

Dilemmas of a Modern Science Bureau in a Post-Modern World



Introduction

The South Florida Everglades is a vast, flat, wetland landscape that has been largely converted to agriculture and urban development. The remaining natural areas are fragmented and face significant threats from climate change, sea level rise, and human activities. The USGS is currently conducting a comprehensive study of the Everglades, focusing on water flow, sediment transport, and ecosystem health. This study is part of a larger effort to understand the impacts of human activities on the Everglades and to develop strategies for restoration and protection.

Background

The Everglades is a unique and valuable ecosystem that has provided a wide range of services to society, including water supply, flood protection, and wildlife habitat. However, the Everglades has been largely converted to agriculture and urban development, and the remaining natural areas are fragmented and face significant threats from climate change, sea level rise, and human activities. The USGS is currently conducting a comprehensive study of the Everglades, focusing on water flow, sediment transport, and ecosystem health. This study is part of a larger effort to understand the impacts of human activities on the Everglades and to develop strategies for restoration and protection.

Methods

The study is based on a combination of field observations, remote sensing, and modeling. Field observations include water level measurements, sediment sampling, and vegetation surveys. Remote sensing includes satellite imagery and aerial photography. Modeling includes hydrologic modeling, sediment transport modeling, and ecosystem modeling. The study is part of a larger effort to understand the impacts of human activities on the Everglades and to develop strategies for restoration and protection.

Results

The study has identified several key findings, including the following:

- Water flow is significantly reduced in the Everglades due to human activities, including dam construction and water diversion.
- Sediment transport is significantly reduced in the Everglades due to human activities, including dam construction and water diversion.
- Ecosystem health is significantly degraded in the Everglades due to human activities, including dam construction and water diversion.

Conclusions

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USGS

The Goal?

Optimal Intelligence Function

Produces a *shared believed-in* (single text) “map” of how the world works, *sufficient* to identify and secure common interests

Civility

Processes that identify and secure common interests

Human dignity

Participatory

Identifying interests
Identifying questions

Accessible

Understandable

Comprehensive

Including factors hard to measure but important

Relevant

to the immediate situation

Empirical

Cost-effective

Timely

Standards

USGS

1879

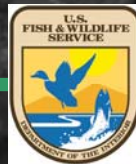
Division of Ornithology & Mammalogy

Division of Biological Survey

1896

Bureau of Biological Survey

1905



1939



National Biological Service

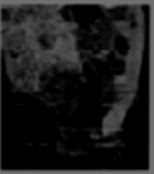
1993

Biological Resources Discipline

BRD

1996

Present



USGS

Structures of authority & control (internal)

U.S. Geological Survey

Director
Mark D. Myers

Deputy Director
Bob Doyle

Director, Office of Budget and Performance
Carla Burzyk

Director, Office of Communications and Outreach
Barbara Wainman

Biological Resources Discipline (BRD)

Associate Director Biology
Sue Haseltine

Associate Director, Administrative Policy & Services
Karen Baker

Regional Director Western Region
Anne Kinsinger (Acting)

Associate Director Geography
Barbara Ryan

Associate Director Human Capital
Pam Malam

Regional Director Central Region
Tom Casadevall

Associate Director Geology
Pat Leahy

Regional Director Eastern Region
Suzette Kimball

Associate Director Water
Bob Hirsch

Associate Director Geospatial Information and Chief Information Officer
Karen Siderelis

BRD

Tradition of not charging "customers" for administrative burden

Goals and goal-like statements

Produce science...

Reliable
Impartial
Accurate

Predictive models
Decision support tools

to serve customers

Resource Managers
Planners
Decision-makers
“citizens”

Agencies

& enhance agency prestige

“become a world leader”
“to strengthen our scientific leadership”
“to strengthen...our contribution”

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Produce science...

Reliable
Impartial
Accurate

Predictive models
Decision support tools

U.S. Geological Survey
to serve customers

Resource Managers
Planners
Decision-makers
"citizens"


Agencies

DEPARTMENT OF THE INTERIOR

Potential for Goal arrest, Goal inversion

Given evolutionary theory...

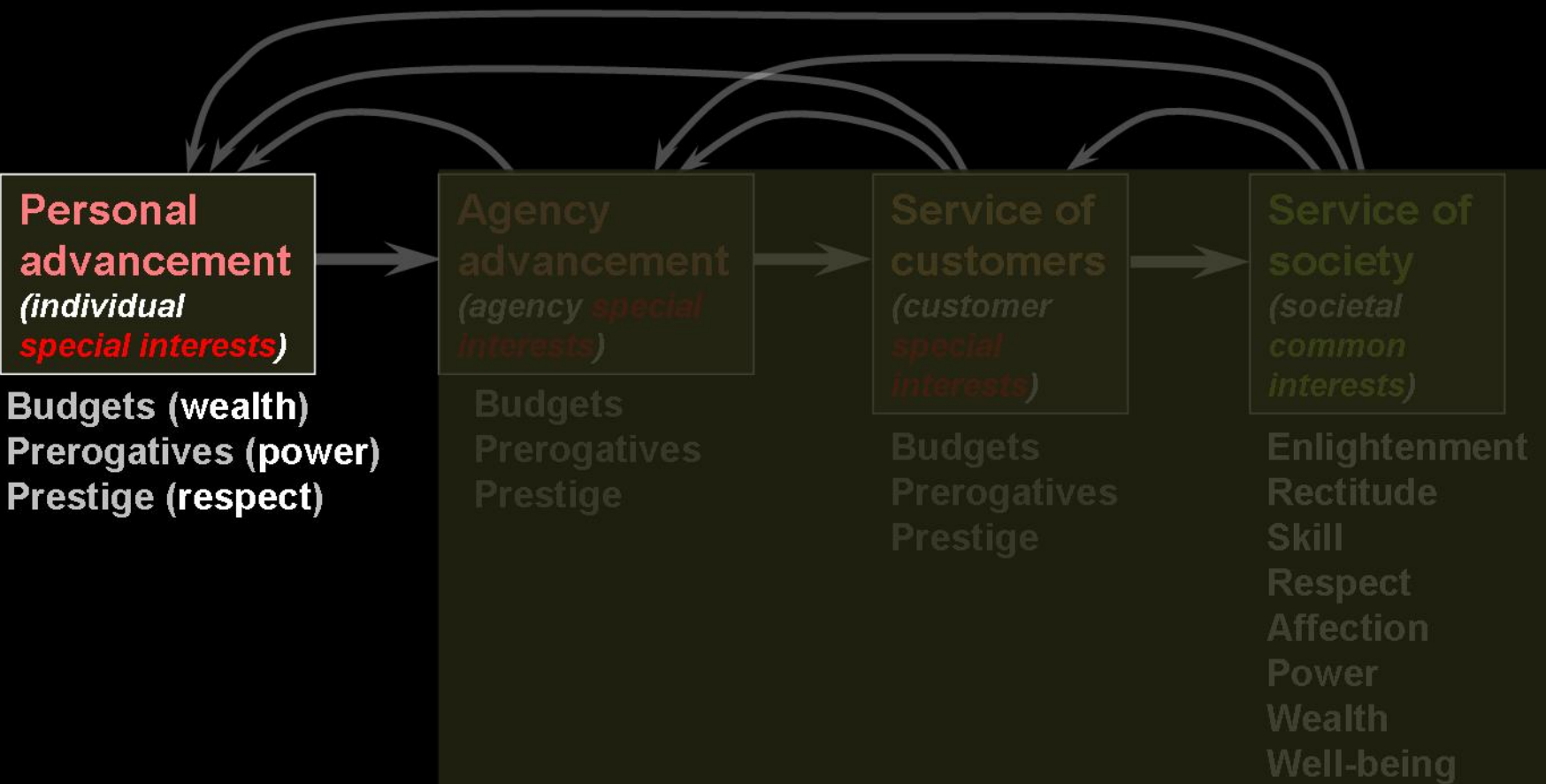
R. Trivers W. Hamilton

- I. **Self** ←
 - II. **Family (*near “kin”*)** ←
 - III. **The group of immediate resource sharers (e.g., agency or interest group)** ←
 - IV. ***The “greater good”???*** ←
- 

