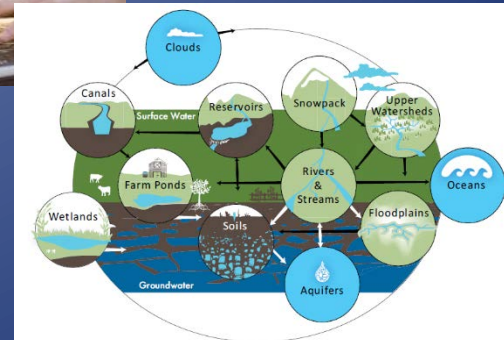
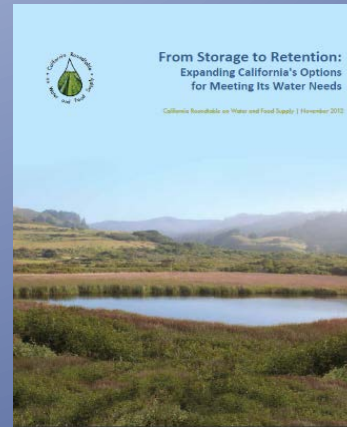


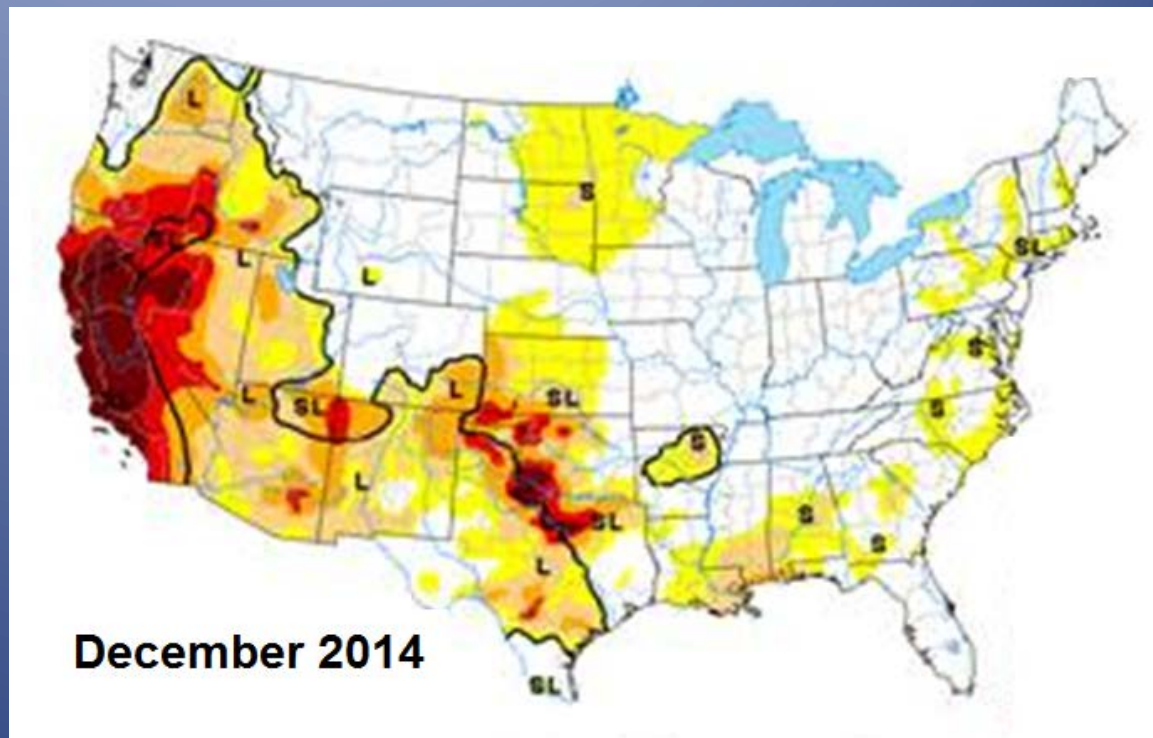
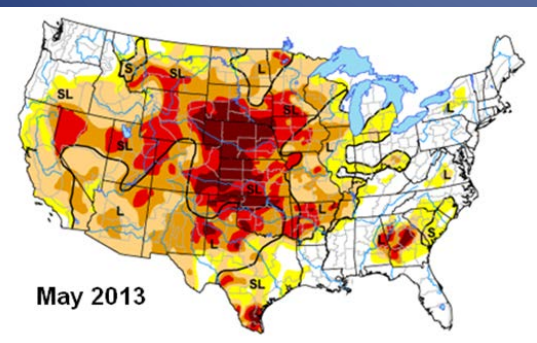
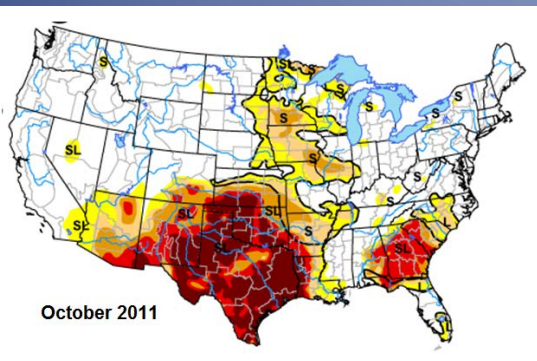
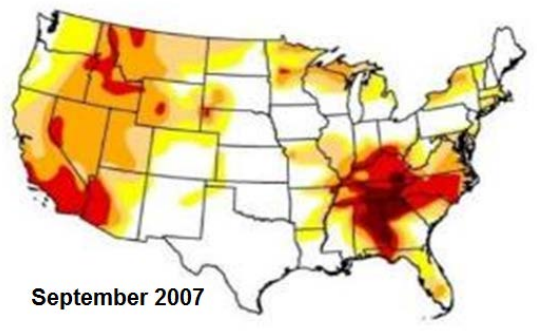
Fighting Scarcity: Innovation & Comprehensive Strategies to Address Our Water Challenges

