

# Barriers to Effective Science Delivery and Application

Transfer of Forest Science  
Knowledge & Technology Conference  
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# ***Acknowledgments***

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- Aldo Leopold Wilderness Research Institute
- Joint Fire Science Program
- BLM National Science & Technology Center
- Pacific Southwest Research Station
- Pacific Northwest Research Station
- University of Montana
- National Fire Plan
- National Center for Landscape Fire Research

# *Communication Objectives*

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- Identify future needs
- Collaborate during research
- Delivery and application of results to broad audience

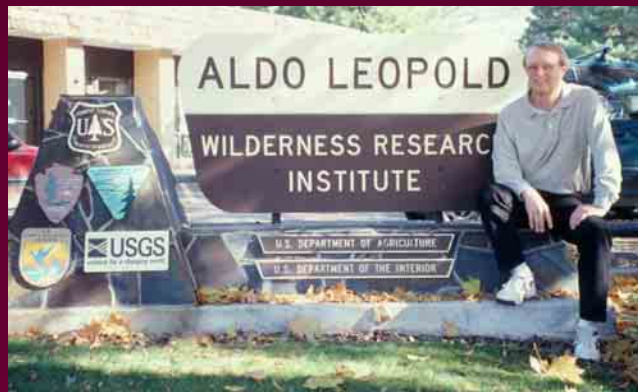
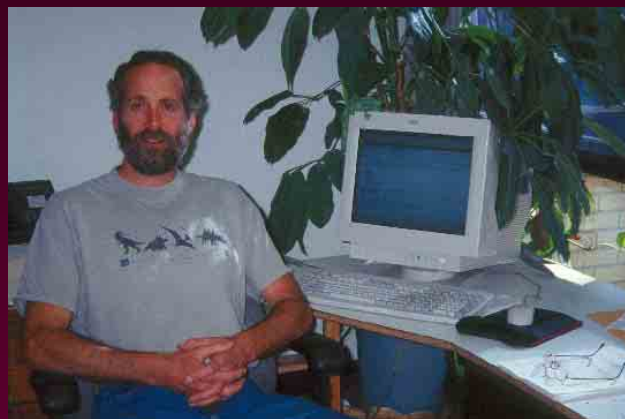
# *Communication Objectives*

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- Identify future needs
- Collaborate during research
- Delivery and application of results to broad audience

# *Research Application by Scientists:* Publications, Presentations, Consultations



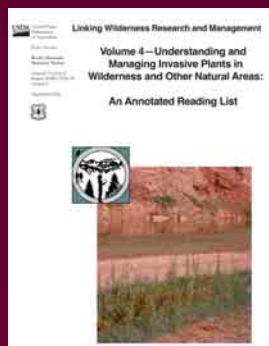
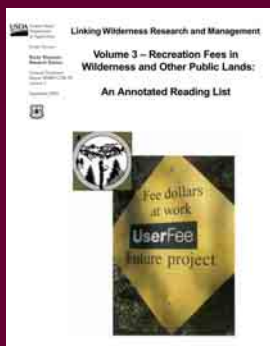
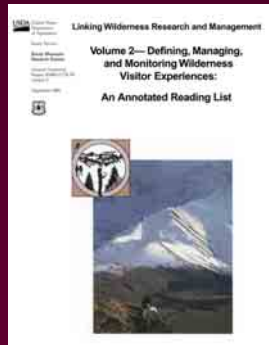
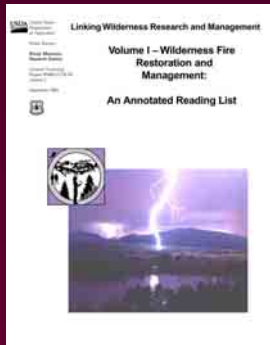
# Products to Improve Access:

Web Site

<http://leopold.wilderness.net>

Research Priorities, Projects, Publications, Staff Activities

# Annotated Reading Lists



# Research Briefings

## RESEARCH IN A NUTSHELL

Results and Management Implications

The screenshot shows a web page titled 'RESEARCH IN A NUTSHELL' with a sub-header 'ALDO LEOPOLD WILDERNESS RESEARCH INSTITUTE'. The main content is organized into several sections: 'DAY USERS IN WILDERNESS: HOW DIFFERENT ARE THEY?', 'Background &amp; Management Report', 'Keynote', 'Project Objectives', 'Key Characteristics', 'Population of Day Users', 'Management Implications', 'Publications / Products', and 'Additional Information'. The page includes a small photograph of a person in a wilderness setting.