INCENTIVES
CONSCIENCE

Potential for Goal arrest, Goal inversion

The human condition



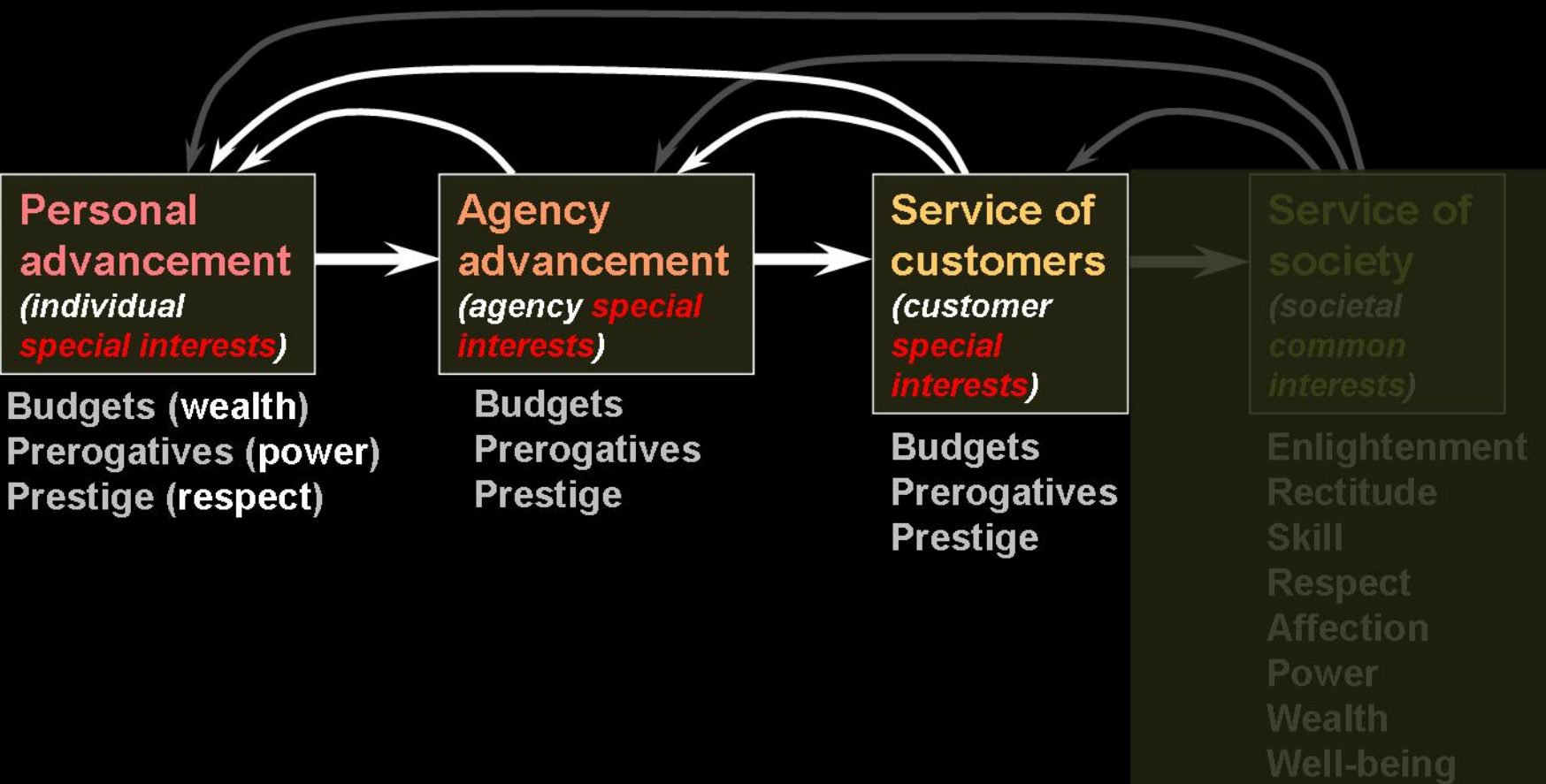
Potential for Goal arrest, Goal inversion

As weakly prescribed and strongly implied by USGS



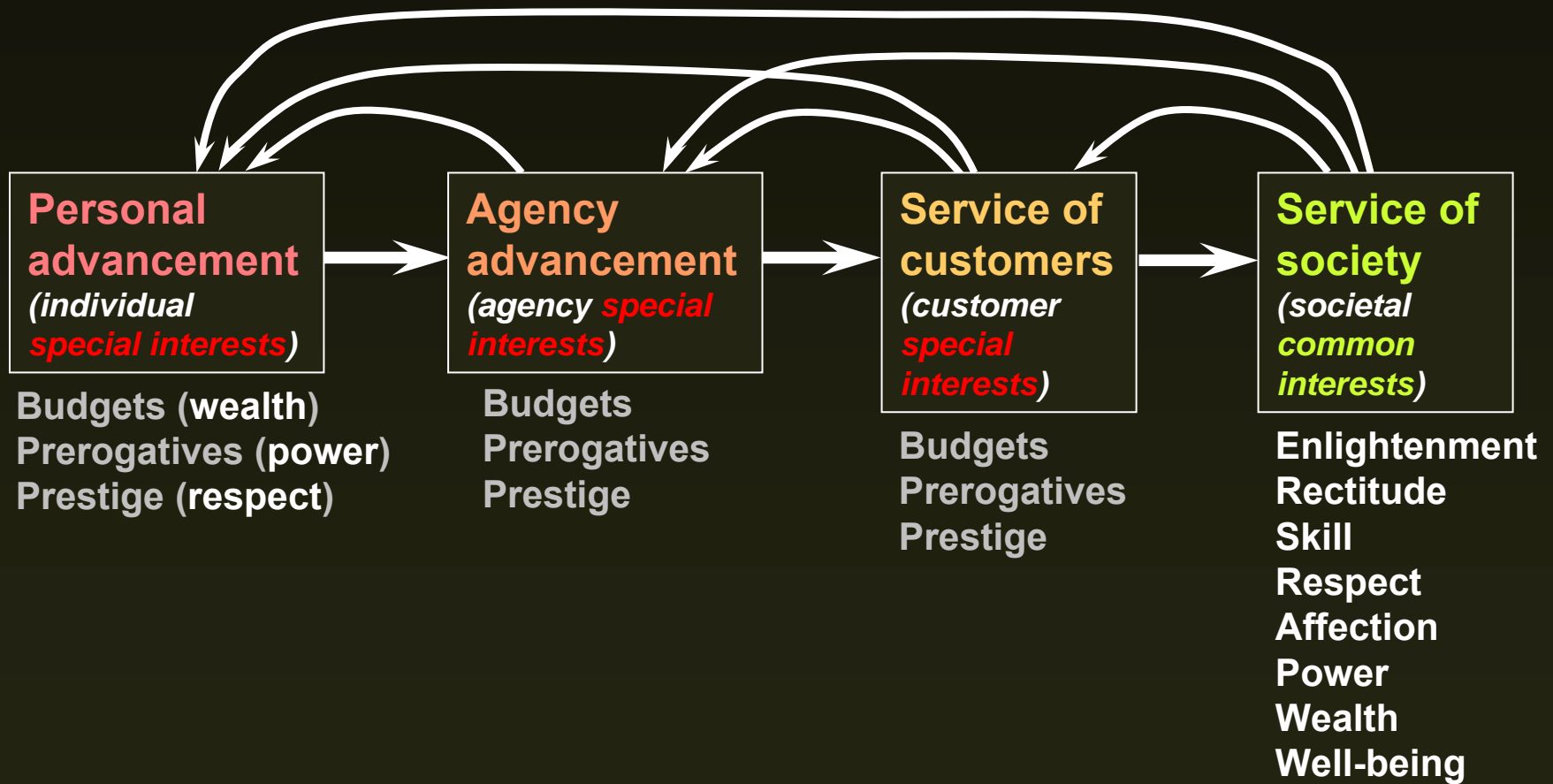
Potential for Goal arrest, Goal inversion

As overtly prescribed by USGS

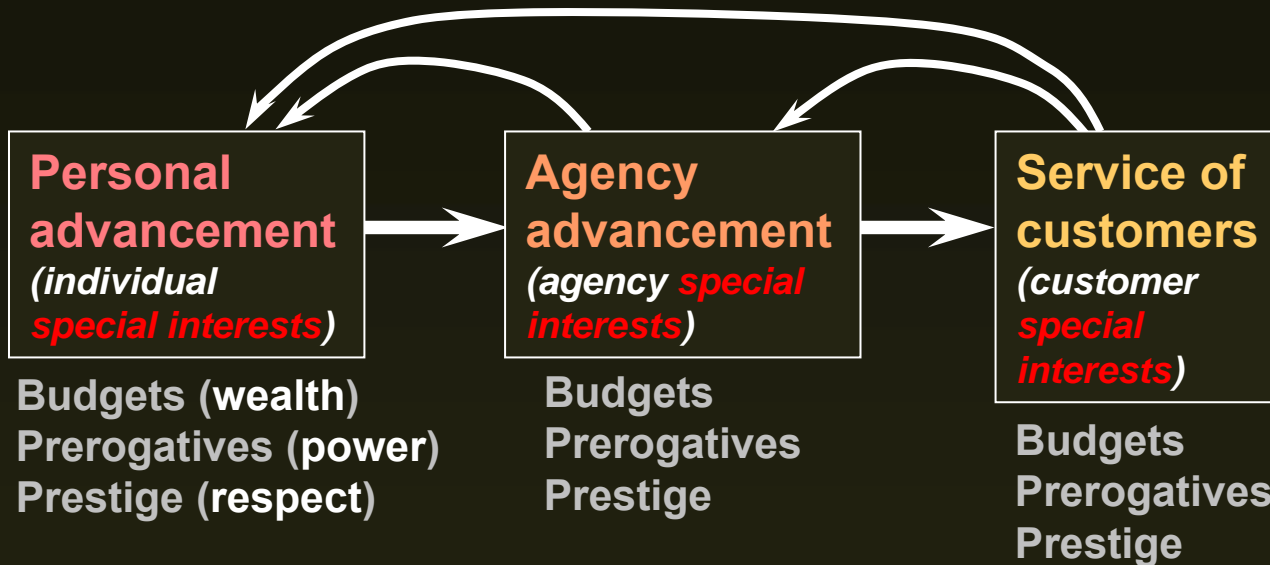


Potential for Goal arrest, Goal inversion

The parenthetical “customer”

