

The expanding influence of the Long Term Resource Monitoring Program (LTRMP)

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Acknowledgements: David P. Herzog, Robert
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Missouri Department of Conservation

LTRMP: History

- Water Resources Development Act (1986)
 - Upper Mississippi River Restoration– Environmental Management Plan (UMRR–EMP)
 - 1st comprehensive program
 - Upper Mississippi River System
 - Long Term Resource Monitoring Program (LTRMP)
 - Habitat Rehabilitation and Enhancement Program

LTRMP: Mission....

- ▶ *“Provide scientific foundation...
.....to base management
actions, environmental policy”*



5 UMRS states and reaches monitored by LTRMP

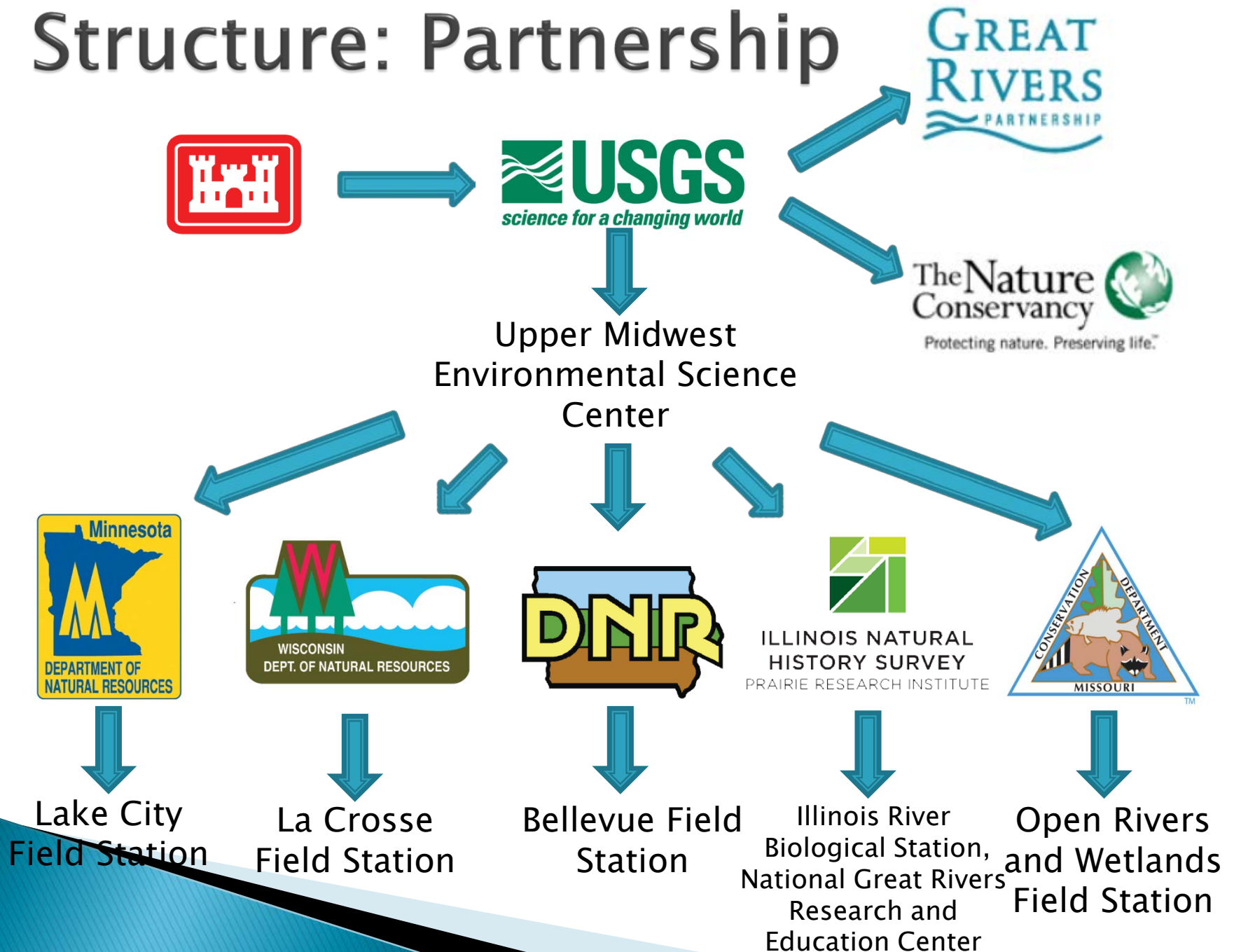
LTRMP: Components

- ▶ Fish
- ▶ Water Quality
- ▶ Aquatic Vegetation
- ▶ Macroinvertebrates
- ▶ Land Cover
- ▶ Bathymetry
- ▶ GIS Data
- ▶ Other Research



