Leonard Shabman
Resources for the Future

Designing Pay-for Environmental Services Programs

The Florida Ranchlands Environmental Services Project

(FRESP)

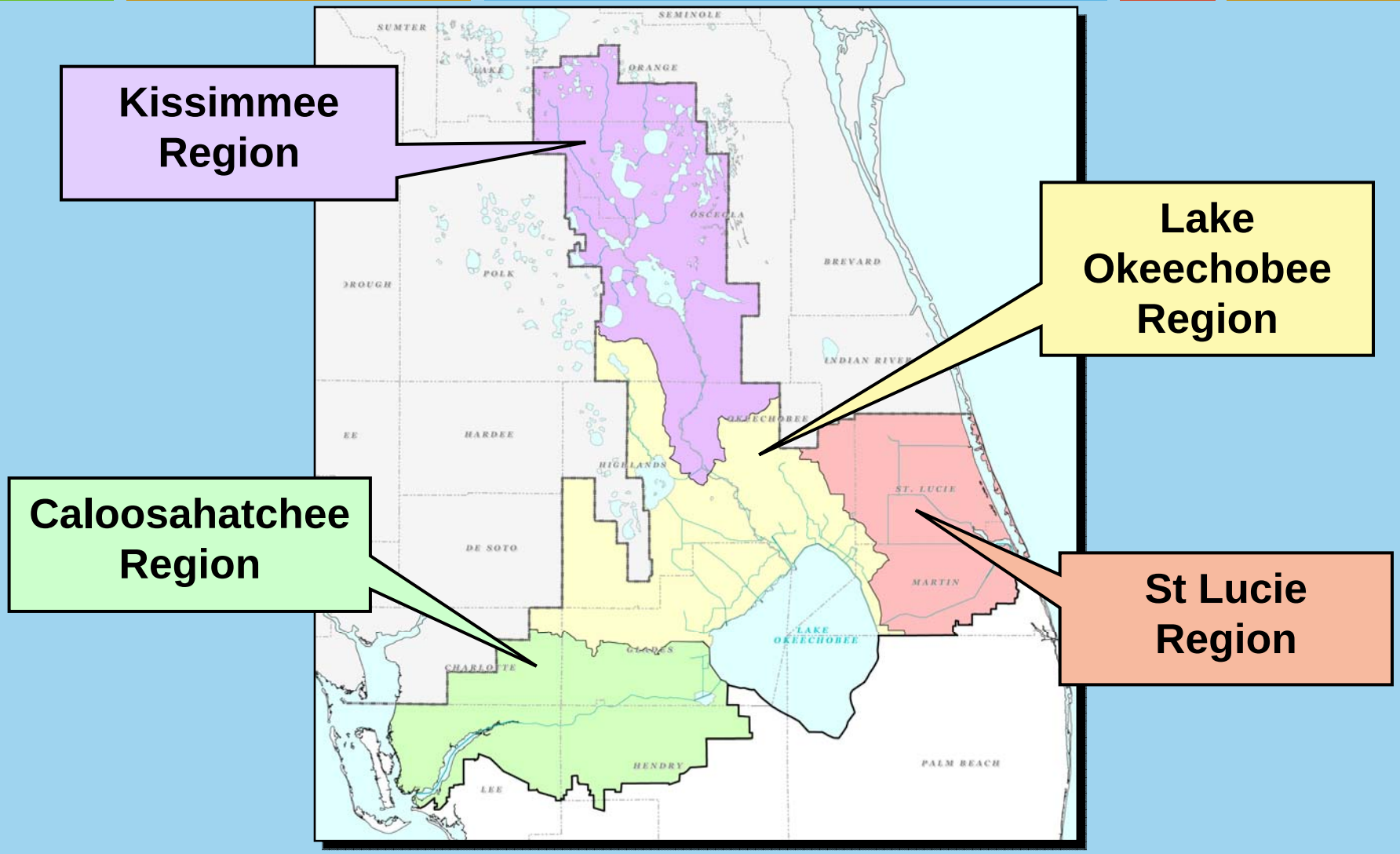
FRESP *The Florida Ranchlands Environmental Services Project*

Goal: Design program to pay ranchers for Water and P Retention

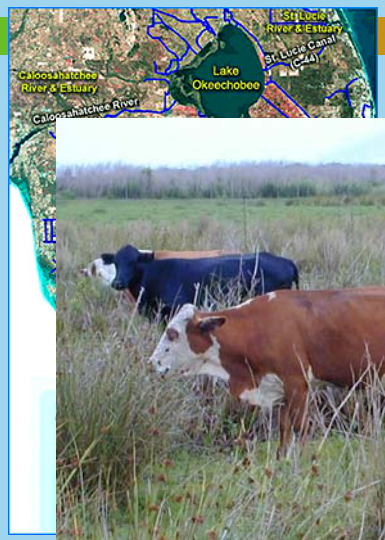
- **Profit Center for thin margin enterprises**
- **Complement Exiting Programs**
- **Cost-effective for taxpayers, relative to public projects**
- **Feasible to administer**

Lake Okeechobee and the “Northern Everglades”

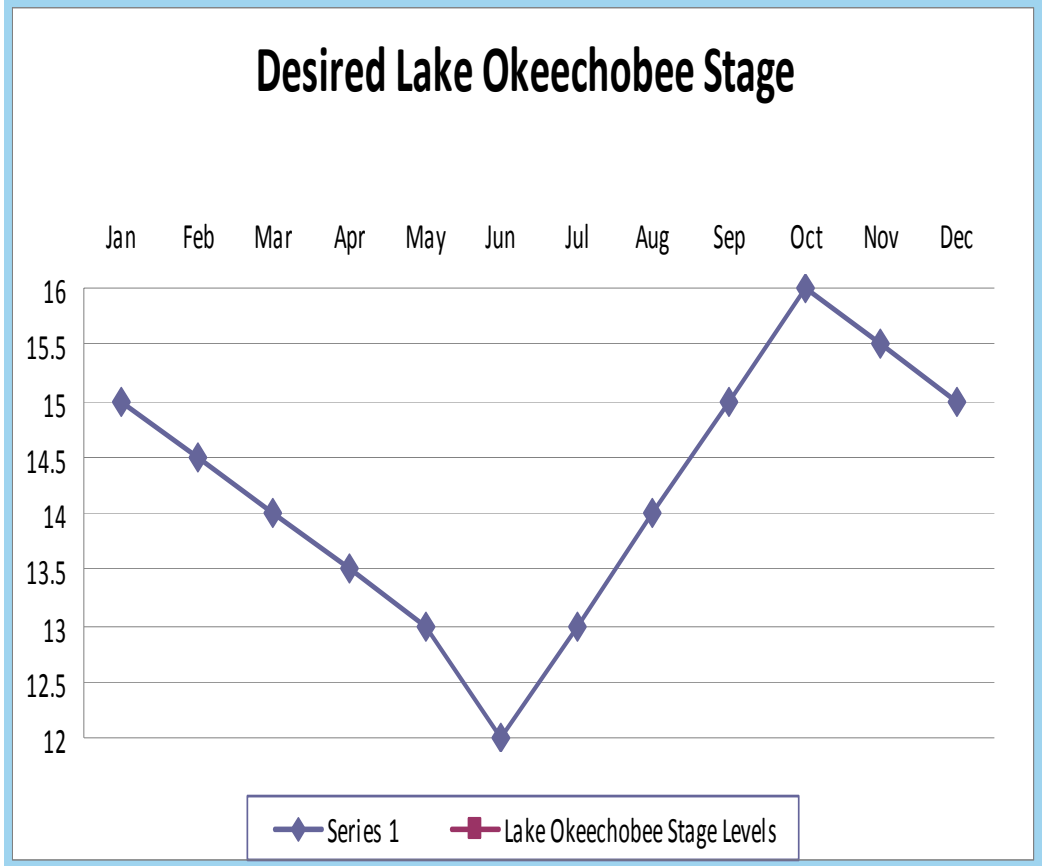
The Northern Everglades



Past, Present, Future?



