Natural Resources Research in ARS

Dr. Mark R. Walbridge
National Program Leader
Soil and Water Resource Management
Acting Deputy Administrator
Natural Resources and Sustainable Agricultural Systems
USDA/Agricultural Research Service

NP212 Stakeholders Workshop
Denver, CO
May 13-15, 2008

Agriculture in the U.S. Economy

- 16% of the $9 trillion U.S. gross domestic product
- 17% of employment
- 8% of U.S. exports in 2006
- <2% U.S. workforce on farms
- 100% of the citizens are users

Agricultural Research Service

- ARS is the in-house research arm of USDA

http://www.ars.usda.gov/

Profile of the Agricultural Research Service

- In-house research arm of USDA
- Farm-to-table research scope
- 30 National Programs
- 1,100+ projects
- 8,000+ employees
- 2,100+ scientists
- 100+ laboratories
- $1.2B annual budget
- Partnerships
- International collaboration

ARS Mission

To conduct research to develop and transfer solutions to agricultural problems of high national priority and provide information access and dissemination to:

- Ensure high quality, safe food and other products
- Assess the nutritional needs of Americans

Sustain a competitive agricultural economy

USDA

Enhance the natural resource base and the environment

USDA

ars

Provide economic opportunities to rural citizens and society as a whole

USDA

ARS

How Does ARS Meet This Mission?

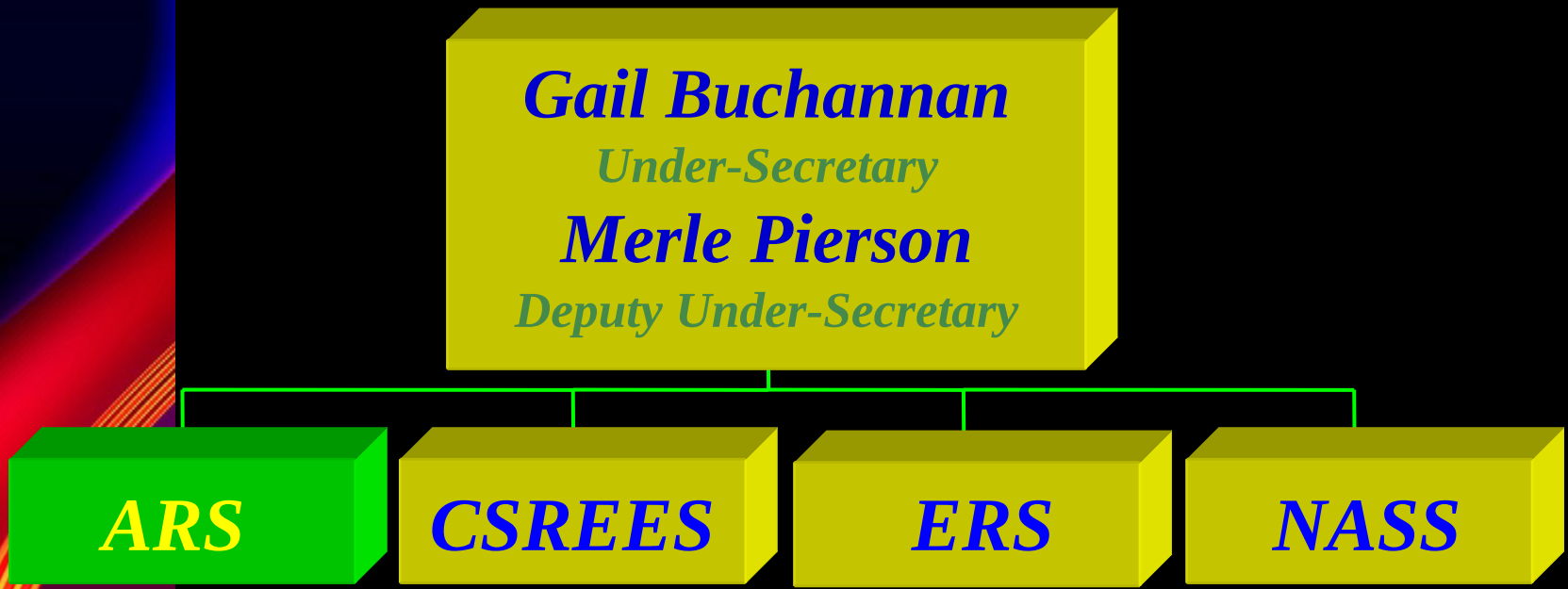
Through Our National Programs

– A group of research projects directed towards common goals to solve agricultural problems of high National priority.