Dr. Glenda Humiston
State Director, California
USDA Rural Development



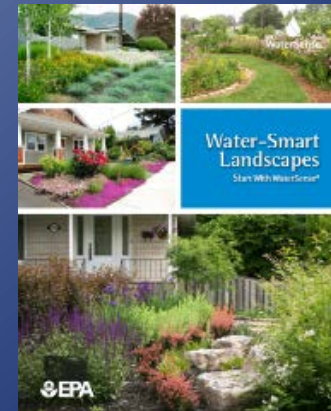
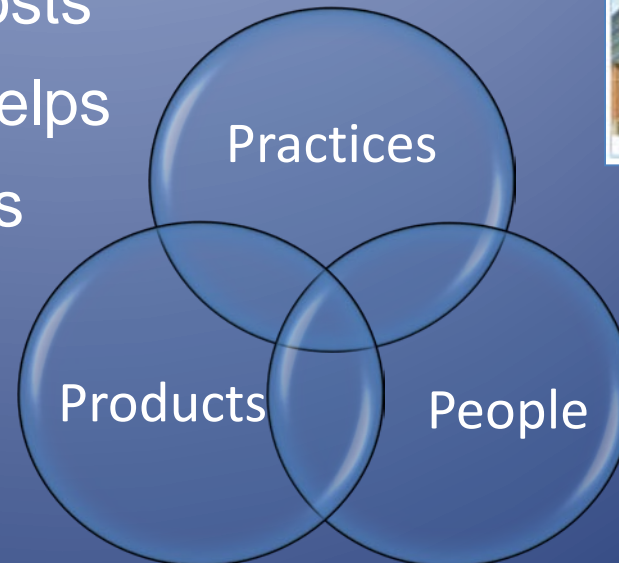
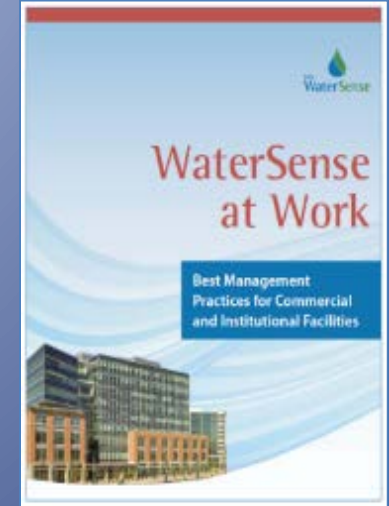
Water Scarcity is a Growing Problem

- Drought is somewhere every year
- Climate change only exacerbates problems and increases uncertainty



Saving Water Provides Multiple Benefits

- Water efficiency improves resilience to water shortages
- Water, sewer, and energy costs are rising; water efficiency helps reduce these operating costs
- Saving water saves energy

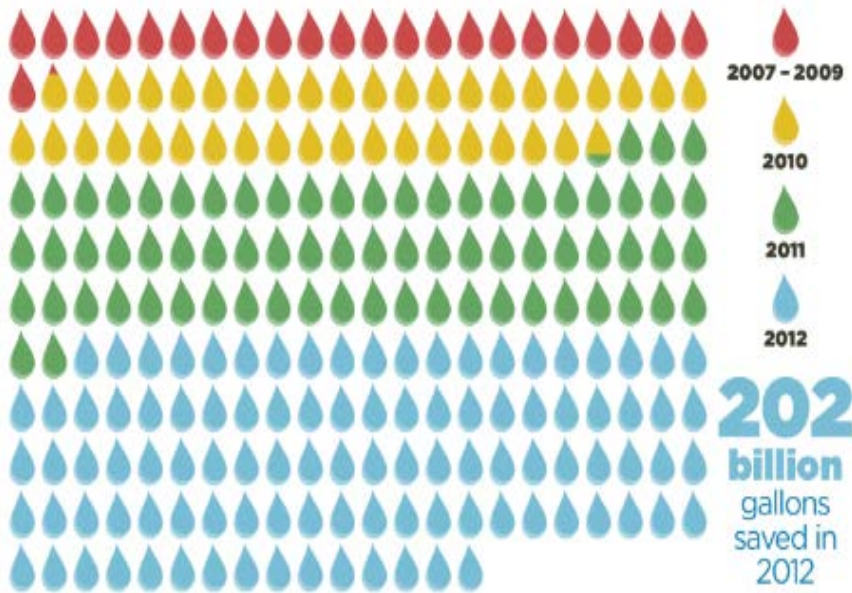


www.epa.gov/watersense

Savings Add Up Quickly!

2006 – 2012

487 billion gallons of water saved since 2006!



That's enough water to supply all the homes in **Colorado** and **Arizona** for a year!

WaterSense has helped reduce the amount of **energy needed** to heat, pump, and treat water by

64.7 billion kilowatt hours,

enough to supply a year's worth of power to more than



Saving consumers \$8.9 Billion
In water and energy bills!

Pursuing Net-Zero Water Use for Ag

U.C. Davis: Jess Jackson Sustainable Winery Building

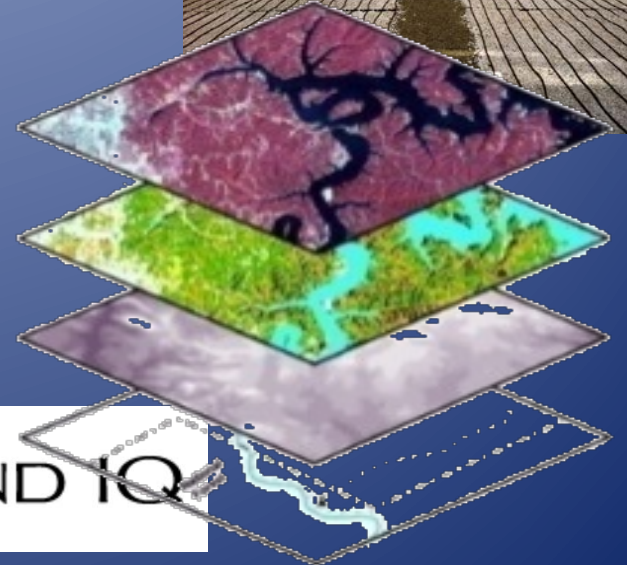
Showcasing “smart” technology that maximizes environmental capabilities of winery, brewery, and food-processing complex.

- ✓ Automated systems to clean equipment
- ✓ High-purity filtration of rainwater
- ✓ Off-peak processing, ...and more!



90% of water & chemicals from each cleaning cycle is captured and processed for future use in the complex, eventually being used as many as 10 times.

How It Works



Average Water Use Decreased by 10%
Average Production Increased by 10%
Water Savings 5 Times More Per \$ Invested Than Changing From Flood to Drip Irrigation



CA Roundtable on Water & Food Supply

- Launched in 2010
- Consensus-based process
- Diverse Stakeholders
- Objectives:
 - Build relationships between agriculture & other key stakeholders
 - Generate common principles and recommendations for decision-makers & the public