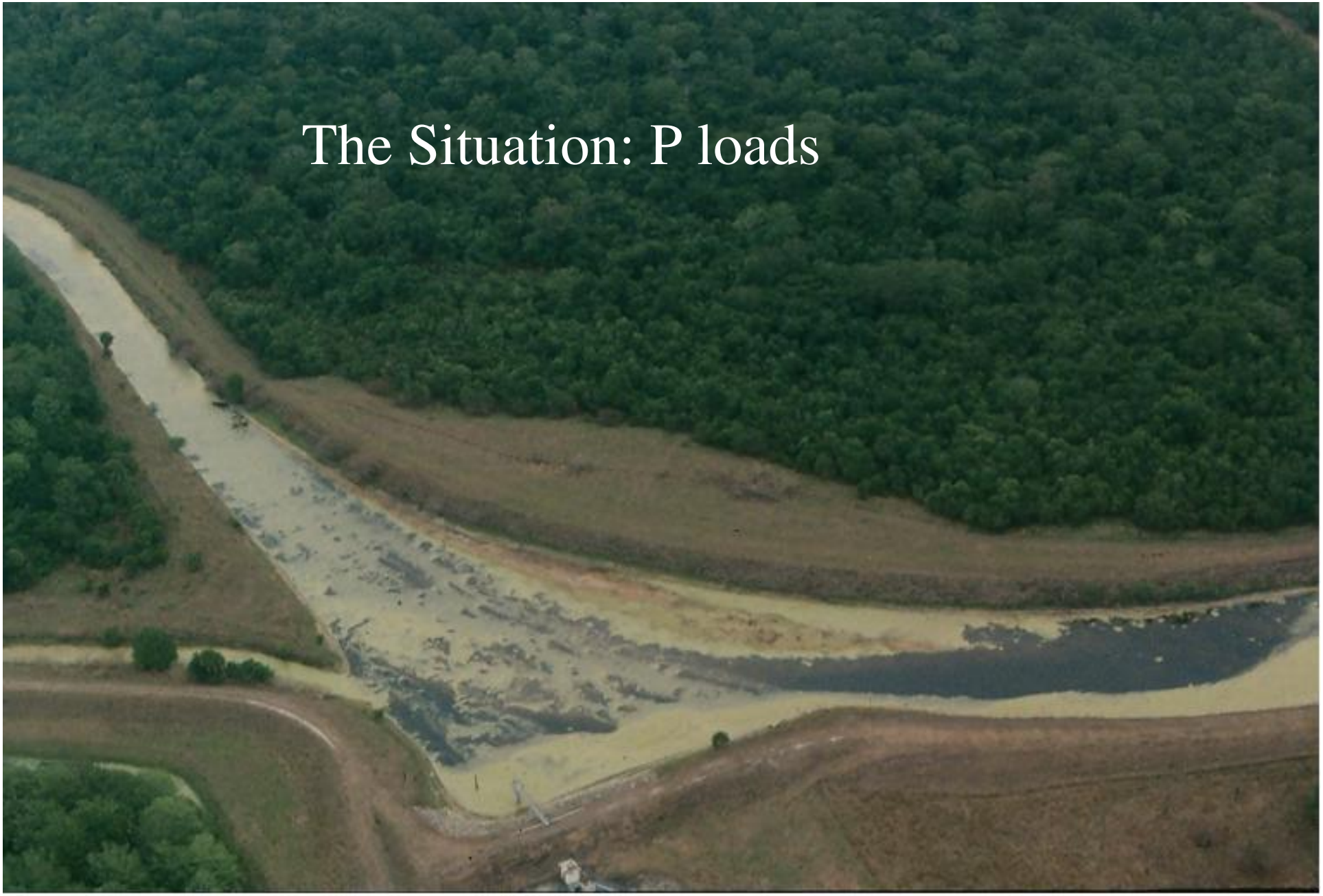
The situation: The Lake and Estuaries



The Opportunity: Land Extensive Ranches Can Retain P-laden Storm Water from Lake

- **More than 300,000 acre feet of *immediate* water retention**

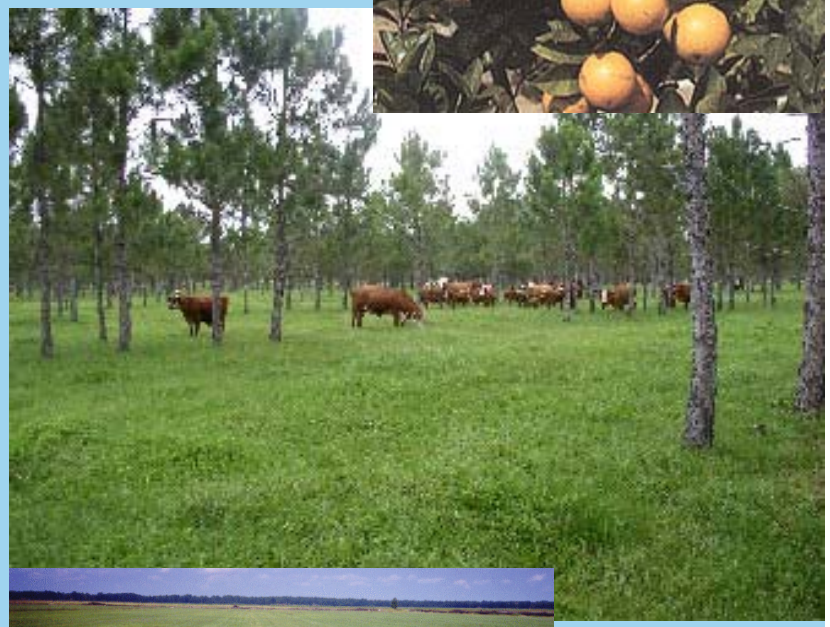
The Situation: P loads



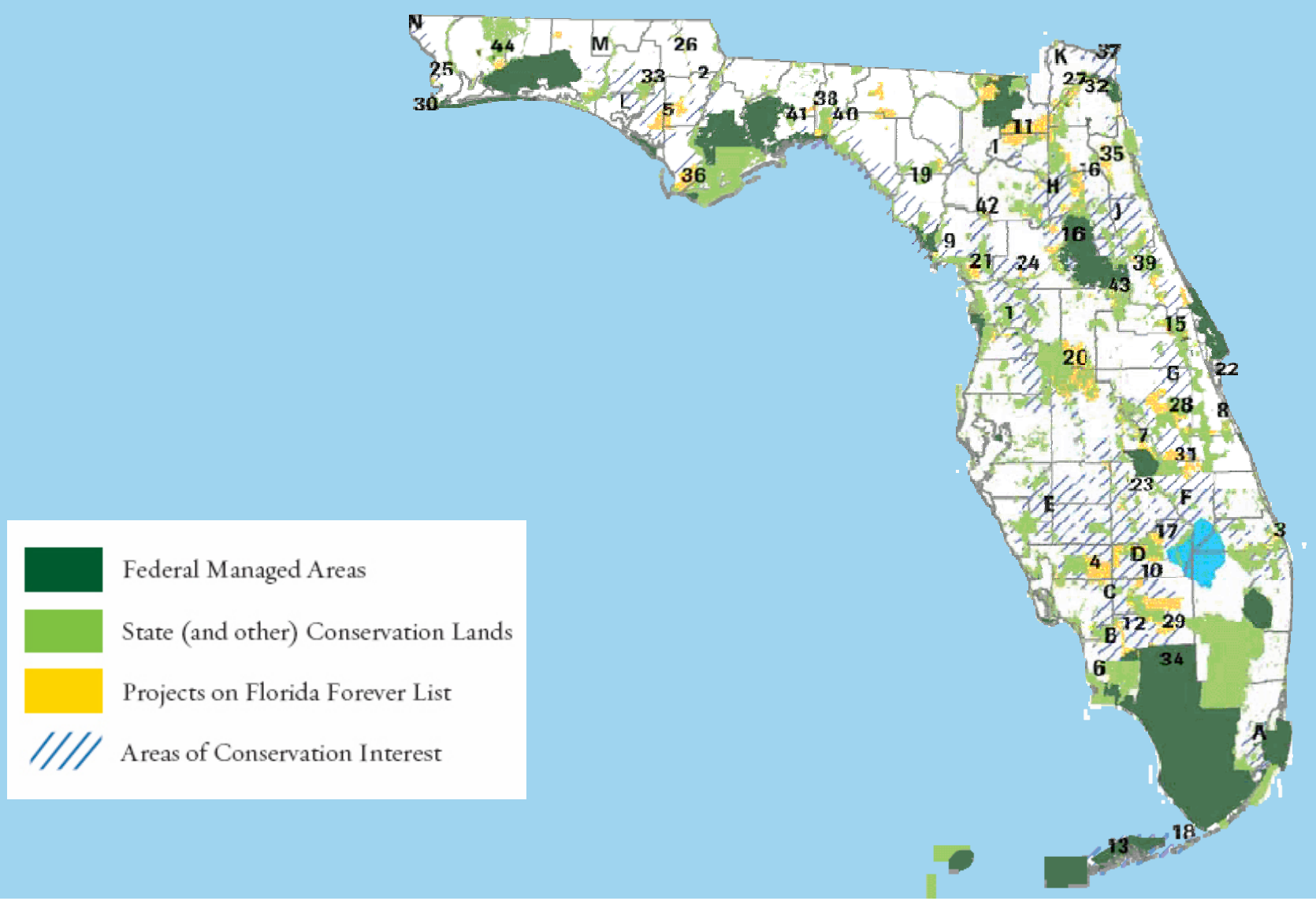
Algae blooms in Nubbin Slough reveal phosphorus pollution ready to flow into Lake Okeechobee. Photograph Paul Gray

The Opportunity: Land Extensive Ranching Contributes Little To P Load On A Per Ace Basis

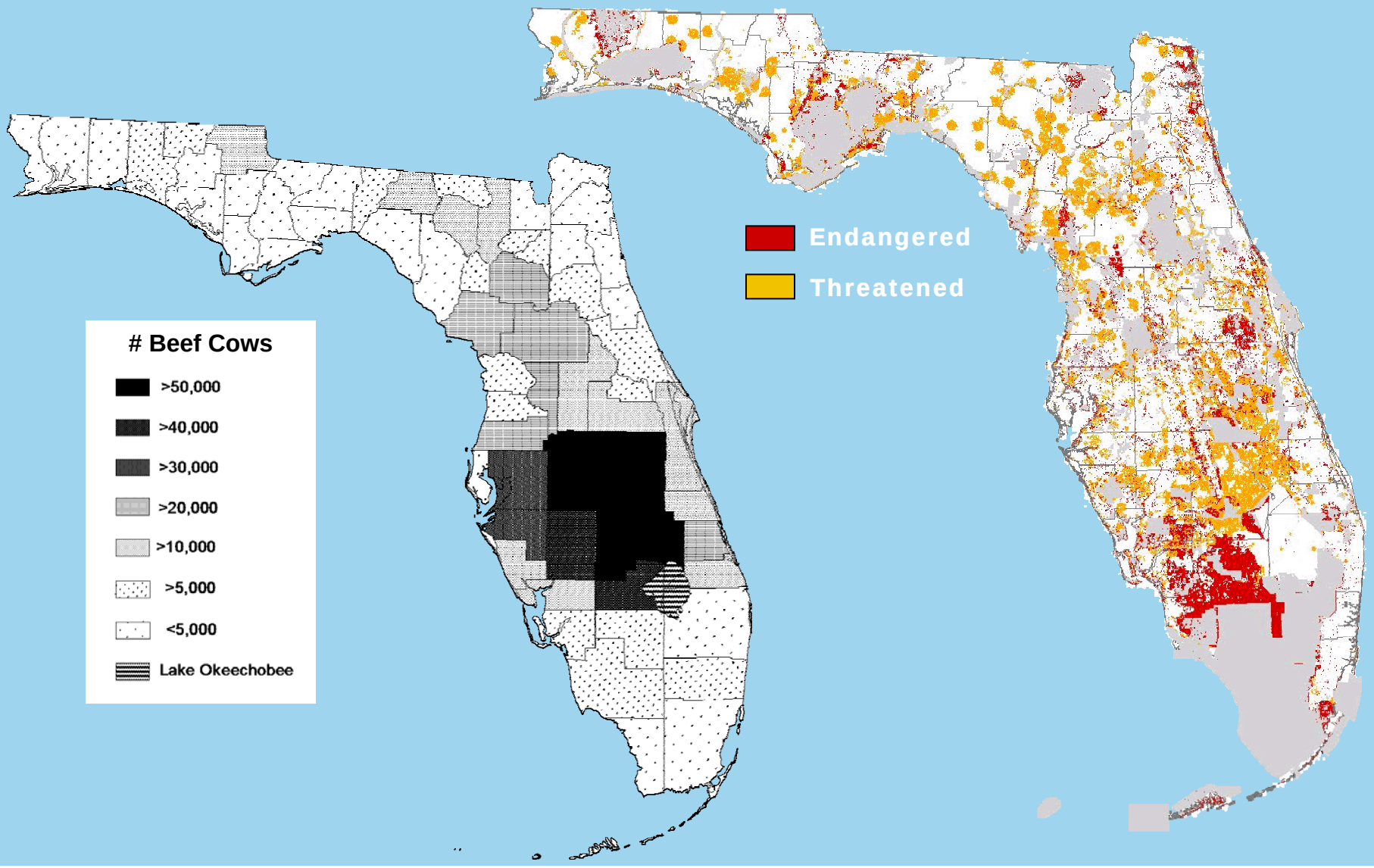
Land Use	Acres	% of Basin	P lbs/ac
Row Crops	7,087	1%	170
Dairy	21,063	2%	48
Residential	24,068	2%	14
Golf Course	932	0%	9
Ornamental	7,937	1%	8
Field Crops	5,624	0%	6
Citrus	**62,744**	**5%**	***6***
Improved Pasture	**454,110**	**36%**	***3***
Sod	**17,318**	**2%**	***2***



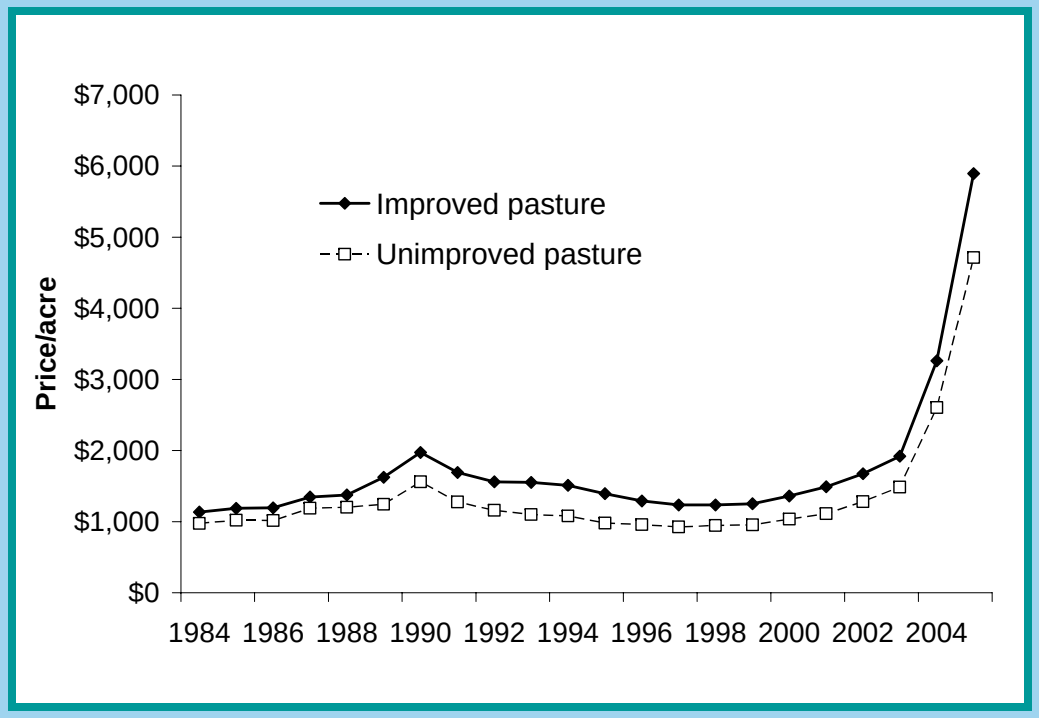
The situation: Limited Public Conservation Lands



The Opportunity: T & E Species Are Concentrated On Ranchlands



Can't buy *and* manage this land



The FRESP Vision – To Move

From …

- Cost share for agency-approved BMPs for ***P load control***
- Revenue neutral
- Limited verification / assumed effectiveness
- First come- first served

