

International LTER Network

an overview



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ILTER Network Vision, Mission, and Goals

ILTER Network Vision: *A society in which exemplary science contributes to the advancement of the health, productivity, and sustainability of the global environment that, in turn, advances the health, prosperity, welfare, and security of humanity.*

ILTER Network Mission: *To develop and effectively deliver to the scientific community, policy makers, and society in general, sound scientific information and predictive understanding of global processes associated with large temporal and spatial scales needed to better conserve, protect, and manage ecosystems at local, regional, and global scales, their biodiversity, and the services they provide.*



East Asia Pacific Regional LTER Network

- Australia
- China
- China-Taipei
- Mongolia
- South Korea

North American Regional LTER Network

- Canada
- Mexico
- United States

Central/Eastern European Regional LTER Network

- Austria
- Czech Republic
- Hungary
- Latvia
- Poland
- Slovak Republic
- Ukraine

African Regional LTER Network

- Mozambique
- Namibia
- South Africa
- Zambia

Middle East Regional LTER Network

- Israel

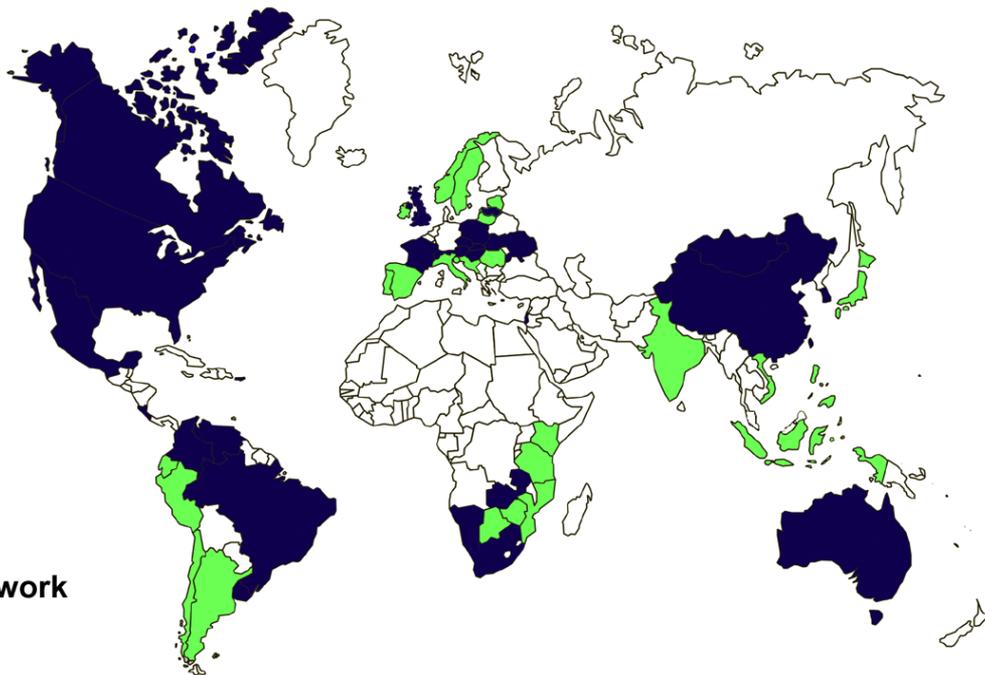
Western European Regional LTER Network

- France
- Switzerland
- United Kingdom

Central/South American Regional LTER Network

- Brazil
- Colombia
- Costa Rica
- Uruguay
- Venezuela

The International Long Term Ecological Research Network



■ Official ILTER Networks
■ Countries Considering LTER Networks

Argentina	Ireland	Philippines
Botswana	Italy	Romania
Chile	Japan	Slovenia
Croatia	Kenya	Spain
Ecuador	Lithuania	Sweden
Estonia	Norway	Tanzania
India	Portugal	Vietnam
Indonesia	Peru	Zimbabwe

Updated August 04



ILTER Organization

- **ILTER Chairperson:** Hen-biau King (Taiwan)
- **ILTER Executive Committee**
 - Western Europe - Christian Leveque (France)
 - Central/Eastern Europe - Julius Oszlanyi (Slovakia)
 - North America - Manuel Maass (Mexico)
 - Central/South America - Jorge Jimenez (Costa Rica)
 - East Asia/Pacific - Zhao Shidong (China)
 - Southern Africa (ELTOSA) - Johan Pauw (S. Africa)
- **ILTER Coordinating Committee**