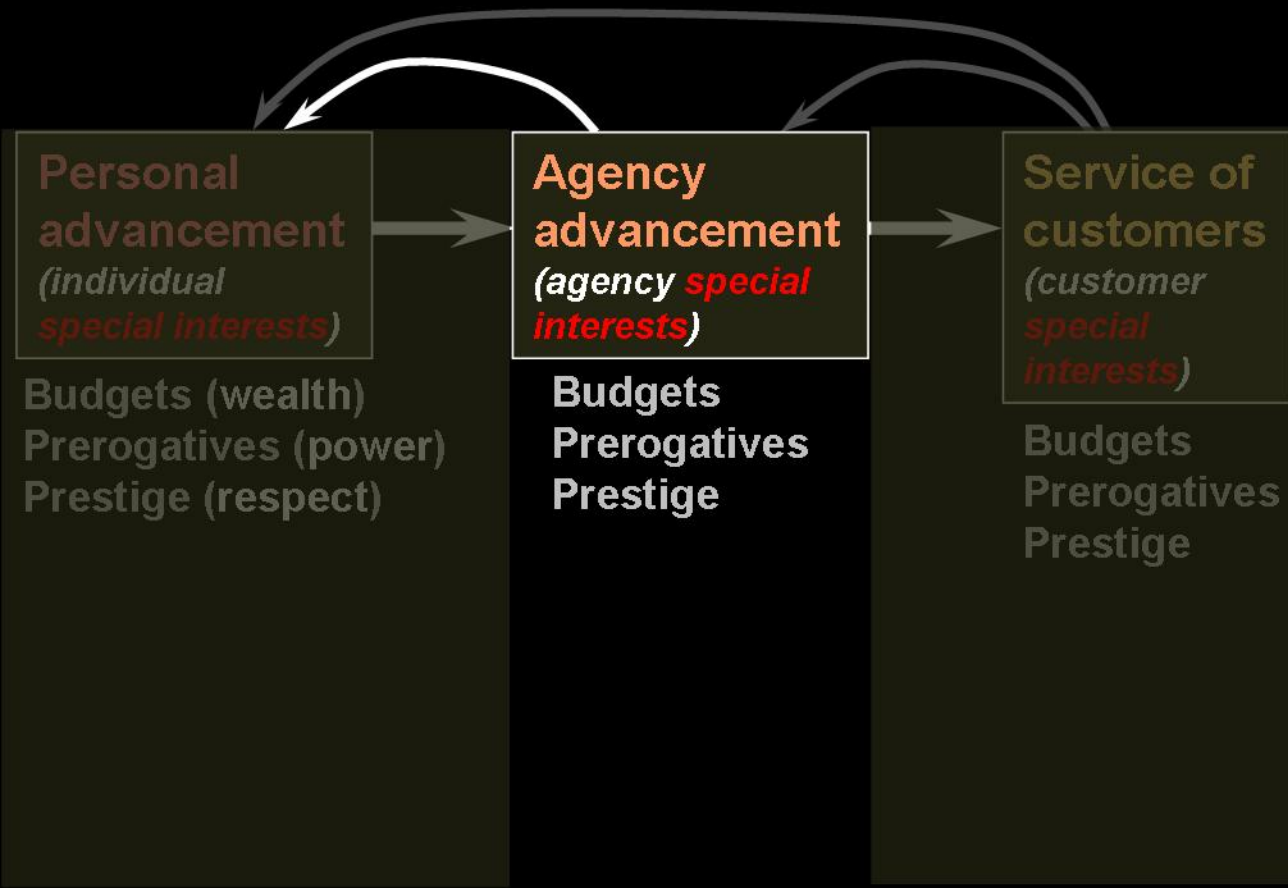


Institutionalized *Goal arrest* As overtly prescribed by USGS

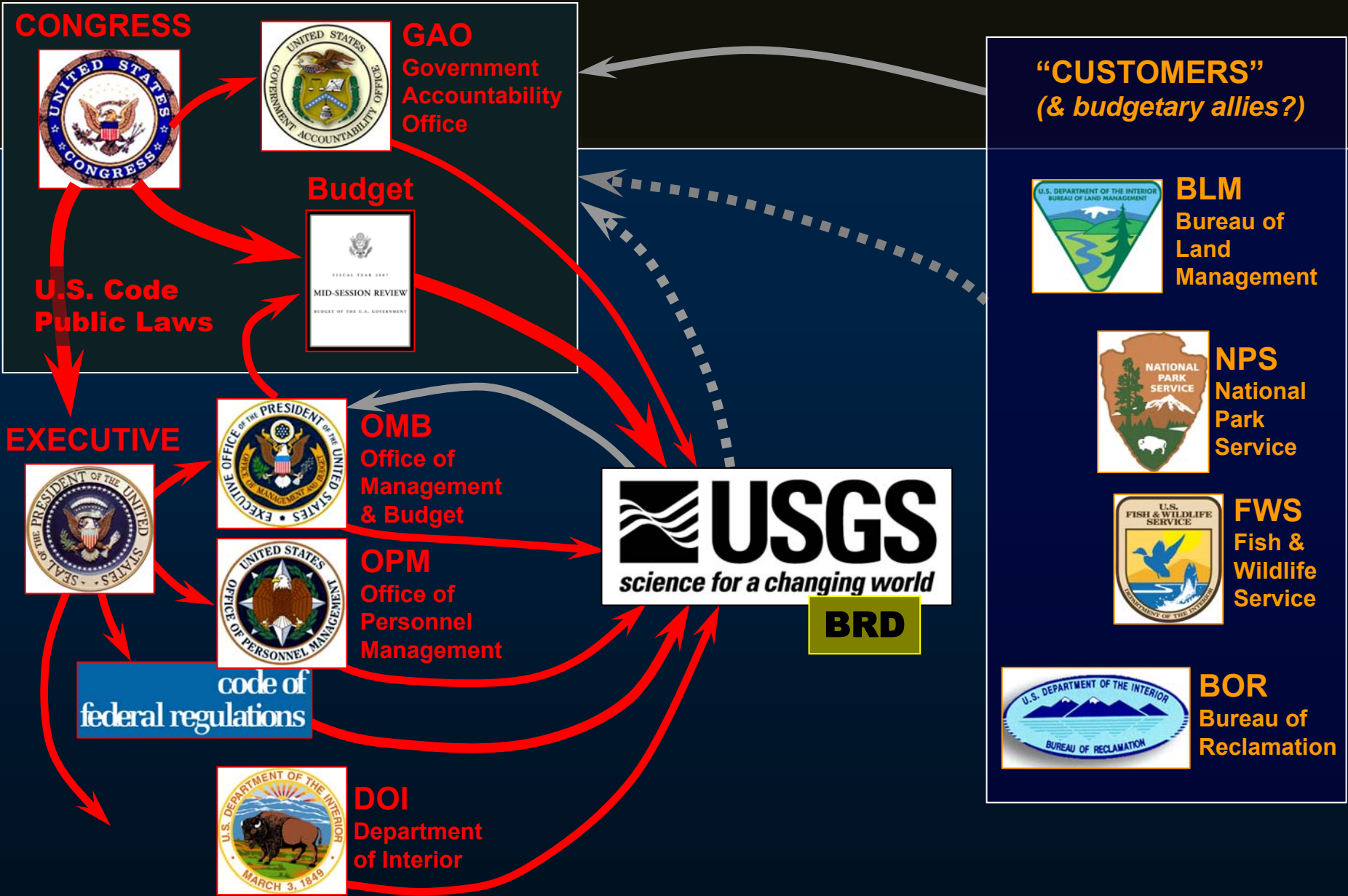


Institutionalized *Goal inversion*

Apparent (vs. stated) agency focus of attention



Structures of authority & control (external)



Justifying myths (*doctrine*) → legitimized *formulae*

Classical liberalism

Capitalism

Business/corporate model of government

(increasingly since the Reagan era, circa 1980)

Justifying myths (doctrine) → legitimized formulae

“Services” should be provided by the private sector

Less “government” is better than more

Government provides “products”

Appraisal should be based on delivery of “products” (physical outcomes)

Humans are fundamentally venal (especially government employees)