- National Programs are outcome driven, e.g., “A safer food supply”

USDA

Research, Education, and Economics



ARS Organization

Secretary of Agriculture

Under Secretary, Research, Education, and Economics (REE)

Administrator Agricultural Research Service (ARS)

Central Planning, Coordination, and Support

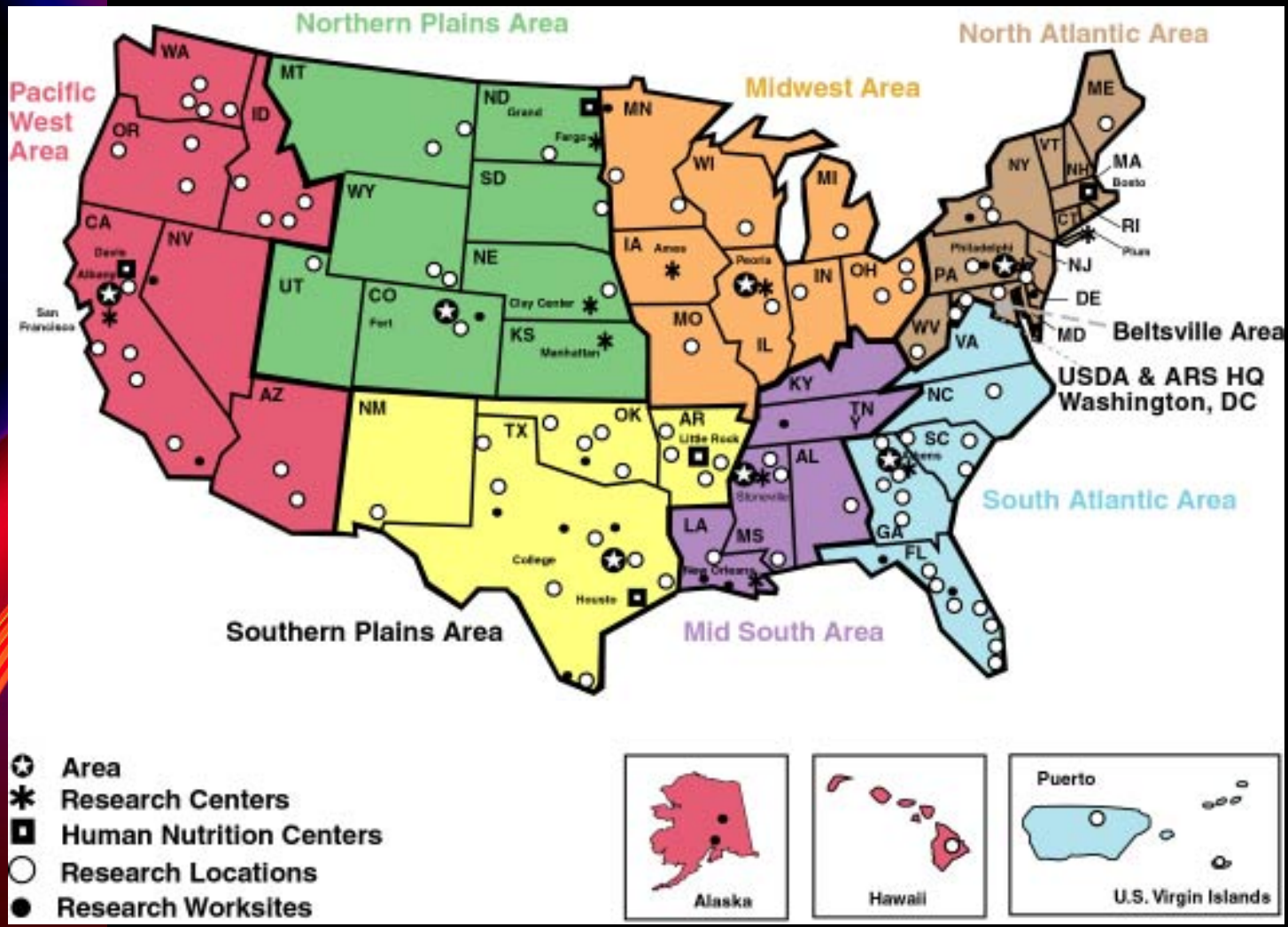
- National Program Staff
- Administrative & Financial Management
- Office of Civil Rights
- Office of Technology Transfer
- Information & Public Affairs
- Office of International Research Programs
- Chief Information Officer
- ARS Homeland Security
- Budget & Program Management
- Office of Scientific Quality Review

Decentralized Research and Information Delivery Programs

- Beltsville Area
- Mid South Area
- Midwest Area
- North Atlantic Area
- Northern Plains Area
- Pacific West Area
- South Atlantic Area
- Southern Plains Area
- National Agricultural Library

ARS LABORATORIES

USDA-ARS Locations



- Montpellier, France
- Rome, Italy
- Thessaloniki, Greece
- Brisbane, Australia
- Beijing, China
- Hurlingham, Argentina

National Program Staff

Caird Rexroad

Associate Administrator

Steven Kappes
Animal Production & Protection

Mark Walbridge*
Natural Resources & Sustainable Agricultural Systems

Jim Lindsay*
Nutrition, Food Safety, and Quality

Judy St. John
Crop Production & Protection

USDA

ars

Role of National Program Staff

Maintain relevance of ARS research through:

- Priority setting
- Budget development
- Program analysis
- Reporting to Congress and stakeholders
- Program coordination

USDA

ARS

Agricultural Research Service Matrix Management

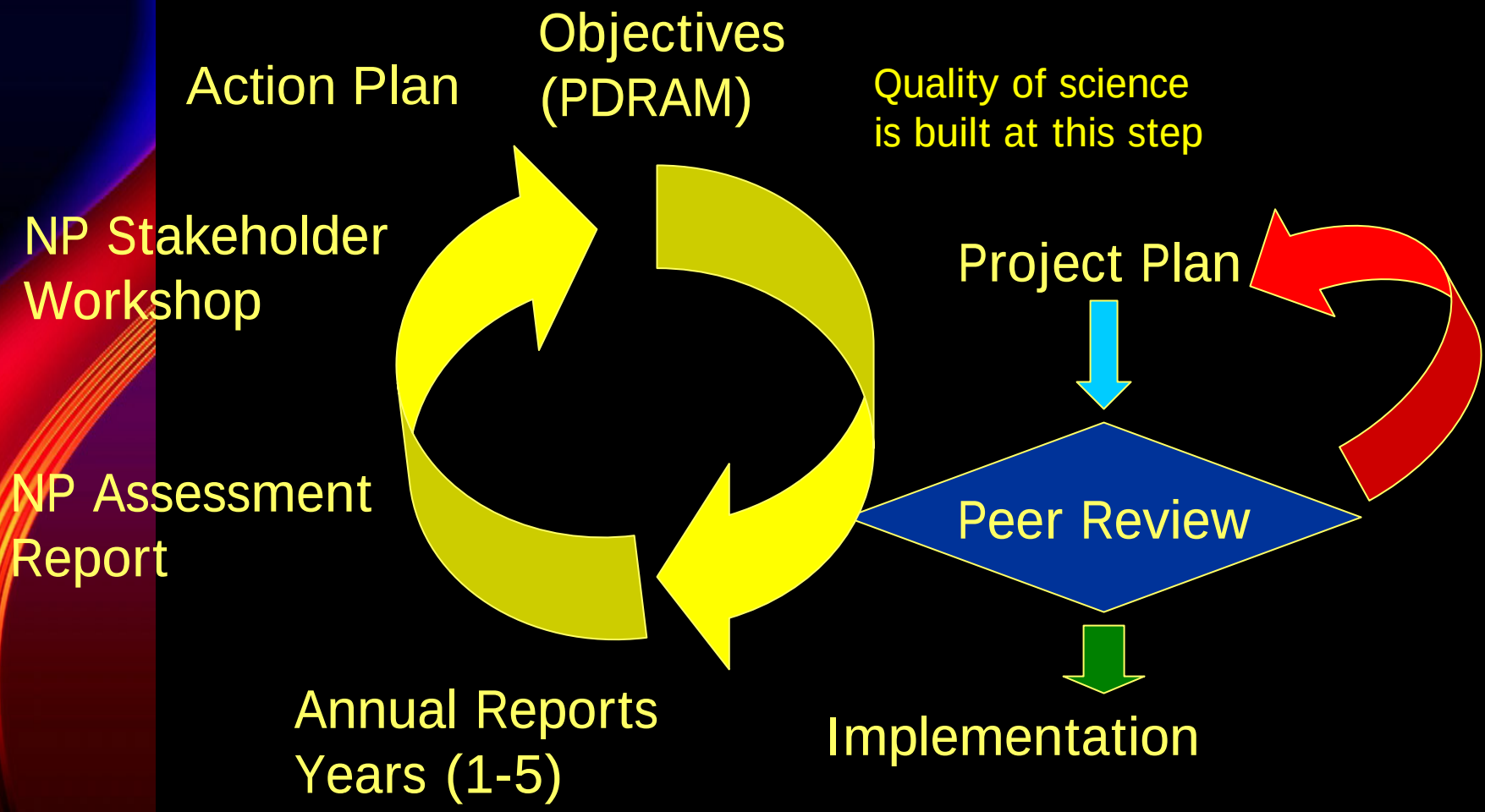
Planning & Coordination

- National Program Staff
  - Relevance
  - Research Direction and Coordination
  - Retrospective Quality

Implementation

- Area Office
  - Scientific Merit Peer Review (OSQR)
  - Implementation
  - Performance
  - Capacity
- Research Leader
- Lead Scientist