components based on
STANDARDIZED methods

Structure: Partnership



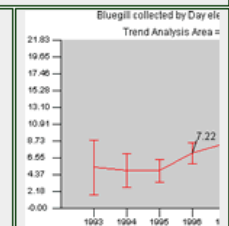
LTRMP: Exposure

- ▶ Expanded influence since inception
 - Global recognition
 - Widespread knowledge of methodologies
 - Hosted visiting scientists
 - Hosted visiting media outlets
 - Data/information available online



▢ About the LTRMP Fish Component
▢ Help Page
Fish Metrics
▢ Catch Per Unit of Effort
▢ Proportional Stock Density
▢ Frequency of Occurrence
▢ Species List
▢ Community Composition
▢ Species Richness
▢ Sampling Allocations
▢ Total Catches
▢ LTRMP Hydrographs
▢ Treemap Data Analysis Tool

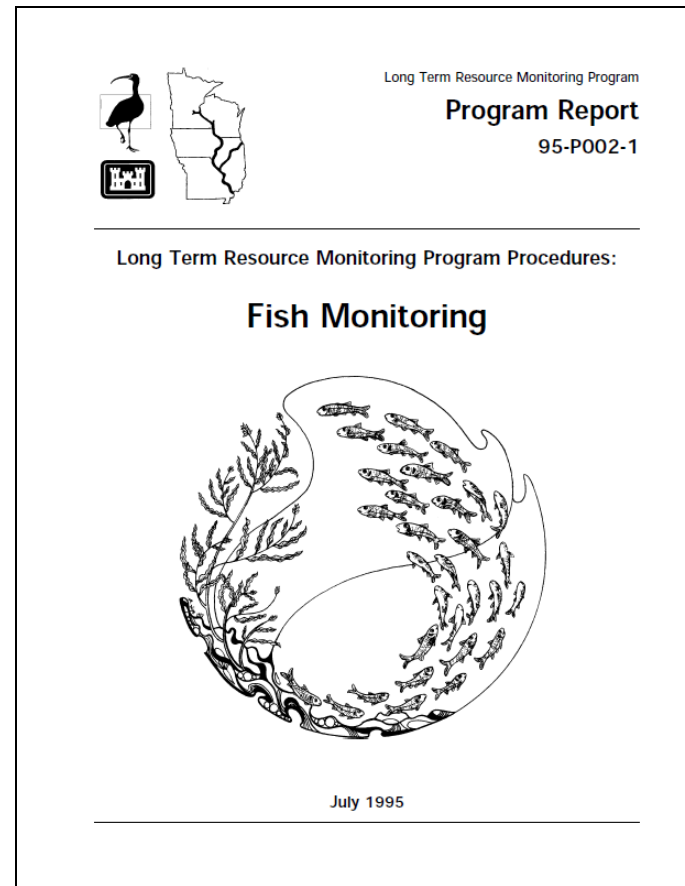
Graphical Fish Database Browser



Catch Per Unit Effort (CPUE) is a measure of a species relative abundance. CPUE metrics are calculated from random samples that provide an unbiased measure of relative abundance. Within the Graphical Fish Database Browser, CPUE metrics are portrayed as time series.