**Downsizing
Budgetary “starvation”
Competitive sourcing**

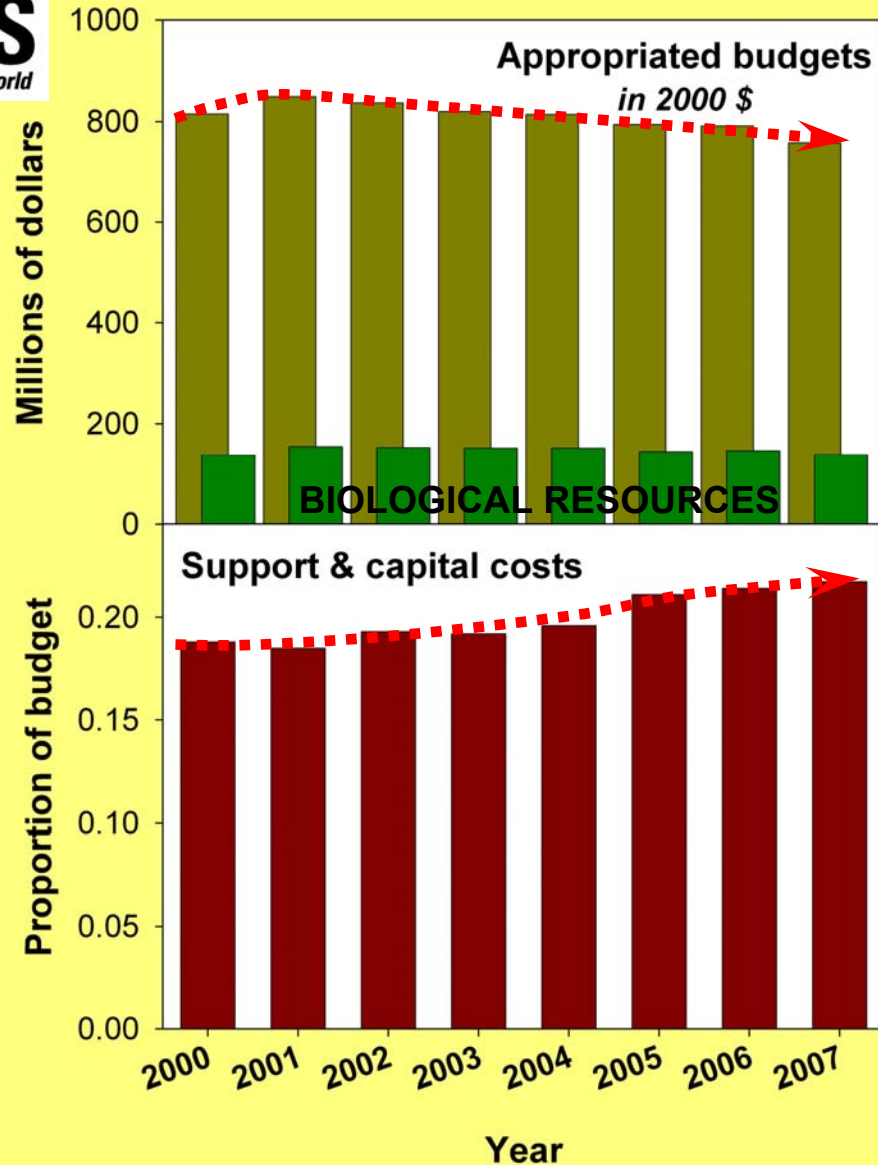


**↑ reporting requirements
↑ emphasis on (physical) products**

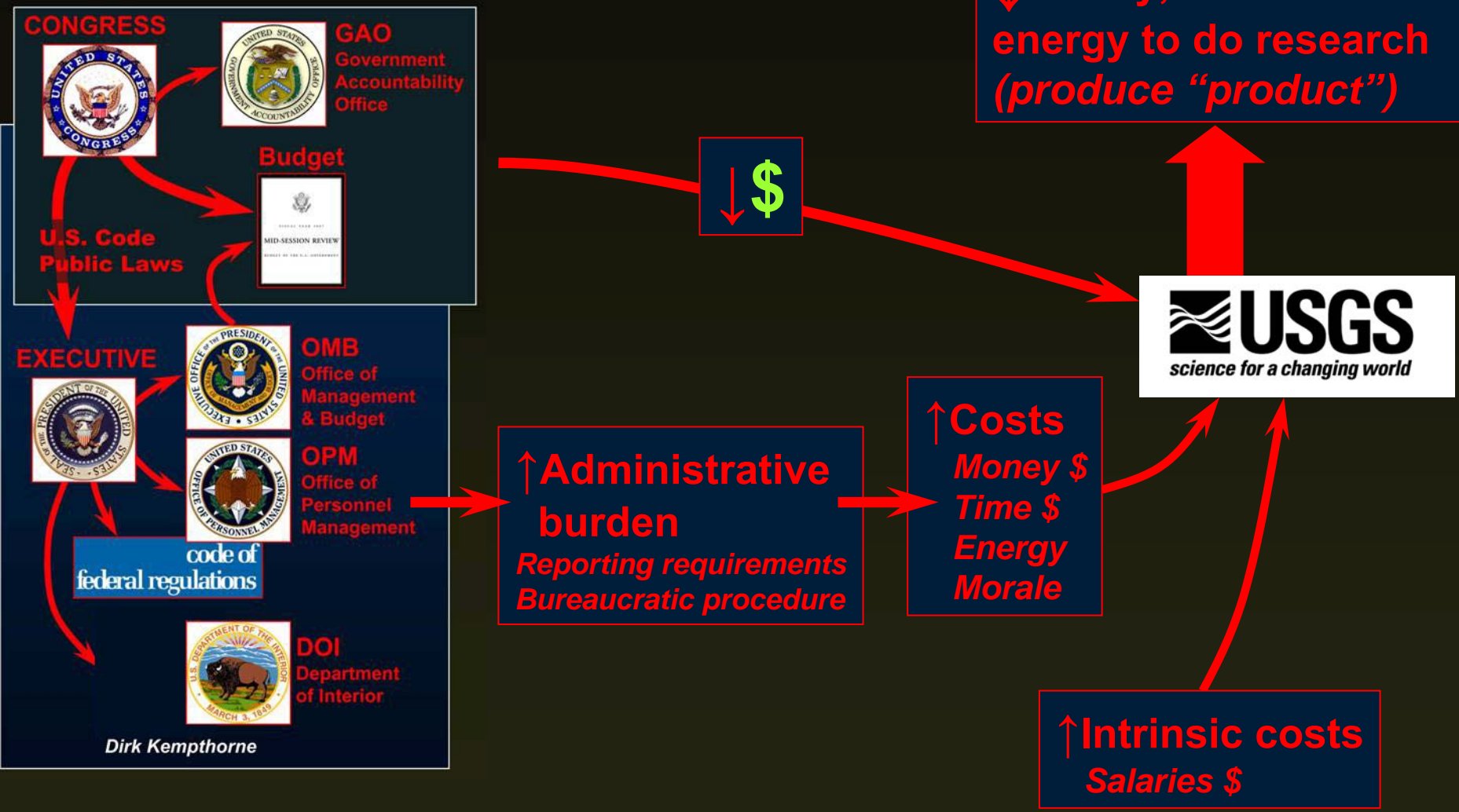
↑ burden of prohibitive regulations

Capitalism

Outcomes & effects *Less is more?*



Outcomes & effects




Outcomes & effects

Charge "customers" administrative costs
DOI 15%
non-DOI 24%


Money, time & energy to do research (produce "product")

CONGRESS




GAO Government Accountability Office

Budget



U.S. Code Public Laws

EXECUTIVE




OMB Office of Management & Budget



OPM Office of Personnel Management

code of federal regulations



DOI Department of Interior

Dirk Kempthorne

\$

↑ Costs of "product" \$

↑ Admin burden Reporting Bureaucracy

"CUSTOMERS" (& budgetary allies?)



BLM Bureau of Land Management



NPS National Park Service



FWS Fish & Wildlife Service



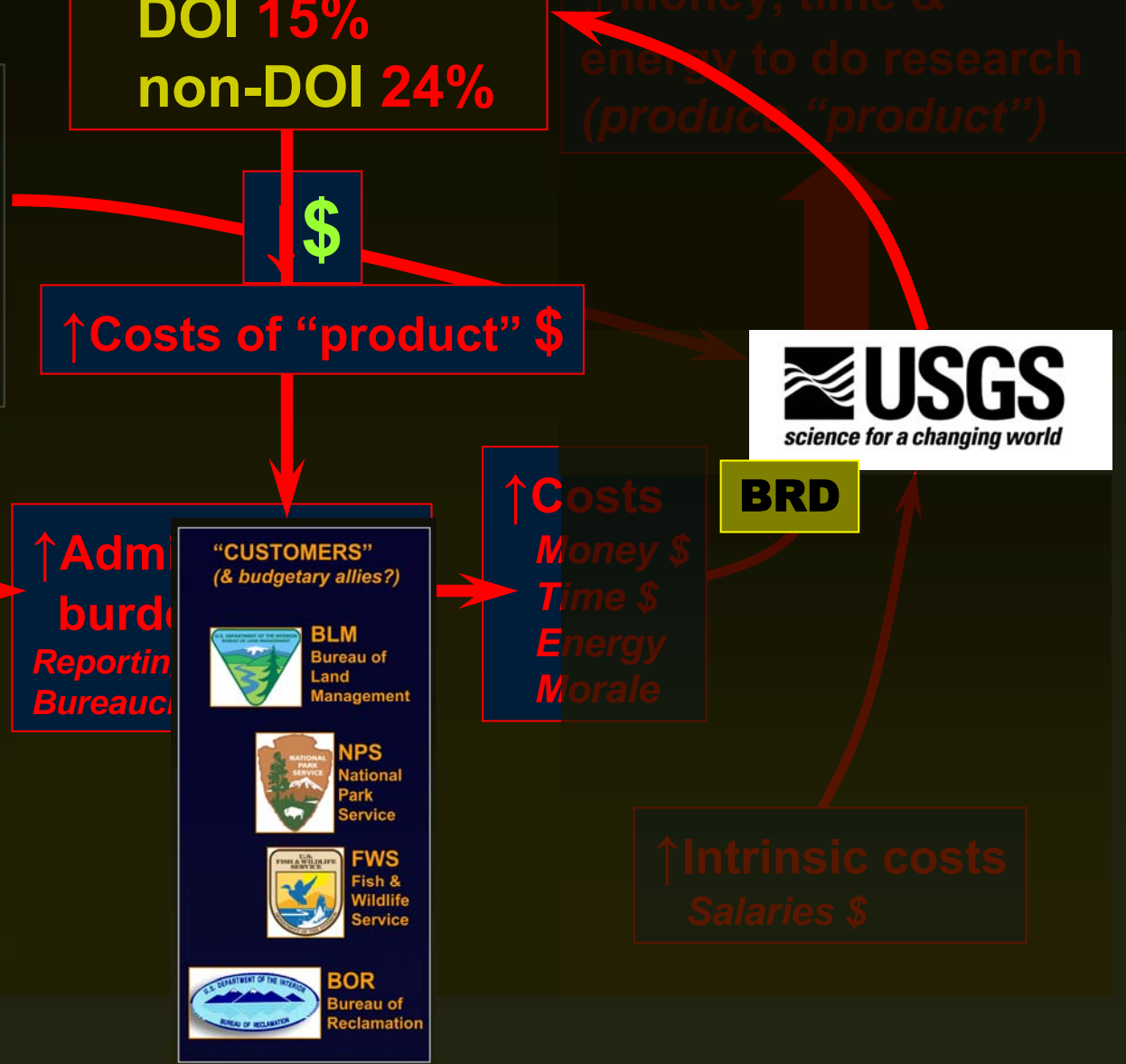
BOR Bureau of Reclamation

↑ Costs Money \$ Time \$ Energy \$ Morale



BRD

↑ Intrinsic costs Salaries \$



Outcomes & effects

In context of history...