To …

- Payments for producing ***multiple*** environmental services
  - Ranchers choose how to produce
  - Ranchers choose what and how much
- Ranch profit center
- Payment depends on ***documented*** performance
- Payments target most valued services

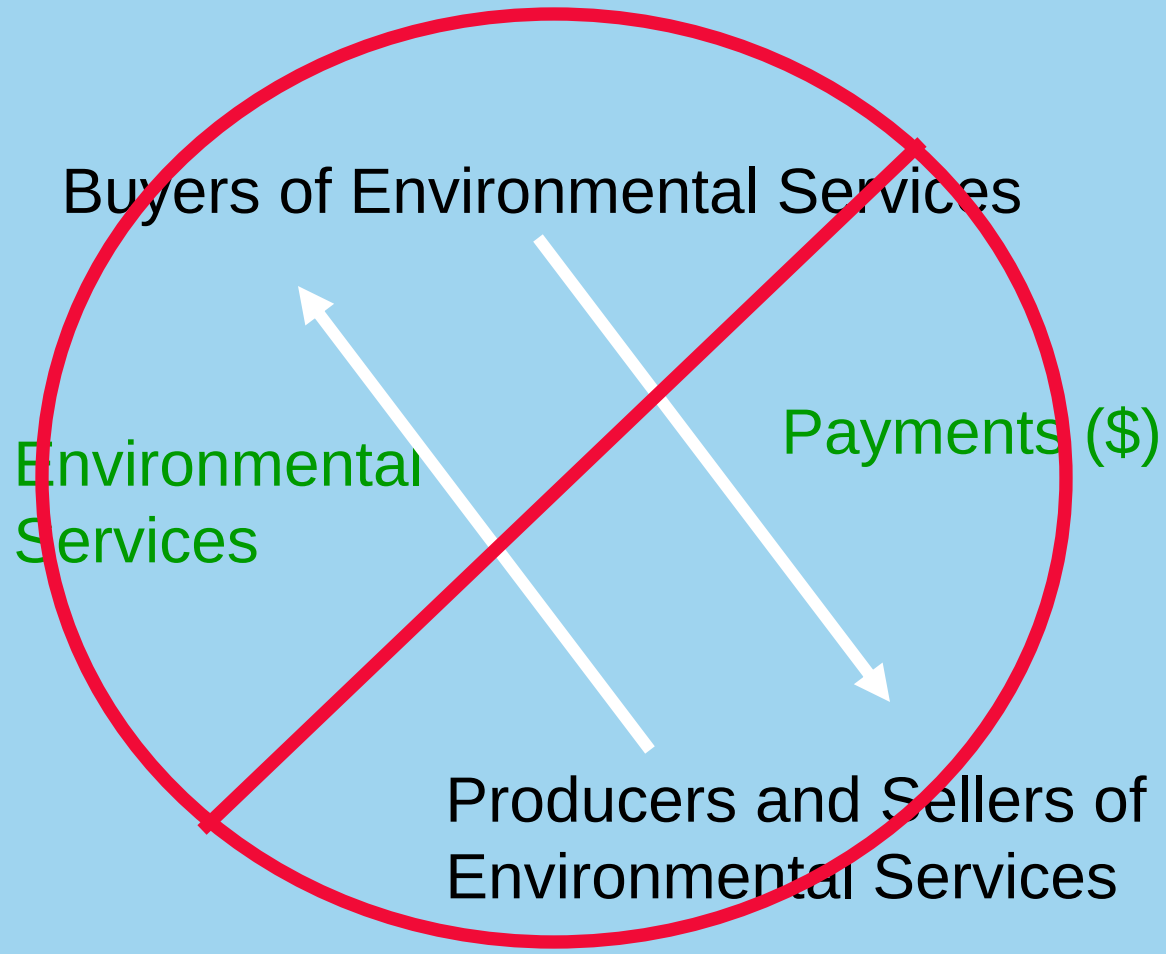
“ Imagine a world in which farmers and ranchers were paid to generate not just standard agricultural goods such as strawberries, hay and corn, but a whole slew of ecosystem services such as water filtration, carbon sequestration and wildlife habitat. Imagine a world in which carbon and water-quality credits traded on a commodities exchange alongside oat and wheat futures.

Sound crazy? The U.S. Department of Agriculture (USDA) doesn't think so.” Chicago Climate Exchange

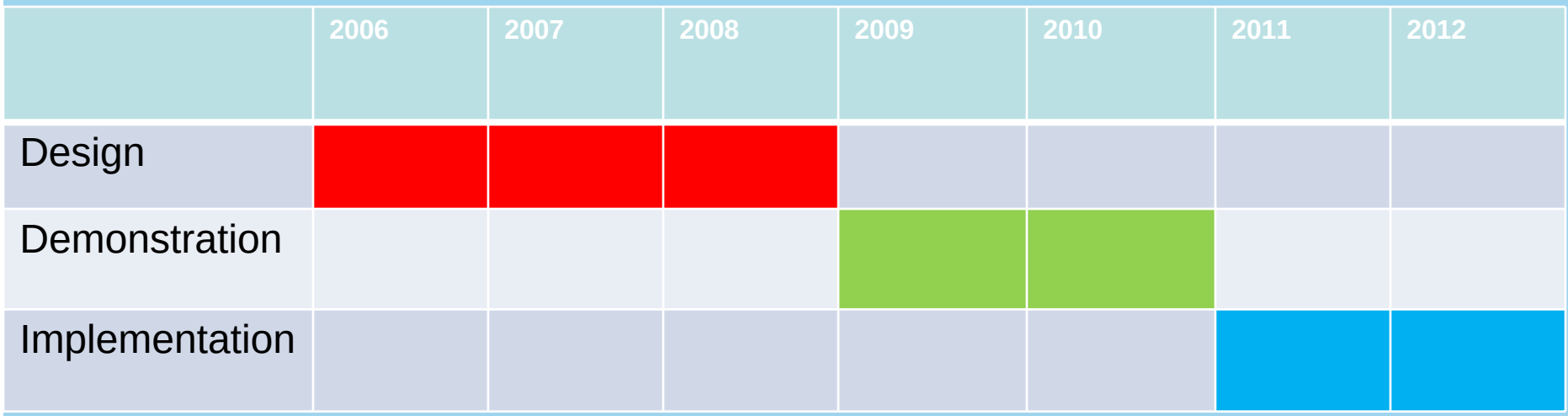
FRESP builds on market-like principles

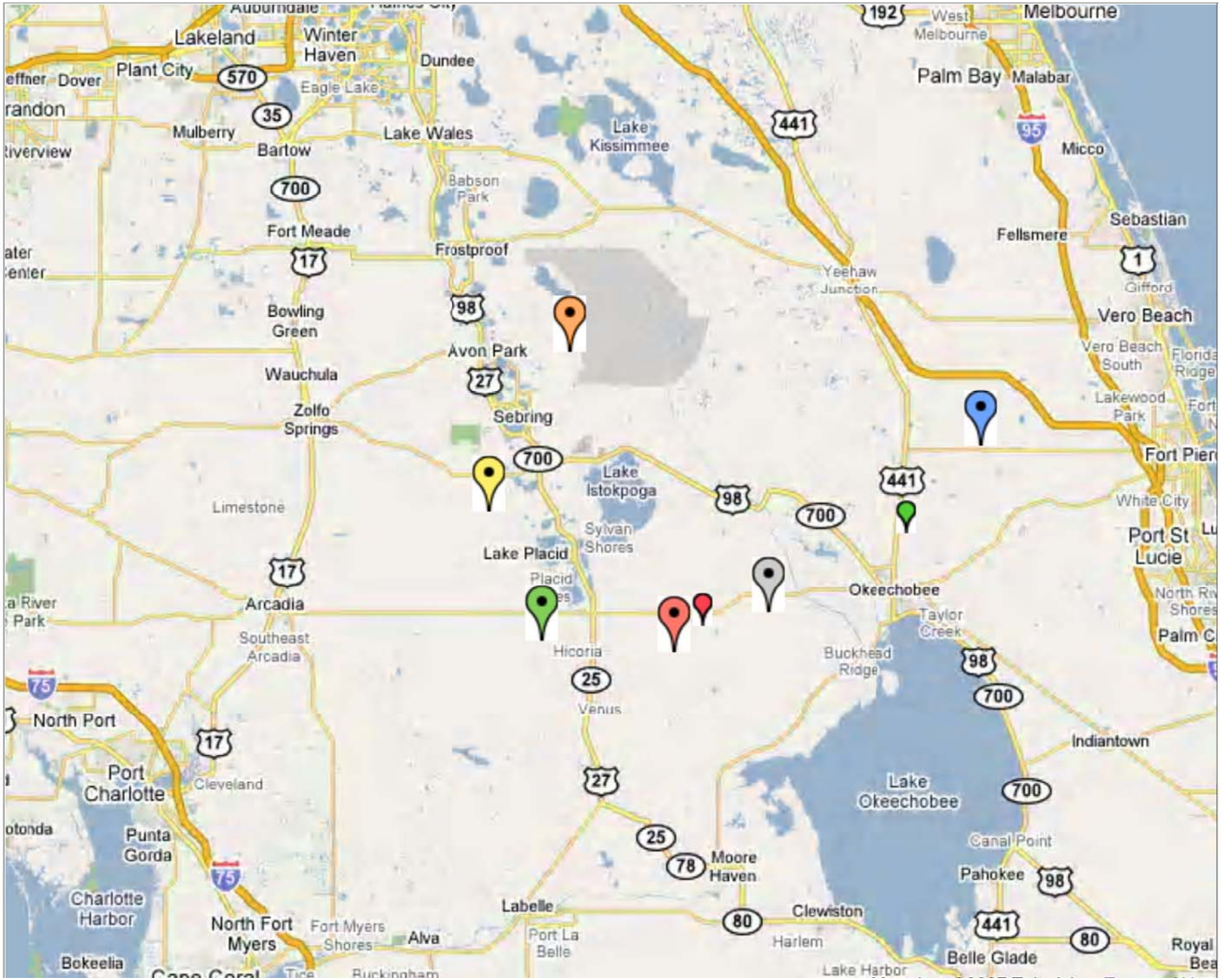
- **Contracts between agencies of state and ranchers**
- **Establish payments to ranchers for water and P retention services**
  - Ranchers choose level of services to produce and how to produce service
  - Agencies choose what ranches to contract with based on assessment of service potential
- **Payments are made**
  - If there is documentation that the service is provided during the contract period
  - Only if, ranchers first implement minimum set of on –ranch actions (“above and beyond”)

