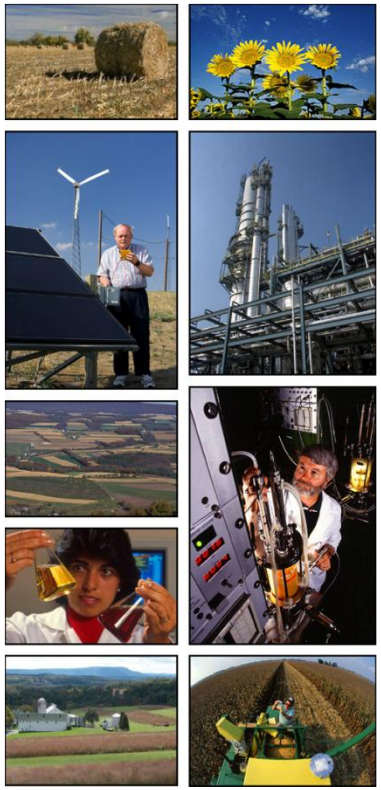


USDA Biomass Research Centers – History, Mission, Organization and Relationships to Private & Public Partners

Customer/Stakeholder Workshop
Denver, Colorado
March 15, 2011

Jeffrey J. Steiner, National Program Leader
Biomass Production Systems
USDA Agricultural Research Service

The Need For This Workshop

What Links the Two, and What Links Us

Biofuel Supply Chain


Feedstock Development


Feedstock Production


Feedstock Logistics


Biofuels Conversion


Fuel Testing & Approval


Large Scale Deployment

The purpose for this workshop is to identify the most significant challenges an advanced biofuels industry faces that can be addressed by research within the mission of the centers.

Who is Participating in this Workshop

24 – Industry representatives

10 – Stakeholder representatives from research organizations, federal & university laboratories, and non-government organizations

14 – federal agency stakeholders

30 – ARS researchers and leaders

USDA Biomass Research Centers

Overview of Biomass Research Centers

Research Capacity of the Centers

Expected Outcomes from the Workshop

USDA

United States Department of Agriculture

Research, Education, and Economics
Agricultural Research Service

Customer/Stakeholder Briefing Documents

USDA Biomass Research Centers
Customer/Stakeholder Workshop
March 15-16, 2011
Denver, Colorado

Office of National Programs
6801 Sunnyside Avenue, George Washington Carver Center, Room 4-2284
Beltsville, Maryland 20705

USDA Biomass Research Centers
ARS Background Briefing

BACKGROUND:

The President's Biofuels Interagency Working Group report *Growing America's Fuel* identifies USDA as having research leadership responsibility for the improvement of non-food biomass crops and woody species, and the development of sustainable production and management systems for farms and forests.[1]

The plan called for the establishment of five regional USDA Biomass Research Centers. The purpose for this USDA-led effort is to help ensure that dependable supplies of needed feedstocks are available for the production of advanced biofuels to meet legislated goals and market demand, and enable as many rural areas across the country as possible to participate and benefit economically.

Secretary Vilsack formally announced the USDA Biomass Research Centers as a part of a major policy speech at the National Press Club on October 21, 2010.[2]

WHAT ARE THE USDA BIOMASS RESEARCH CENTERS?

The Biomass Research Centers serve to compliment and coordinate USDA Agricultural Research Service (ARS) and Forest Service Research & Development (FS) intramural research from across the country to help accelerate the establishment of commercial region-based biofuel supply chains based on agricultural and forestry-based feedstocks.

- The USDA Regional Biomass Research Centers are networks of existing ARS and FS facilities and scientists located in research centers and more than 100 locations nation-wide.
- The centers help leverage USDA nation-wide intramural science capacity and provide expertise and coordination needed to lead a national research effort in the development of sustainable biomass production systems and superior performing feedstocks and value-added co-products.
- The centers utilize national natural resources networks such as the *Conservation Effects Assessment Project* (CEAP), the *Greenhouse gas Reduction through Agricultural Carbon Enhancement network* (GRACEnet), and *Renewable Energy Assessment Project* (REAP) along with a full range of science disciplines – from genetics to sustainable feedstock production to conversion and biobased product development.
- The USDA Biomass Research Centers provide a long-term leadership structure that is focused on coordinated region-based biomass research across the country. The centers maintain a national perspective that compliments and partners with other USDA and federal agency efforts focused on renewable energy, as well as those of universities, states, and private industry.