Consists of one voting person from each ILTER member network
- **ILTER Support**

Short-term support for a coordinator to insure success during transition - John VandeCastle (USA)



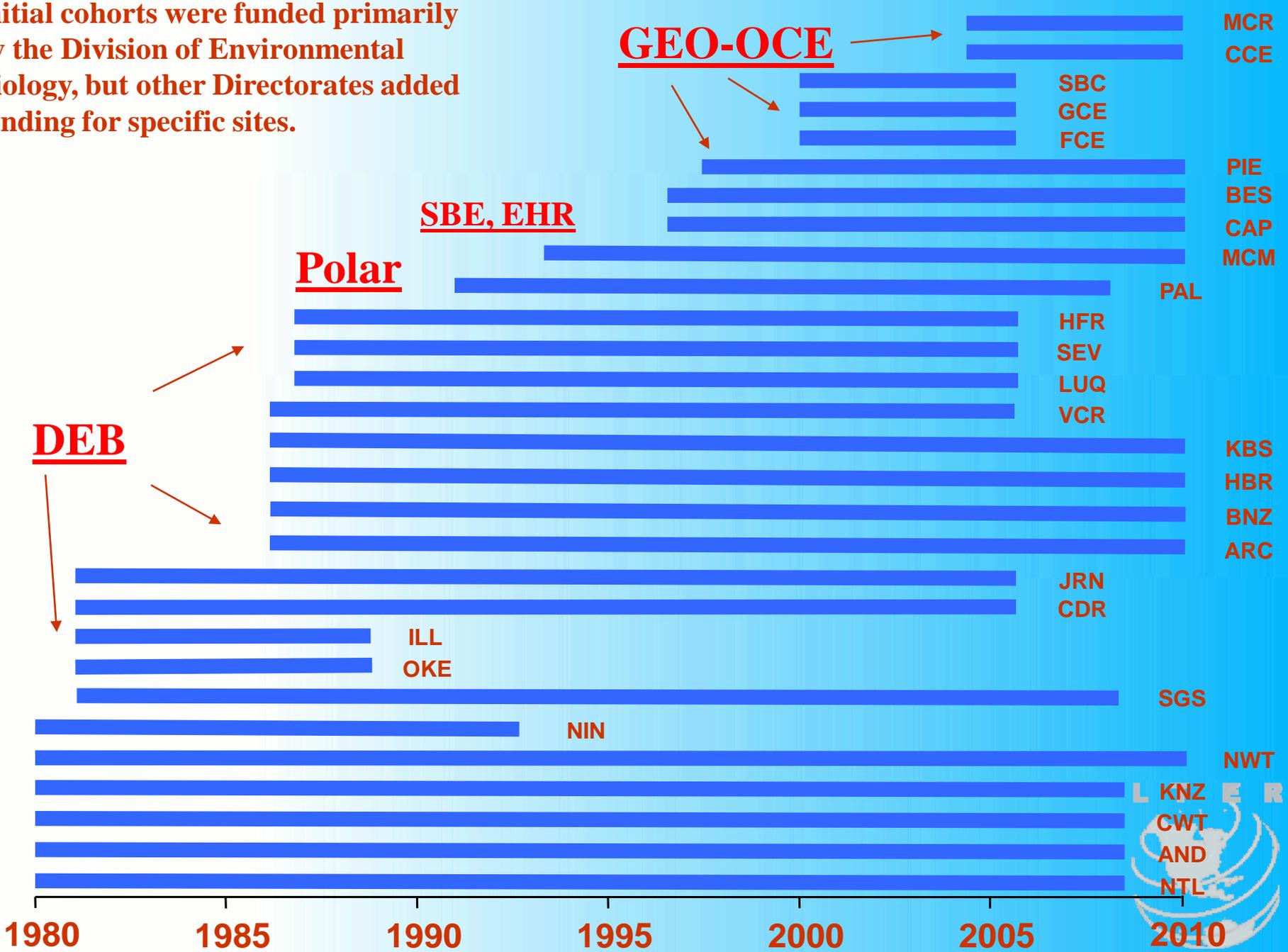
US Long Term Ecological Research Network

The US Long Term Ecological Research (LTER) Network is a collaborative effort involving more than 1200 scientists and students investigating ecological processes operating at long time scales and over broad spatial scales.