It sounds simple



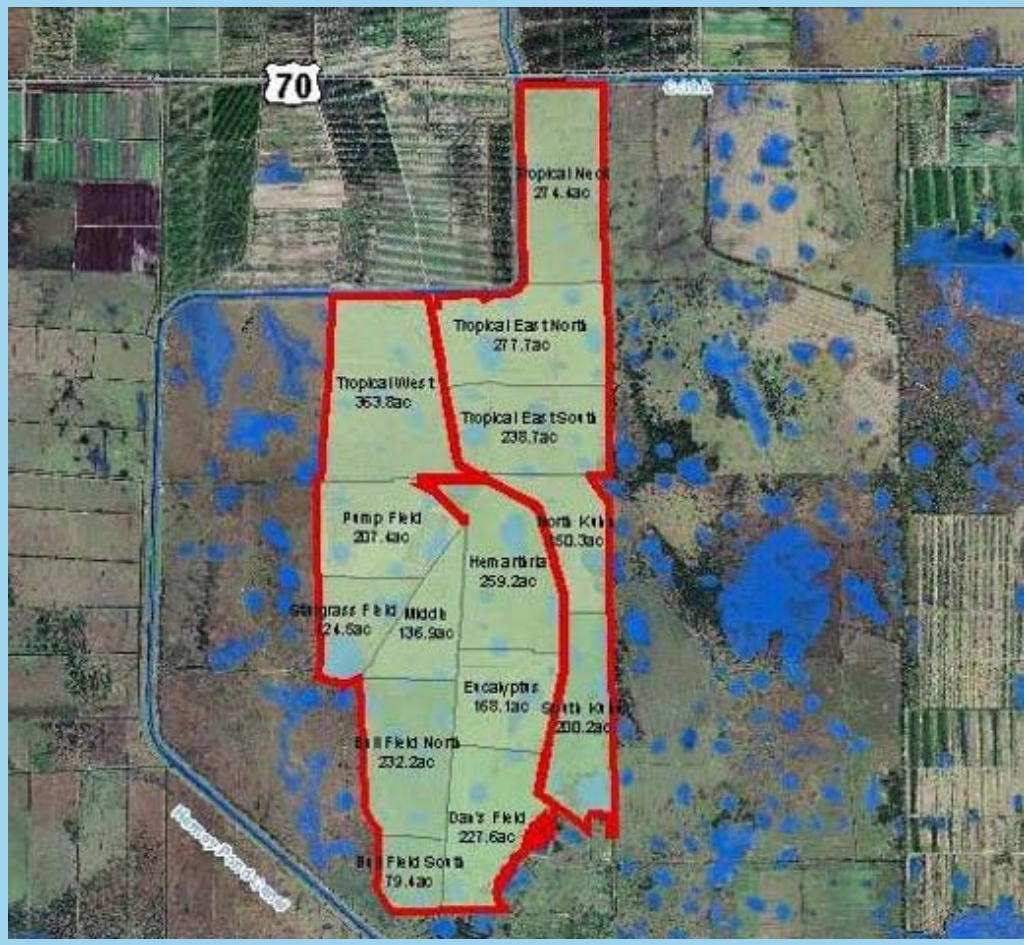
The Plan: through 2012




Lakeland
Winter Haven
Plant City
Dundee
Eagle Lake
Mulberry
Bartow
Lake Wales
Lake Kissimmee
Babson Park
Fort Meade
Frostproof
Bowling Green
Avon Park
Wauchula
Zolfo Springs
Sebring
Lake Istokpoga
Sylvan Shores
Lake Placid
Limestone
Arcadia
Southeast Arcadia
Hicoria
Venus
Placid
Okeechobee
Taylor Creek
Buckhead Ridge
Lake Okeechobee
Indiantown
Canal Point
Pahokee
Moore Haven
Clewiston
Harlem
Belle Glade
Lake Harbor
Labelle
Port La Belle
North Port
Port Charlotte
Cleveland
Punta Gorda
Charlotte Harbor
North Fort Myers
Fort Myers Shores
Alva
Bokeelia
Melbourne
West Melbourne
Palm Bay
Malabar
Micco
Sebastian
Fellsmere
Gifford
Vero Beach
Vero Beach South
Lakewood Park
Fort Pierce
Port St Lucie
White City
Yeehaw Junction
570
35
700
17
98
27
441
192
95
1
25
78
80

Installation

Results Envisioned: Strom Water Retained

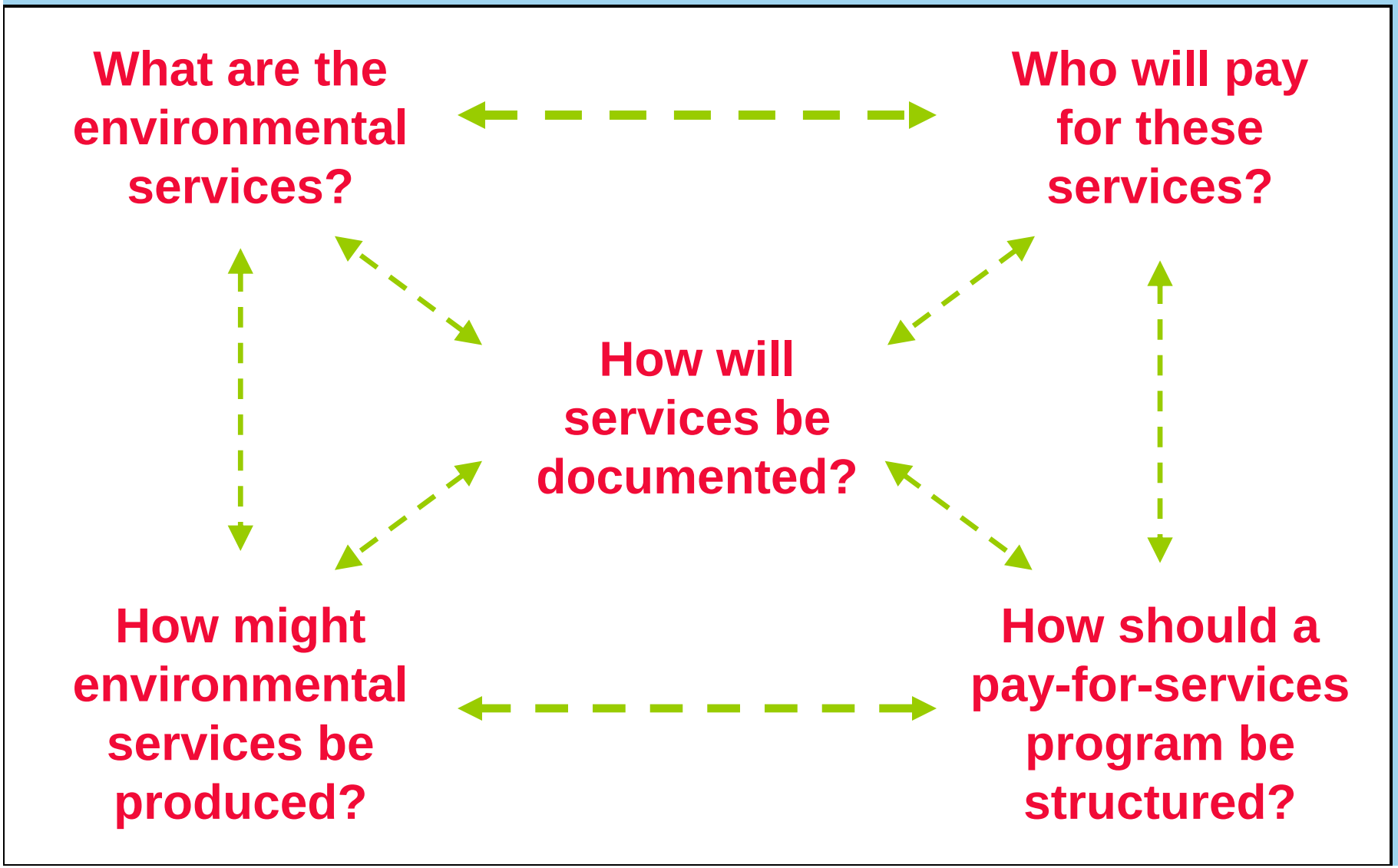


Results Envisioned: Detention Reservoir To Treat Off-ranch Water From Public Canal

Why Have Pilot Sites?

- Proof of concept for service provision by different WMAs
  - Construction
  - Operations
- Proof of Concept for documentation
  - Cost effective
  - Directionally accurate
- Demonstration for other build interest
- Collaboration and discussion on program design
  - Contract design
  - Price making
  - Regulatory Compliance

How complicated can design get?

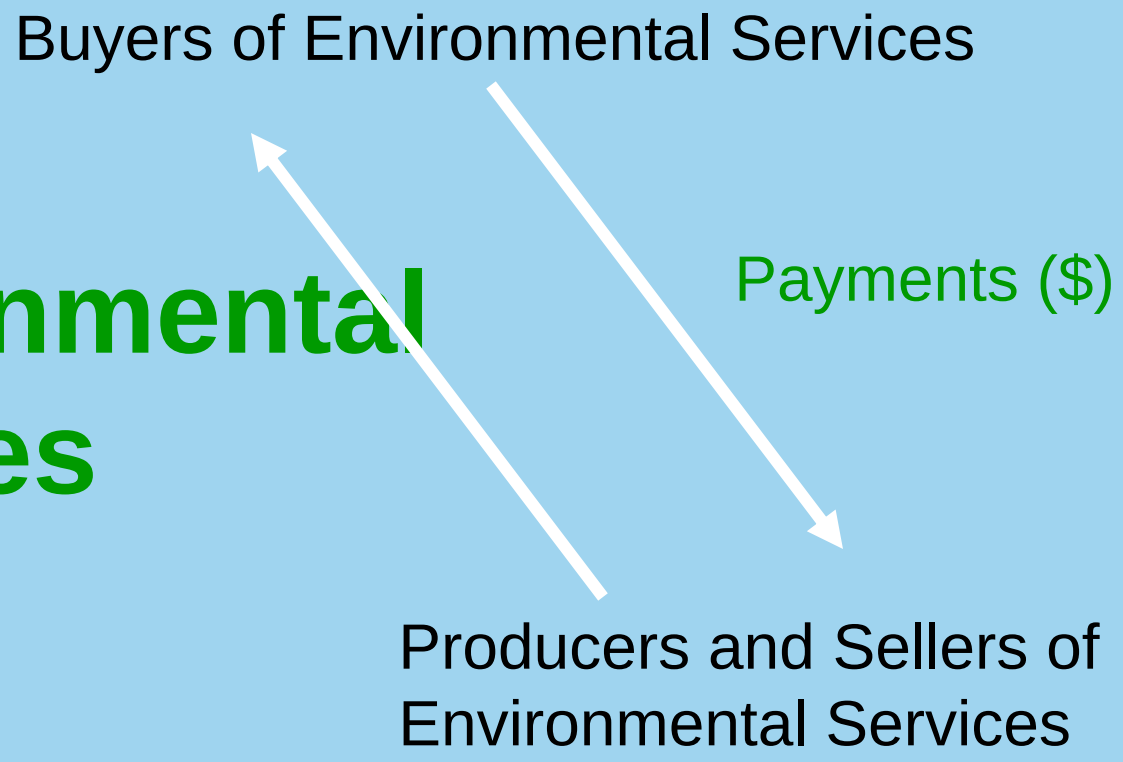


FRESP Team

FRESP Team Accomplishments

- Negotiated **State Agency** Buyer and **Rancher** Seller **agreement** on:
  - Concept of PFS program (profit center to ranchers for documented services);
  - Services paid for will be “Above and Beyond” ranch regulatory requirements
  - Definitions of the environmental “commodities” (water retention and Phosphorus load reduction)
  - Buying “option value” (regardless of rainfall) resulting in a guaranteed minimum annual payment over the life of a contract;
  - Documentation approaches for water and P

