Particule Phosphorus

Source, Transport and Control

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Components of a Sample of Water

100% Phosphorus

Water	40 %	Soluble	*Fertilizers*
Sediment	60 %	**Particulate**	*Soils, Vegetation*

Particulate Phosphorus

Potential Sources

- Soil Erosion
- Erosion of Canal Bottom
- Erosion of Canal Banks
- Floating Aquatic Vegetation (FAV)

Management Practices to avoid Particulate P

- Soil Erosion
  - Fallow fields Flooding
  - Land Leveling
  - Sediment Sump in Culverts
  - Canal Berms
- Erosion of Canal Bottom
  - Slow velocity when draining
  - High water levels in the canals
- Erosion of Canal Banks
  - Vegetation in canals banks
  - Gentle slope in canal banks
- Floating Aquatic Vegetation (FAV)
  - Canal Cleaning Program

Management Practices to avoid Particulate P

- Fallow fields Flooding

- Field Leveling

Management Practices to avoid Particulate P

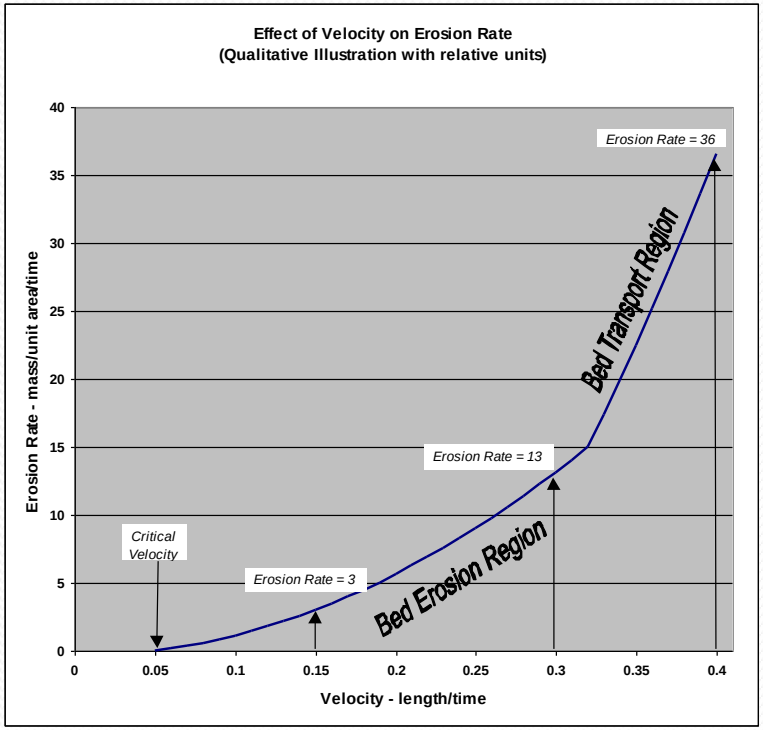
- Sediment Sump in Culverts

- Canal Berms

Management Practices to avoid Particulate P

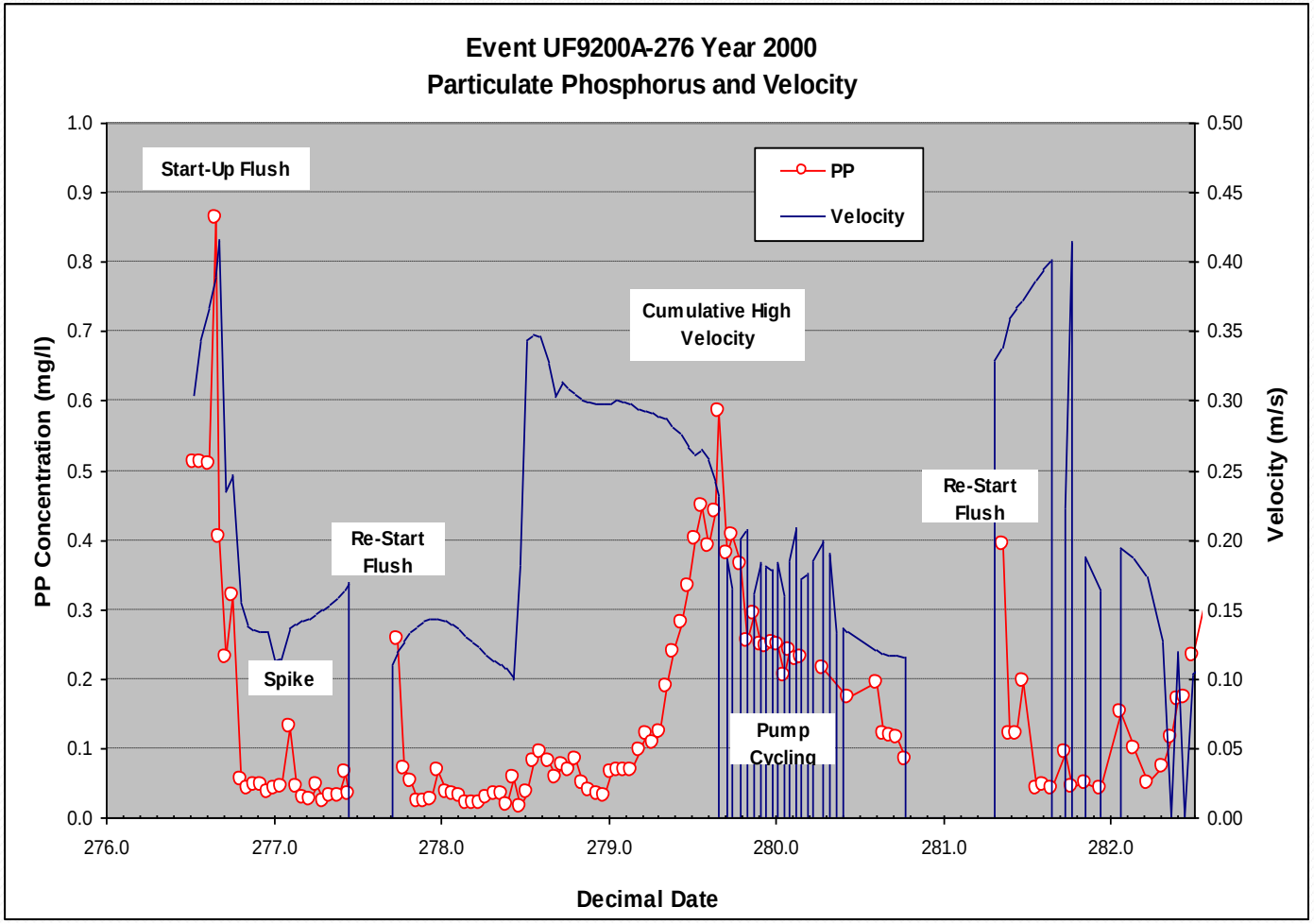
- Vegetation in canals banks
- Gentle slope in canal banks