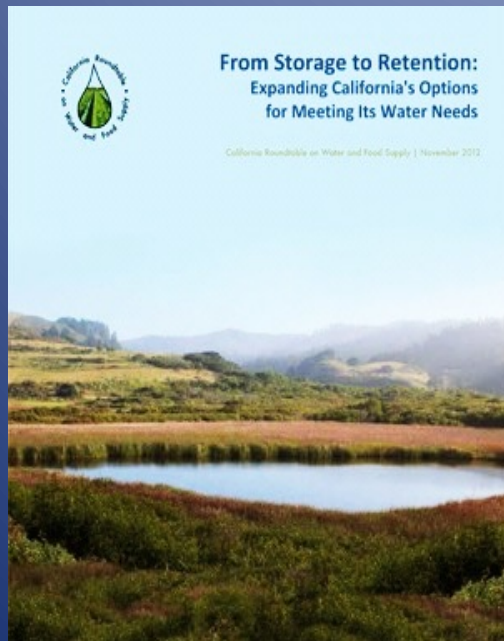
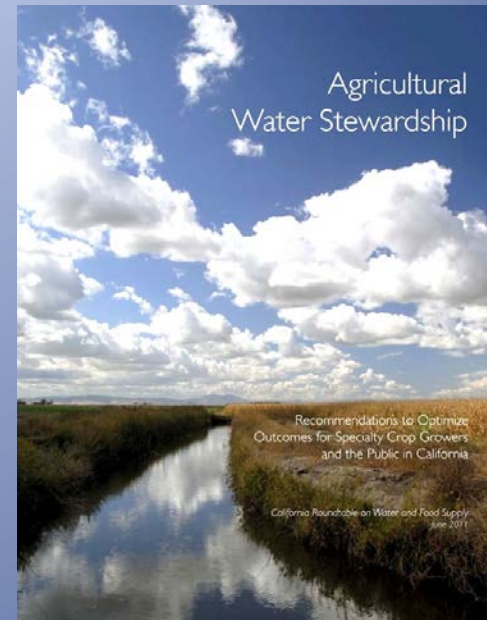