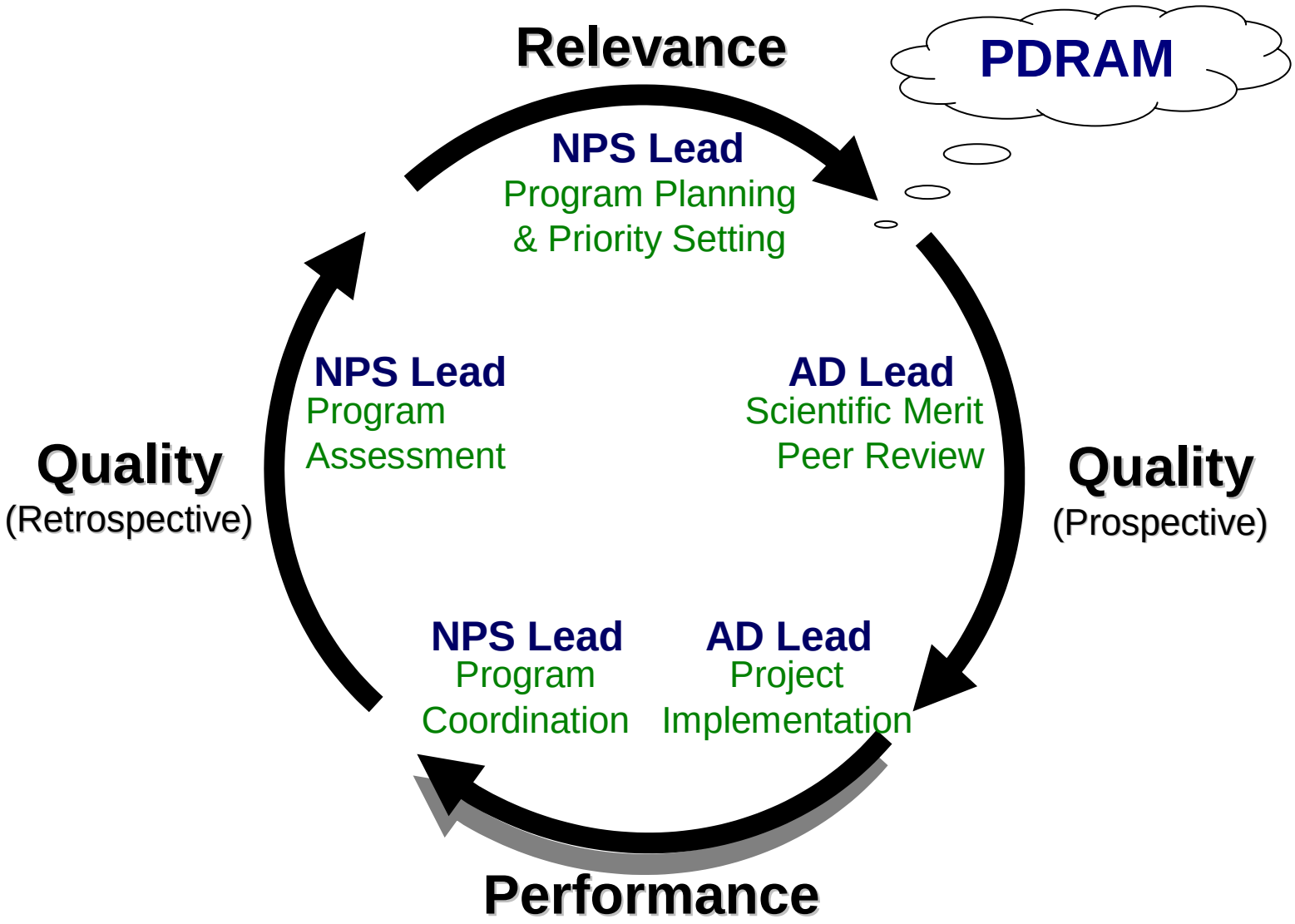
ARS Research Program Cycle



OMB Research & Development Investment Criteria

ARS National Program Cycle

ARS Matrix Management Responsibilities



Program Direction and Resource Allocation Memos (PDRAM's)

- Means by which NPS hands off program direction decisions to Area Directors
- Area Directors begin the research implementation and the prospective research quality assurance phase of the cycle

PDRAM's —What's Included?

- Assigned research objectives and expected outcomes at CRIS project level
- Level of SY effort and funding to be allocated to project
- Personnel recruitments, assignments, and disciplines
- Information conveyed to the applicable RL, Lead SY, and Project Team in the form of an Implementation Memo signed by the Area Director
- Resources

Research Project Plan Development & Review

It is required that:

- ARS research to be peer-reviewed every 5 years
- Majority of panelists to be external to ARS

ARS Office of Scientific Quality Review:

- Selects top-notch panel chairs who in turn select panelists
- Administers panel meetings for about 200 projects per year
- Provides scientific-writing guidance to scientists

The Peer-Review Process:

- Prospective evaluation of each research project plan
- Emphasizes scientific merit and advice to improve each project plan
- Does not approve or allocate project funding

USDA

ARS

Natural Resources Program Staff

Deputy Administrator

Caird E. Rexroad, Jr.