- Slow velocity when draining



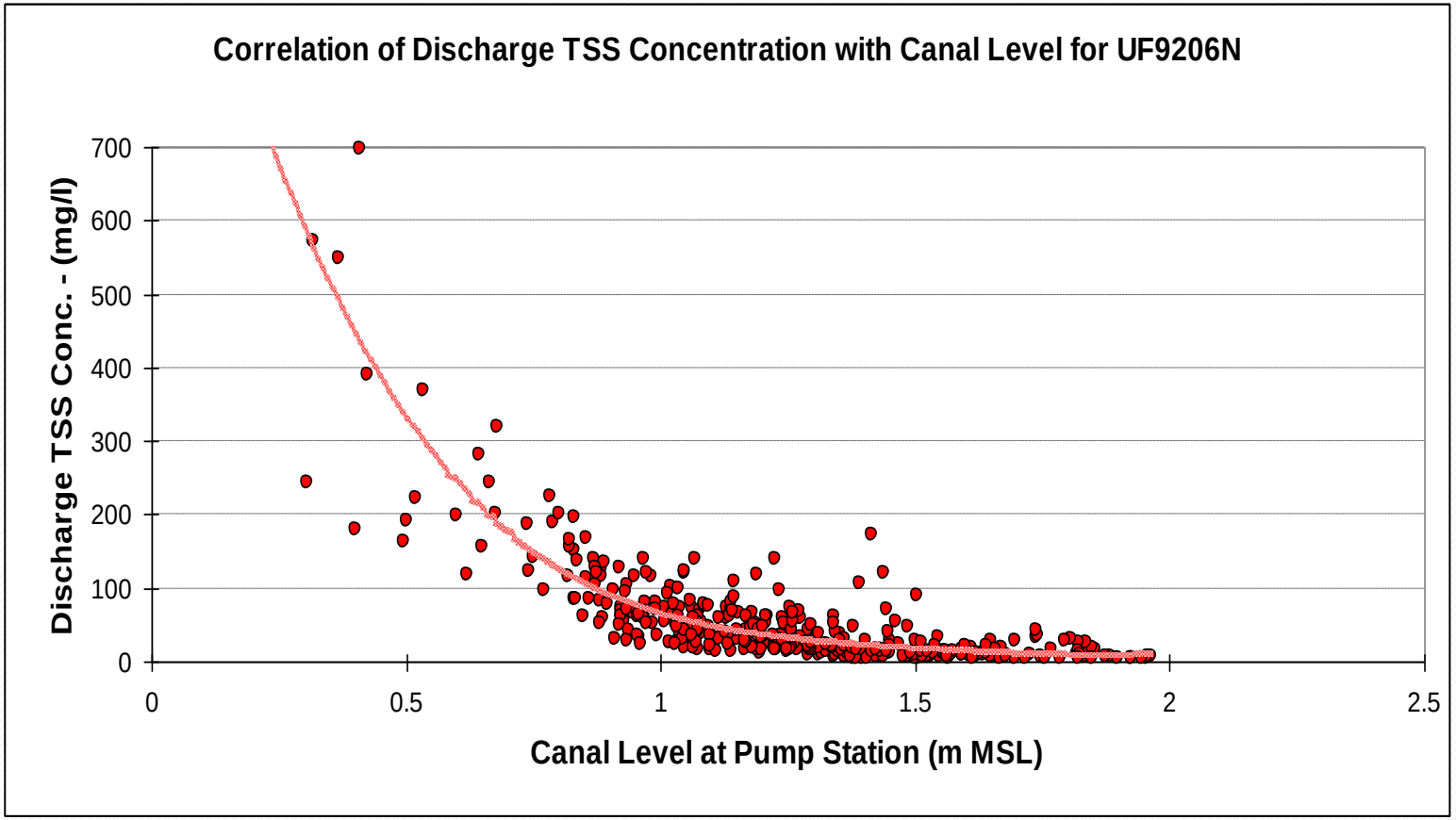
Management Practices to avoid Particulate P

Water Pump Management



Management Practices to avoid Particulate P

Water Level Management



Management Practices to avoid Particulate P

Water Velocity Control

- Limit maximum speed
- Pump for a long time at a low rate
- Long Pumping cycles are good, short pumping cycles are bad
- Determine critical water levels: Do not drain the farm below Stop elevations