[1] http://www.whitehouse.gov/sites/default/files/rss_viewer/growing_americas_fuels.PDF
[2] http://www.usda.gov/wps/portal/usda/usdahome?contentidonly=true&contentid=2010/10/0546.xml

Significant Events Regarding the Centers

Presidential Memo, *Biofuels Interagency Working Group* (IWG) May 5, 2009

IWG Report *Growing America's Fuels Report* – February 03, 2010

Secretary Vilsack announcement at the National Press Club – October 21, 2010

Overview of Biomass Research Centers

USDA Biomass Research Centers

Overview

- Networks of *existing* ARS and FS research locations.
- Leverage current USDA nation-wide capacity to lead sustainable biomass production research.
- Coordinate ARS and FS research occurring across different locations into a comprehensive program.
- Coordination of intramural research agency and NIFA's AFRI Bioenergy Coordinated Agricultural Projects (CAP) and other extramural region-based projects.

USDA-ARS National Programs

Judy St. John

Associate Administrator

Natural Resources & Sustain. Agric. Systems

Steven Shafer

- Water Availability and Watershed Management
- Global Change, Soil and Emissions
- Bioenergy and Bioproducts
- Agricultural Waste and Byproduct Utilization
- Pasture, Forage and Range Land Systems
- Agricultural System Competitiveness and Sustainability

Crop Production & Protection

Kay Simmons

- Plant, Microbial & Insect Germplasm Conservation & Development
- Plant Biological & Molecular Processes
- Plant Diseases
- Crop Protection & Quarantine
- Crop Production
- Methyl Bromide Alternatives

Animal Production & Protection

Steven Kappes

- Food Animal Production
- Animal Health
- Arthropod Pests of Animals and Humans
- Aquaculture

