

Network Information Management System



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Vision: LTER IM



Promote ecological science - site,
network, and global- by fostering
synergy between science and
technology through a bottom-up,
research-driven approach to
informatics

Where is LTER leading the way?

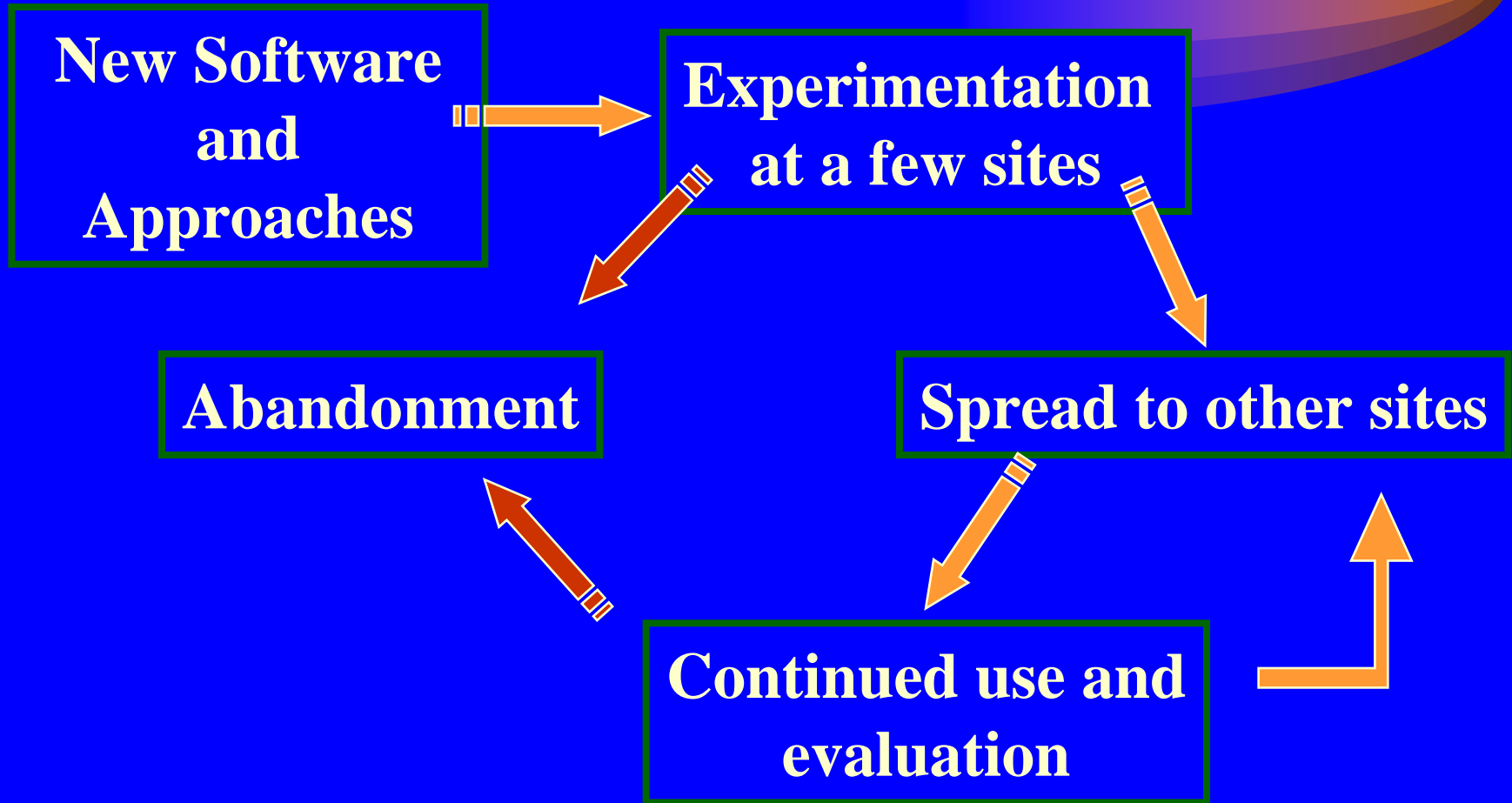


- Recognize/value data diversity & site differences
- Build prototype solutions - “incubators” - DTOC, SiteDB, ClimDB, PERSDB, ASBIB
- Facilitate education of Site researchers *with* Information Managers
- Lead research: science & computer-science interface
- Find scalable solutions

“Healthy” *Tensions*

- Top-down vs. bottom-up
- Commercial data vs. scientific data
- Production-driven vs. research-driven
- Site-centric vs. network-centric
- Holding data vs. sharing data
- Standardization vs. diversity
- Centralized vs. distributed
- *Technology-drift* vs. status-quo

The “LTER Cycle”³



LTER: EcoInformatics Laboratory



- Develop human capital for “Laboratory for the future”
- Develop Curriculum in Research Information Management
- Create “new breed” of scientist - “interpreter” of data across spatial scales, disciplines, & cultures



"I get it! For this game I have audio, but no video."