During the legacy move of NPS, FWS & BLM scientists into the National Biological Survey and then USGS, *only salary money was taken from parent agencies*

BRD scientists *require outside money (from DOI or non-government sources) to do virtually any research*



Science entrepreneurs *in competition* wt academics & contractors for research funds



Outcomes & effects

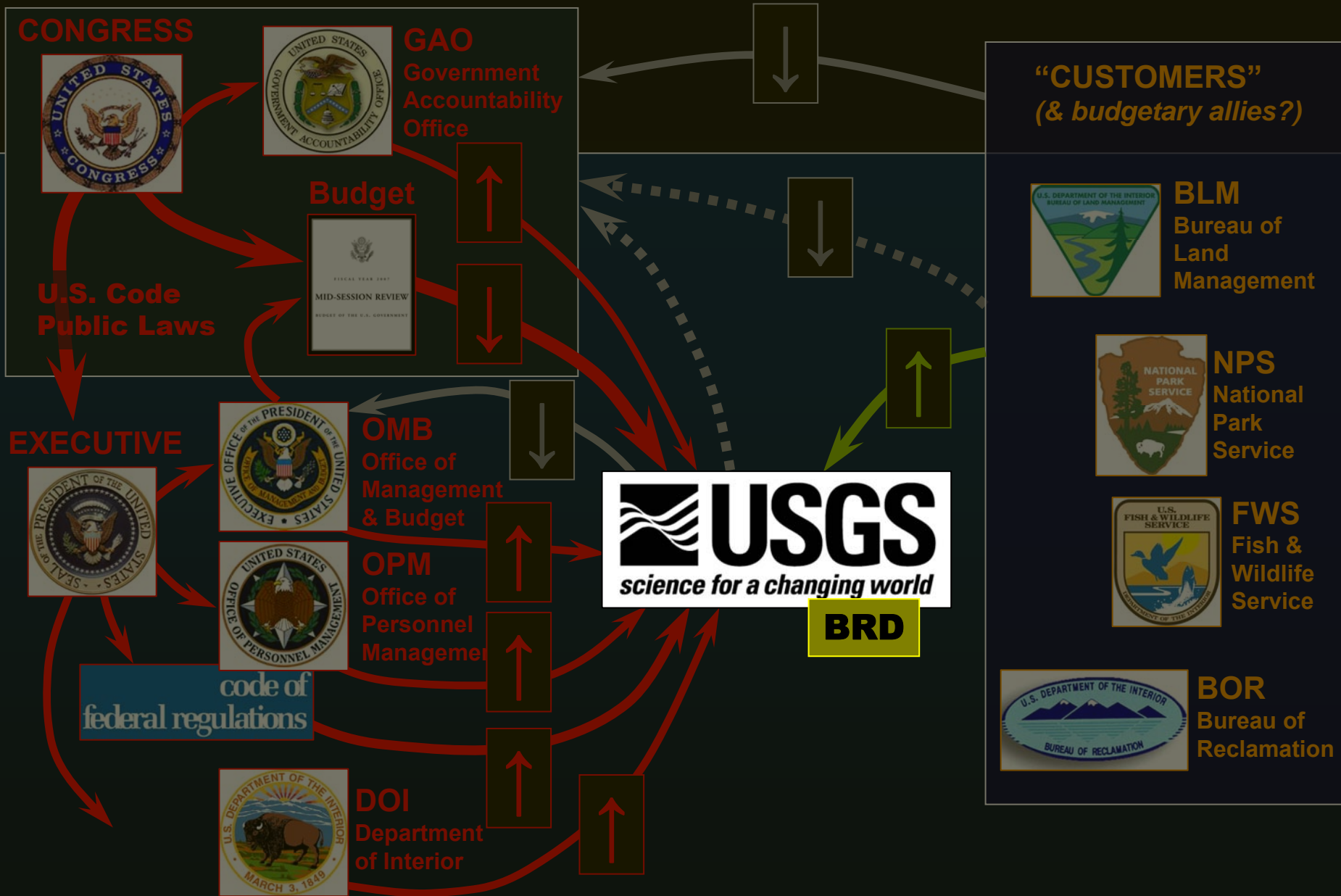
BRD scientists become less competitive with increased costs from charging “customers” for administrative overhead



BRD

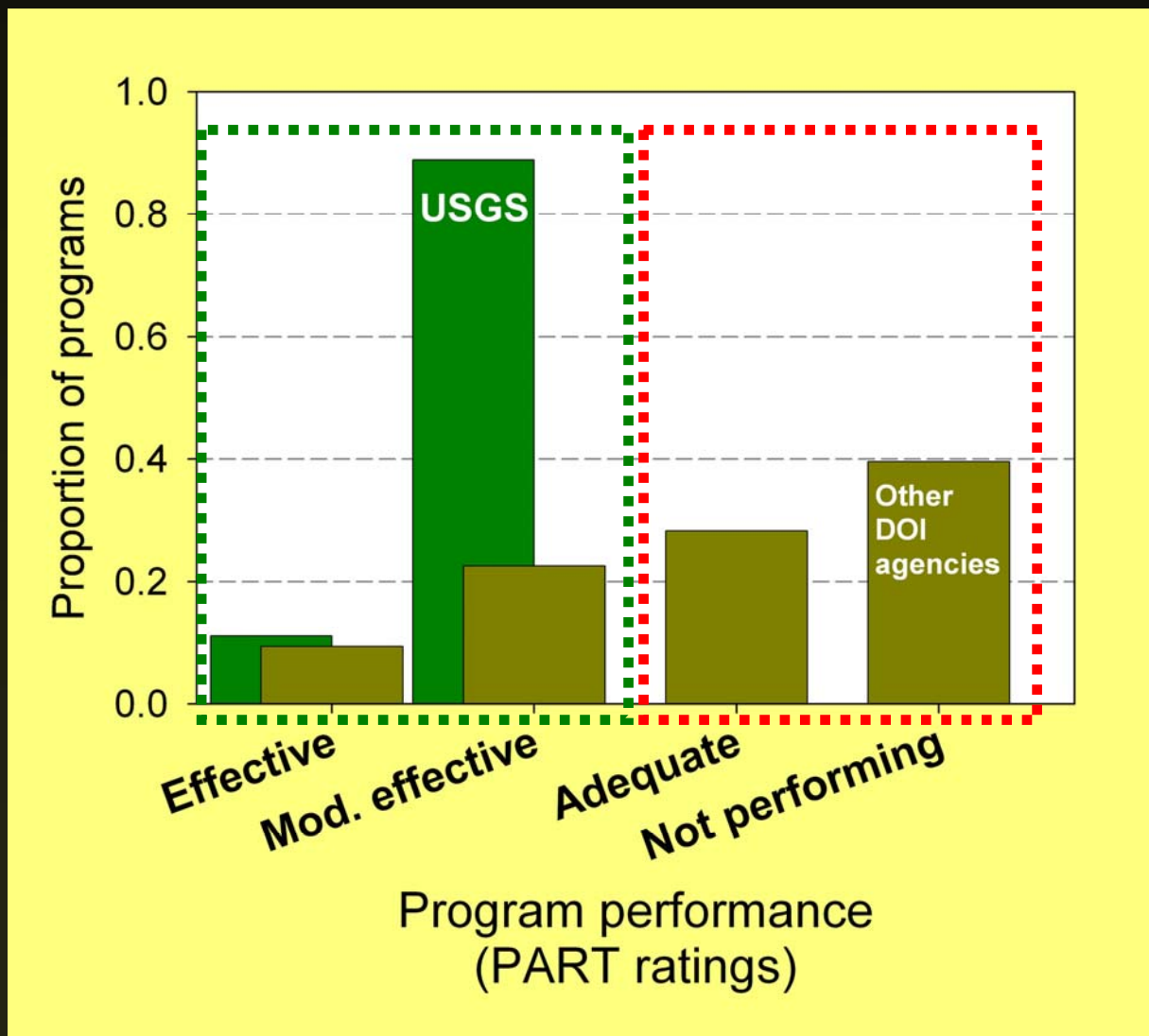
Past norms of business are also violated, creating ill-will among traditional “customers”

Outcomes & effects



Outcomes & effects

OMB-administered appraisal



Justifying myths (*doctrine*) → legitimized *formulae*



"CUSTOMERS"
(*& budgetary allies?*)

 **BLM**
Bureau of
Land
Management

 **NPS**
National
Park
Service

 **FWS**
Fish &
Wildlife
Service

 **BOR**
Bureau of
Reclamation

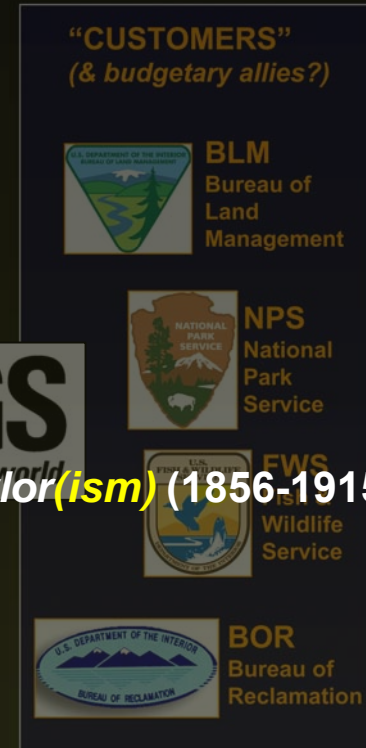
***Bureaucratic /
Scientific management
(since circa 1900)***

Justifying myths (*doctrine*) → legitimized *formulae*

Icons of modernity



Frederick Taylor (*ism*) (1856-1915)