Nutrition, Food Safety & Quality

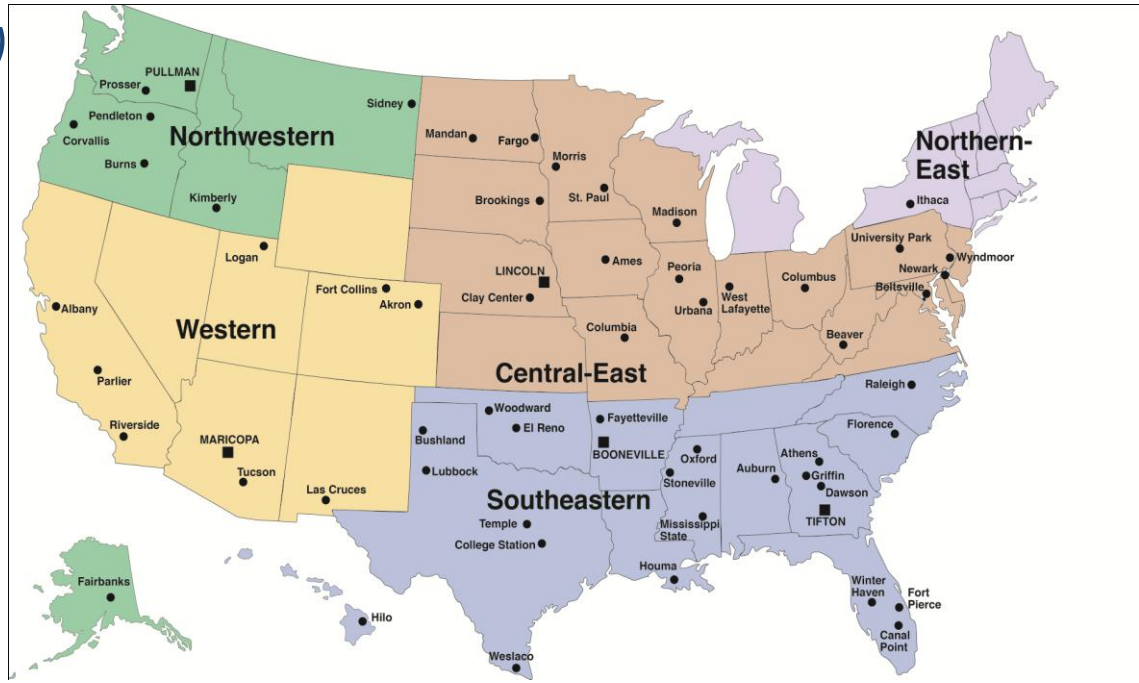
Molly Kretsch

- Human Nutrition
- Food Safety
- New Uses, Quality & Marketability of Plant & Animal Products

USDA Biomass Research Centers

Coordination Hubs and Agency Leadership

- **Central-East** *(Lincoln, NE – ARS)*
- **Southeastern** *(Booneville, AR & Tifton, GA – ARS; Auburn, AL – Forest Service)*
- **Northern-East** *(Madison, WI – Forest Service)*
- **Western** *(Maricopa, AZ – ARS)*
- ***Northwestern*** *(Corvallis, OR – Forest Service; Pullman, WA – ARS)*