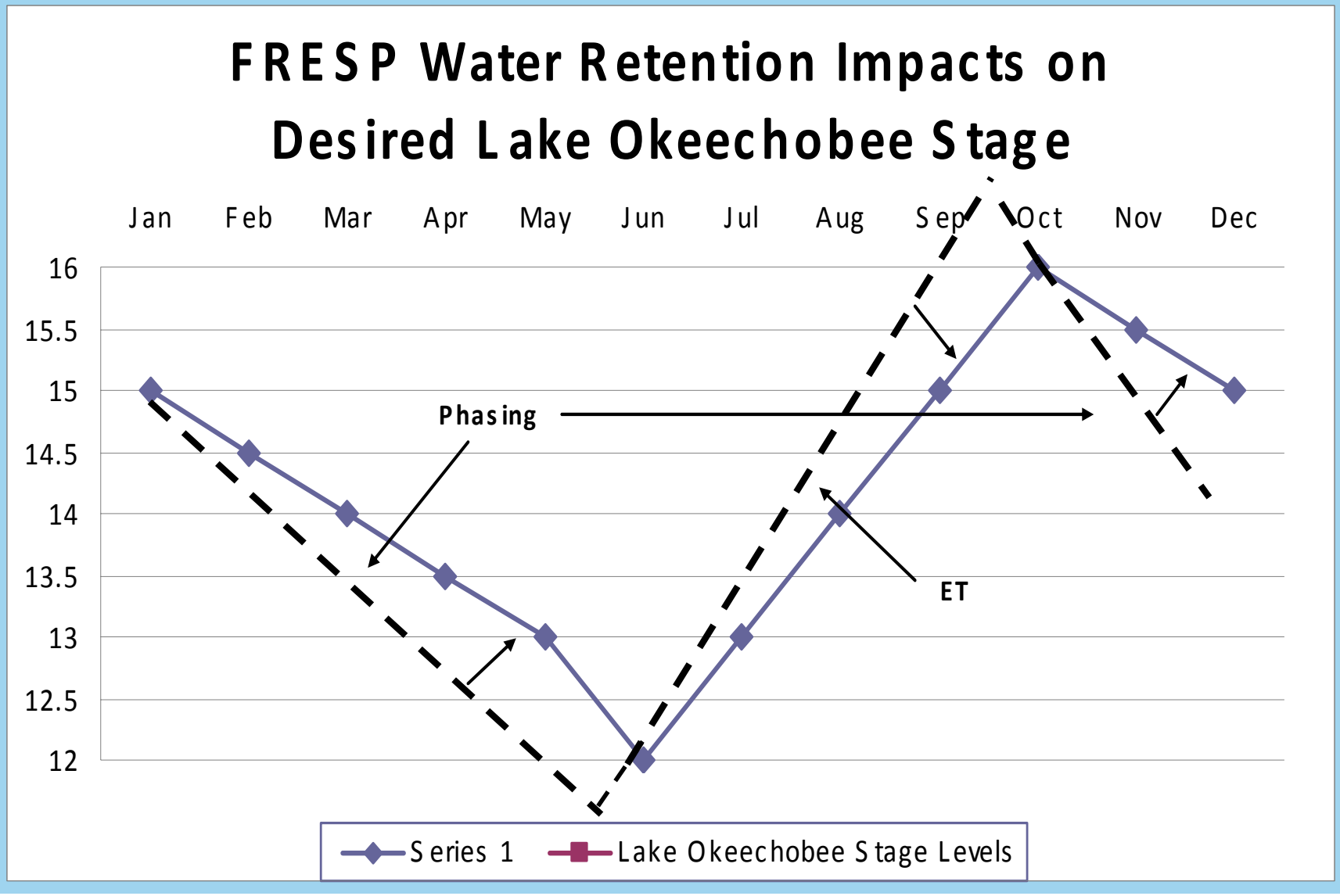
The Commodity



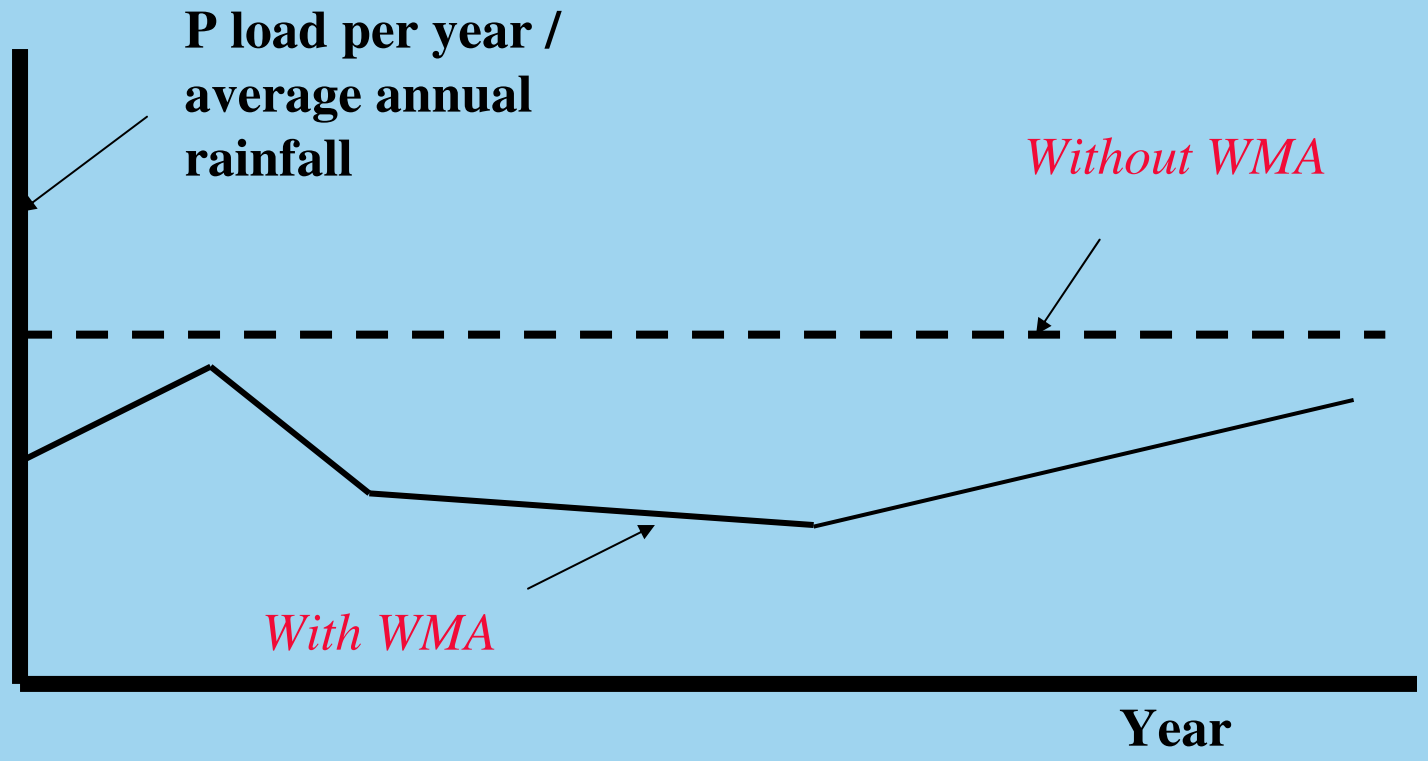
Water Retention

- *Defined:* Water held back for a period of time in wetlands, ditches and in the soil profile, with the release of water in a different volume, phase and pathway (seepage) than would be the case without the WMA.
- *Measured:* The *acre feet* that do NOT flow in the drainage network of the WMA site in a water year with the WMA, as compared with the water that would have flowed without the WMA.

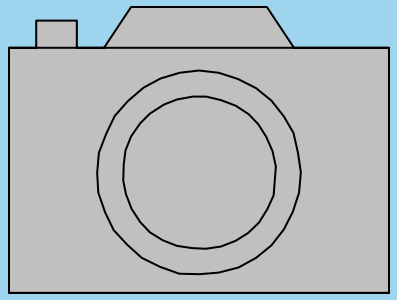
Value of Water Retention to the Lake and Estuaries



How can program assure P-load reduction when water is retained?