A project of Ag Innovations Network

www.aginnovations.org

Module 1: Ag Water Stewardship

Outlines an agricultural water stewardship framework – conservation & efficiency

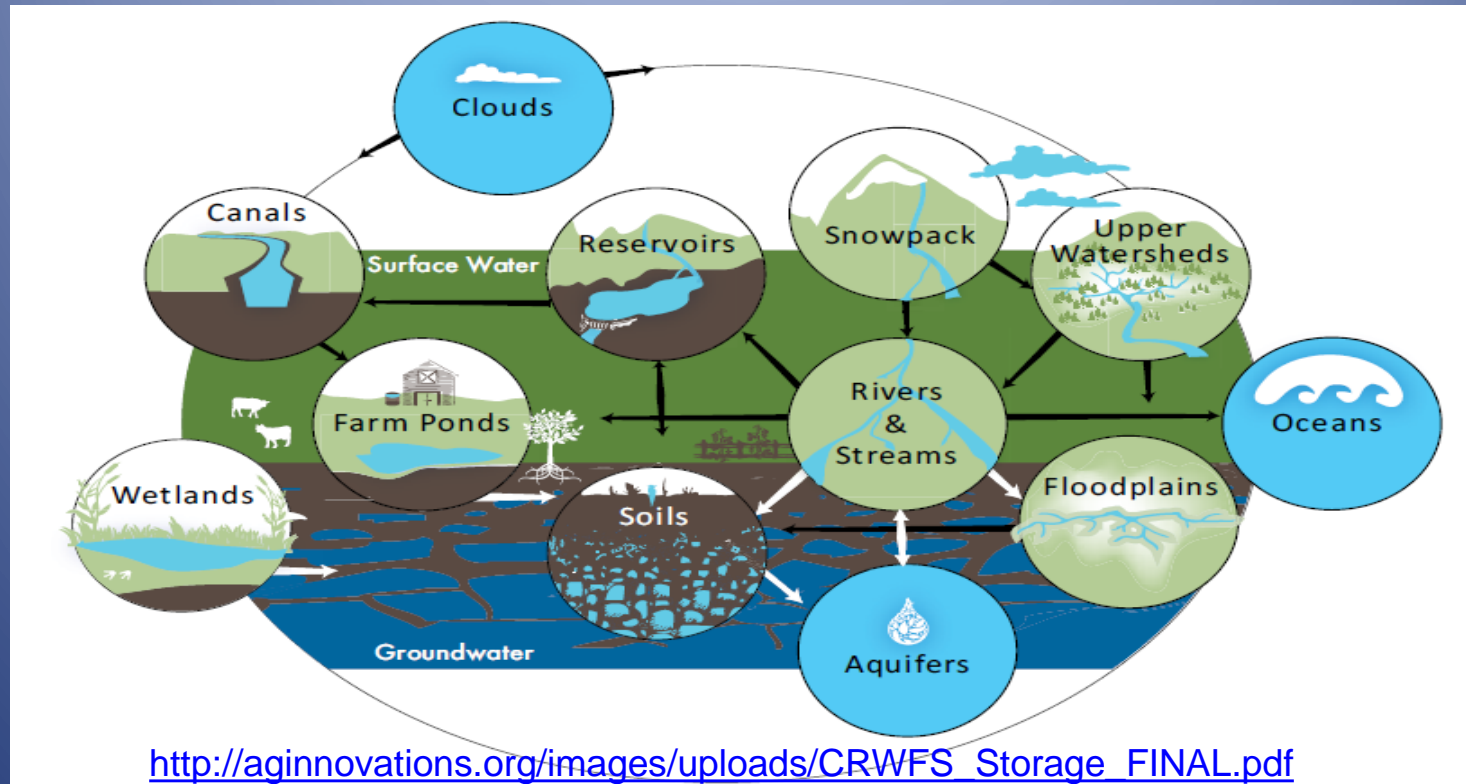


Module 2: From Storage to Retention

New approaches to storing water – expanding options and site-specific parameters

Identifies priorities for action

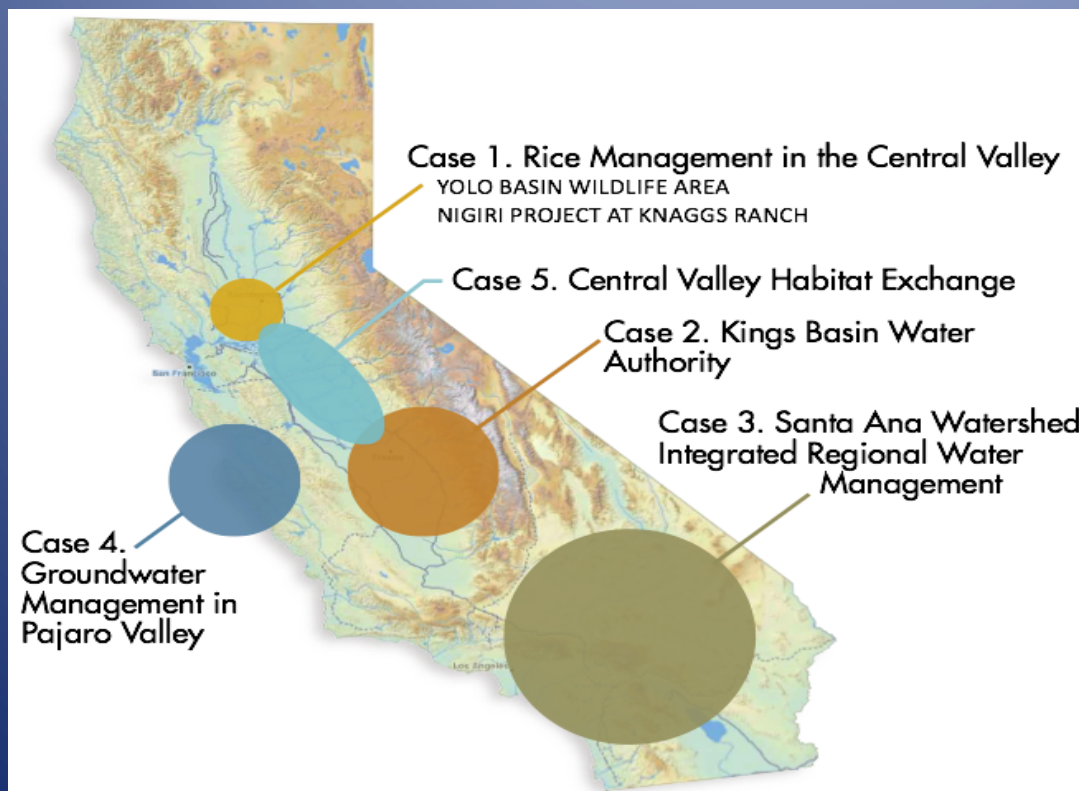
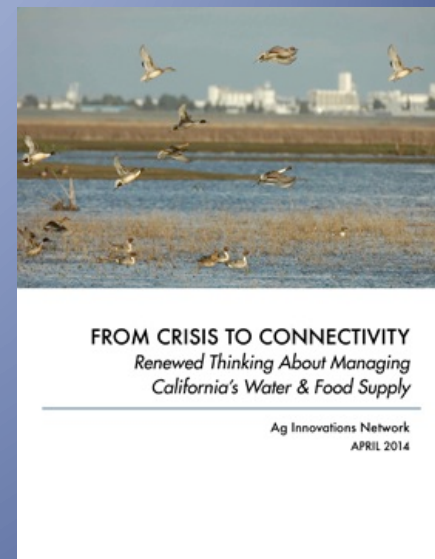
Understanding diverse “reservoirs” can bridge gaps in natural availability of water.



Healthy watersheds in the Sierra & Cascade Ranges can produce 9 – 16% more water.

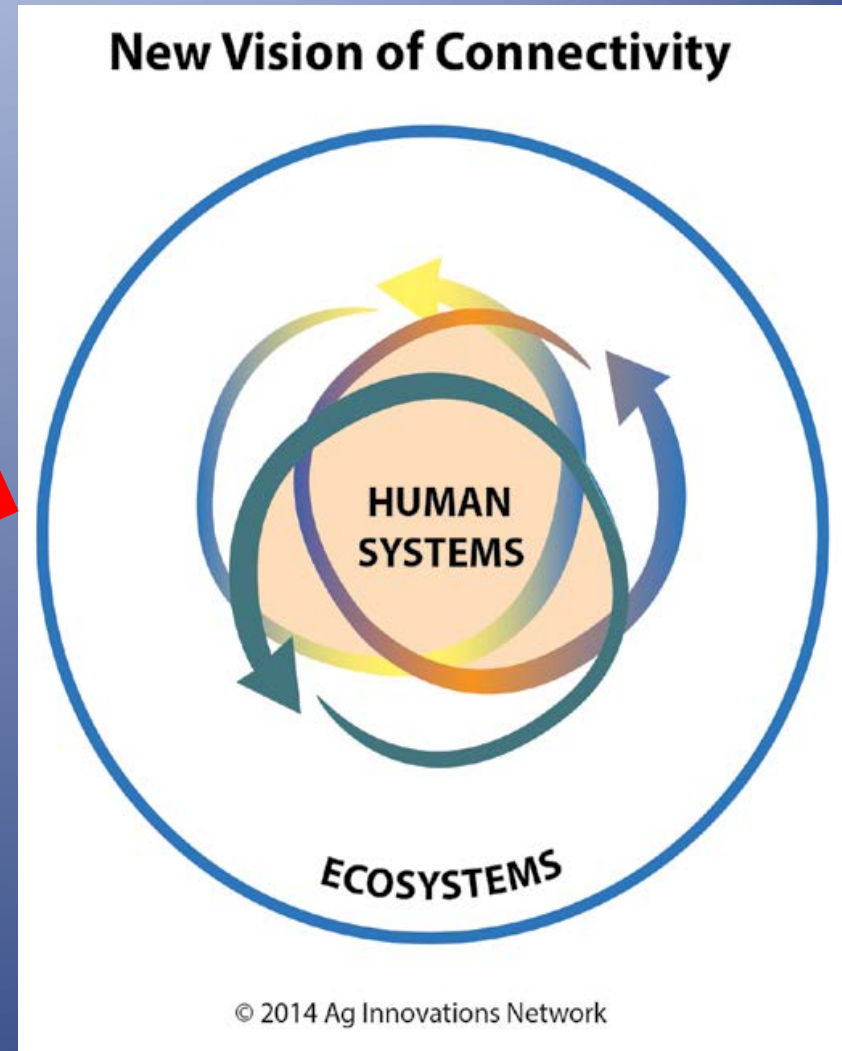
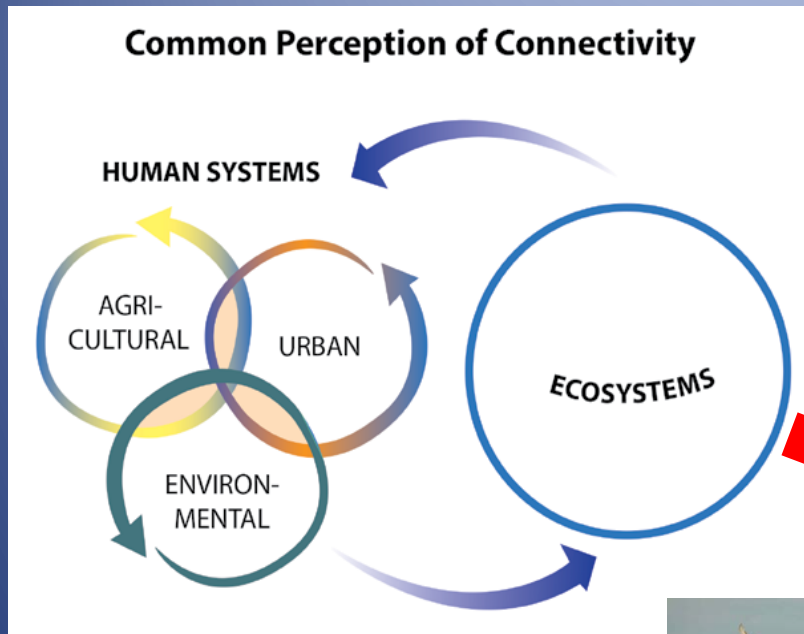
Module 3: From Crisis to Connectivity