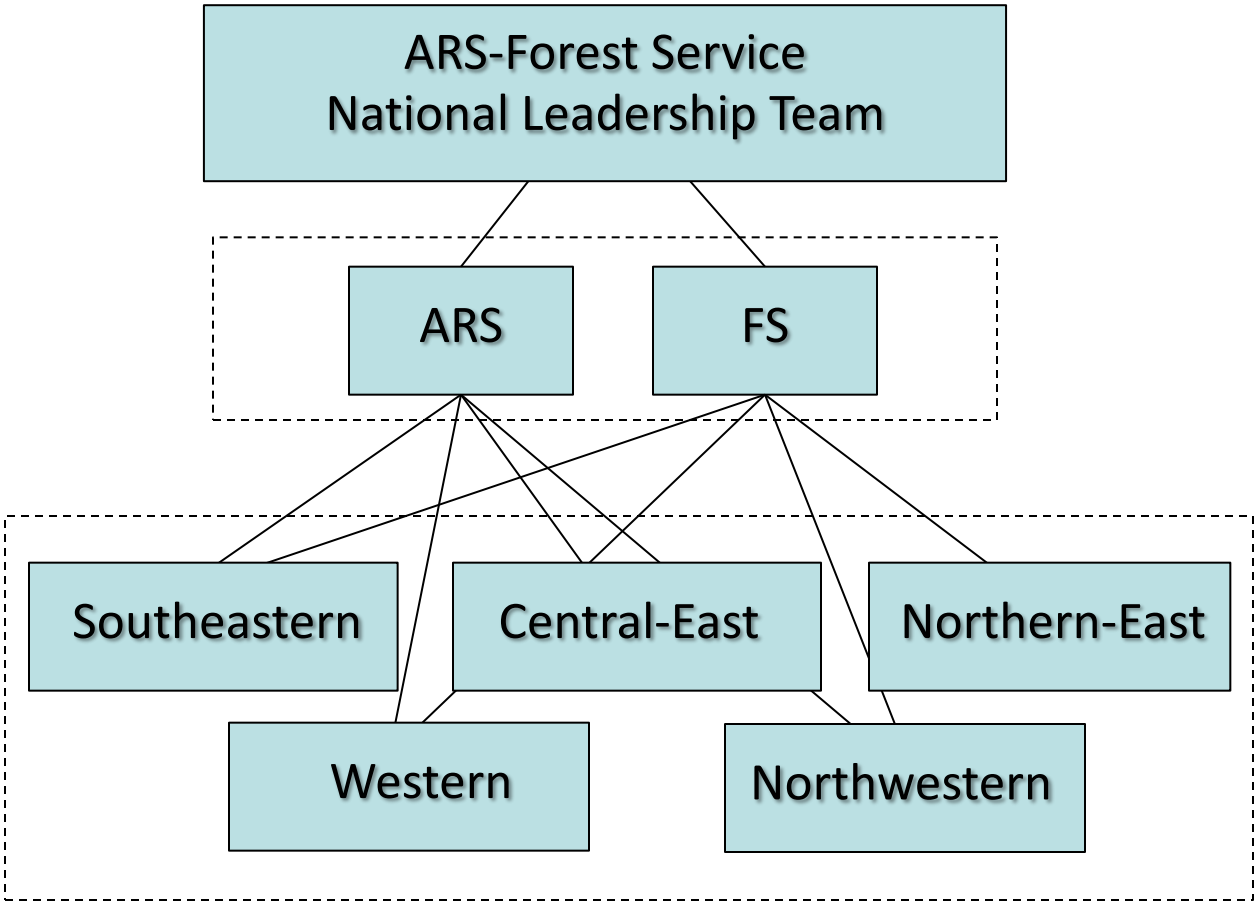


Biomass Research Centers Leadership

National Leadership Team

Agency Leadership Teams

Coordinators and Regional Leadership Teams



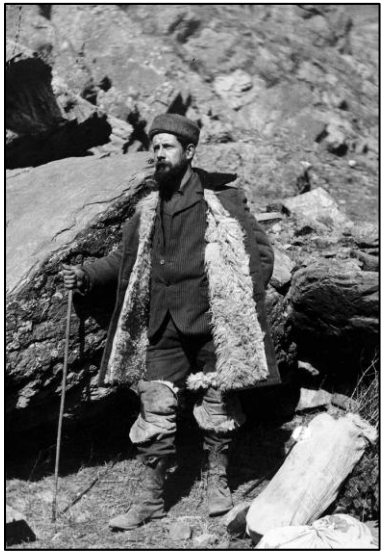
Indicates interagency coordination

Research Capacity of the Centers

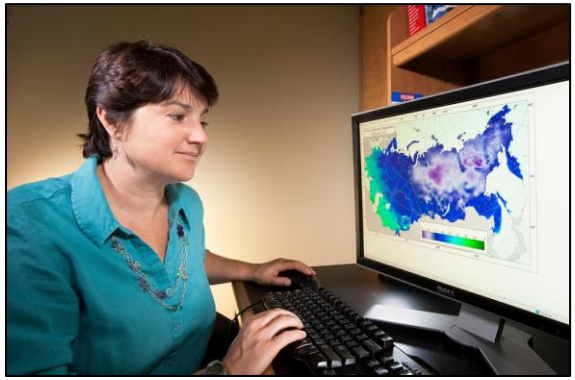
Research Objectives Supporting Sustainable Biomass Production

- Increase biomass production efficiency to increase grower profits and reduce biorefinery transaction costs.
- Optimally incorporate biomass and other dedicated feedstocks into existing agriculture and forestry-based systems.
- Address the uncertainties of expanded production up-front to avoid negative impacts on existing markets and ecosystem services.
- Develop and utilize new value-added coproducts to help enable commercially preferred biorefining technologies.

Plant Exploration & Germplasm Resources



USDA plant explorer Frank Meyer in the mountains of China in 1908.



AgroAtlas contains 1,500 maps that illustrate the distribution of crops, wild crop relatives, diseases, pests, weeds, and more.

Packages Brassica seeds for distribution at the North Central Regional Plant Introduction Station in Ames, Iowa.

Feedstock Development

Feedstock Production

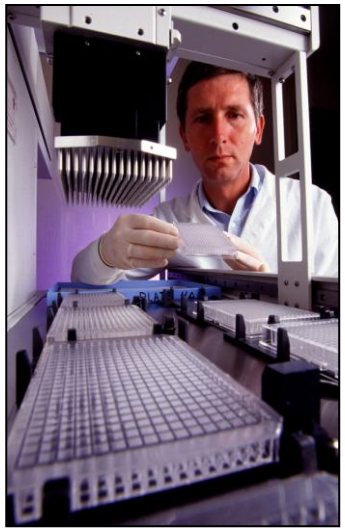
Feedstock Logistics

Biofuels Conversion

Fuel Testing & Approval

Large Scale Deployment

Genetic Mapping and Enhanced Populations, Varieties, & Hybrids with Improved Traits



Reviewing a recently developed genomic map

Harvesting switchgrass seed as part of a breeding program to develop new cultivars with improved biomass conversion yields.