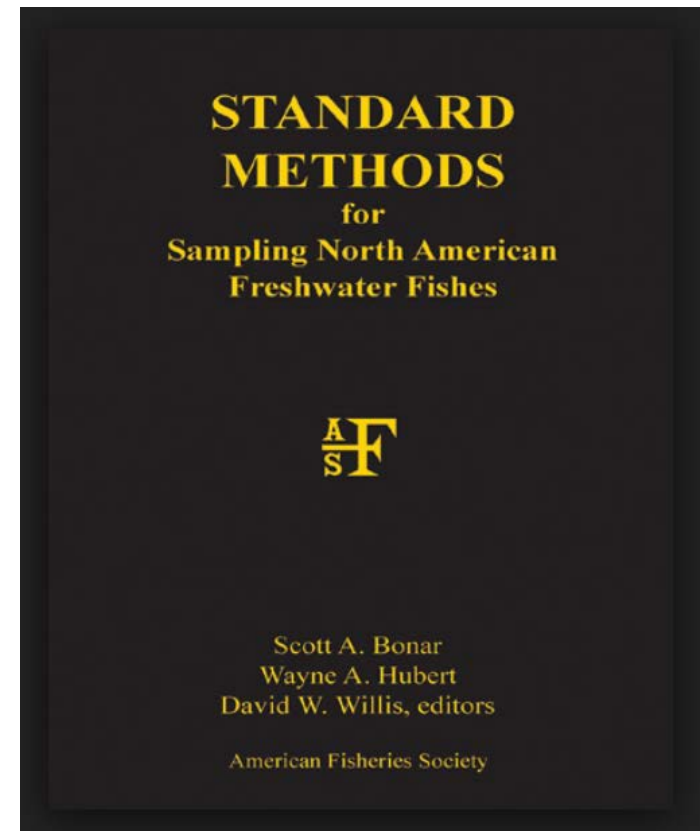
Distribution of methodologies: fish

- ▶ Nearly impossible to know extent
- ▶ 2013 Survey: fisheries professionals in Midwest
 - 228 responses: 78 “fish researchers”
 - 95% use standard methods
 - 53% know of LTRMP fish standards
 - 42% have used LTRMP methods



Distribution of methodologies: fish

- ▶ American Fisheries Society—oldest, largest organization
 - AFS: 2009
- ▶ LTRMP methods noted multiple times, multiple chapters
 - Trawling
 - Electrofishing
 - Standardization of power used



Adoption of gear

- ▶ The Mini Missouri Trawl
 - Adapted from LTRMP standard trawl by Open Rivers Field Station
 - Dave Herzog, Dave Ostendorf, Robert Hrabik: LTRMP personnel
 - Greg Faulkner: Innovative Net Systems (INS)

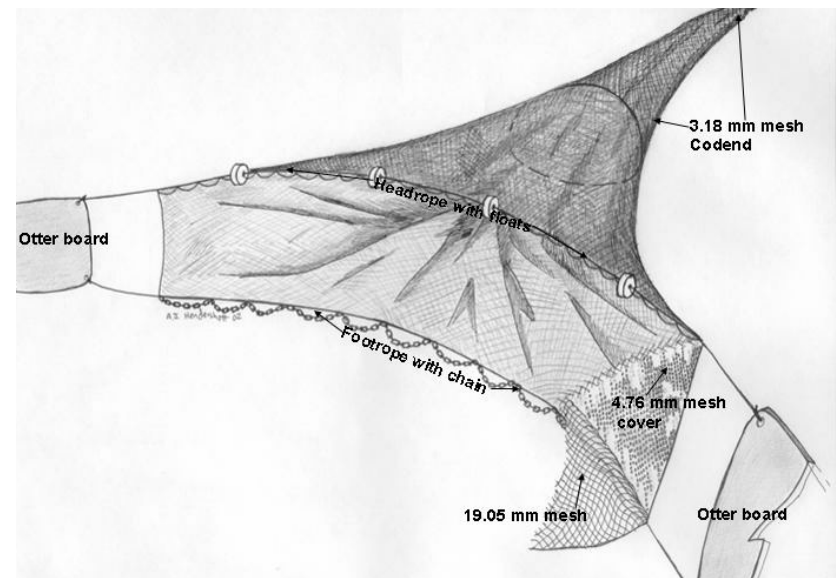


Image from Herzog et al, 2005

LTRMP trawl



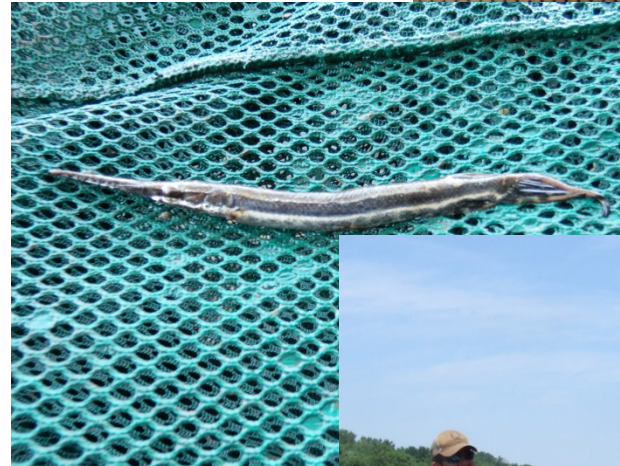
Mini-Missouri Trawl



Local work, global reach

- ▶ Dozens of North Am. rivers
- ▶ Trawl adopted across the world
 - Borneo
 - Indonesia
 - Guyana
 - China
 - Arabian sea
 - East, Central, Western Canada
 - Central America
 - Almost every state in U.S.