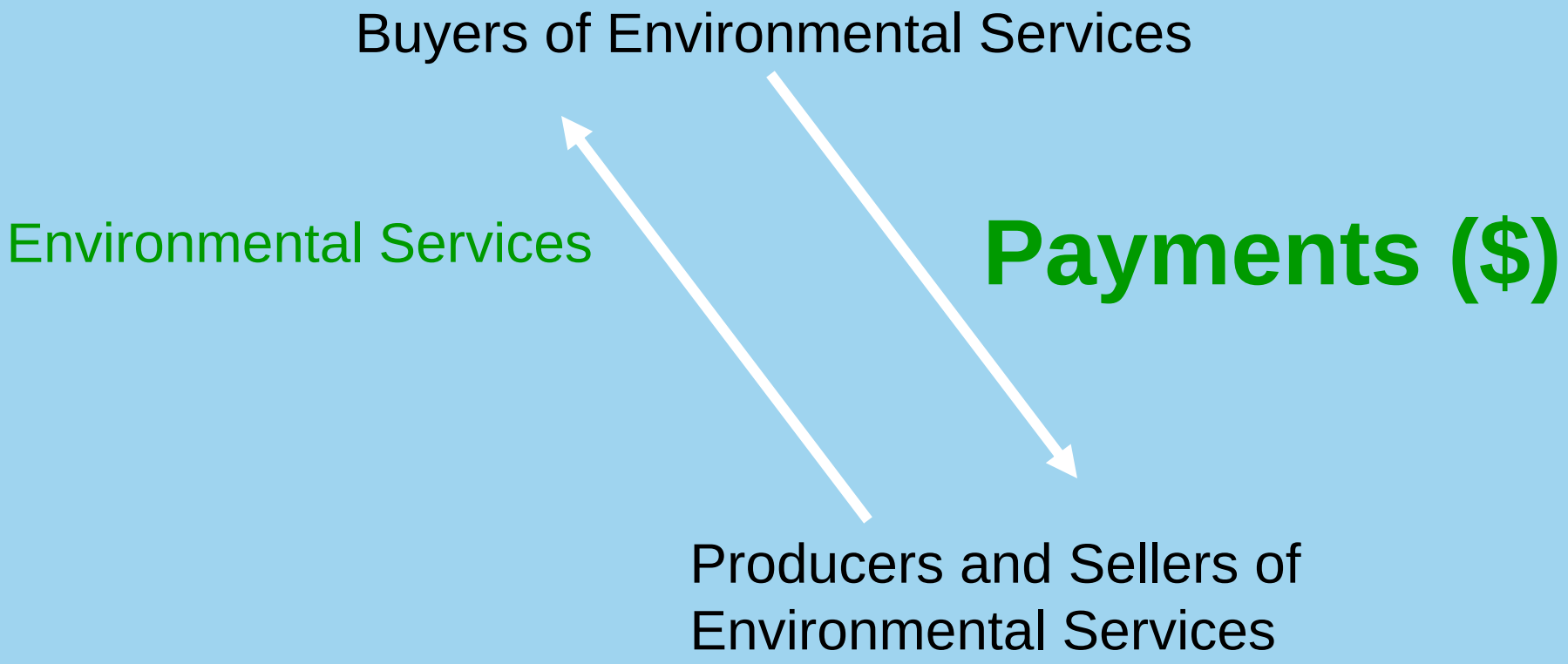


Practical and not cost prohibitive commodity documentation



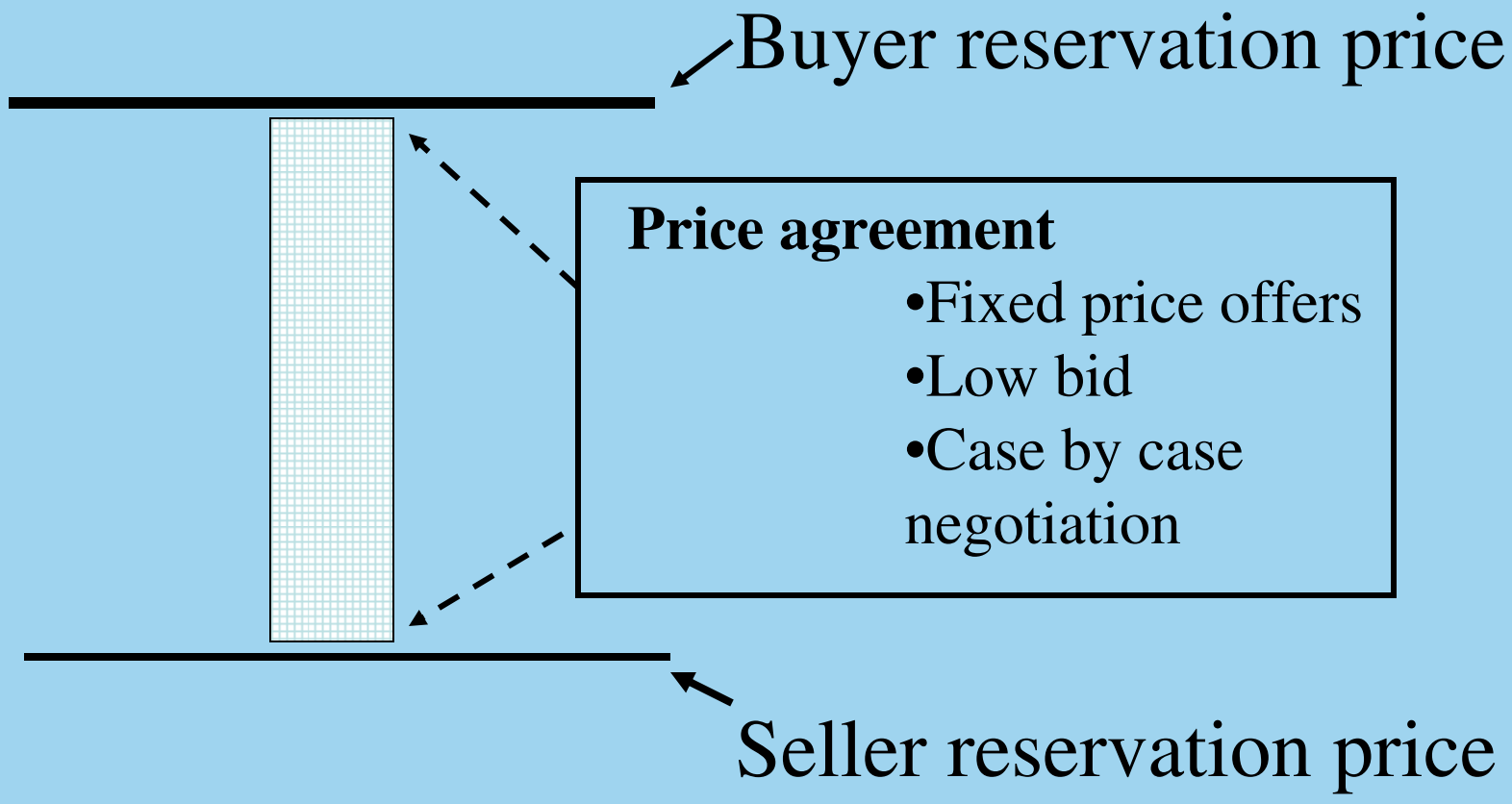
Photographic Documentation

Price Discovery

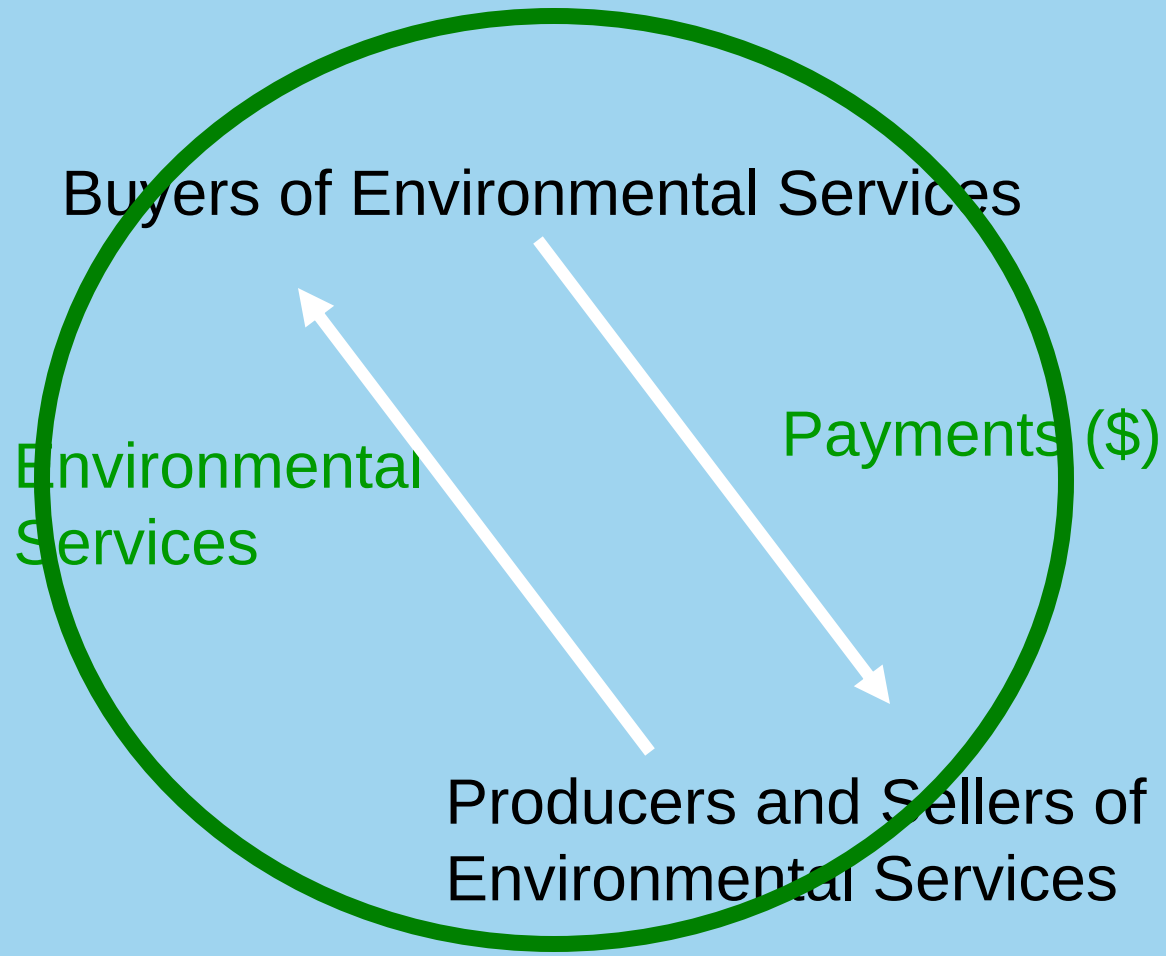


Price making – still in the works

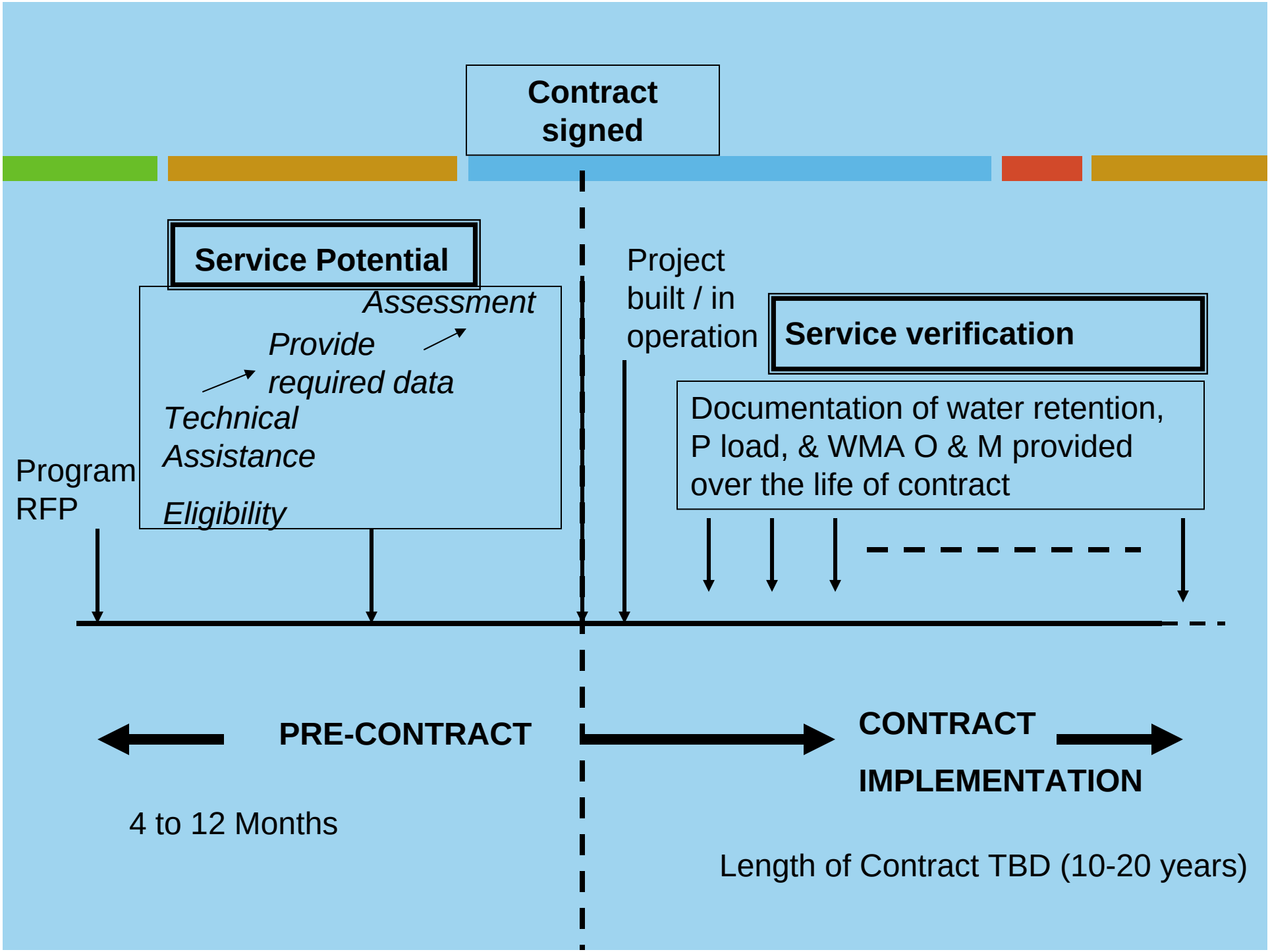
- **Agencies reservation price - willingness and ability to pay**
  - Cost of public alternative
  - Immediacy
  - Permanence
  - Certainty
  - Magnitude and location of service (targeting)
  - Budget exposure and management
- **Ranchers reservation price - willingness and ability to sell**
  - Cost of production on the ranch
  - Competitive return on investment
  - Mesh with other ranch operations
  - Cash flow certainty


Buyer reservation price
Price agreement
•Fixed price offers
•Low bid
•Case by case negotiation
Seller reservation price

Contracting –It isn't easy being green



- Program Requires Payment Certainty
  - For investment planning, a rancher needs a guaranteed minimum annual payment over the contract lifetime regardless of rainfall
  - For budget planning, an agency needs to accurately predict future budget outlays and be able to commit funds to future payments
- So
  - Assure payment certainty while still making payment contingent on actual service provision


Contract signed
Service Potential
Assessment
Provide required data
Technical Assistance
Eligibility
Program RFP
Project built / in operation
Service verification
Documentation of water retention, P load, & WMA O & M provided over the life of contract
PRE-CONTRACT
CONTRACT IMPLEMENTATION
4 to 12 Months
Length of Contract TBD (10-20 years)