Feedstock Development

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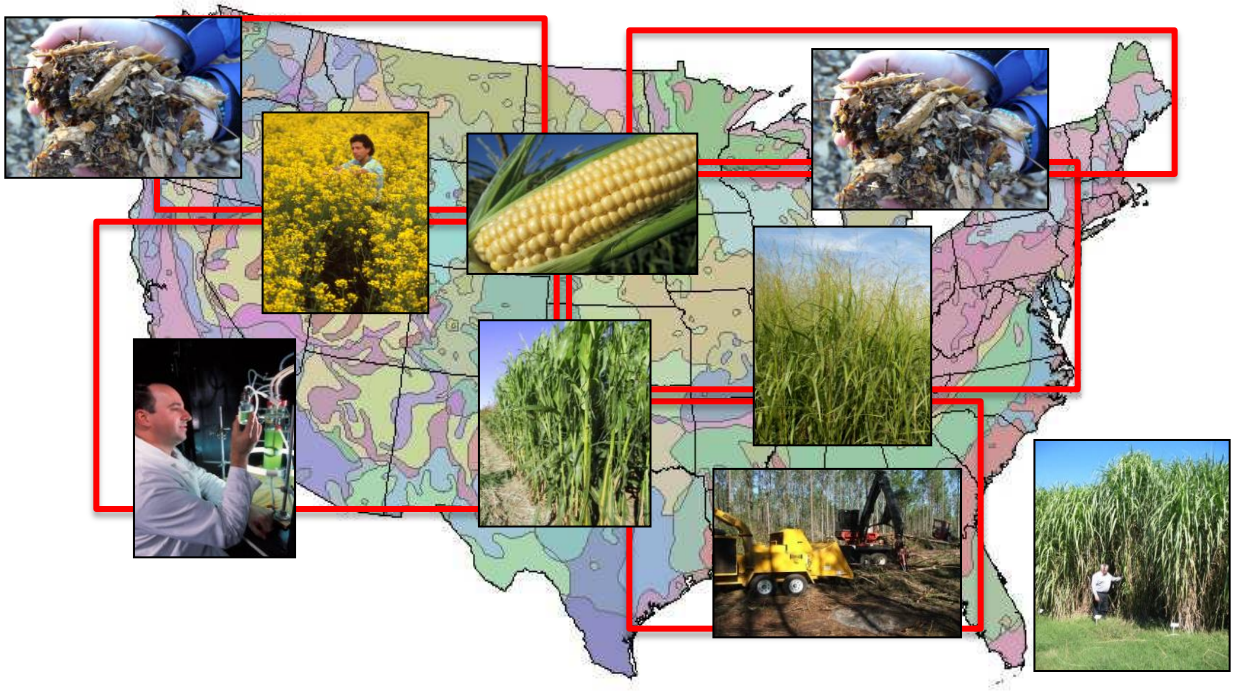
Incorporating Biomass into Agricultural & Forest Systems

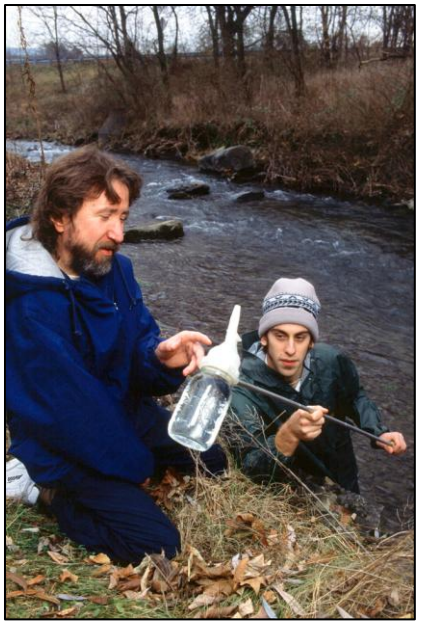


Feedstock Development | Feedstock Production | Feedstock Logistics | Biofuels Conversion | Fuel Testing & Approval | Large Scale Deployment