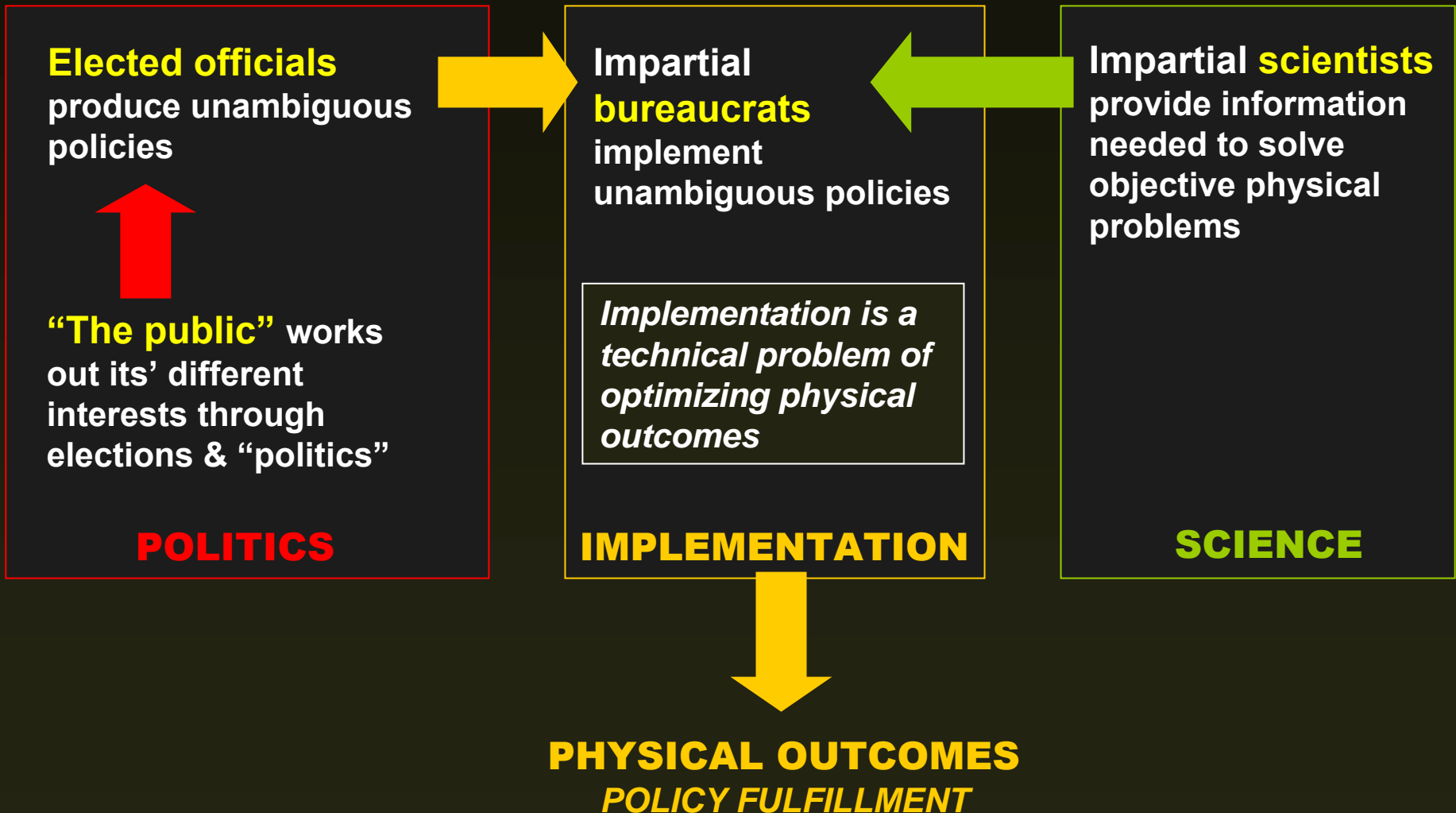
*Bureaucratic /
Scientific management
(since circa 1900)*

Gifford Pinchot (1865-1946)

Justifying myths (*doctrine*) → legitimized *formulae*



The linear model of scientific-bureaucratic management



Outcomes & effects



Institutionalized criteria / norms of scientific practice

Research Grade Evaluation (RGE) – “Product”

- ▶ **Quantity of publications**
- ▶ **Quality of publications** (*journals/citations*)
- ▶ **“Relevant”**

Agency scientists

Internal review policies

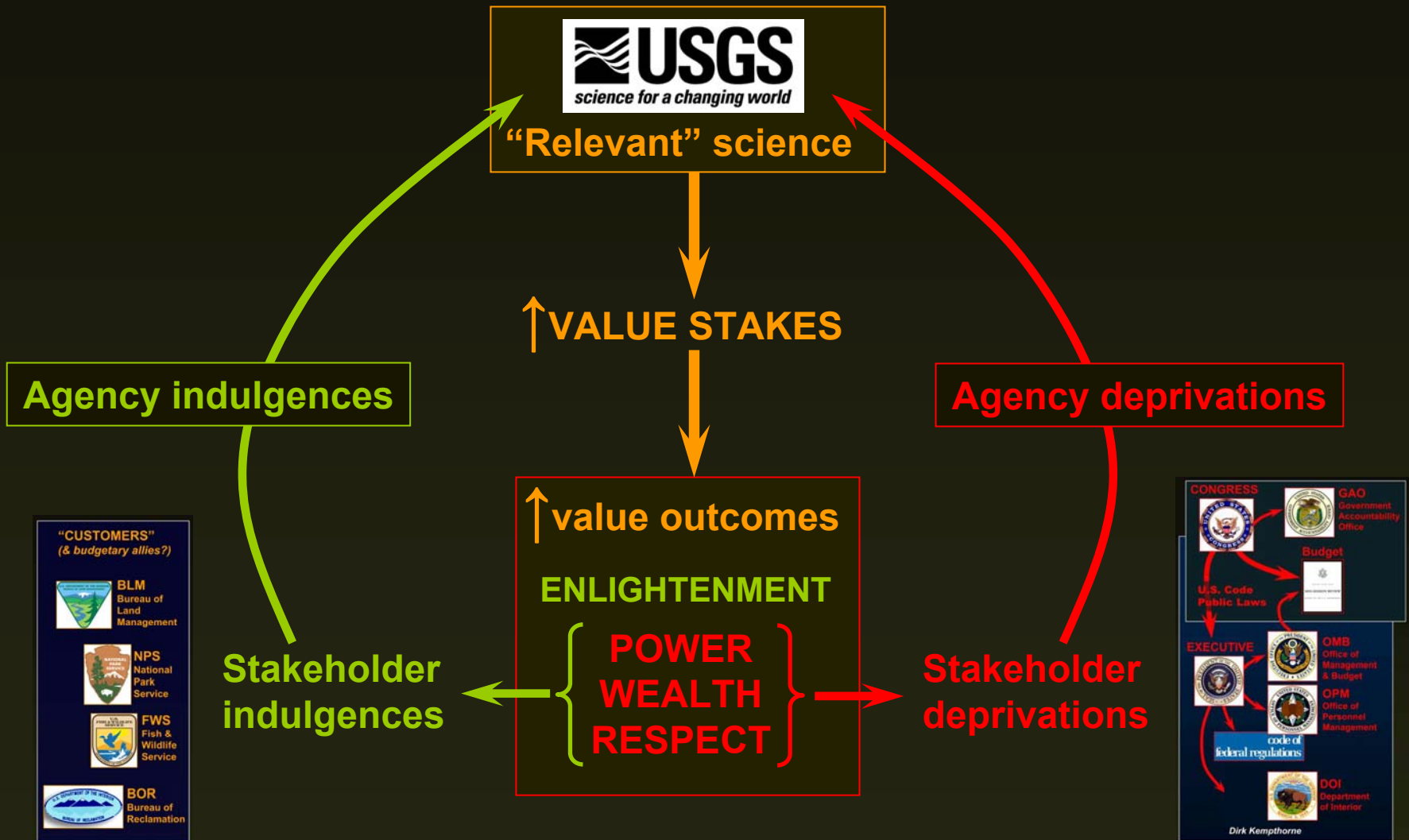
- ▶ **“Reliable”**
- ▶ **“Impartial,” Non-provocative** (*absence of “inflammatory” statements; absence of policy advocacy or criticism; absence of overt or implicit criticism of budgetary allies*)