Pre contract: Predicting Potential Water Retention

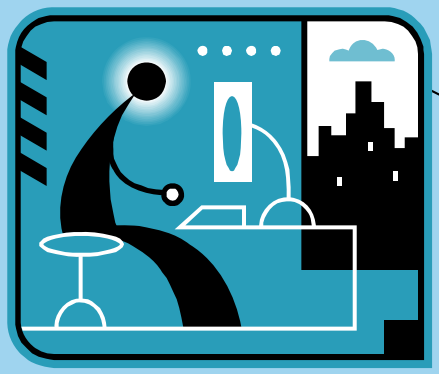
Potential water retention

Historical rainfall records

Site characteristics

Contract life

Simulation of stage and volume



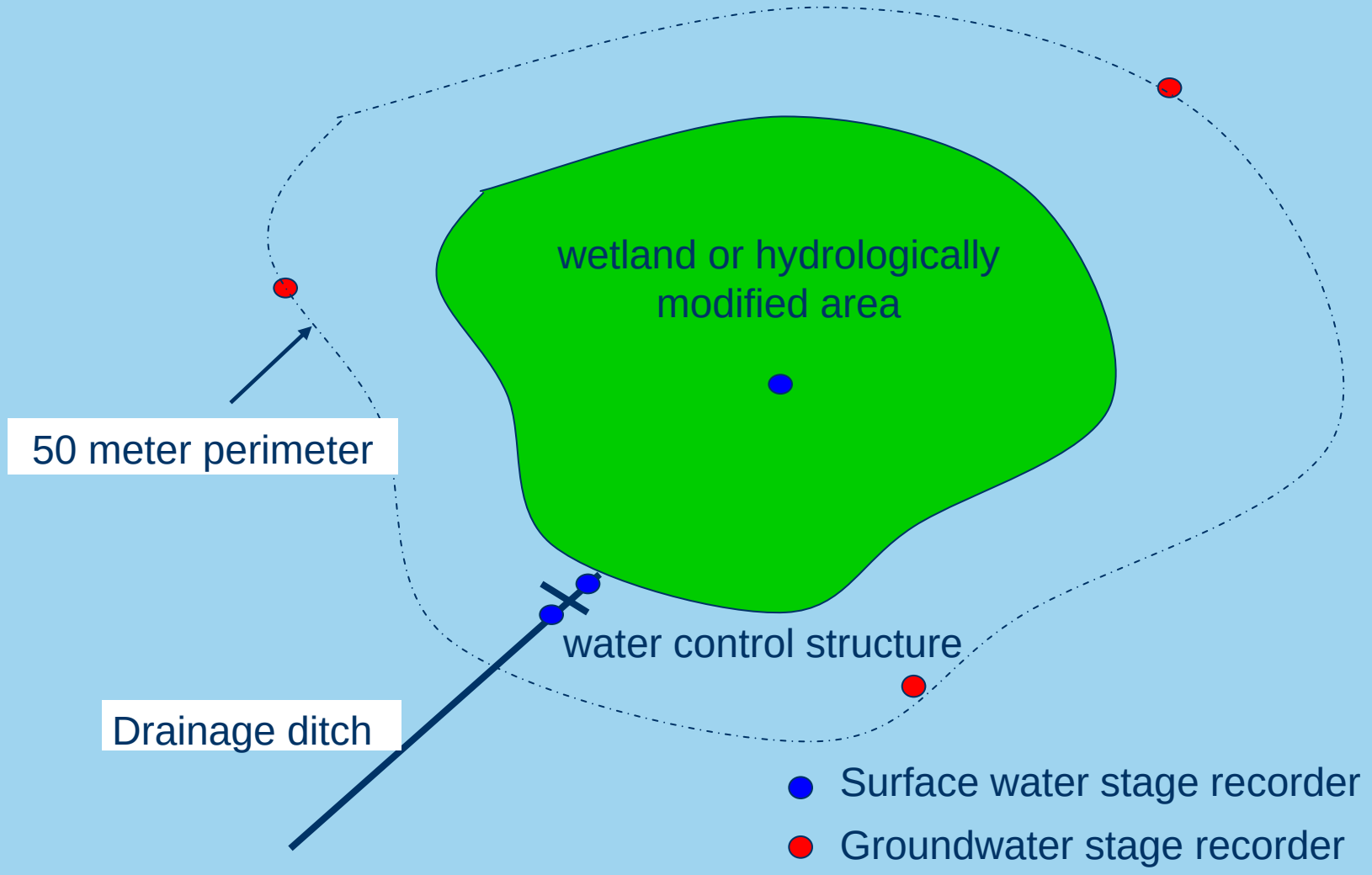
95% confident

Predicted Water Retained, for a hypothetical water year.

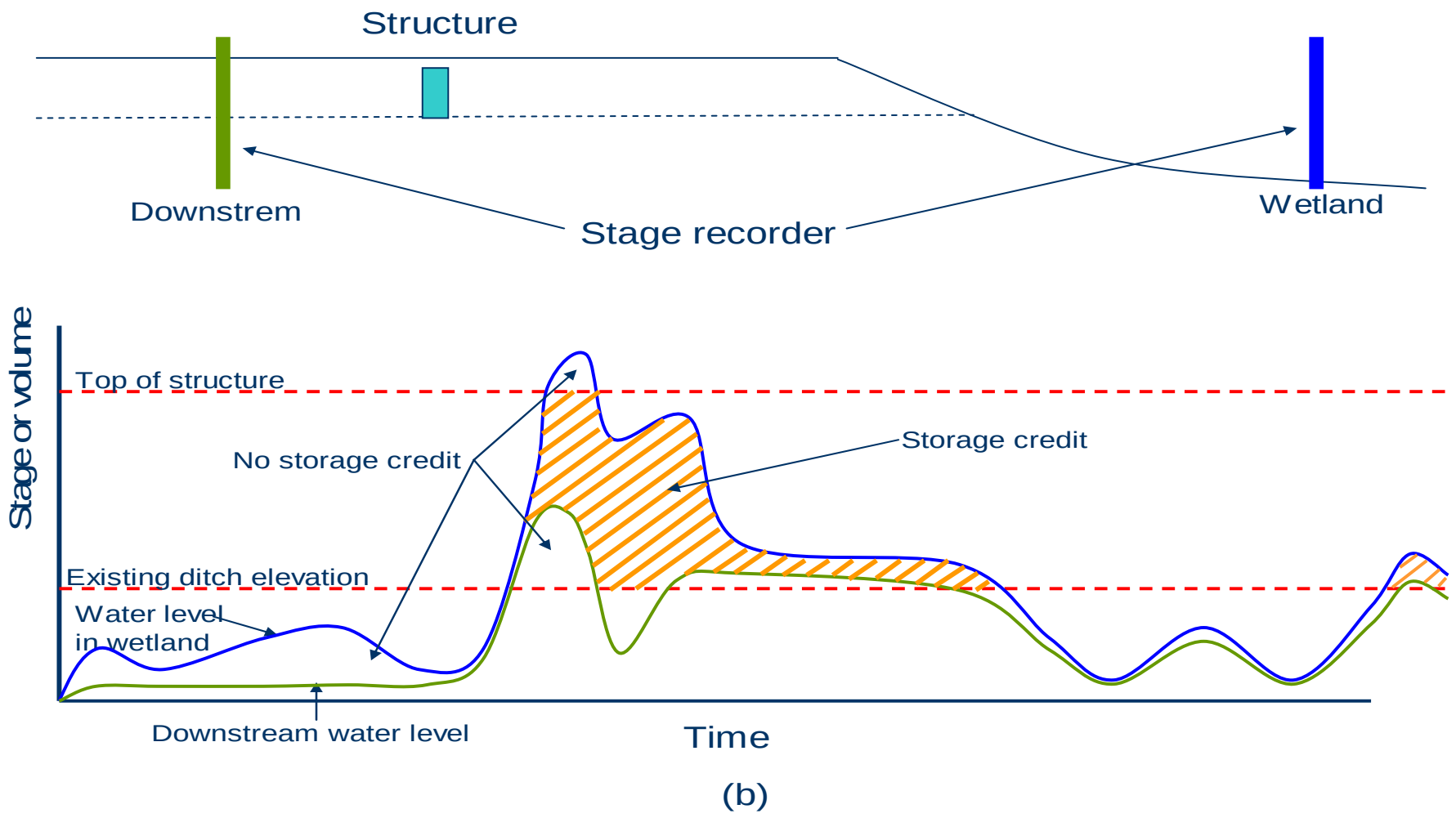
Post-contract Documentation:

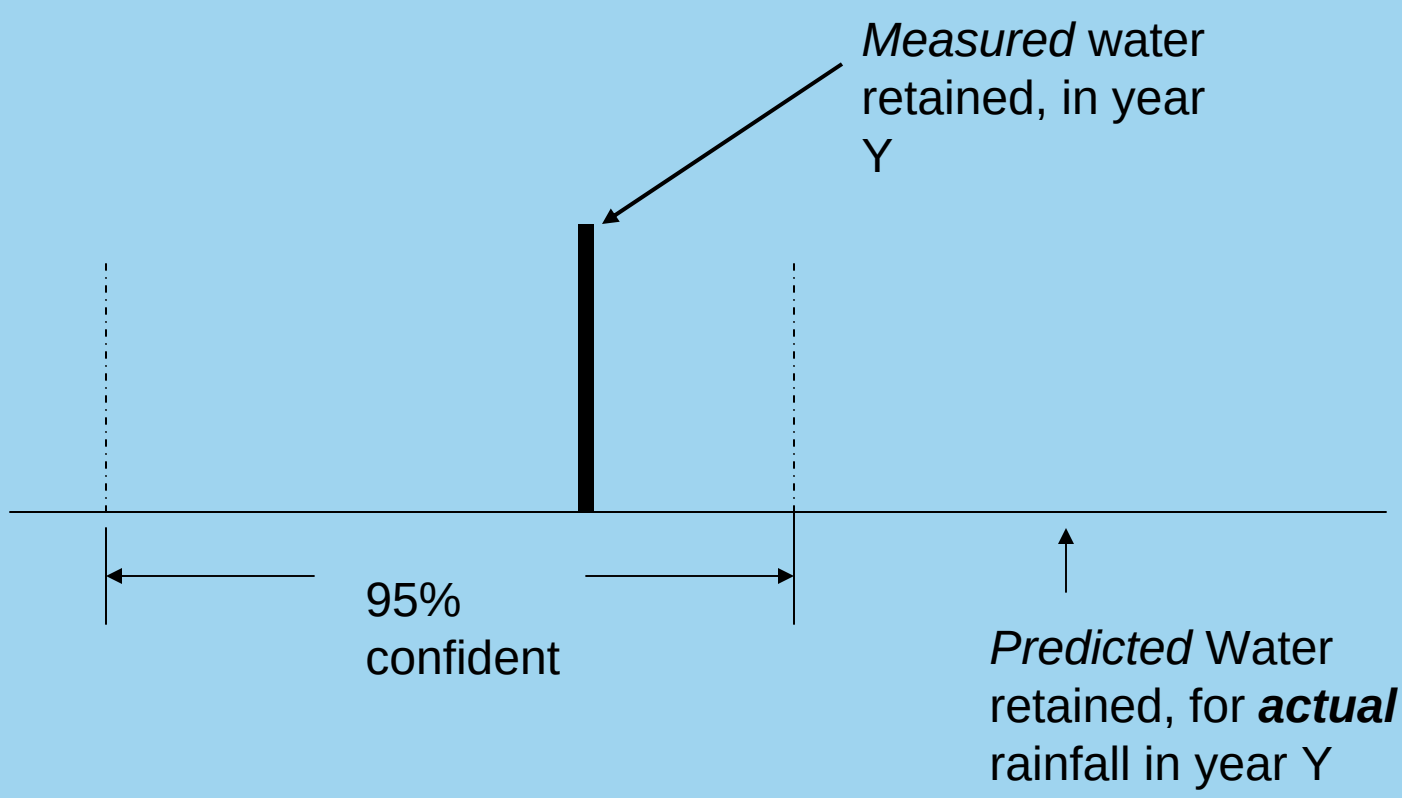
Determining Water Retained

Documenting water retention

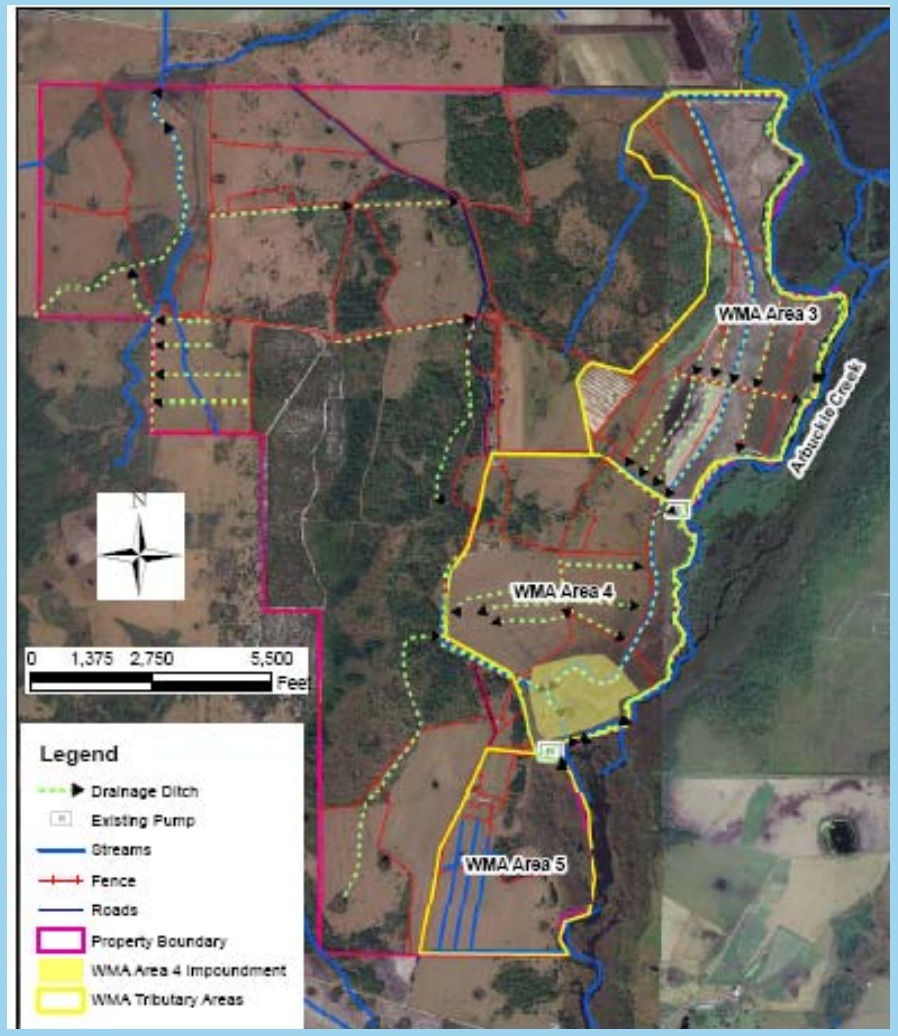


Conceptual Hydrograph for Crediting Water Retained




Measured water retained, in year Y
95% confident
Predicted Water retained, for ***actual*** rainfall in year Y

