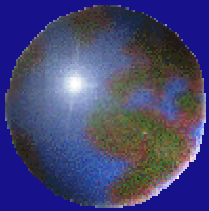




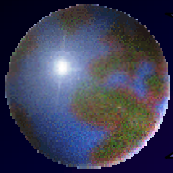
Australian Government

Department of Agriculture, Fisheries and Forestry



No more tea leaves and entrails: strategic foresight in the twenty first century

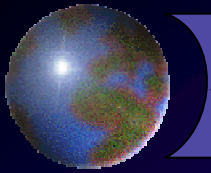
Peter Black BVSc MPVM MACVSc MSc
Principal Research Scientist
Office of the Chief Veterinary Officer
Australia



Outline of presentation

*Generic issues then
emerging infectious disease as an example*

- **Definitions**
- **Why bother?**
- **Historical context**
- **What is different (now)?**
- **Where to invest resources for the future**

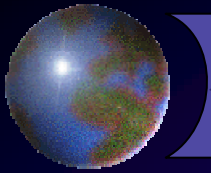


EID definition

Infections that have newly appeared in the population or

Existed, but rapidly increasing incidence or geographic range

Morse SS (1995) 'Factors in the emergence of infectious diseases', *Emerging infectious diseases*, vol. 1, pp. 7–15.



Strategic foresight

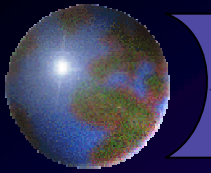
**Is the ability to create and maintain
viable forward views**

and

**to use the insights arising in socially
useful ways**

Richard Slaughter

<http://www.swin.edu.au/afi/>



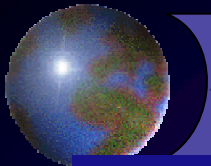
Foresight - It is not rocket science

- But it is a bit like common sense
 - i.e. not always that common

- Definitely a human capacity

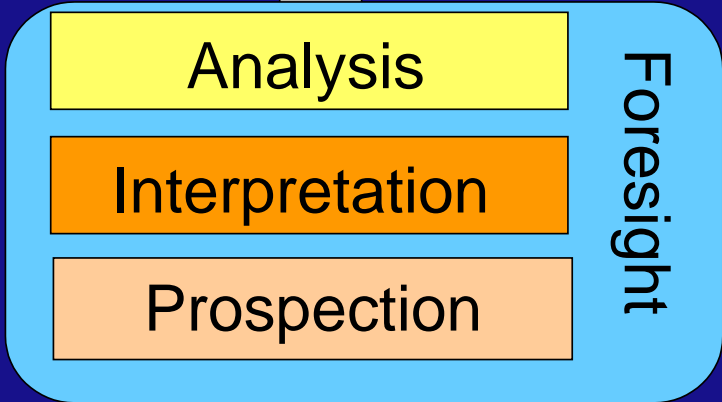
- On the surface – banal!!

'I have always done this – it is nothing new'



Inputs

look and see what's happening



“what seems to be happening?”

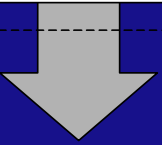
“what's really happening?”

“what might happen?”

Outputs

“what might we need to do?”