Incorporating Biomass into Agricultural & Forest Systems

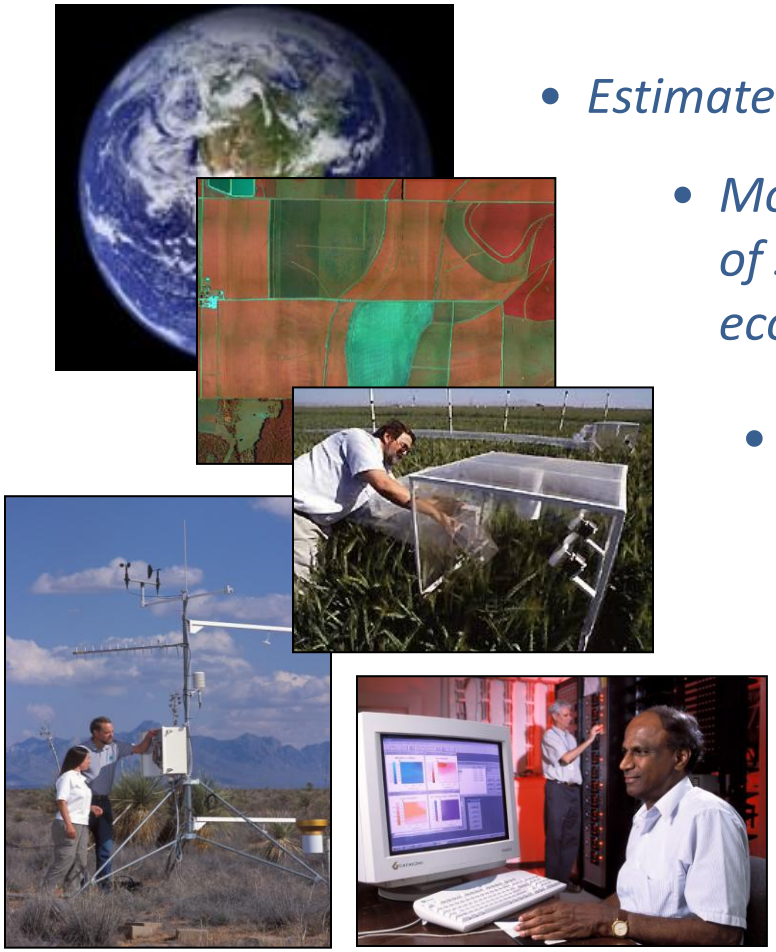
Alternative cropping system plots at the Central Great Plains Research Station.

Samples will be analyzed for carbon dioxide, nitrous oxide, and methane with a gas chromatograph.



Water samples from streams used to identify “hot spots” where the most pollution can be stopped at the least cost.

Incorporating Biomass into Agricultural & Forest Systems



- *Estimate feedstock supply dependability*
  - *Modeling and methods development of soil, water, air quality and other ecosystem services*
    - *Evaluation and management of multifunctional landscape & ecosystem services*
      - *Impacts on existing food, feed, fiber production systems & markets*

Develop and Utilize New Coproducts that Help Enable Commercial Biorefining Technologies

New barley to ethanol process.

Developing new fuel winterizing technologies.

Optimizing biomass thermochemical conversion processes.