Management Practices to avoid Particulate P

Canal Cleaning Program
Where to Place the Sediment

Best

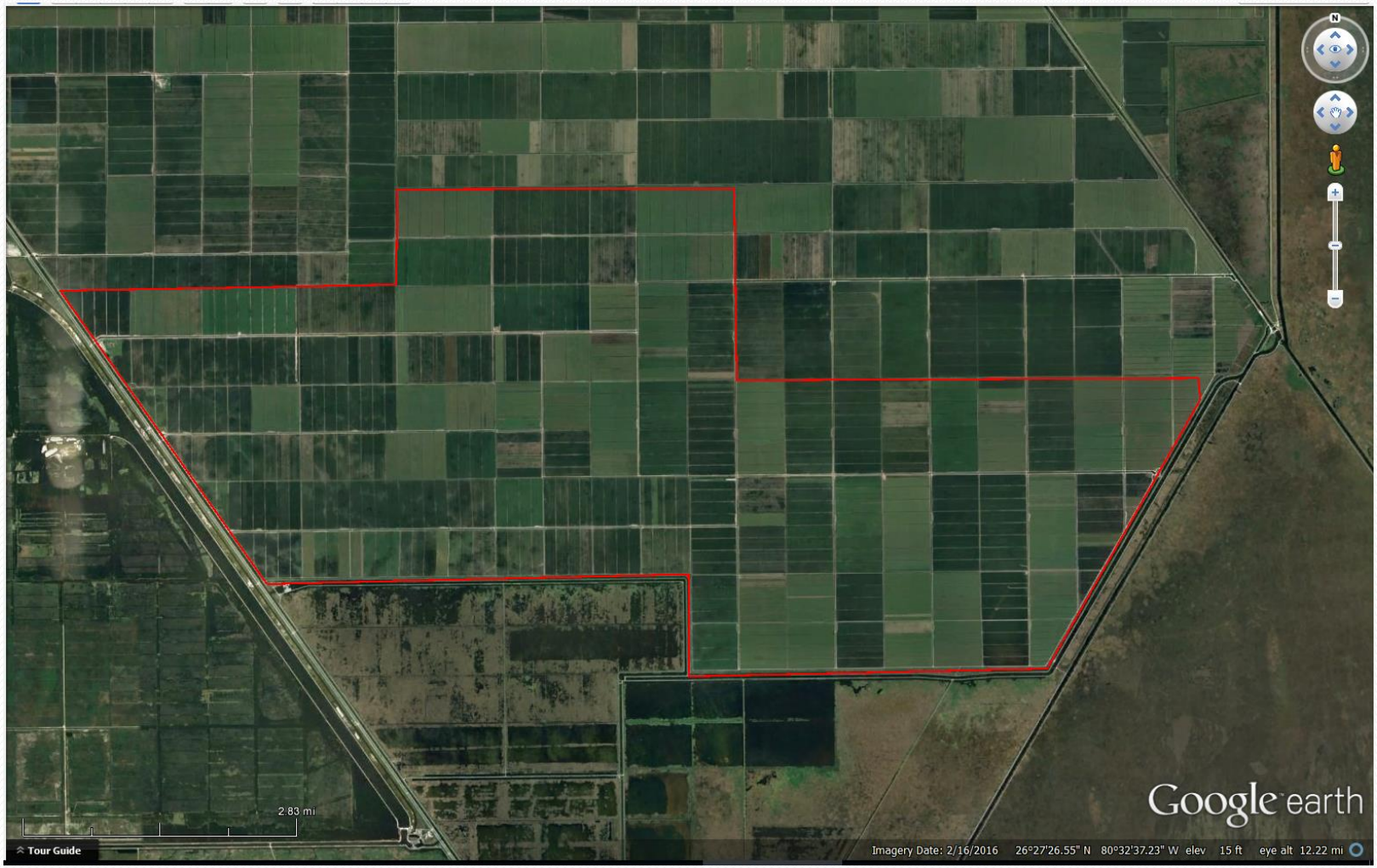
Better

Bad

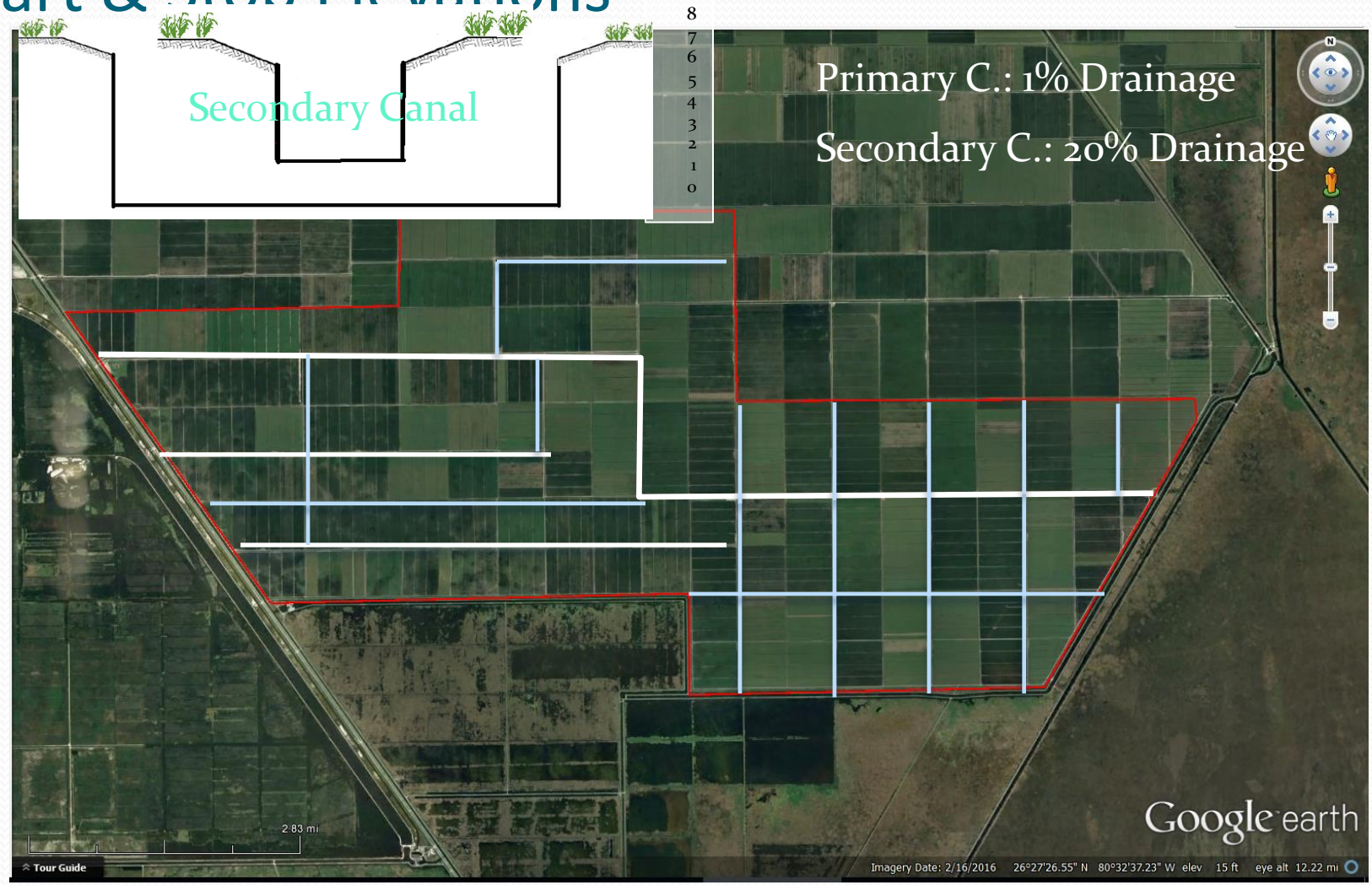
Management Practices to avoid Particulate P