LTER was established in 1980 by the National Science Foundation to support research on long-term ecological phenomena in the United States. The network now consists of 26 sites representing diverse ecosystems and research emphases.



Initial cohorts were funded primarily by the Division of Environmental Biology, but other Directorates added funding for specific sites.



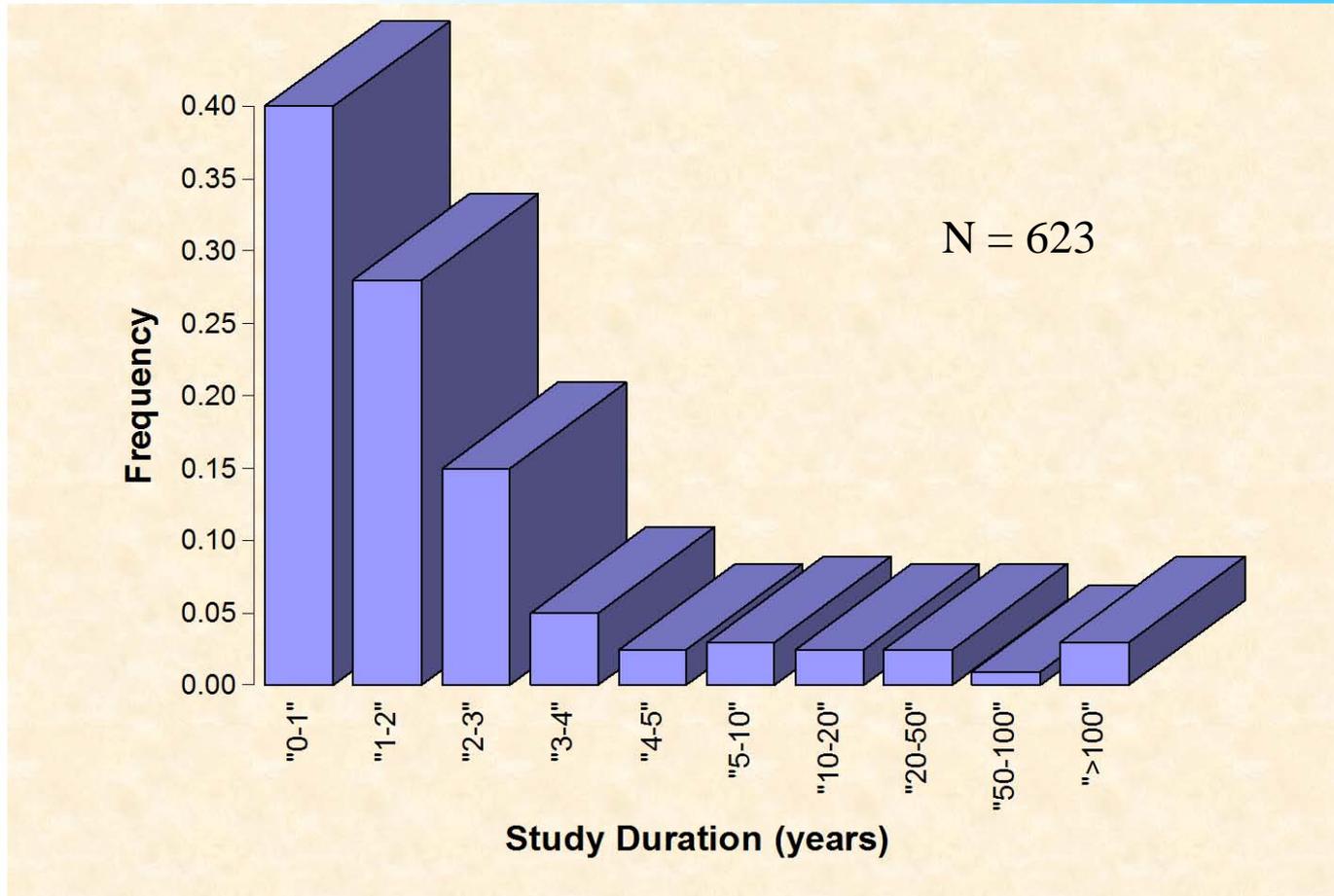


Long-term research is necessary to reveal:

- Slow processes or transients
- Episodic or infrequent events
- Trends
- Multi-factor responses
- Processes with major time lags