Agency elites

Plus, institutionalized promotion of “relevance” of USGS science

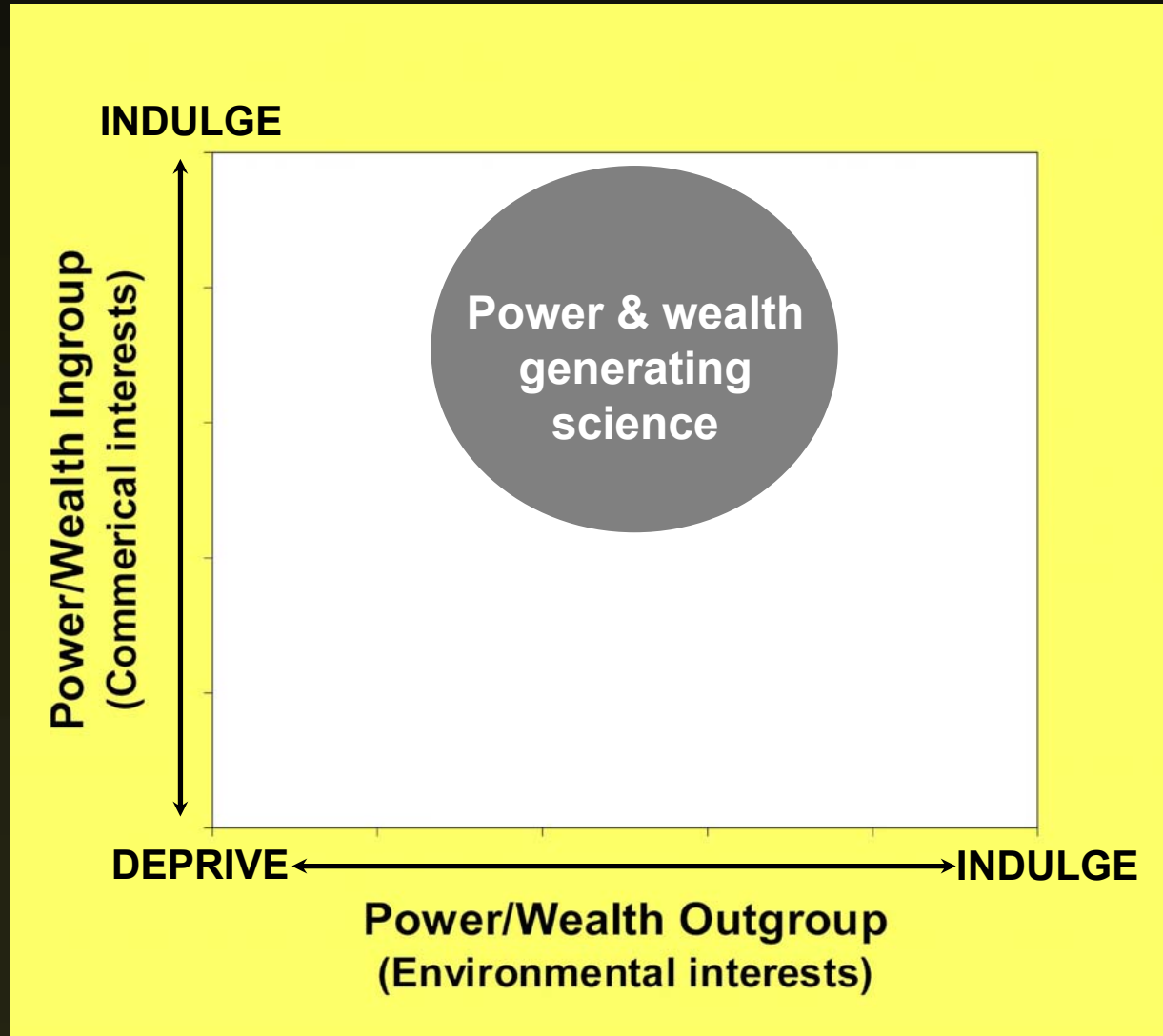
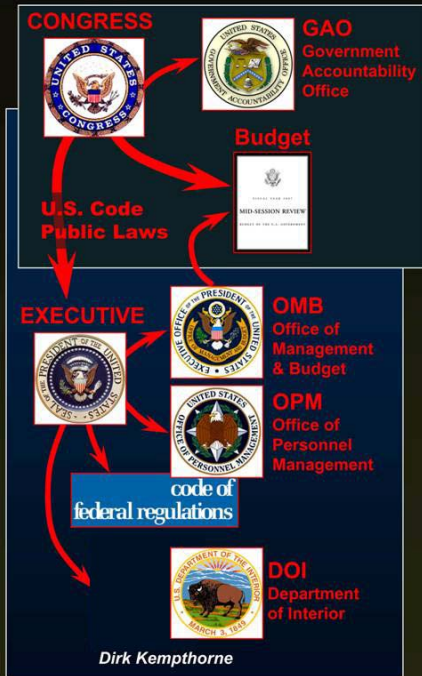
Outcomes & effects

The conundrum of “relevance”