Acting Deputy Administrator
Natural Resources & Sustainable Agricultural Systems

Mark R. Walbridge*

National Program Leaders

- Agricultural Waste and Byproduct Utilization - Vacant
- Bioenergy - Bob Fireovid
- Integrated Agricultural Systems - Jeffrey Steiner
- Rangeland, Pastures and Forages - Ev Byington
- Soil and Air Resource Management - Charlie Walthall
- Water Availability and Watershed Management - Mark Walbridge; Mike Shannon

Program Analysis

- Program Analyst
  Ellen Buckley
- Program Assistant
  Michele Simmons

USDA

ARS

NRSAS' Mission

- To help farmers, ranchers, and other managers effectively steward the diverse agricultural landscapes found in the US.

- Emphasis is on developing technologies that are economical to use and systems that support profitable production and enhance the Nation's renewable natural resource base.

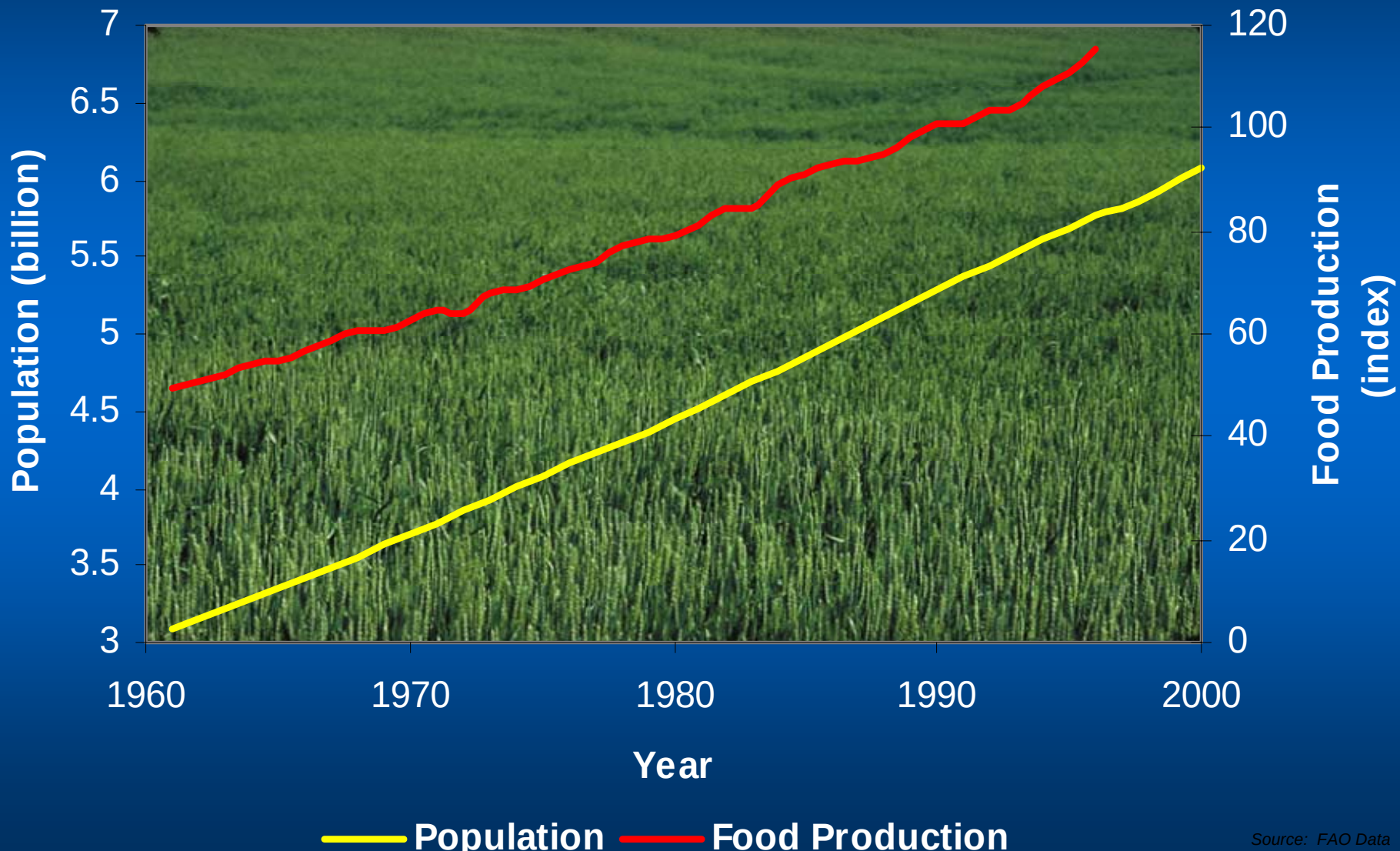
- Research priorities are identified through a continual dialogue with a wide range of customers and stakeholders to ensure that our science is relevant and provides effective solutions to their concerns.