- Examines historical disconnections that have led to water crises in CA
- The connectivity approach offers a model for designing strategic and systemic solutions

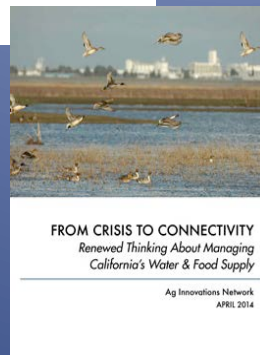


Offers guiding principles for implementing a resilient water infrastructure

Changing How We Look at Systems



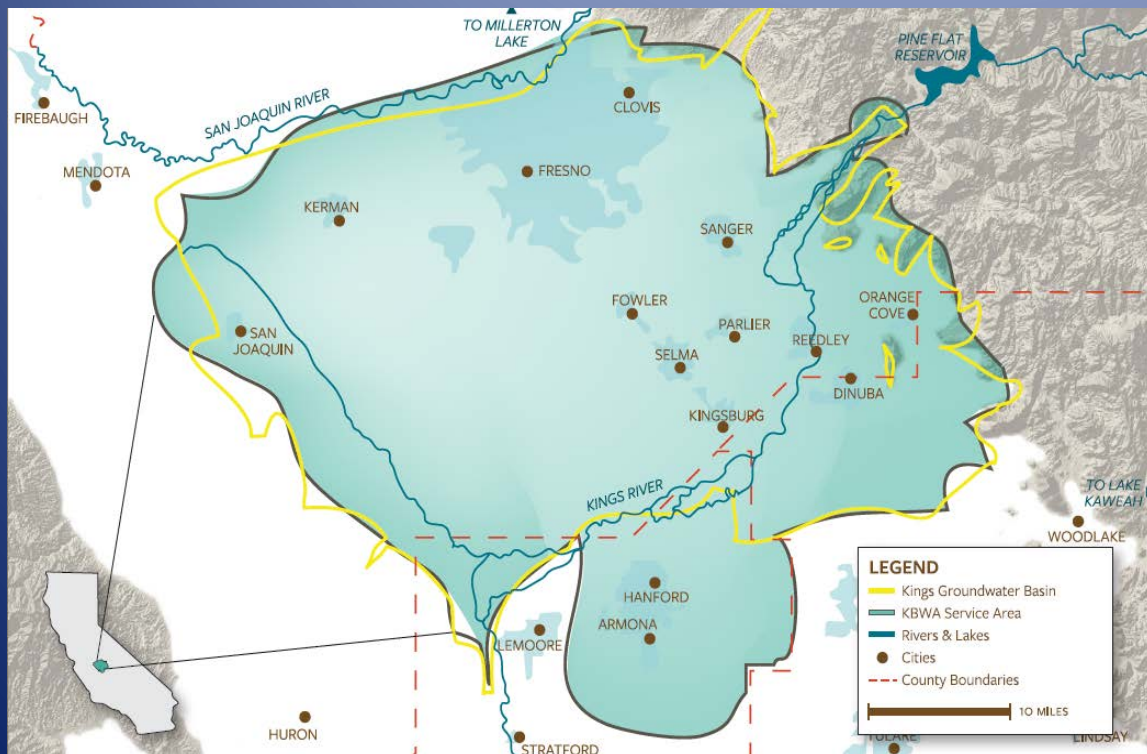
Developed by the California Roundtable on Water & Food Supply, May 2014



© 2014 Ag Innovations Network

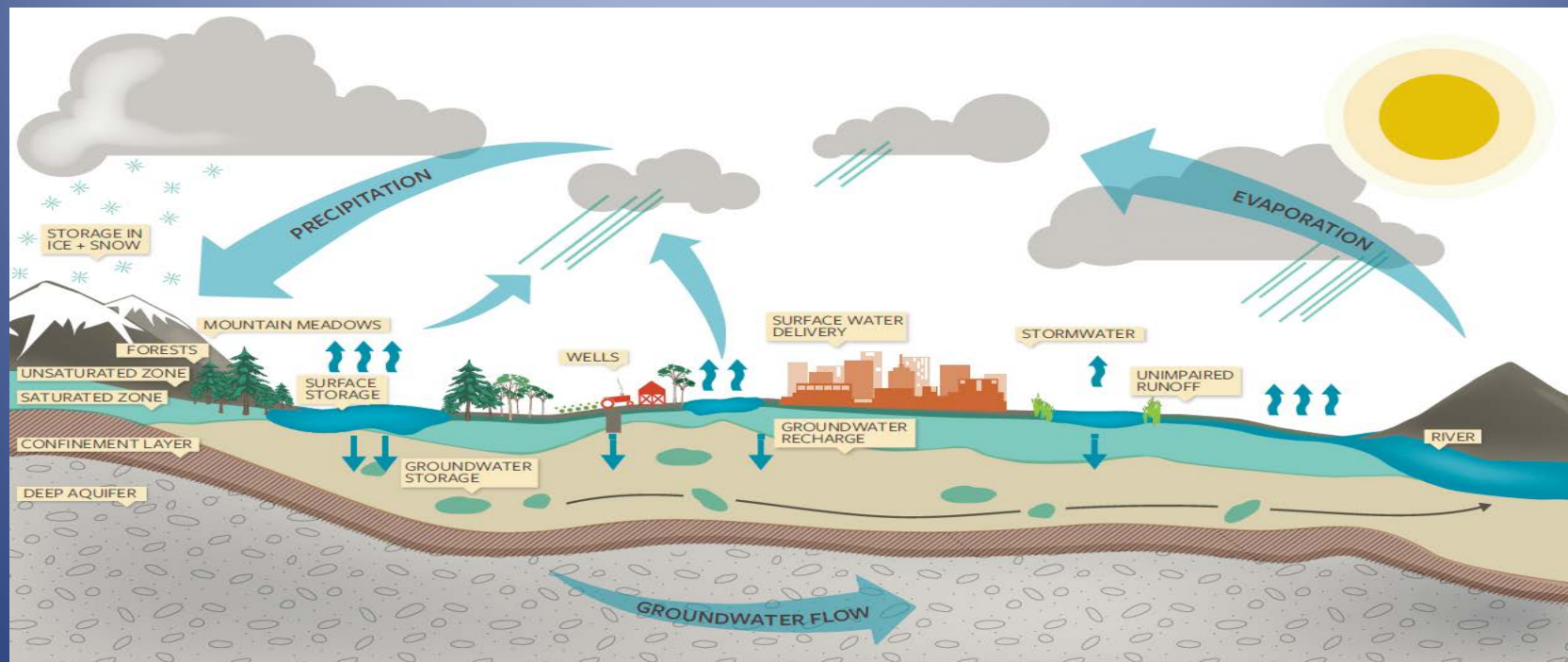
Module 4: Applying the Connectivity Approach: Groundwater Management in CA's Kings Basin

Clarifies opportunities for improved connectivity in groundwater management planning and implementation in the state.