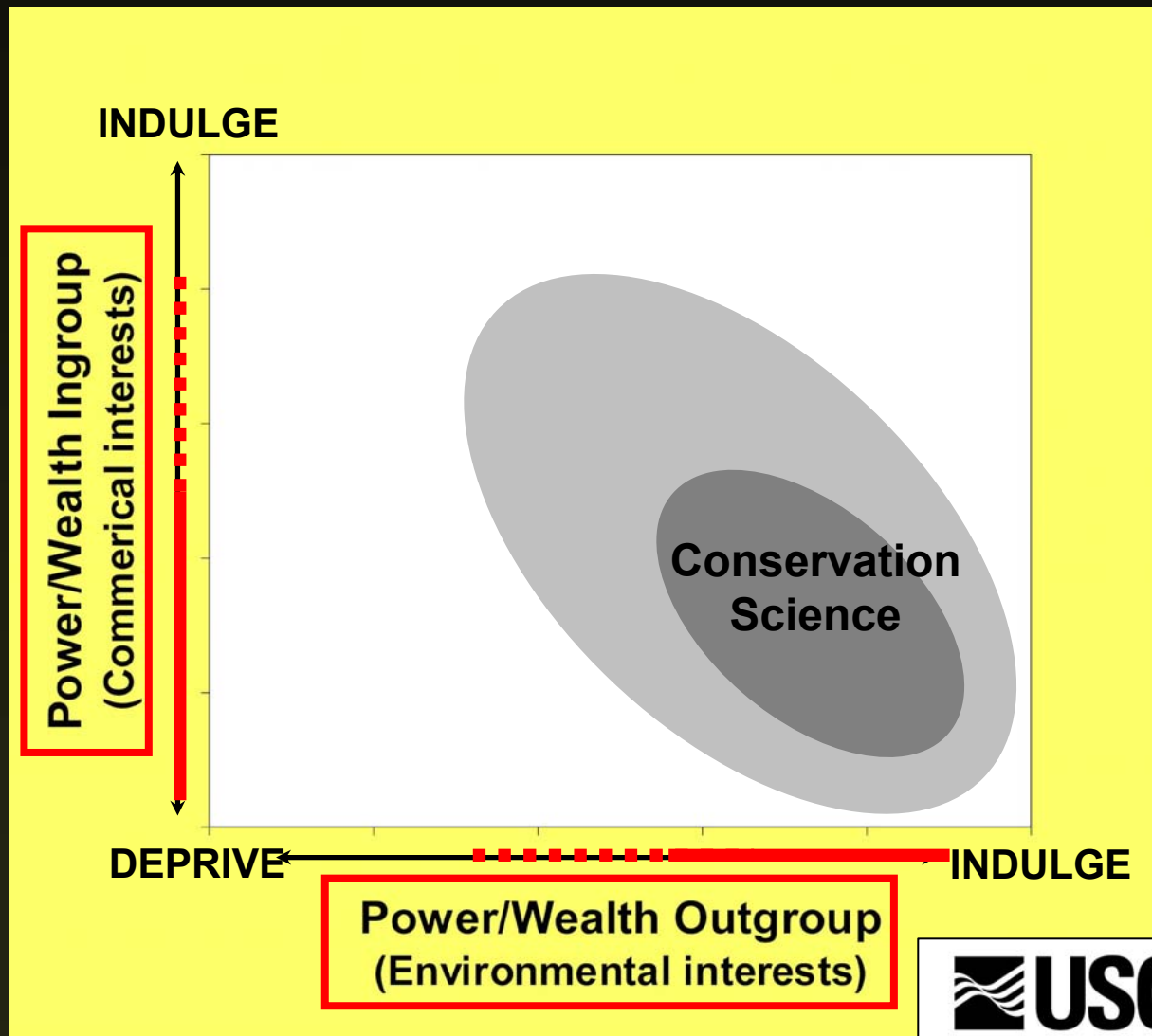
Outcomes & effects

The conundrum of “relevance” -- BRD



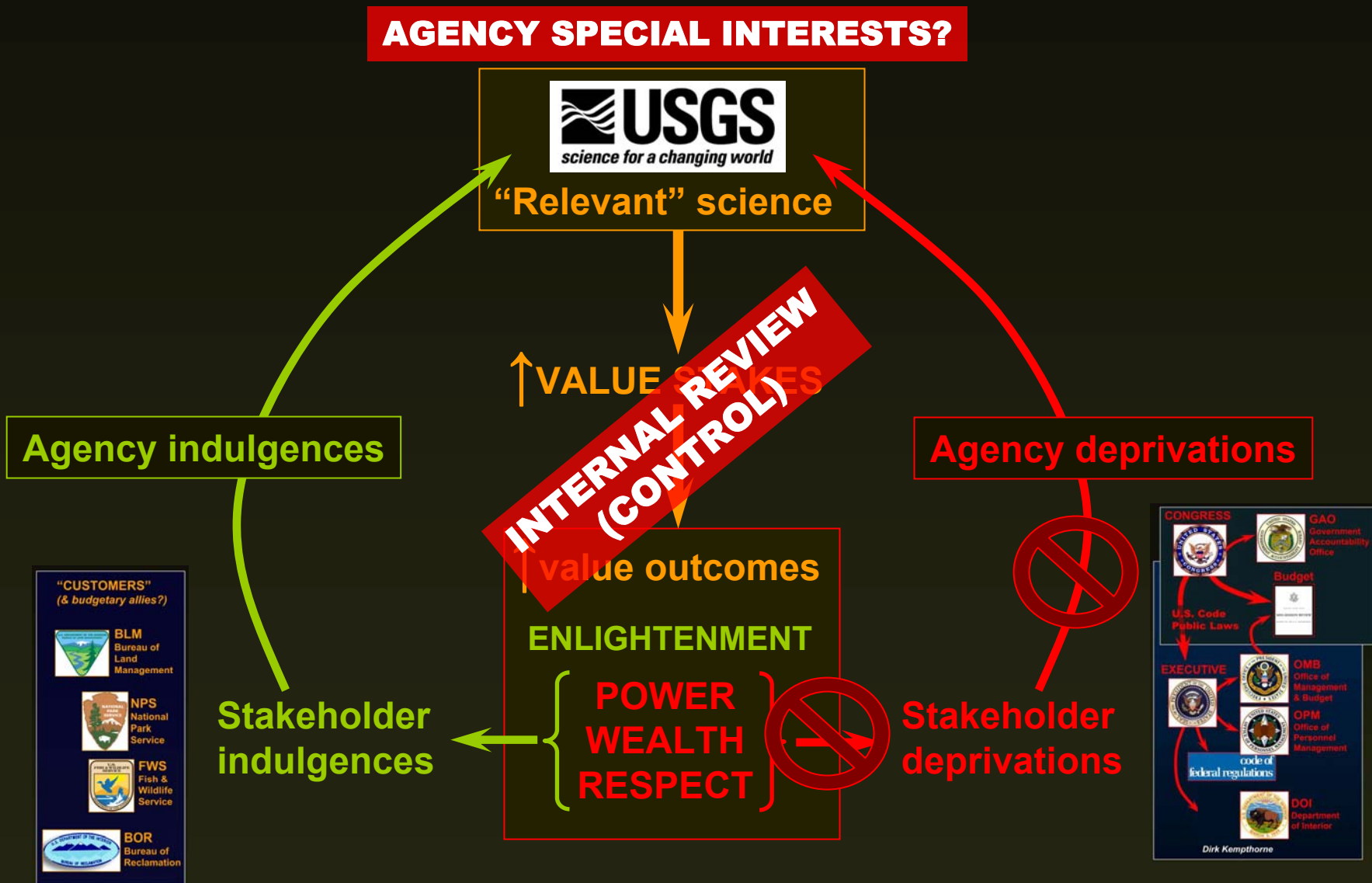
Outcomes & effects

The conundrum of “relevance” -- BRD



Outcomes & effects

The conundrum of “relevance”



Outcomes & effects

Dissonant product standards (expectations)

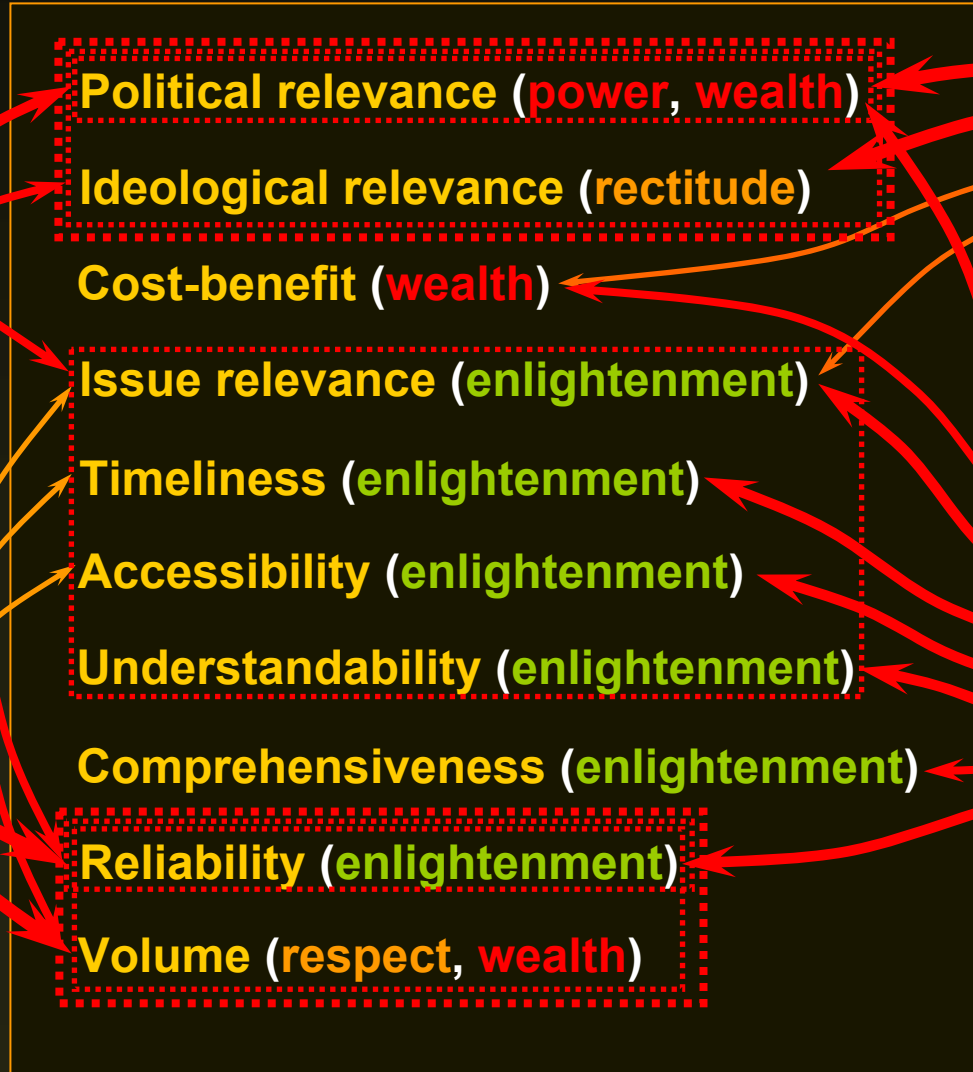


Elites

Agency
prestige



Scientists



Political elites



"Customers"

Outcomes & effects

Dissonant product standards (expectations)

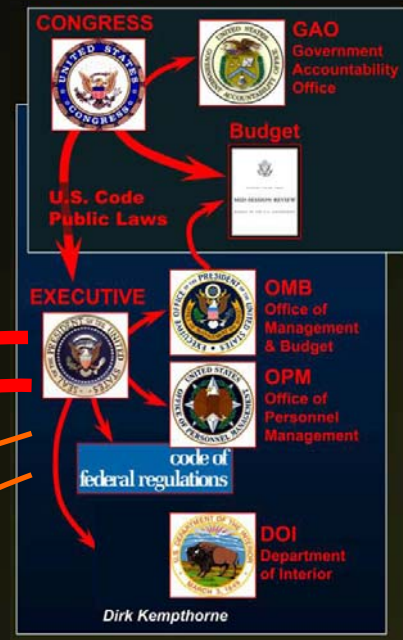
INTERNAL REVIEW



Elites

Agency
prestige

- Political relevance (power, wealth)**
- Ideological relevance (rectitude)**
- Cost-benefit (wealth)**
- Issue relevance (enlightenment)**
- Timeliness (enlightenment)**
- Accessibility (enlightenment)**
- Understandability (enlightenment)**
- Comprehensiveness (enlightenment)**
- Reliability (enlightenment)**
- Volume (respect, wealth)**



Political elites

Outcomes & effects

Dissonant product standards (expectations)

INTERNAL REVIEW



Elites

Agency
prestige



Scientists

Political relevance (**power**, **wealth**)

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~~Issue relevance (enlightenment)~~

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Understandability (enlightenment)

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~~Volume (respect, **wealth**)~~

“CUSTOMERS”
(& budgetary allies?)



“Customers”

Problematic Trends

Framed as agency expedient (special) interests

↑ Internal and external transactions costs

↑ administrative & reporting requirements

(flowing from symbolic politics and a business model of governance grounded in administrative rationality)

↑ product review requirements

(flowing from need to minimize deprivations associated with symbolic political constructions & issue relevance)

↑ Internal contradictions of outcomes & effects

↑ transaction costs lead to ↑ \$ costs & ↓ timeliness

YET

↑ need to be competitive in terms of costs & timely deliveries

↑ need for relevance and accessibility

YET

↑ risk of inflammatory symbolic constructions of USGS “science”

Problematic Trends

Framed as agency expedient (special) interests

↑ Contradictions of internal expectations & external demands

Current internal emphasis on *reliability* & *volume* of “science”

YET

↑ external demands for *relevance*, *timeliness*, *accessibility*,
understandability, *comprehensiveness*, & *cost-benefit*

Conclusions? (so far)

USGS is not an *impartial participant*

Circumstances lead ineluctably to a focus on *agency expedient interests*

USGS is best understood as a *stakeholder* in policy processes

This conclusion probably holds for all government agencies

Framed as agency expedient (special) interests, these problematic trends are dilemma-like

**“CUSTOMERS”
(*& budgetary allies?*)**



BLM
Bureau of
Land
Management



NPS
National
Park
Service



FWS
Fish &
Wildlife
Service



BOR
Bureau of
Reclamation

Reframing the “dilemma”

Optimal Intelligence Function

Produces a *shared believed-in* (single text) “map” of how the world works, *sufficient* to identify and secure common interests

Civility

Processes that identify and secure common interests

Participatory

Identifying interests
Identifying questions

Accessible

Understandable

Comprehensive

Including factors hard to measure but important

Relevant

to the immediate situation

Empirical

Cost-effective

Timely

Standards

Human dignity

Reframing the “dilemma”

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“The problem”?

Lack of **participatory civil venues** that produce information in a **timely** and **cost-effective** manner that is **empirical, relevant** to the immediate situation, **understandable** and **accessible**, and **comprehensive** enough to address all important facets.

“The solution”?

Constitutive/Governance

Clearly identify agencies, including USGS, as **participating stakeholders**

Recognize **limitations of positivistic, reductionist science**; Respect & encourage **other ways of knowing**

Governance

Abandon or substantially modify the model of **scientific bureaucratic management** (as a top-down power model)

Abandon the **business** (i.e., “product”-based) **model** of governance & science

Reconfigure incentives for USGS scientists to encourage **meaningful participation in stakeholder processes**

Train USGS scientists in the art of **holistic policy-relevant contextual scientific practice**

Ordinary

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Clearly identify agencies, including USGS, as **principal stakeholders**

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Congressional, Executive, & USGS elites; USGS culture

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