Duration of all observational and experimental studies

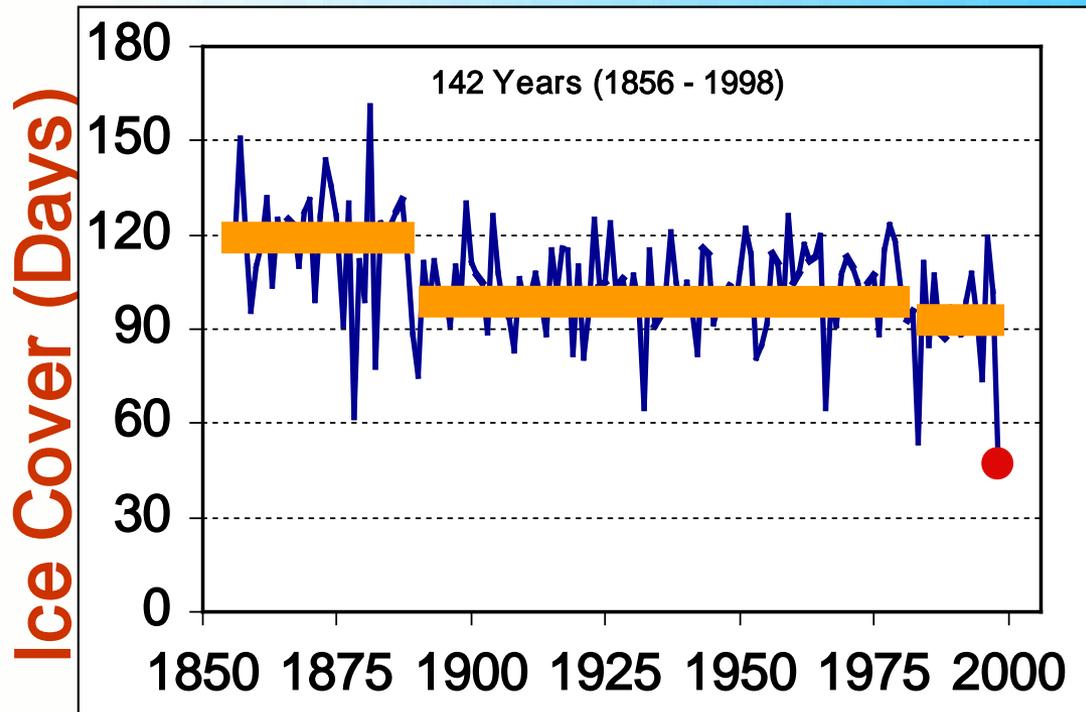


Eighty percent of studies in the ecological literature last less than three years

From Tilman, D. 1989. Ecological experimentation: strengths and conceptual problems. pp. 136-157. In Likens, G.E. (ed). Long-Term Studies in Ecology. Springer-Verlag, New York.



Lake Mendota, Wisconsin, USA



The most recent data indicate another potential pattern.