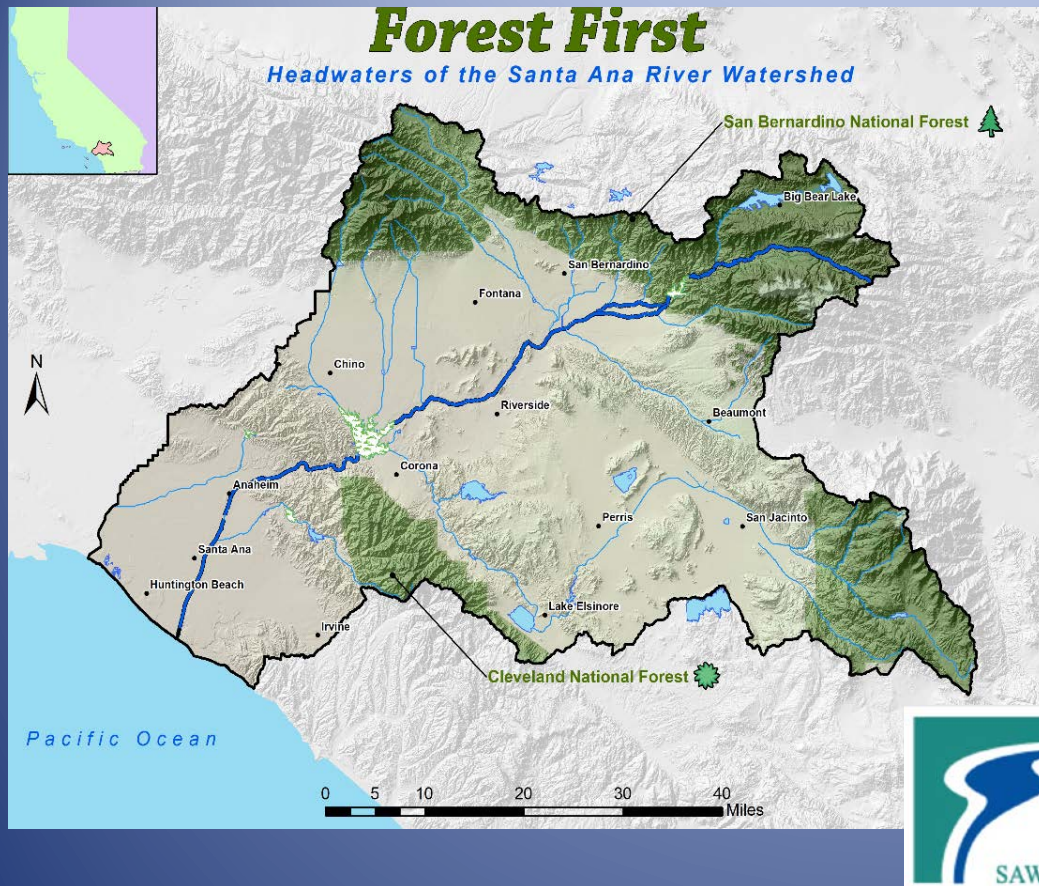


Kings Basin is addressing water challenges and has notable successes from effective multi-stakeholder collaborations & leadership from local agencies.

Module 4: Applying the Connectivity Approach: Groundwater Management in CA's Kings Basin



- ✓ Upper and lower watershed connectivity
- ✓ Surface and groundwater storage connectivity
- ✓ Alignment of governance structures and tools
- ✓ Improved public and stakeholder engagement

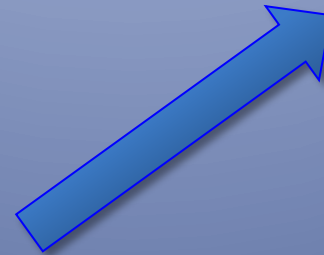
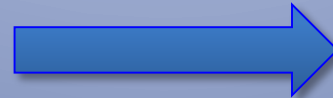
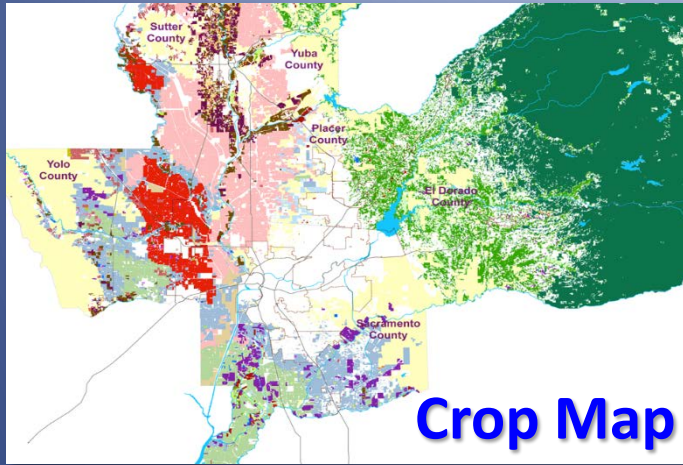


As the headwaters of the Santa Ana River, national forest lands encompass about 30% of the Santa Ana River Watershed's land mass & receive 90% of annual precipitation.

“Forest First” is a collaborative venture between the U.S. Forest Service and downstream stakeholders to develop methods to ensure that the forests and headwaters within the Watershed are kept as healthy as possible.

Rural-Urban Connections Strategy

Sacramento Area Council of Governments • www.sacog.org/RUCS

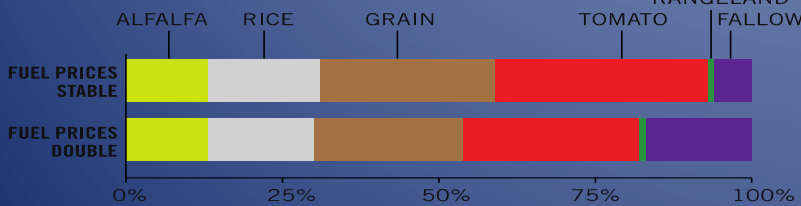


**RUCS
Scenario
Analysis
Tool**

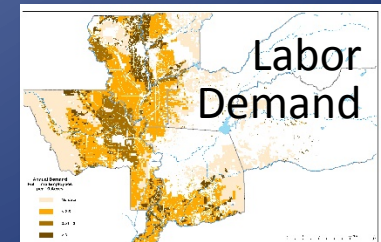
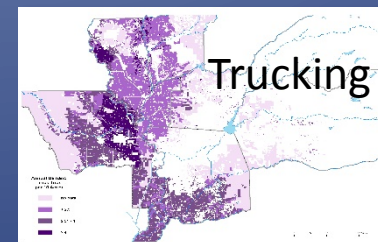
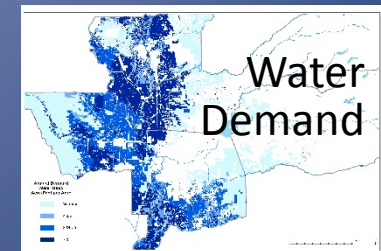
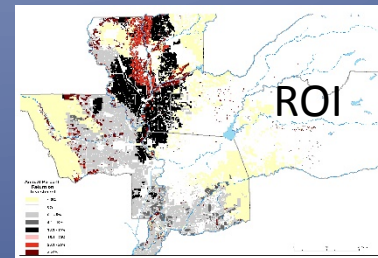