Feedstock Development

Feedstock Production

Feedstock Logistics

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Large Scale Deployment

Emphasis on Partnerships

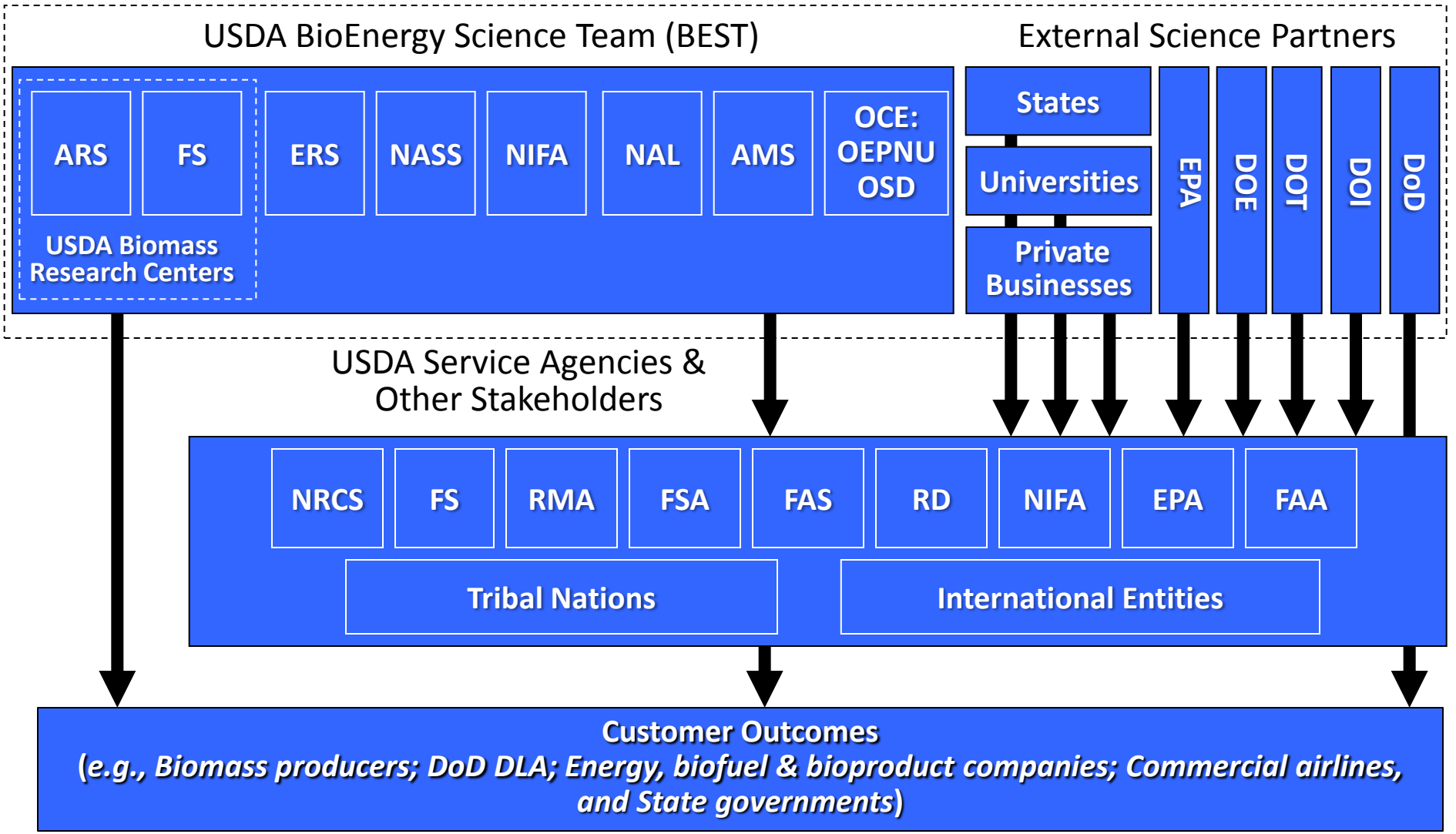
The centers will coordinate their efforts with USDA service agency programs and other Federal agencies

Coordinate with universities with inclusion of educational and extension goals

Target partnerships that include 1890's, Tribal Nations, & Hispanic Serving Institutions participation