*Research Results*



# *Science Application*

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Awareness = Use

True/False

# *Science Application*

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Awareness = Use

True/False

# ***Barriers to Successful Application***

## ***USFS Interviews:***

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- TIME!
- Lack of training & skills
- Availability of science
- Conflicting results
- Cultural differences between managers and researchers

# ***Social Sciences***

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- Communication theory
- Social psychology
- Decision theory
- Organizational theory
- Policy sciences
- Adult learning

# *Innovation*

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“idea, practice, or object that is  
*perceived as new*”

e.g.,  
knowledge & technology

# *Adopting Innovations*

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Change Agent (Researcher)

Adoption:



Individual Adopter  
(Manager)

# Adopting Innovations

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Change Agent (Researcher)



Adoption:



Individual Adopter  
(Manager)

Diffusion:



Social System  
(Management Community)



# *Stages of Adoption*

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Awareness / Knowledge



Interest / Evaluation



Decision to try



Implementation



**Adoption /  
Application**

-Diffusion of Innovations Theory

# *Science Application Process*

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Awareness / Knowledge

Interest / Evaluation

Decision to try

Implementation

**Adoption /  
Application**

# Science Application Process

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# *Effective Communication?*

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Mutual understanding...

# *Potential for Misunderstanding*

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Conduit model vs. inferential strategic model



- Ambiguity
- Inference / guesswork
- Mixed messages
- Selective attention

# *Selective Attention*

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- Relevance to goals
- Long-held beliefs
- Stereotypes
- Relationship to messenger
- Background knowledge

# *Context*

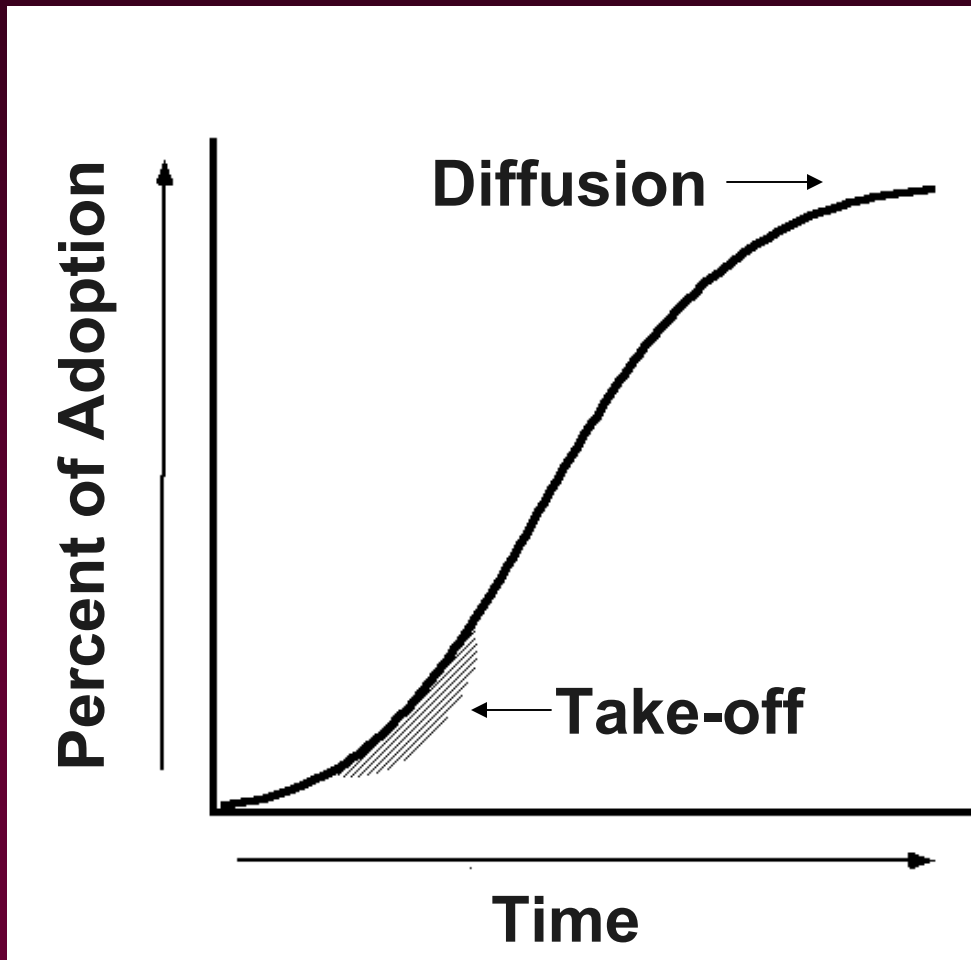
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Understanding:

“layered knowledge  
beneath, behind, or within”  
spoken words

# *Rate of Adoption*

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Diffusion takes  
time!