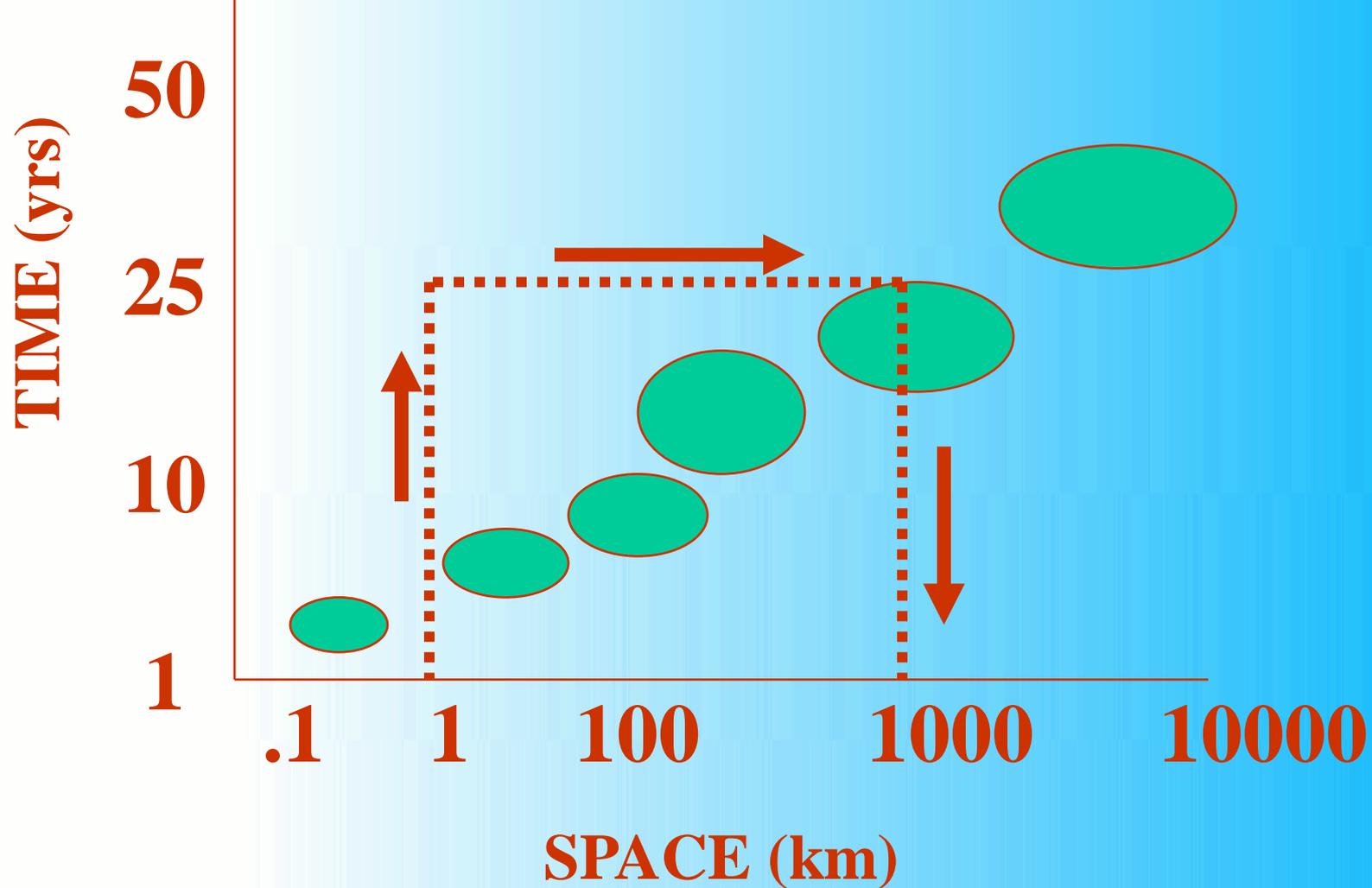


LTER research covers time scales from months to centuries

YEARS	RESEARCH SCALES	PHYSICAL RESET EVENTS	BIOLOGICAL PHENOMENA
10 ⁵ 100 MILLENNIA	PALEO ECOLOGY & LIMNOLOGY	• Continetal Glaciation	• Evolution of Species
10 ⁴ 10 MILLENNIA			• Bog Succession
10 ³ MILLENNIUM		• Climate Change	• Forest Community Migration
10 ² CENTURY	LTER	• Forest Fires	• Species Invasion
10 ¹ DECADE		• CO ₂ Climate Warming	• Forest Succession
10 ⁰ YEAR		• Sun Spot Cycle	• Cultural Eutrophication
10 ⁻¹ MONTH		• El Nino	• Hare Population
10 ⁻² DAY	MOST ECOLOGY	• Prairie Fires	• Prairie Population
10 ⁻³ HOUR		• Lake Turnover	• Annual Plants
		• Ocean Upwelling	• Plankton Succession
		• Storms	• Algal bloom
		• Diel Light Cycle	• Diel Migration
		• Tides	

The time scales addressed by the Long Term Ecological Research Program fall outside the range of those typically addressed in other ecological research programs





Over time, long-term studies experience events that normally are associated with large spatial scales (e.g., droughts). Thus, long-term studies provide opportunities to extrapolate to larger spatial scales.