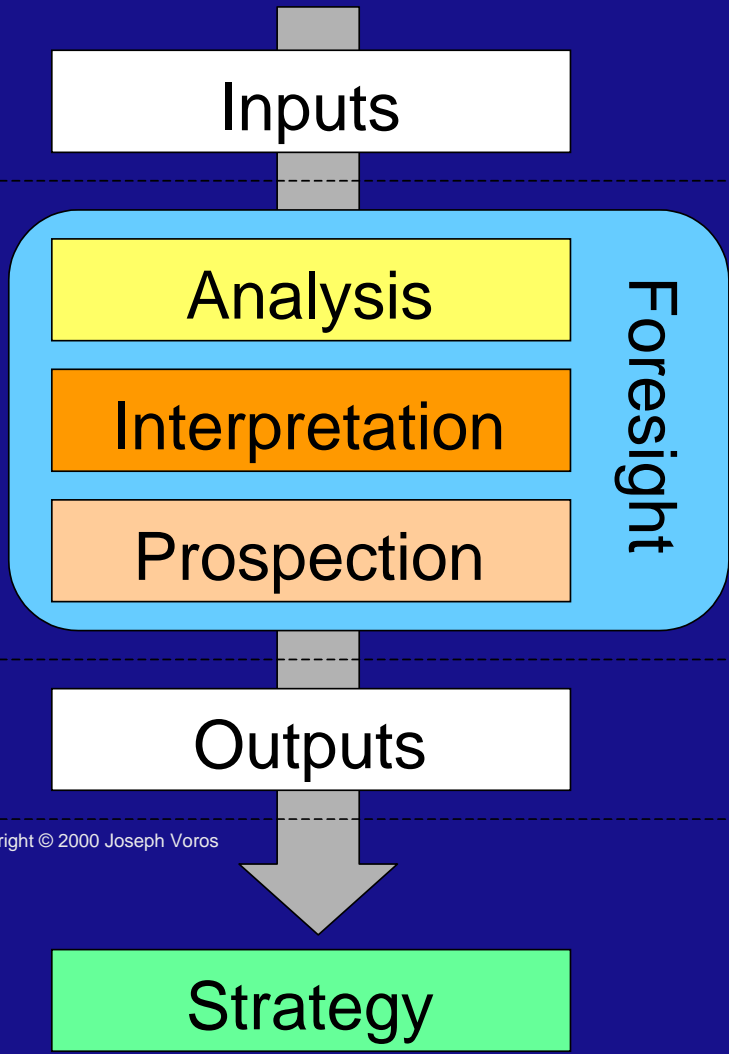
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Strategy

“what will we do?”

“how will we do it?”



Environmental Scanning

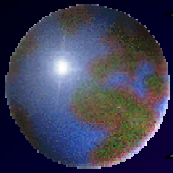
Trends/Forecasts
 emerging issues analysis
 Cross-impact matrices
 Systems Thinking (IOS)
 Causal Layered Analysis
 Scenarios, “Visioning” &
 backcasts

**Expanded Perceptions
 of Strategic Options**

**Strategy Development &
 Strategic Planning:
 individual, organisation, society,
 workgroup**

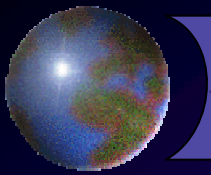
Copyright © 2000 Joseph Voros

Adapted from Voros, J (2003) 'A generic foresight process framework',



Why bother?

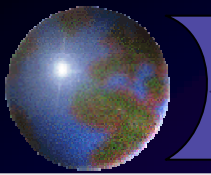
- Increase decision making space – i.e. wiser decisions
 - Quality of life, survival
- Increase range of strategic options
- Individual level – direct feedback; benefits are clear
- Group level – some say limited to concern about close group – beyond that?
- If this is true – what does the future of the globe look like?



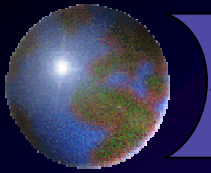
Historical context

- ❖ Veterinary medicine - Thrusfield
- ❖ 5 stable periods and revolutions up to middle of 20th Century relating to disease control

Discussion about the 5 periods on Veterinary Medicine is drawn directly from Thrusfield 2004, *Veterinary Epidemiology*, 3rd edition

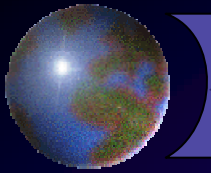


Period	Time	Features
1	Up to 1 st century AD	Horse
2	Up to 1762	Horse
3	1762-1884	Animal plagues
4	1884-1960	Microbial theory, eradication
5	1960-2006	Causality, technology, eradication
6	2006+	Global issues



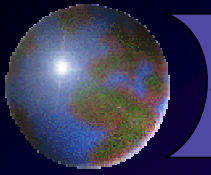
The enlightenment

- Physical universe is orderly – explained mathematically – extension to biological world
- Mathematical models of disease epidemics
- Quantification, probability, statistical inference, prediction
- However – careful assessment required
 - 'may convey an illusion of certainty and security that is not warranted (Gupta 2001 cited in Thrusfield 2004)



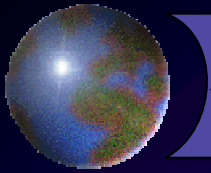
Currently

- Infectious disease still important globally including transboundary diseases (TBDs) like FMD and HPAI
- Complex natural histories of disease
- Intensification (Livestock's Long Shadow)
- Subclinical disease
- EIDs – increasing rates, increasing interest



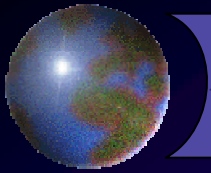
Sixth period (Black period): 2006...