Influenced by:

- Audience characteristics
  - Individual
  - Community

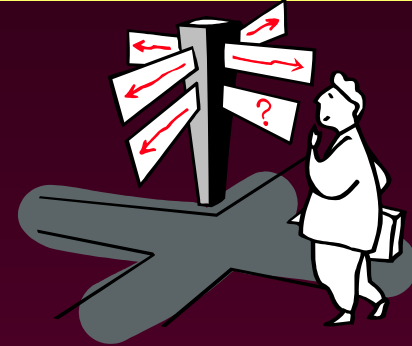
# *Individual Characteristics*

## *(Personality)*

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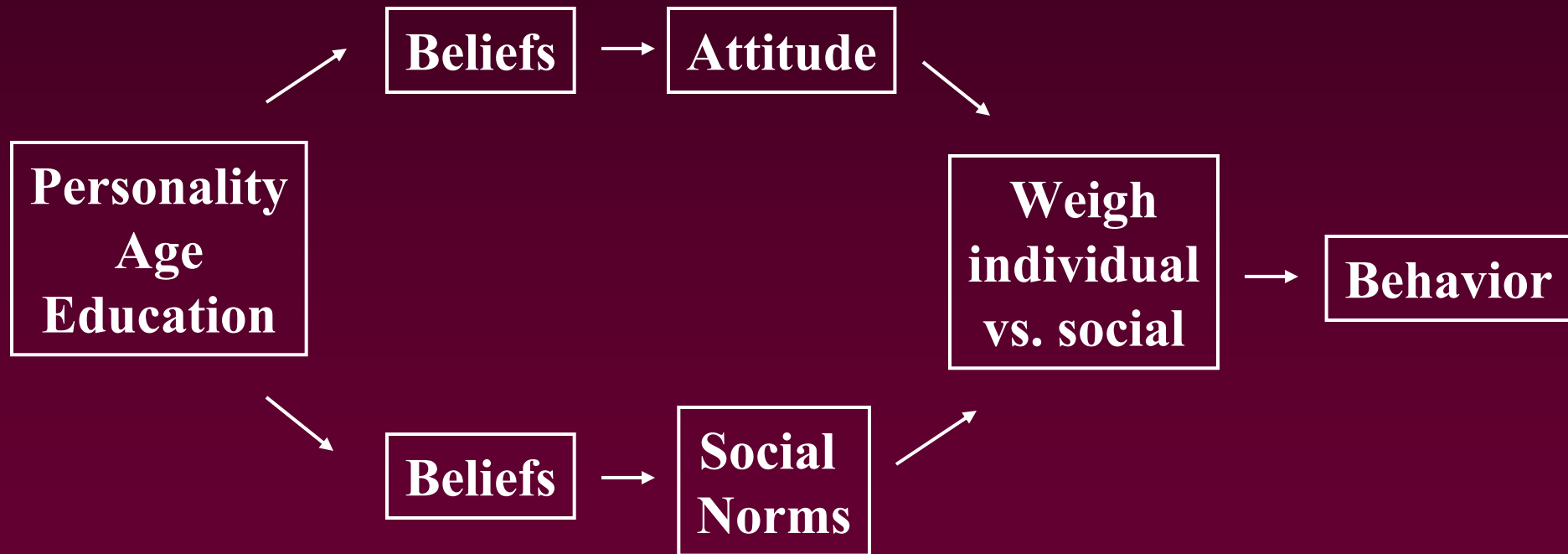
### Disposition...

- Innovators
  - Risk & uncertainty ok
- Early Adopters (**Opinion Leaders**)
  - Respected by peers; role models
- Early Majority
  - Deliberate about adoption
- Late Majority
  - Pressured by peers; skeptical; cautious
- Laggards
  - Isolates; point of reference in past



# *Understanding Behavior*

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-Theory of Reasoned Action

# ***Community Characteristics (Organizational Culture)***

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Shared values, beliefs, assumptions, perceptions, norms, artifacts, and patterns of behavior

Provide meaning and direction to organizational members

Homophily vs. heterophily

# ***Influences to Effective Delivery and Application***

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- Personality
- Beliefs / attitudes
- Organizational culture
- Organizational structure
- Communication networks
- Workload / stress

# ***Message Production Under Uncertainty***

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To produce effective messages,  
need to predict beliefs and actions  
of message recipients

--Berger 1997



# ***New Project: Influences to Success of Science Delivery***

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## Target Audiences

- Agencies (USFS, BLM, NPS)
- Disciplines (fire, wildlife, etc.)
- Hierarchical levels
  - Decision makers, staff specialists, field implementers
- Location
  - Centralized vs. local offices



# ***New Project: Influences to Success of Science Delivery***

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## Methods:

- Literature review
- Agency meetings
- Agency case studies – interviews
  - Identify & understand influences
- Mail survey
  - Prevalence & characteristics



# ***New Project: Influences to Success of Science Delivery***

## **Forest Service Case Study:**

**Regional Office**  
Decision maker  
FMO  
Fuels Specialist  
Wildlife "  
Invasives "



**National Forest**  
Decision maker  
FMO  
Fuels Specialist  
Wildlife "  
Invasives "



**District**  
Decision maker  
FMO  
Fuels Specialist  
Wildlife "  
Invasives "



**District**  
Decision maker  
FMO  
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# ***New Project: Influences to Success of Science Delivery***

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## Outcomes:

- Understand influences to research application *in target audiences*
- Prioritize research application efforts
- Increase the use of relevant research
- Better accountability
- Ultimately, better stewardship