Research Over Broad Spatial Scales

- Answers large scale questions concerning ecological phenomena
- Creates opportunities for comparisons between ecosystems across regional, continental, and global gradients
- Allows scientists to distinguish system features controlled by absolute and relative scales

AREA (m ²)	RESEARCH PROGRAMS		
10 ¹⁴ GLOBAL	GLOBAL SCIENCES		
10 ¹² CONTINENT	IGBP	LTER	MOST ECOLOGY
10 ¹⁰ REGION			
10 ⁸ LANDSCAPE			
10 ⁶ LANDSCAPE			
10 ⁴ PLOT, PATCH			
10 ² PLOT, PATCH			
10 ⁰ SAMPLE POINTS			

The spatial scales addressed by the Long Term Ecological Research Program fall outside the range of those typically addressed in other ecological research programs



Hypothesis-driven research

The LTER community has identified several strategies for achieving synthesis science. In the committee's view, the first and fundamental strategy must be the organization of LTER research *a priori* by hypotheses and theory, with networked data acquisition, analysis and testing by predictive models across broader and broader phenomena.

[\[1\]](#) *Twenty-year Review of the LTER Network 2002..*



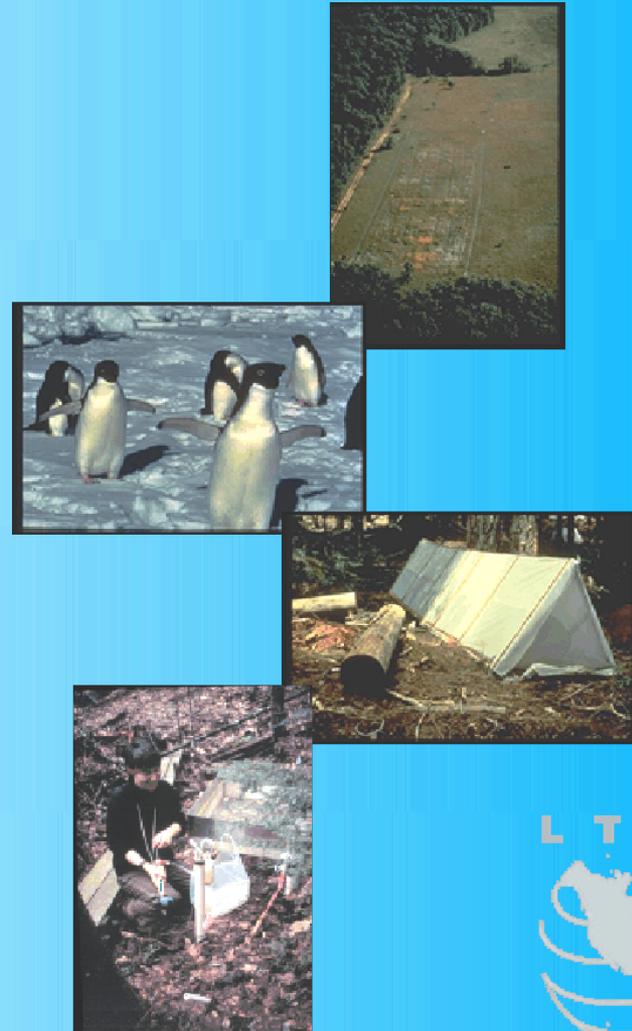
LTER Goals

- **Understanding**: Gaining ecological understanding of a diverse array of ecosystems
- **Synthesis**: Using the network of sites to create general ecological knowledge through the synthesis of information gained from long-term research
- **Information Dissemination**: Creating well designed, documented, accessible databases
- **Legacies**: Creating a legacy of well designed and documented observations and experiments
- **Training**: Developing a cadre of scientists equipped to conduct long-term, collaborative research
- **Outreach**: Providing knowledge to the broader ecological community, general public, resource managers, and policy makers