- We address issues affecting both private and public lands, because together these are the foundation of a healthy and vibrant agricultural industry that not only provides food, feed, fiber, and renewable energy to the nation, but also abundant and high quality supplies of fresh water and clean air, as well as healthy ecosystems.

ARS Customers

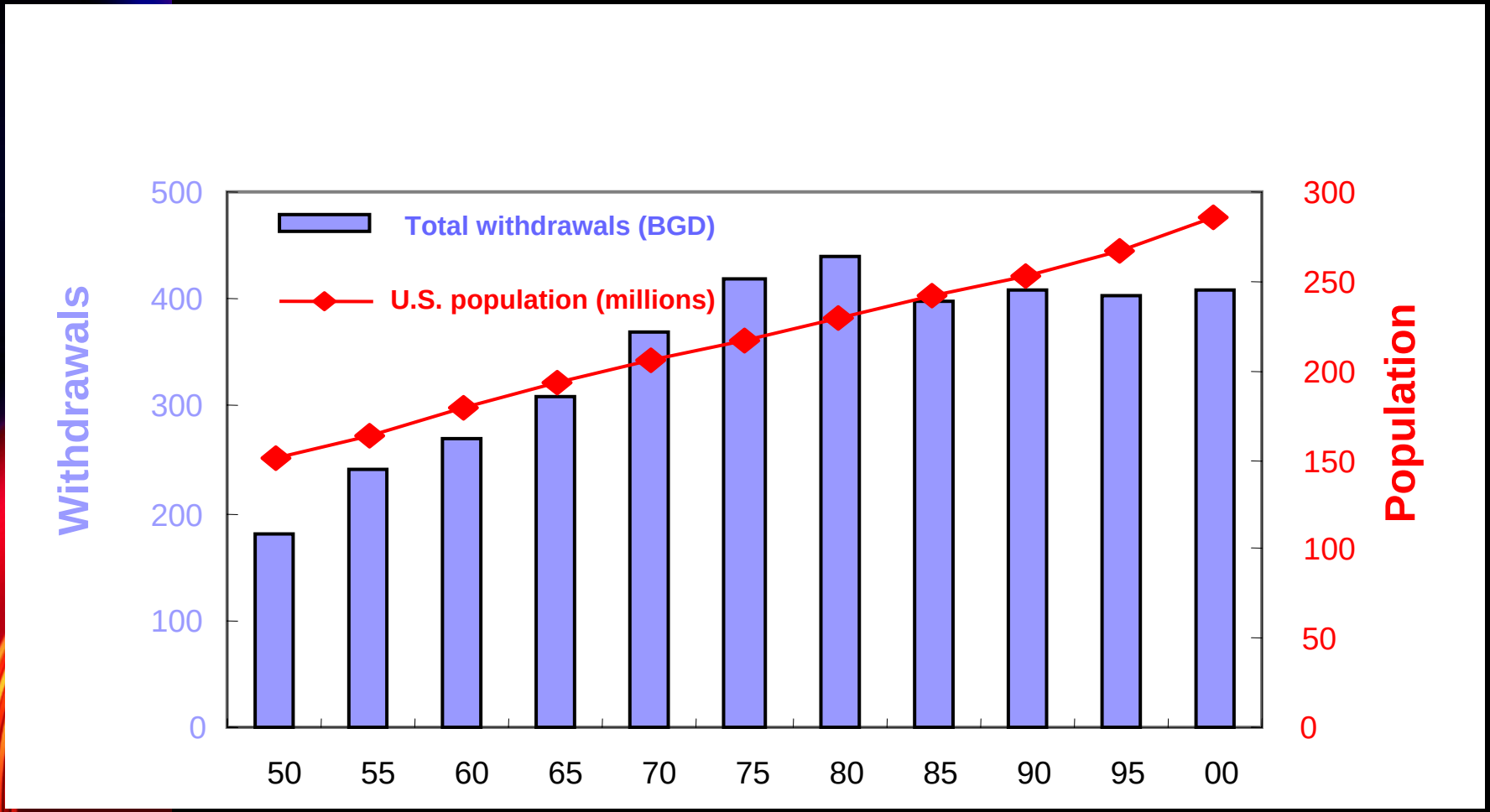
- Federal Action and Regulatory Agencies
- Producers–Farmers and Ranchers
- Industry
- Non-governmental Organizations (NGOs)
- State and Local Governments
- Consumers