- ⊕ What do I foresee?
- ⊕ Concentrate on EIDs
- ⊕ Foresight process



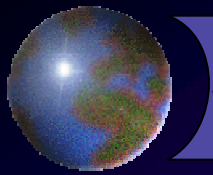
What is different?

- ⊕ This time in history
- ⊕ Speed of change
- ⊕ Lack of agency
- ⊕ Increased understanding of systems
 - ▣ Complex adaptive systems, non-linear behaviour, resilience concepts



‘Wake up’ reports and other events

- Millennium Ecosystem Assessment (MEA)
- Stern
- IPCC
- Weather Makers - Tim Flannery
- Inconvenient truth - Al Gore
- Water, water, water!!!!
 - ▣ experienced directly

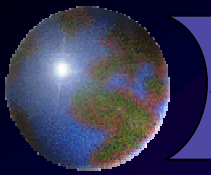


Limits to growth?

- Growing human population and economics inevitably must butt against the resource limits of a finite planet. The increasing complexity and extent of society over hundreds of millennia must at some point reach the scale of the planet itself. That point is now'

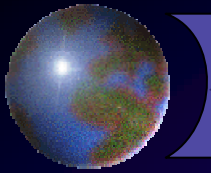
Raskin, P; Banuri; T; Gallopin, G, Gutman, P; Hammond, A; Kates, R; and Swart, R. (2002). *Great transition- Promise and lure of the times head,*

Stockholm Environment Institute, Boston



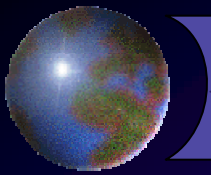
MEA Finding #1

- Over the past 50 years, humans have changed ecosystems more rapidly and extensively than in any comparable period of time in human history
- This has resulted in a substantial and largely irreversible loss in the diversity of life on Earth



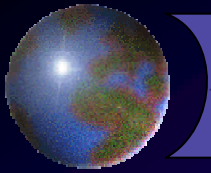
MEA Finding #2

- ❑ Ecosystems change lead to substantial net gains in human well-being and economic development
- ❑ But these gains have been achieved at growing costs that, unless addressed, will substantially diminish the benefits that future generations obtain from ecosystems



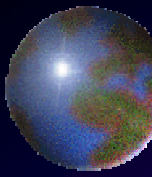
MEA Finding #3:

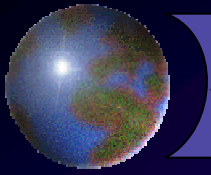
- The degradation of ecosystem services could grow significantly worse during the first half of this century and is a barrier to achieving the Millennium Development Goals



Finding #4:

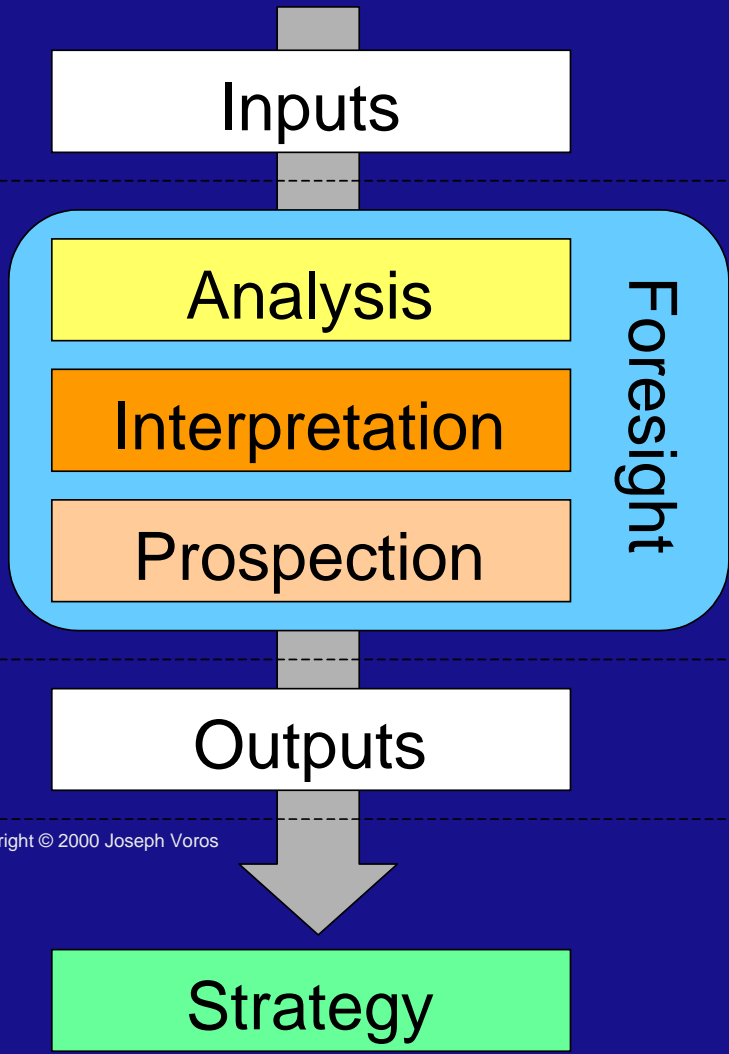
- ❑ The challenge of reversing the degradation of ecosystems while meeting increasing demands for their services could be met - but these would involve significant changes in policies, institutions and practices, that are not currently under way
- ❑ Many options exist to conserve or enhance specific ecosystem services in ways that reduce negative trade-offs or that provide positive synergies with other ecosystem services