Modules Informing Scenarios

Market Affects on Crops



Local Market Food Production

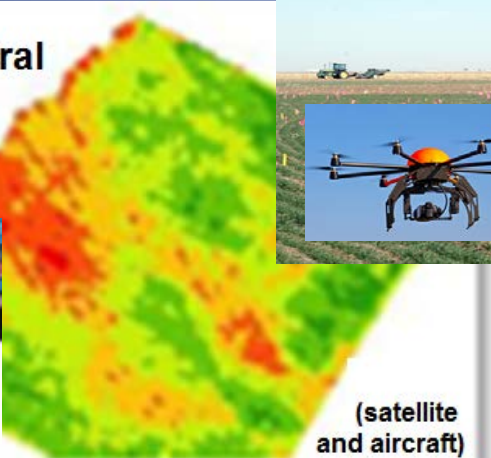


Rural
Development

Committed to the future of rural communities

Sustainable Resource Management Need Fresh Technologies

Multispectral
Imagery



(satellite
and aircraft)



Ag
Drones

Wireless
Soil
Sensors

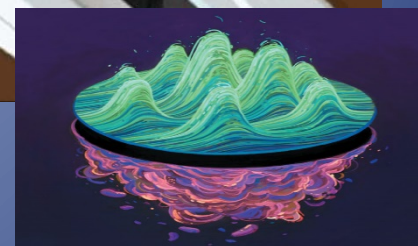


Test kit detects foodborne pathogens

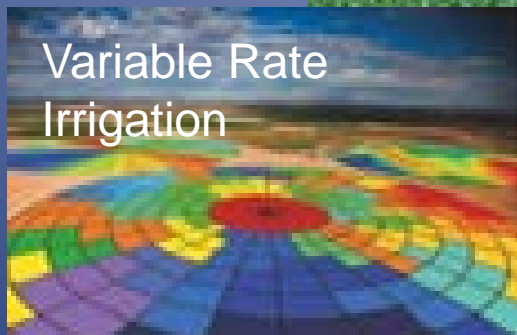
By Jenni Spinner, 09-Jul-2013



Food
Safety



Variable Rate
Irrigation



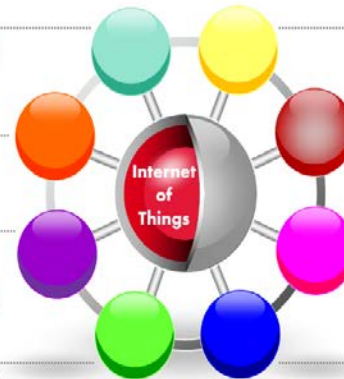
Precision Applications

*A dynamic global network
infrastructure*

*with self configuring
capabilities*

*based on standard and
interoperable
communication protocols*

*where physical and virtual
"things"*



*have identities, physical
attributes, and virtual
personalities*

use intelligent interfaces,

*and are seamlessly
integrated*

*into the information
network.*

Apps for Ag

A Series of Agricultural Hackathons

April 17 – 19: West Hills College Coalinga hosted a competitive hackathon designed to partner young farmers with mobile application developers.

The event kicked off with Young Farmers & Ranchers from California Farm Bureau Federation informing invited developers of business needs. Coder teams spent weekend creating apps and judges rendered verdicts Sunday night.

Organized by the California AgTech Roundtable, formed in 2013 to create jobs in rural California through ag technology.



Rural
Development

Committed to the future of rural communities

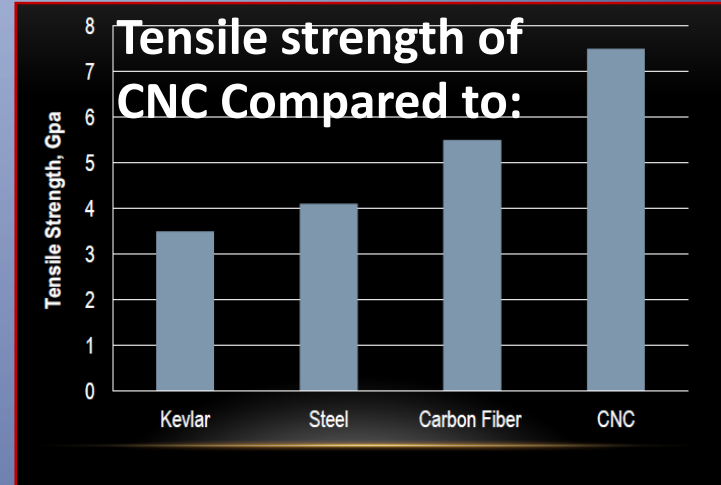
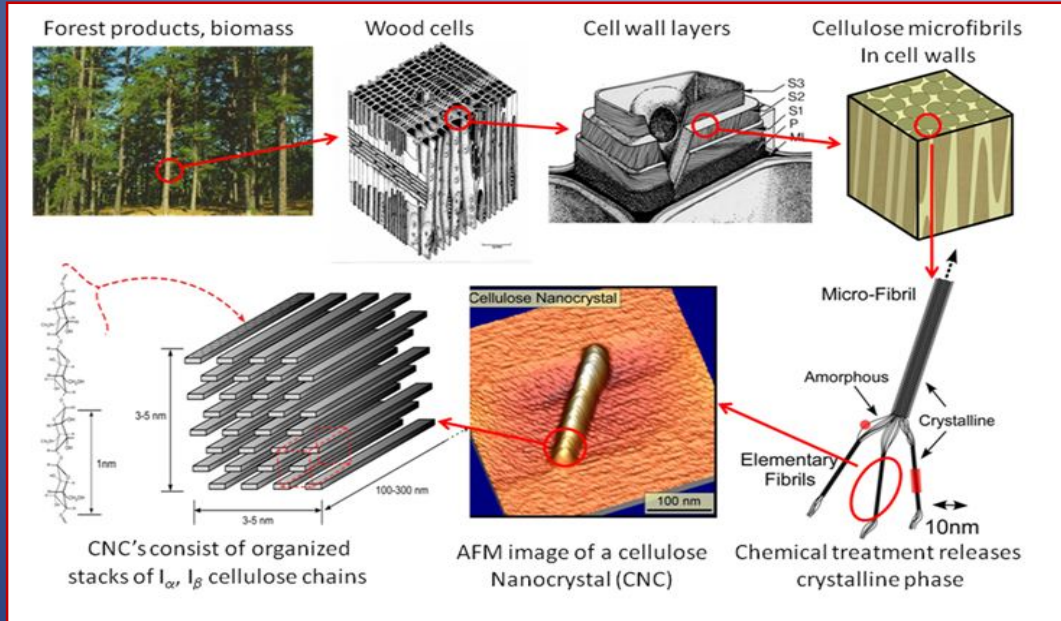
Opportunity: Cellulosic Nanomaterials (CNC)