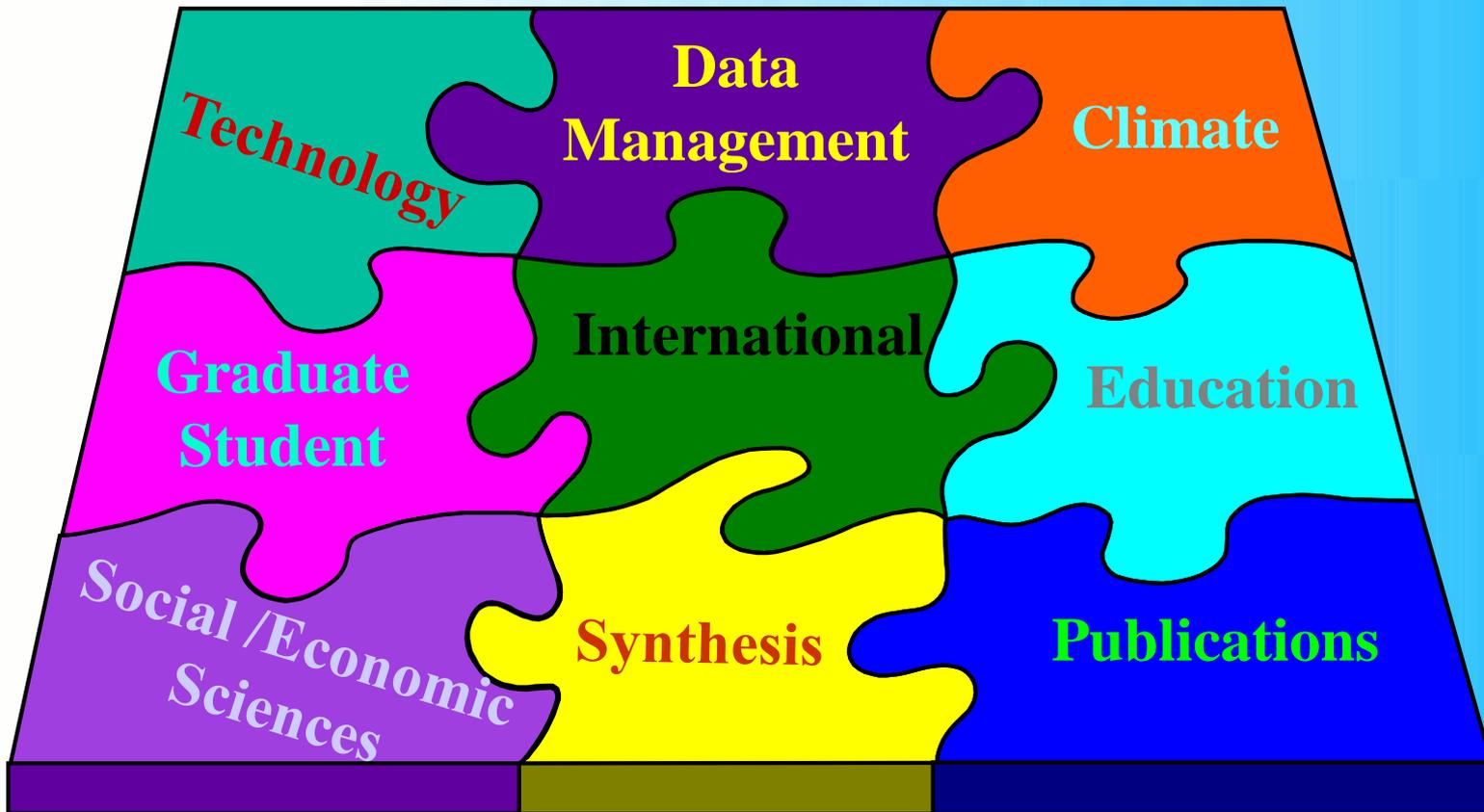


LTERR sites share a common commitment to long-term research on the following core topics:

- **Pattern and control of primary production**
- **Spatial and temporal distribution of populations selected to represent trophic structure**
- **Pattern and control of organic matter accumulation in surface layers and sediments**
- **Patterns and movements of inorganic inputs through soils ground- and surface waters**
- **Patterns and frequency of disturbance**



Network Management



THE IMPORTANCE OF CROSS-SITE SYNTHESIS

“The power of the network approach of the LTER program rests in the ability to compare similar processes (e.g., primary production or decomposition of organic matter) under different ecological conditions. As a result, LTER scientists should be able to understand how fundamental ecological processes operate at different rates and in different ways under different environmental conditions” (Risser Report, 1993).