e.g. Global warming (GEC)

- Issue kicked into play and rapid change in focus from politicians and public
- Now firmly on the agenda
- We are all part of the system in every way



Environmental Scanning

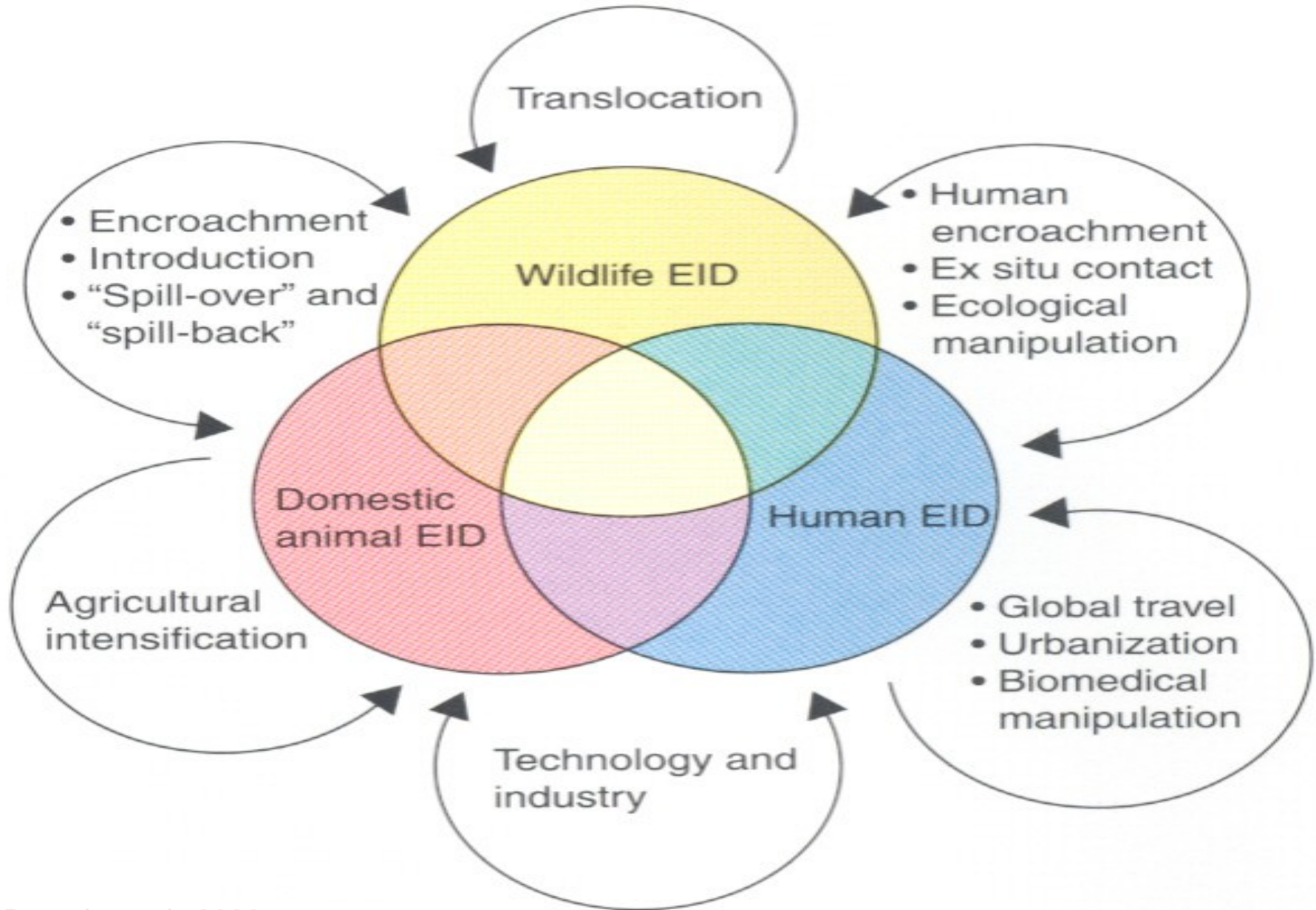
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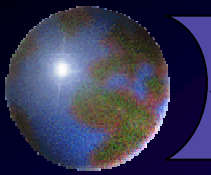
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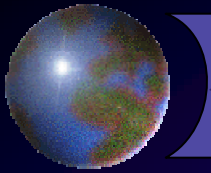
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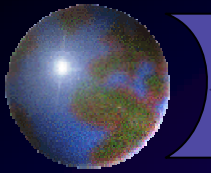
Profile of 'typical' emerging human pathogen