✓ Stronger

✓ Lighter

✓ Cheaper

✓ Renewable



Wood pellets

\$155 (100% conversion)

Fuel Ethanol

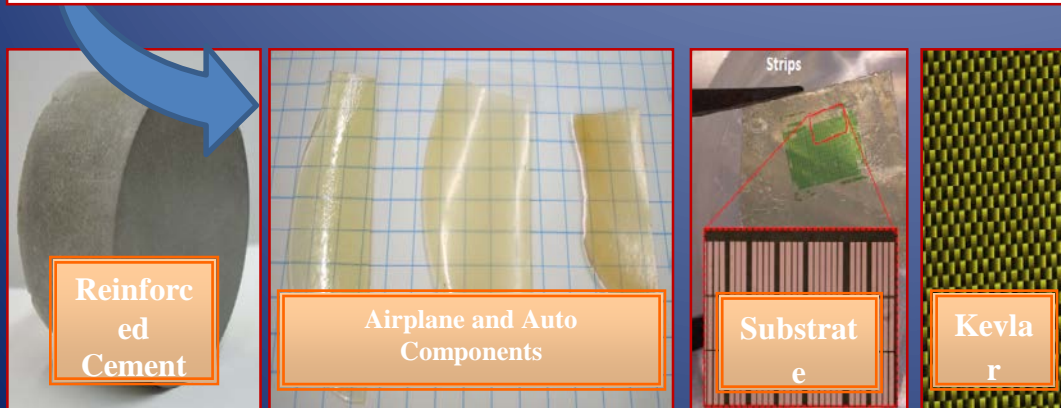
\$255 (@100 gallons/ton)

High Brightness Paper

\$500 (\$1,000/ton - 45% yield)

Cellulose Nanocrystals

\$1,350 (\$6,000/ton - 22.5% yield)



Strategy for a Sustainable Economy =

- ✓ WORKFORCE & TRAINING
- ✓ SUPPLIER NETWORKS
- ✓ ACCESS TO CAPITAL
- ✓ INFRASTRUCTURE
- ✓ BUY / PROCURE LOCAL
- ✓ TRADE / NEW MARKETS
- ✓ RESEARCH AND INNOVATION
- ✓ OPERATIONAL IMPROVEMENTS

SYNERGY

Synergia (Greek): creation of a whole greater than the simple sum of its parts.

Synergos (Greek): "working together".



Triple Bottom Line:

PEOPLE ~ PLANET ~ PROSPERITY



Rural
Development

Committed to the future of rural communities



LOS ANGELES FOOD POLICY COUNCIL



ABOUT
FOOD POLICY
COUNCIL



OBJECTIVES
GOALS AND
ACCOMPLISHMENTS



GOOD FOOD
OVERVIEW AND
ISSUES



PROGRAMS & POLICY
WORKING GROUPS, PROGRAMS
AND POLICY INITIATIVES



RESOURCES
INFORMATION
AND TOOLS



LAFPC is a network working for a good food region for everyone – where food is *healthy, affordable, fair & sustainable*.

Its goals are to reduce hunger, improve public health, increase equity in our communities, create good jobs, stimulate local economic activity, and foster environmental stewardship.

<http://goodfoodla.org/>





Private Sector



Foundations



Government Agencies



Economic Development Corporations

Prosperity

People



Planet

Financial Institutions

Community Colleges & Job Training



Coop Extension & Research Institutions




NGOs



Equity capital invested in rural areas is just as successful as in tech-oriented metro regions.

A study of 18,000 investments found no statistical difference between rural and metro regions measuring key variables: jobs created, type of industry, length of venture, exit, or performance.

Patricia Scruggs et al, "The Role of Equity Capital in Rural Communities," 2010



Access to Capital

- ✓ Growing Local Businesses
- ✓ Financing Entrepreneurs
- ✓ Building Strong Economies

Developed by the
California Financial Opportunities Roundtable
Representing finance, impact investing, philanthropy, business, economic development, government and more.

August 2012

CalFOR
California Financial Opportunities Roundtable

www.rd.usda.gov/ca



Rural
Development

Committed to the future of rural communities

Potential New Funding Streams

- ✓ **California Organized Investment Network (COIN)** can fund a wide array of infrastructure.
- ✓ Counties, cities, special districts, or joint powers authorities can utilize **tax increment financing** for rainwater harvesting & small water storage projects.
- ✓ **AB 32 cap-and-trade funds** where storage or retention projects deliver climate benefits, such as through reductions in energy use.
- ✓ **Expanded Infrastructure Financing Districts (EIFD)**.

Potential New Funding Streams

A proposal in President Obama's State of the Union: **Qualified Public Infrastructure Bonds** (QPIB) would expand existing financing tools that allow state and local governments to issue tax-exempt bonds to pay for public infrastructure projects.

If approved by Congress, the QPIB program would expand these tax advantages to financing for airports, ports, mass transit, **solid waste disposal, sewer, and water**, and more.

Tax exempt bonds allows the government issuer to pay back investors at a lower interest rate. Also, the new bonds would also have no expiration date and no limit to how many a government can issue each year.



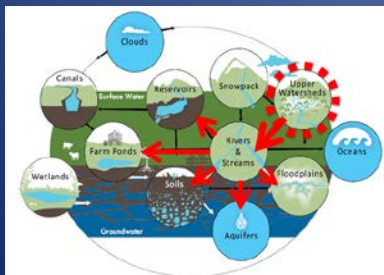
“Layers” of Funding & Economic Activity Will be Needed



Value of Biobased Products will help finance forest health activities – probably not enough.



Augment that with:
Cap & Trade Credits



Need to also monetize value of “reclaimed” water produced from forest health activities!

Connect the Intangible Capital!



Human Capital

Experience

Competencies

Management

Skills

Workforce

Knowledge Capital

Information

Research

Processes

Intellectual

Property



Social Capital

Customers

Vendors

Partners

Policy-Makers

Reputation