Research Into Application

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NOAA’s MISSION

NOAA’s Mission:
Science, Service & Stewardship

To understand and predict changes in climate, weather, oceans, and coasts,
To share that knowledge and information with others, and
To conserve and manage coastal and marine ecosystems and resources

NOAA’s Vision of the Future:
Resilient Ecosystems, Communities & Economies

Healthy ecosystems, communities, and economies
that are resilient in the face of change

- improved scientific understanding
- assessments identify impacts, inform decisions
- mitigation, adaptation choices supported
- a climate literate public

- reduced loss of life, property disruption
- improved freshwater management
- transportation efficiency, safety
- healthy people, communities productive, efficient economy

- resilient coastal communities
- ocean and coastal planning, management
- safe, sound, efficient marine transportation
- improved coastal water quality
- safe, sound arctic access, management

- improved understanding of ecosystems
- recovered, healthy species
- healthy habitats sustain resources, communities
- sustainable fisheries, safe seafood

Engagement Enterprise
- an engaged, educated public for informed environmental decisions

Weather Ready Nation
- integrated services for evolving demands of regional stakeholders

Healthy Oceans
- international partnerships and policy leadership

Resilient Coastal Communities & Economies

Organization & Administration Enterprise
- modern information technology
- diverse, evolving workforce
- modern, safe, sustainable facilities
- a high performing organization

Science & Technology Enterprise
- a holistic understanding of the earth system through research
- accurate, reliable data from integrated earth observations
- an integrated environmental modeling system
NOAA’s MISSION
The National Weather Service of the Future: Building a Weather-Ready Nation
• Innovation is “the process by which individuals and organizations generate new ideas and put them into practice”


• Society does not fully benefit from research without transitions

• NOAA transitions research into applications, including the transition of research from OAR to NWS day-to-day operations
“TRANSITION” DEFINED

• Transition is the transfer of knowledge or technology from a research or development setting to an application, including operational settings.

• Transitions occur in two phases:
  1. **Demonstration** (e.g., use of test-beds to confirm operational usability or demonstration using rapid prototyping), which is part of R&D
  2. **Deployment** (e.g., integration of new people, equipment, or techniques into an operational environment), which is part of applications, including operations.

• Transitions occur in several ways:
  a. From NOAA R&D to Operations (both NOAA and external)
  b. From NOAA R&D to Commercialization
  c. From NOAA R&D to Other Uses (e.g., resource mgt, education, etc.)
The Questions

• What are the critical factors that are necessary to support the successful transition of research into application?

• What are the pitfalls preventing a successful transition?

• What can be done to avoid/resolve these pitfalls?
What are some the Critical Factors

- A well established path to deployment and sustainment
- Ownership
- Relationship to Mission
  - Gap filler
  - Mission enhancer
- Sponsorship and fully funded
What are the Pitfalls

- Benefit to society is not well defined
- Not sponsored and fully funded
- No well established path to deployment and sustainment
- Lack of prioritization
- Lack of collaboration within the community
  - Castles, Little and Big
- Assumptions of the operational platform
- Difference of opinion between disciplines
  - Scientist
  - Engineer
  - Operationists
What Can Be Done

• R&D projects must have a "transition path" - e.g., avoid using standards, frameworks, formats, etc that are incompatible to existing operational systems

• The O2R approach facilitates R2O greatly - conducting R&D using operational infrastructure and systems leading to direct improvements to the operational systems, thus avoid the "valley of death" on the tradition path
  —the valley of death is the graveyard for technologies with known applications that fail to materialize, whereas the graveyard is the valley of lost opportunities.
Depiction of the transition pathways from NASA research to NOAA operations.

UCAR Quarterly, Summer 2003
More of What Can Be Done

- Commitment between interagency test beds
- Use operational success criteria to help set research priorities
- Limit exposing R&D products to operational users; maturity levels of these products and varying levels of user interactions will identify readiness
- Maintaining balance between R&D and Operational computing capacity to ensure operational capacity is available to implement R&D products
- Corporate portfolio planning is accounting for transition requirements
- Continued growth/support of Virtual Labs
THANK YOU!

NATIONAL WEATHER SERVICE

National Weather Service