- An RNA virus that is vector borne with zoonotic potential (reservoir host range that is taxonomically and ecologically broad)
- Potentially transmissible between humans
- Found in areas undergoing ecological, demographic or social change



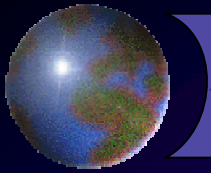
Typical responses

- ⊕ Increased emphasis on prediction and forecasting
- ⊕ Actually an extension of entrails, tea leaves and crystal balls
- ⊕ Scientific – but driven by same desire of decreasing uncertainty
- ⊕ Much epidemiology works within this framework



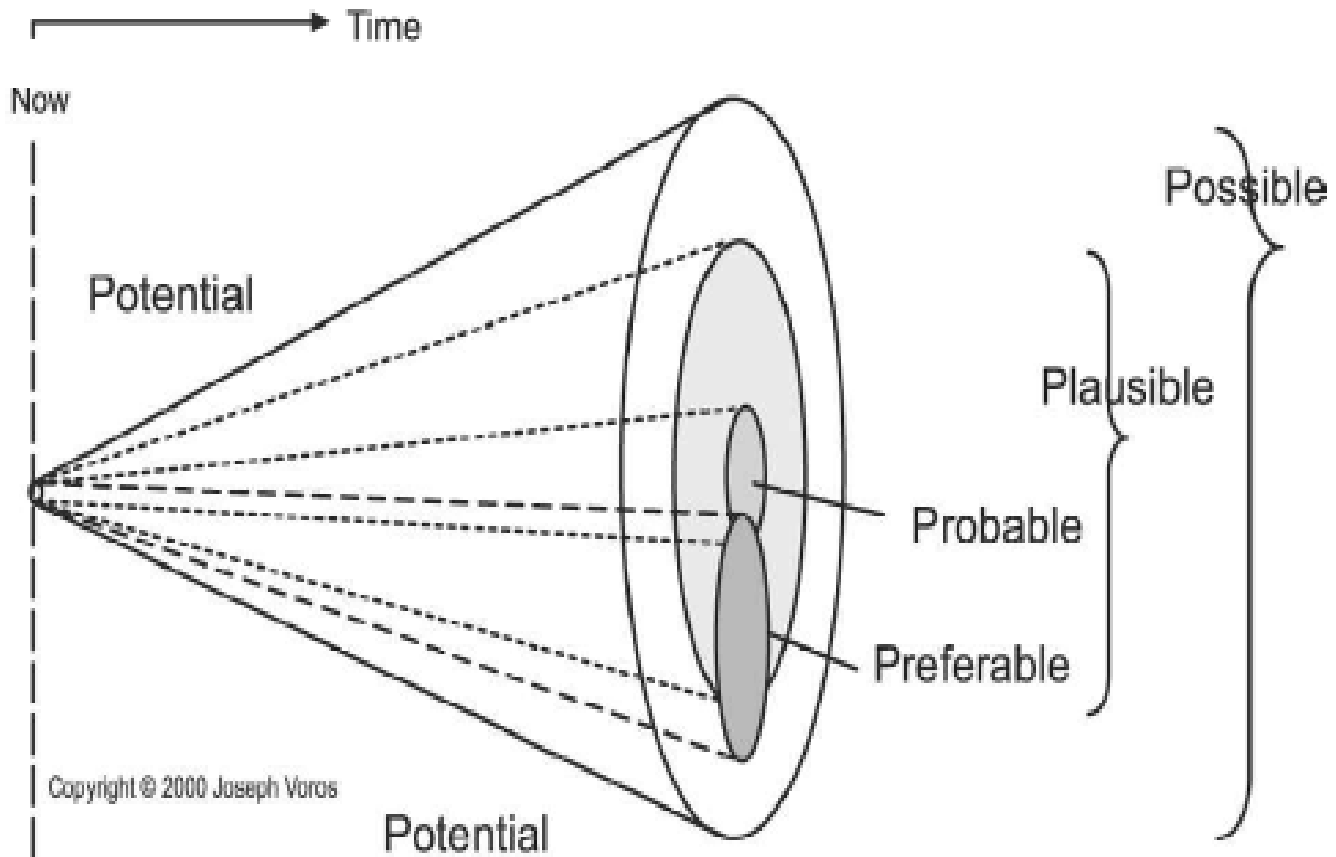
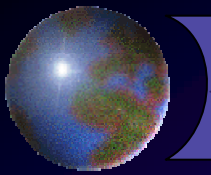
Forecast by Black July 2007