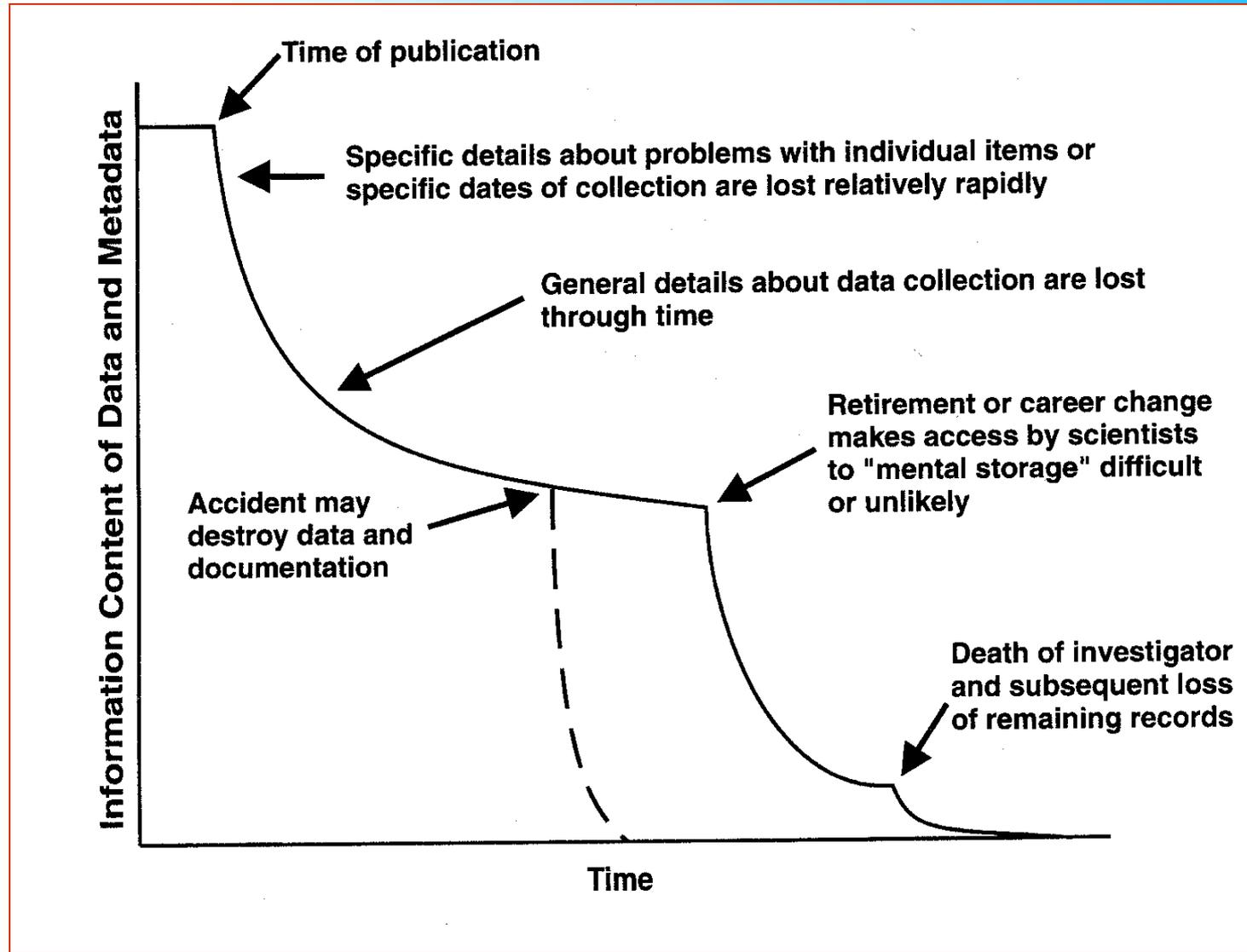


Why do we need a Network Information System?

Modern ecology requires increased access to data and metadata distributed across multiple sites for synthesis and integration across broad spatial and temporal scales.



Information decay



Data loses value over time unless documented and archived.



Network Information System Design and Development

Virtually all of these synthesis efforts require the bringing together of diverse, long-term data sets, with associated problems of compatibility, coding, transformation, sorting, and searching. *There is thus a particular need to establish within the next decade a program of logistical support for LTER-related synthesis efforts, with a focus on database development and informatics techniques optimized for ecological research. – 20-Year Review*



Science drives the need for information management



For the Sites

Long-term studies depend on databases to retain project history

For the Network

Cross-site studies require communication and integration of data

For the Nation

Integrated, multidisciplinary projects depend on databases to facilitate sharing of data



US LTER Committee

- At present: 14 members, 2 co-Chairs elected for 2 years each
- Search for effective representation of skills, geographical coverage, and representation of the US LTER Network
- An evolving model to ensure full engagement of the US LTER in ILTER



ILTER Information on the Web

ILTER Network Home Page

www.ilternet.edu

Links to ILTER Networks

www.ilternet.edu/networks

US ILTER Committee

intranet.ilternet.edu/committees/us_ilter/index.html