World Food Production and Population Growth

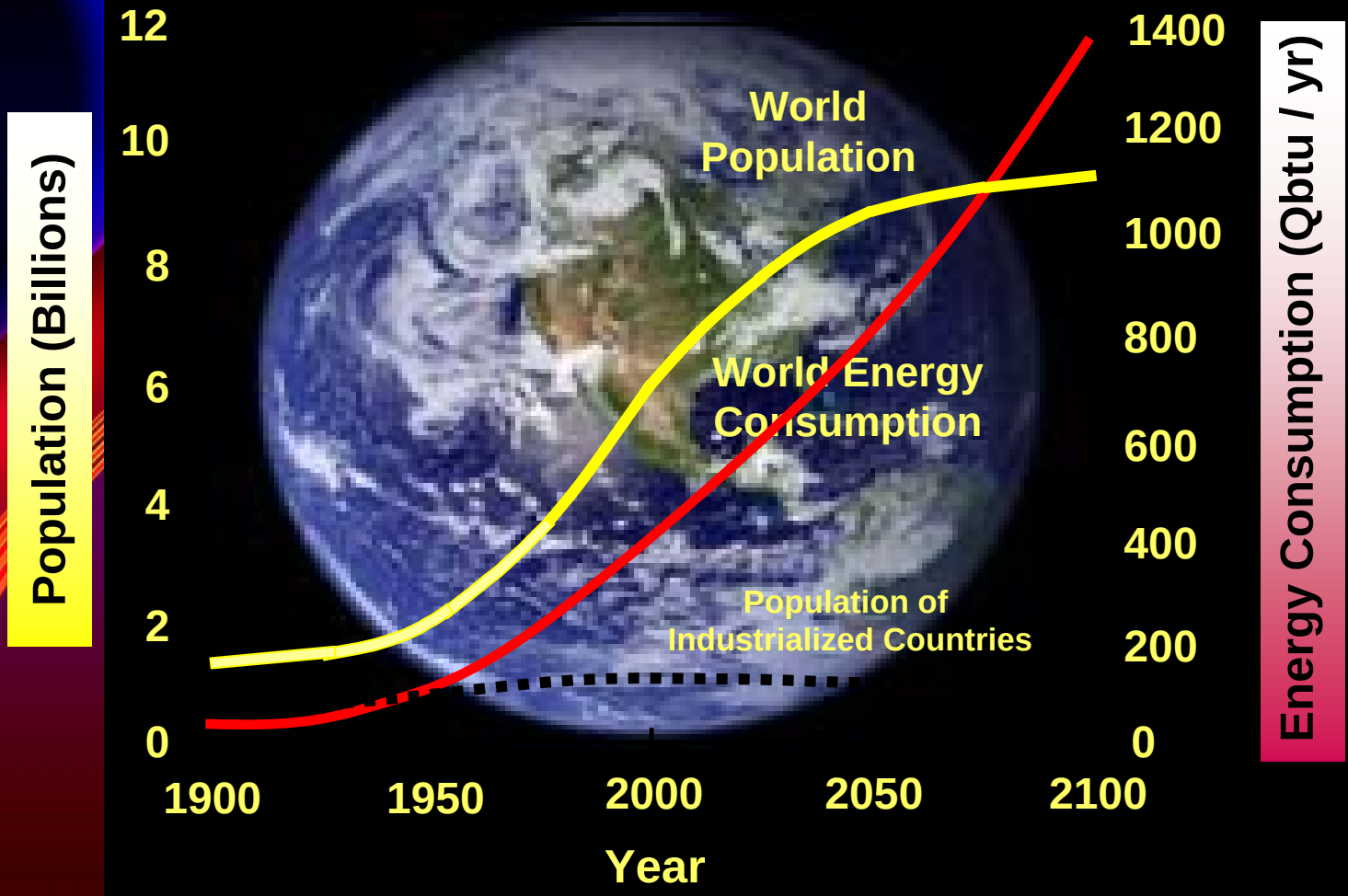


Source: FAO Data

World Population and Water Use

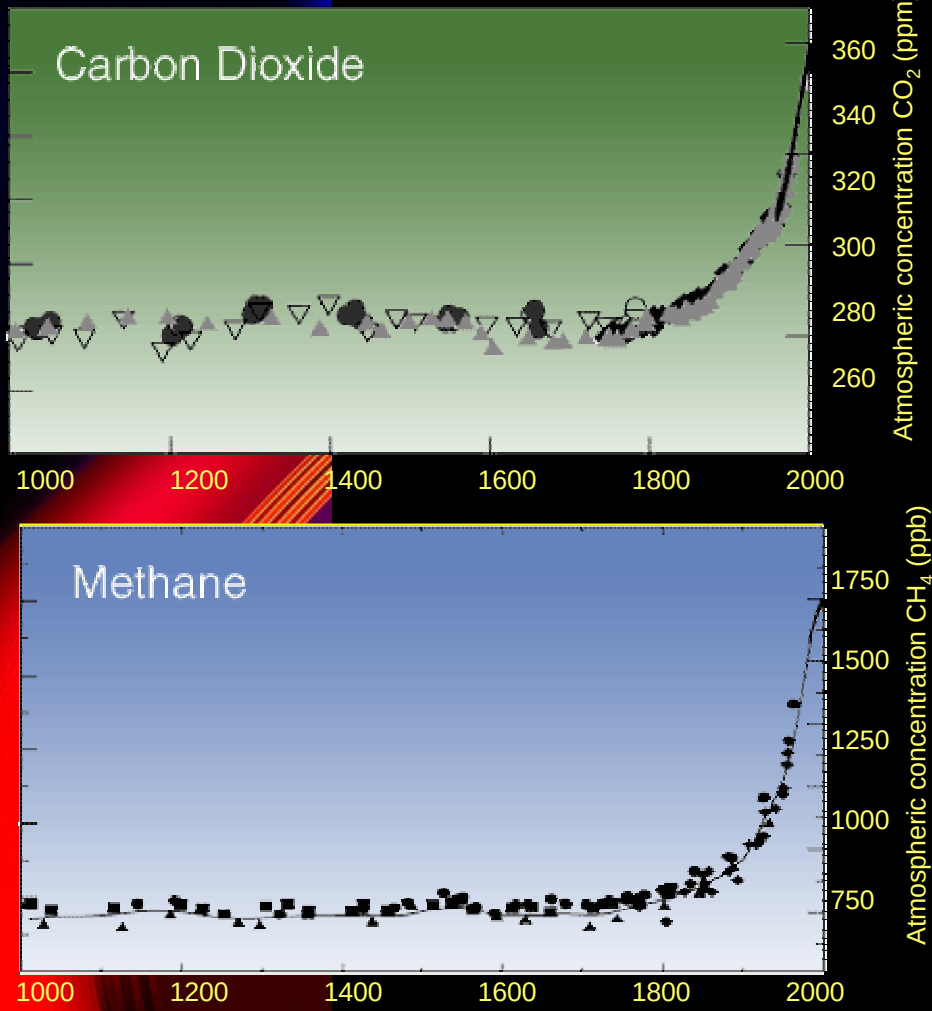


World Population and Energy Use

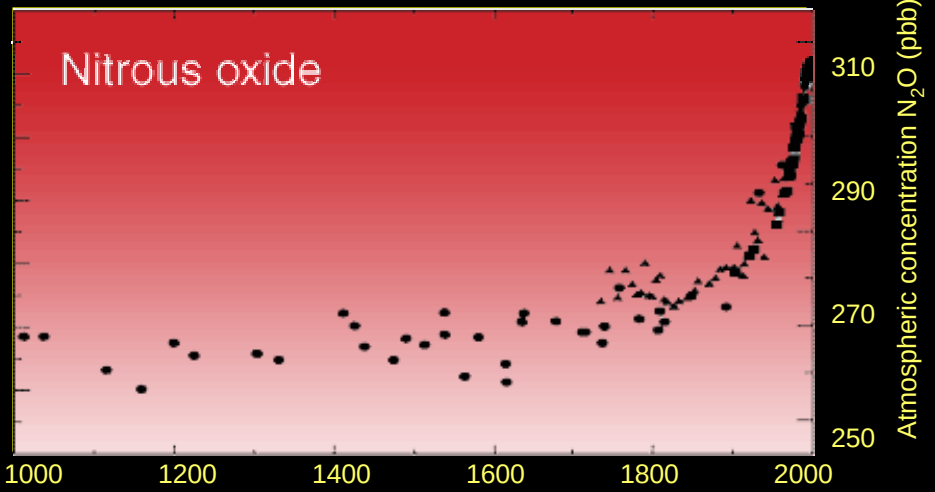


Energy Projections: "Global Energy Perspectives" ITASA / WEC
Population Projections: United Nations "Long-Range World Population Projections: Based on the 1998 Revision"

Changes in Greenhouse Gas Levels



CO_2, CH_4, and N_2O – A Thousand Year History



Source: IPCC Third Assessment Report (2001)

NRSAS National Programs

ARS' NP212 – Soil & Air Quality
Air Quality Components

- Particulate Emissions
- Ammonia and Ammonium Emissions
- Malodorous Compounds
- Ozone Impacts
- Pesticides and Other Synthetic Organic Compounds

ARS' NP212 – Soil & Air Quality
Global Change Components

- Carbon Cycle and Carbon Storage
- Trace Gases
- Agricultural Ecosystem Impacts
- Changes in Weather and the Water Cycle at Farm, Ranch, and Regional Scales

Greenhouse gas Reduction through Agricultural Carbon Enhancement network: *GRACEnet*

- Coordinated national effort by ARS scientists involving 30 locations
- Provides information on soil C status and GHG emissions of current agricultural practices
- Develop new management practices to reduce net GHG emissions, increase soil C sequestration via soil management
- Emphasis on comparing among common management scenarios at each location

What Are the Emerging Issues and Future Research Directions In Air Quality and Global Change For US Agriculture?