledge and results from one hierarchical level to another?

- How to deal with costs (time and money)?

- What are the commonalities? What can be replicated?