Water Retention and P load: The Nexus

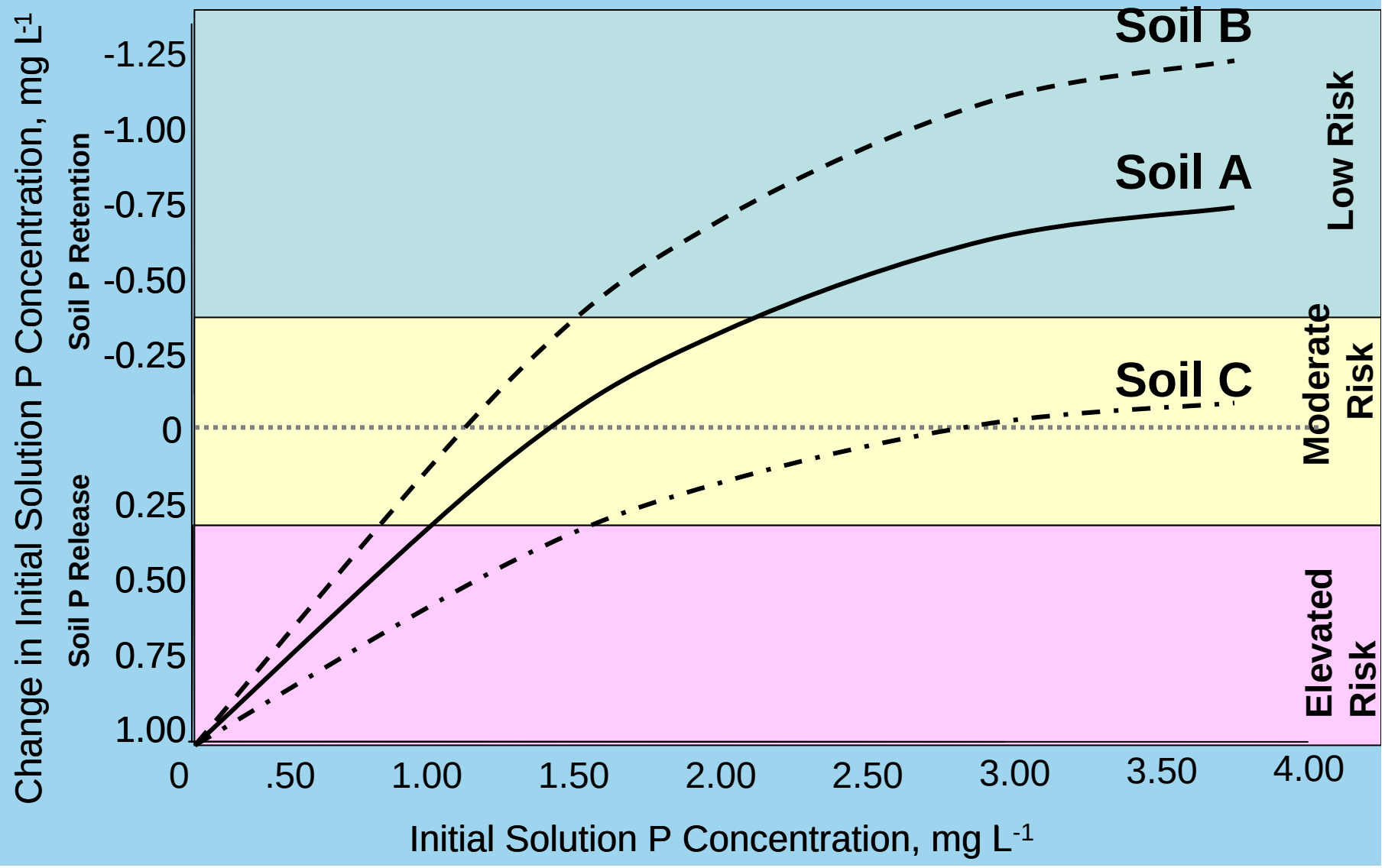


- **A program to pay for increased water retention**
  - *must not* add to the future P load over life of contract
  - *must* reduce P load above that realized without the program

A Measurement Problem

- **Can measure pounds released from site after program begins**
- **Reduction estimate needs pounds released before program BUT**
- **Estimation models are expensive and time consuming**
- **Uncertainty**
  - **Understanding**
  - **Equations**
  - **Data**

Quantitative Soil P Risk Index



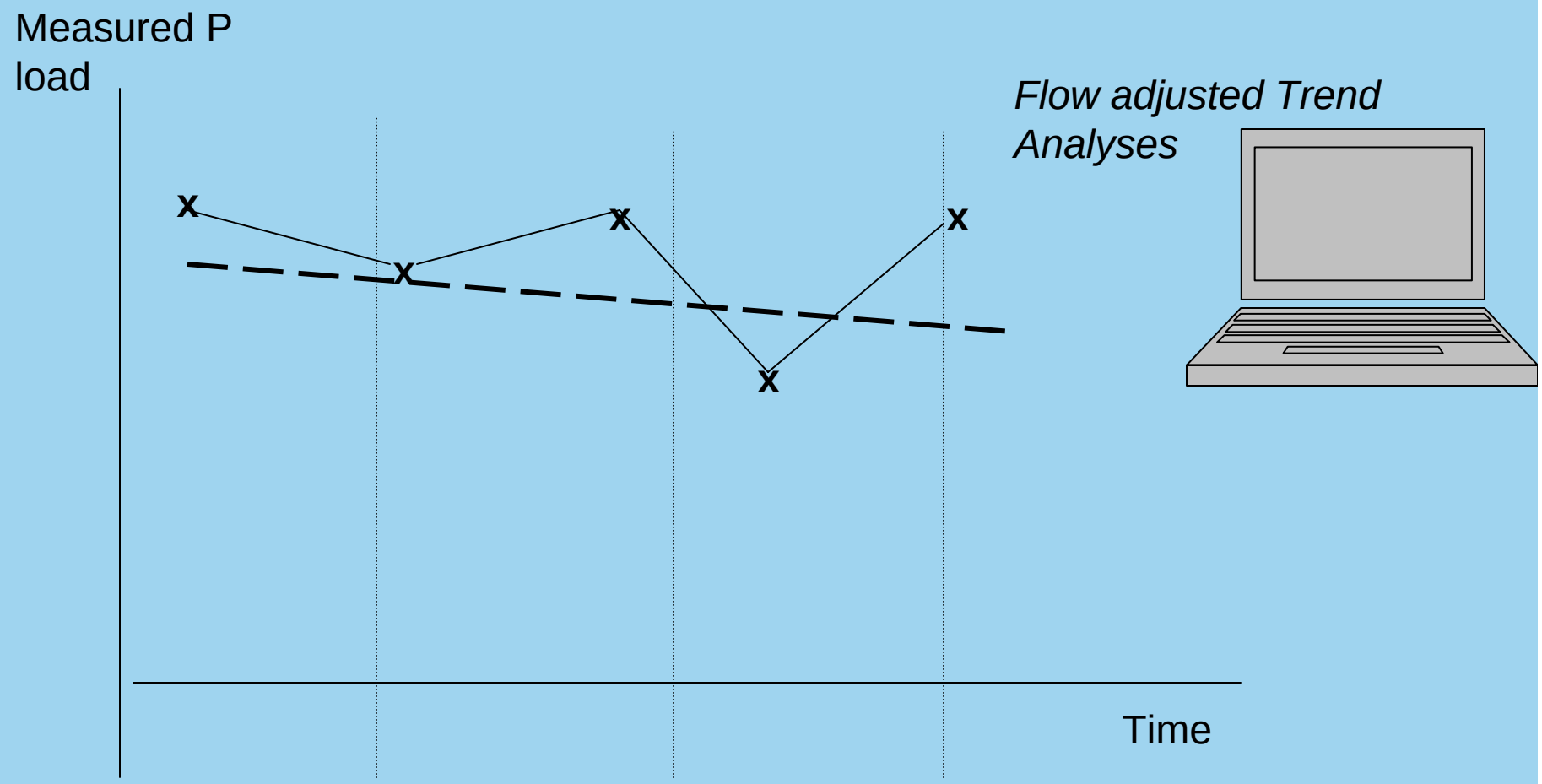
Using the P index: Buyers Target Water Retention Sites

- Sites with high P load risk will not be eliminated from water retention program enrollment
  - Soils analysis identifies legacy P
  - Will be lost over time if no action is taken
- Water retention payment will be conditioned on managing site in consideration of P
  - Costs reimbursed for P management

Using the P index: Establishing Contract Requirements

- All sites that apply to the program will
  - Agree to not apply new P beyond agronomic rates
  - Agree to retain the first flush
- All sites will receive a second level assessment of their` ability to assimilate P
  - type and amount of vegetation (ex marsh system vs. pasture grass)
  - grazing of the site
- The second level of assessment may call for additional management and operations requirements, as a contract condition.

Post Contract Documentation



Flow adjusted Trend Analyses

What if predicted services are not being realized?

- **Actual retention outside confidence band**

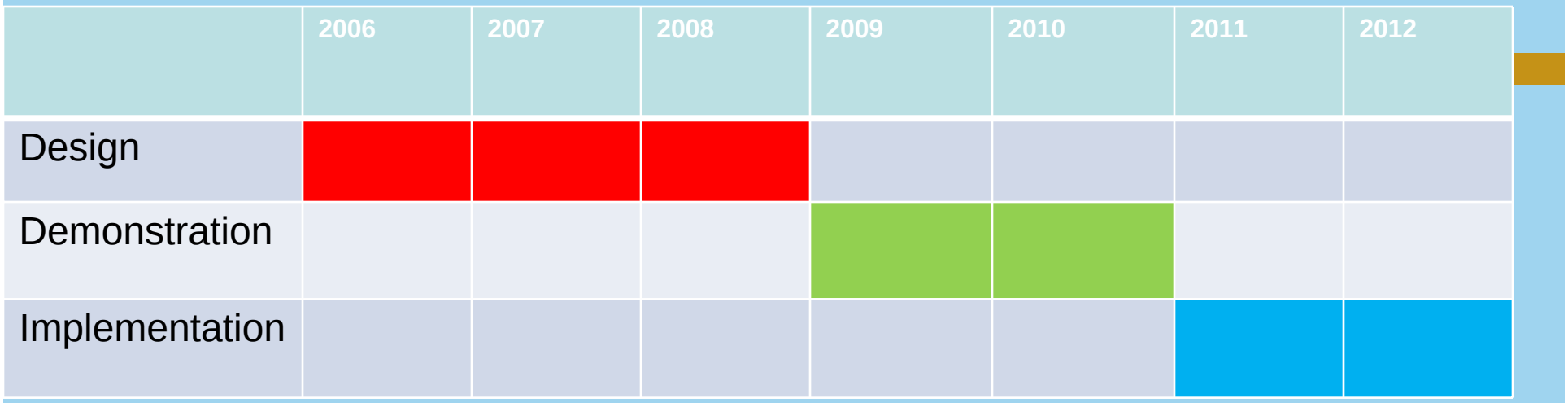
Payment assured over contract life *if*

- WMA Maintained as designed
- Operational rules followed as specified in contract
  - Requires documentation of O&M

Contract renegotiation possibilities

- Rancher innovation
- If P load risk is increasing

The Plan: 2008 - 2011



Measure service in same metrics as NE
Rules for participant eligibility
Procedures for price discovery
Establish model contracts for services rendered
    Term, T&E and 404 protections, etc.
Secure sustainable funding stream
Transfer responsibility for program implementation to buyers & sellers and or their designated agents.

FRESP and its market-like principles

- Contracts between agencies of state and ranchers
- Establish payments to ranchers for water and P retention services
  - Ranchers choose level of services to produce and how to produce service
  - Agencies choose what ranches to contract with based on assessment of service potential
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