Data Policy



- *“Please pass the data.”*
- On-line:
 - Class I: Available within 2-3 years
 - Class II: Rare exception, available after 2-3 yrs.
- *“User beware”*
- Code of ethics, Data pledge

Who are customers for our data?

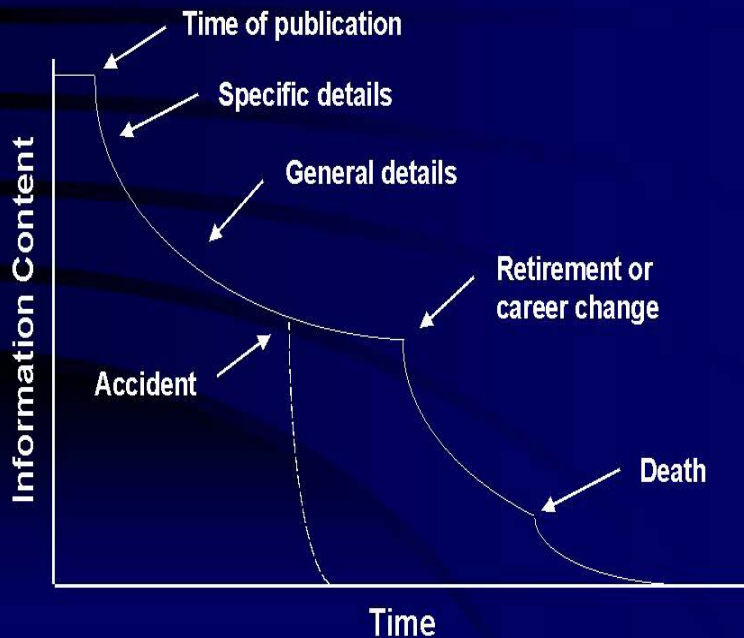


- Scientists
- Students
- K-12 teachers
- Natural Resource Managers
- Policy-makers
- Society

*Lack of Metadata is recognized
impediment to data sharing*

Metadata Standards

The Challenge: Fighting Data Entropy (Michener et al. 1997)



- Avoid data entropy
- Value-added activity
- Standards:
 - FGDC for spatial data
 - Michener et al. for non-spatial data (NCEAS)
- On-going educational effort



Metadata content and structure vs. Level of Use

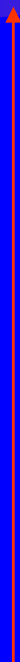


Interoperability Level

Exchange Level

Personal Use Level

Increasing
content and
structure



**following Michener et.al. 1997*

Metadata interoperability does not start with standards

Interface at all levels

scientifically meaningful content

Start Here

translated to accepted standards for interoperability

Z39.50

Dublin Core

SDTS


Not Here

Development of NIS



“One-stop shopping” access to data
& metadata from global sites

NIS: Measure of success?



Facilitates intersite research and
assessment of site/network/global
ecological hypotheses

Goals for LTER NIS Effort



- Increase utility of existing system
- Increase access & query capabilities of intersite data
- Capitalize on strength in site diversity