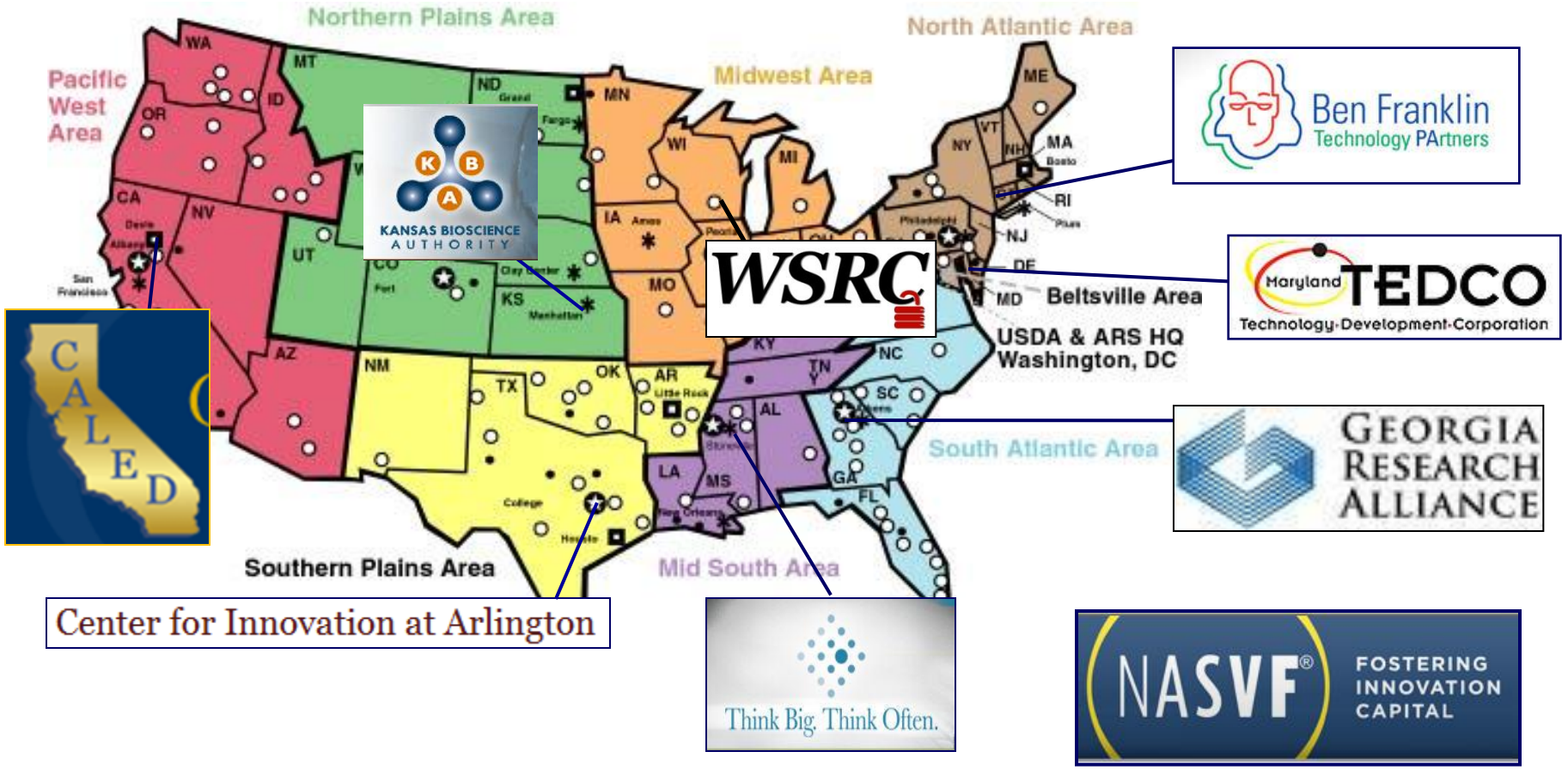
Identifying technology innovation partnerships and other commercial opportunities

USDA-Wide Bioenergy Research



January 11, 2011

Agricultural Technology Innovation Partnership Network



A Supply Chain Systems Approach

Feedstock Development & Production

Advanced Fuels

It starts with the end in mind

Coordinating Available Programs and Incentives

Expected Outcomes From The Workshop

Guidance that helps us develop relevant and high-impact research plans

Specific products that will help you succeed with your mission

New partnerships formed that help accelerate the commercial establishment of a sustainable biomass industry