- More EIDs and likely to be RNA viruses from areas undergoing rapid change
 - demographic, ecological and or social
 - ('I knew that')
- Not enough detail for a targeted prevention strategy
- Archetypal scenarios lead to same general conclusion

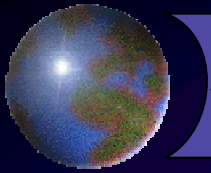


Foresight

- ⊕ Futures cone
- ⊕ Critical futures – contouring the unknown - examining alternative futures
- ⊕ Preferable futures

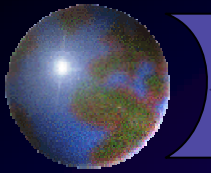


Source: Adapted from Hancock and Bezold (1994)



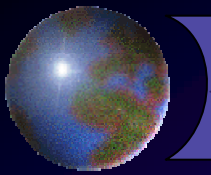
Foresight for probable future

- For EIDs factors of interest include
 - Increasing intensification/industrialisation (trend)
 - Demographic trends in different countries
 - Increasing protein demand
 - Economic development – more interest in environmental, food safety and animal welfare issues
 - New converging technologies (info, bio, nano)



Future for animal production

- Protein sources
- Market signals reflecting ecological impact (water use, energy use, greenhouse effects)
- Red meat less attractive
- Contract and converge
- 'Meat in vat'



Livestock production – promotes EIDs in a number of ways

- Livestock'should be a major policy focus when dealing with problems of land degradation, climate change and air pollution, water shortage and water pollution and loss of biodiversity'

Livestock's Long Shadow

Lead website: <http://www.virtualcentre.org>



Which preferable future?

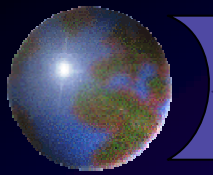
- Preferable future for who?
- Who decides globally
- Geopolitics will remain a key driver
- Changes in value (economics) expected
- EIDs are linked to all the big global issues – they are a symptom of a world under stress



So –

Build institutional responsiveness

- ❊ Increase our capacity to deal with complex systems
- ❊ Accept that 'we' alone do not have the answers (real engagement)
- ❊ Indeed, for many issues – there is no single answer, but a range of pathways
- ❊ Try to address more worldviews in range of options developed



Scientist's role

- ❖ A scientist's role in decision making shifts from inferring what will happen, that is making predictions which are the basis of decisions, to providing decision makers and the community, with an appreciation of how the future might unfold.

JJ Kay et al. 1999. An ecosystem approach for sustainability: addressing the challenge of complexity. *Futures* 31:721-742