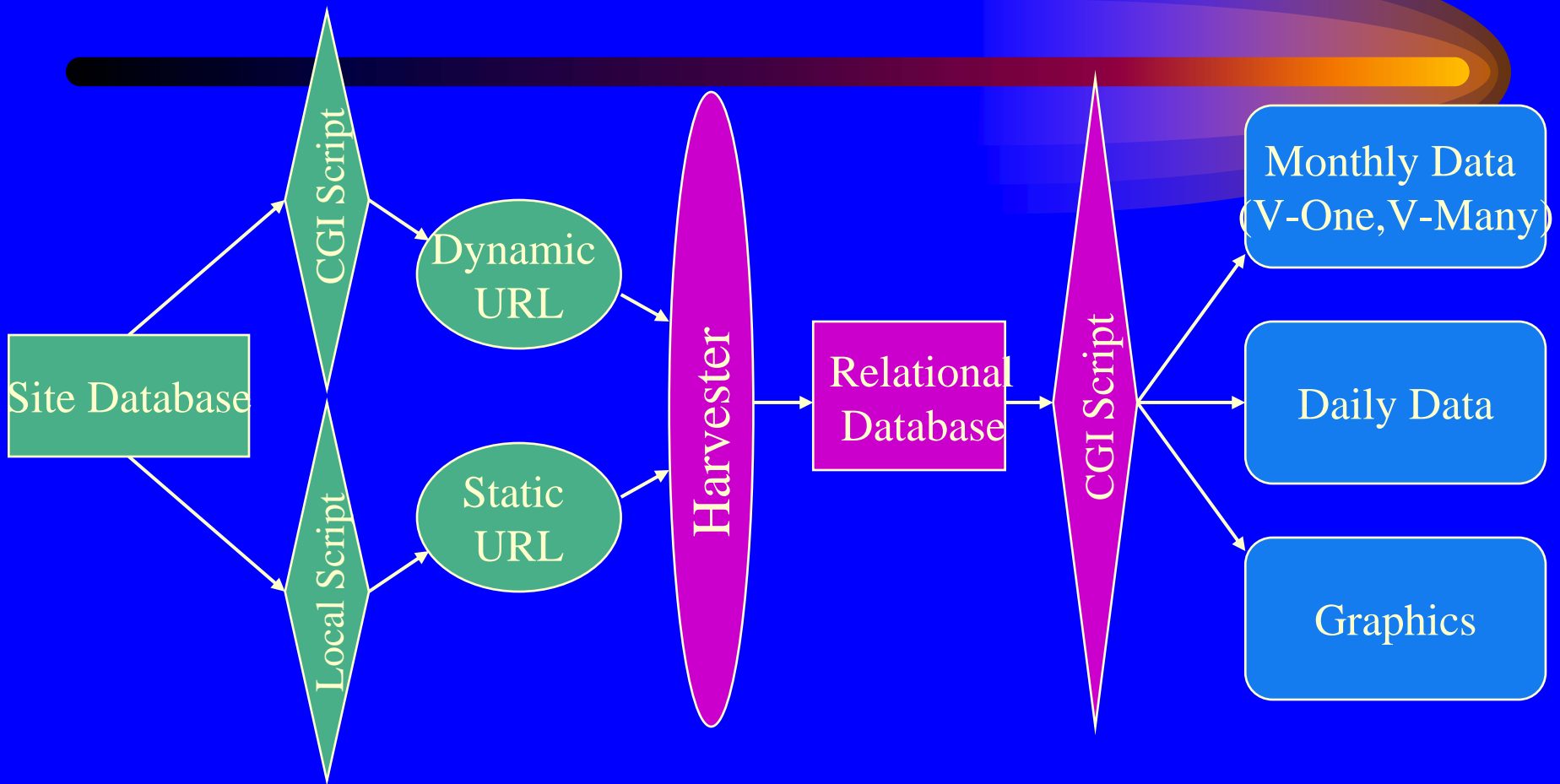
Prototypes of NIS



- Seize web:database connectivity capability
 - Data catalog (DTCOC)
 - Site description (SITEDB)
 - Personnel database (PERSDB)
 - Network climate database (CLIMDB)
 - All Site Bibliography (ASBIB)

ClimDB “Contributed” Mechanics¹

Individual Site → Central Site → Public User



Exchange filters → Exchange format

Distribution filters → Report formats

Data Table-of-Contents (DTOC)



- Each site created a simple Data Table of Contents containing their data sets
- Sample DTOC entry

• [Bird Species List for the H.J.Andrews Experimental Forest and Upper McKenzie River Basin](#) -- [AND](#)
-- [McKee, W. Arthur](#)
-- [biodiversity, bird, species list](#)
-- [SA003](#)

Colored letters have a WWW link back to site metadata

Challenge: To create collections of data resources perceived to be functionally integrated yet each maintaining its autonomy

- LTER: “Centributed”
- CS community: “Mediated access”

Lessons Learned



- Meeting standardized goals with variety of site-specific solutions has built strength into LTER Network
- Leaving data at sites where it can best be managed, while making it accessible through common interface, is viable

Interactions with national efforts

- OBFS-DIMES volume
- CO-DATA
- FLED
- NCEAS-metadata, KDI
- NASA- GMD
- ORNL-DAAC
- NACSE-Hyper-SQL
- NERRS-Centralized Data Mgmt. Off. (NOAA)
- GTOS-DBMS & R-S (International)
- NPACI/SDSC
 - Kansas systematics software proj. (KDI)
 - Long-term storage & archival

Sociology of Information Management



- Develop sense of “community”
- Help LTER focus as a “network”
- Annual meetings since early 80’s
 - Balance site vs. network priorities
 - Shared early, cross-site data documentation efforts
 - Data access policies for Network
- Series of workshops
 - Transfer internationally

LTER & National Trends



- Published guidelines for managing research data
- Published content standards for ecological metadata
- Recognition of ecological informatics as discipline
- National and international training in data management
- Participation in “standards” activities & discussion of electronic publishing
- Development of “contributed” model of data dissemination

Opportunities ahead



- Capitalizing on collaborative efforts
- Building bridges with private sector
- Partnering with agencies
- Fostering international alliances
- Developing more training opportunities
- Balancing “in-reach” & “out-reach”
- Finding scaleable solutions



"We'll always have e-mail."