List courtesy : G. Faulkner:
Innovative Net Systems,
Milton LA



International Information Exchanges

- ▶ July 1993: Russian Scientists visit Open Rivers Field Station
 - Facilitated by Dr. David Galat, University of Missouri
 - LTRMP equipment, gear, methodologies, concepts, tour of field station facilities, Mississippi river in '93
 - Included field demonstrations of LTRMP gears and fish ID
 - Geographic Information Systems (GIS)

Source: River Almanac,
September 1993

Russian scientists visit Open River Field Station

*Information on Big River
sampling programs
exchanged*

by Robert A. Hrabik

On July 26, aquatic scientists from the Institute of Research on Inland Waters, Barok, Russia, visited the Open River Field Station as part of a scientific exchange program. The visiting scientists were fish ecologist and ichthyologist Dr. Arthur

Poddubney, head of the Department of Ichthyology; Gregory Scherbina, an aquatic entomologist from the Laboratory of Aquatic Invertebrate Ecology; and Nadia Ruban, a translator from the Institute.

The exchange took place under the auspices of the Russian-American Joint Committee on Cooperation in the Field of Environmental Protection program. The program is 20 years old and is sponsored by the Russian Academy of Sciences and the U.S. Environmental Protection Agency. The

program was established to create American and, at that time, Soviet work groups to find ways to protect large river basins, lakes, and estuaries in their respective countries. Many ongoing projects exist in this program, especially in the areas of water quality, environmental pollution, and ecology. The project that brought the Russian scientists to Missouri is called Project 15: Assessment of Complex Anthropogenic Impacts on Ecosystems of Reservoirs and Rivers. The principal organizations involved in the exchange are the Barok Institute and the U.S. Fish and Wildlife Service.



Foreground: Yao Yin (back of head); left to right: Nadia Ruban, Gregory Scherbina, Gordon Farabee, and Dr. Arthur Poddubney. Dr. Yin is demonstrating EPPL-7.

*I think we took the first
step toward understanding
large rivers outside
our respective countries
and identifying
global problems.*

International Information Exchanges

- ▶ May 1995: Peruvian Scientist visit Open Rivers Field Station: 2 separate visits
 - Facilitated by Robert J. Sheehan: SIU Cooperative Fisheries Research Laboratory
 - LTRMP equipment, gear, methodologies, concepts, tour of field station facilities, Mississippi river in '95
 - Included field demonstrations of LTRMP gears and fish ID
 - Discussion of Amazon R. vs Mississippi R.
 - Gears used, fish species, ecosystem scale

Source: River Almanac,
May 1996



River Almanac

An Information Sharing Bulletin of the
Long Term Resource Monitoring Program

National Biological Service
U.S. Department of the Interior

Scientists exchange information on Amazon and Mississippi Rivers

by Robert A. Hrabik and
Robert J. Sheehan

“An important objective of our exchange was to provide an opportunity for Peruvian scientists to observe our Program and data analysis tools...”

—Robert Hrabik and Robert Sheehan



Images Courtesy David Ostendorf, MDC

International Information Exchanges: China

- ▶ Facilitated by Great Rivers Partnership (GRP), 2005–Present. The Nature Conservancy (TNC), LTRMP, USACE, USGS (among many others)
 - 2008–Present: Scientists exchange multiple visits
 - U.S. scientists to China: Chinese scientists to U.S.

U.S. delegation of eight scientists visiting China in May 2008

(6 LTRMP scientists)



Highlights:

- ▶ Dr. Yao Yin, LTRMP Vegetation Component Lead: GRP Director of International Strategies
- ▶ Brian Ickes, LTRMP Fish Component Lead: GRP Fellow
 - Assisting Chinese with developing large river monitoring program based on LTRMP methods
- ▶ Ickes: 10 days May 2011
 - Quantify fish populations
 - Assist with implementation of telemetry array to study life history of Asian Carp sp.



Acknowledgements

- ▶ All scientists, past and present, working with all agencies that made these activities possible.
- ▶ Brian Ickes, USGS
- ▶ Greg Faulkner, Innovative Nets Systems



Upper Midwest
Environmental Science
Center



ILLINOIS NATURAL
HISTORY SURVEY
PRAIRIE RESEARCH INSTITUTE



Questions?



Images courtesy of
David Ostendorf,
Missouri
Department of
Conservation