Canal Cleaning Program
Floating Aquatic Vegetation Mechanical Removal

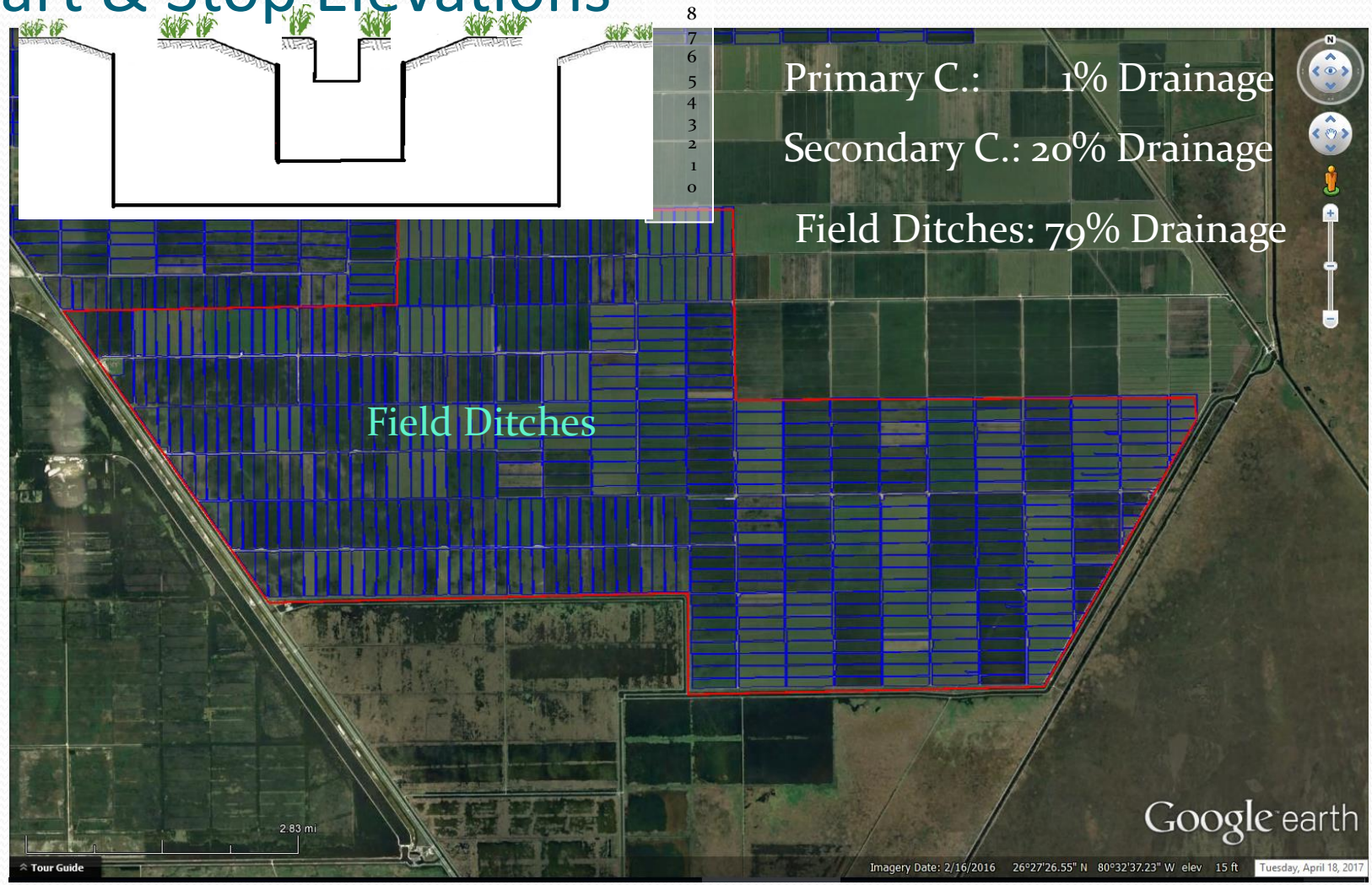
Water Levels in South Florida
Start & Stop Elevations



Water Levels in South Florida
Start & Stop Elevations



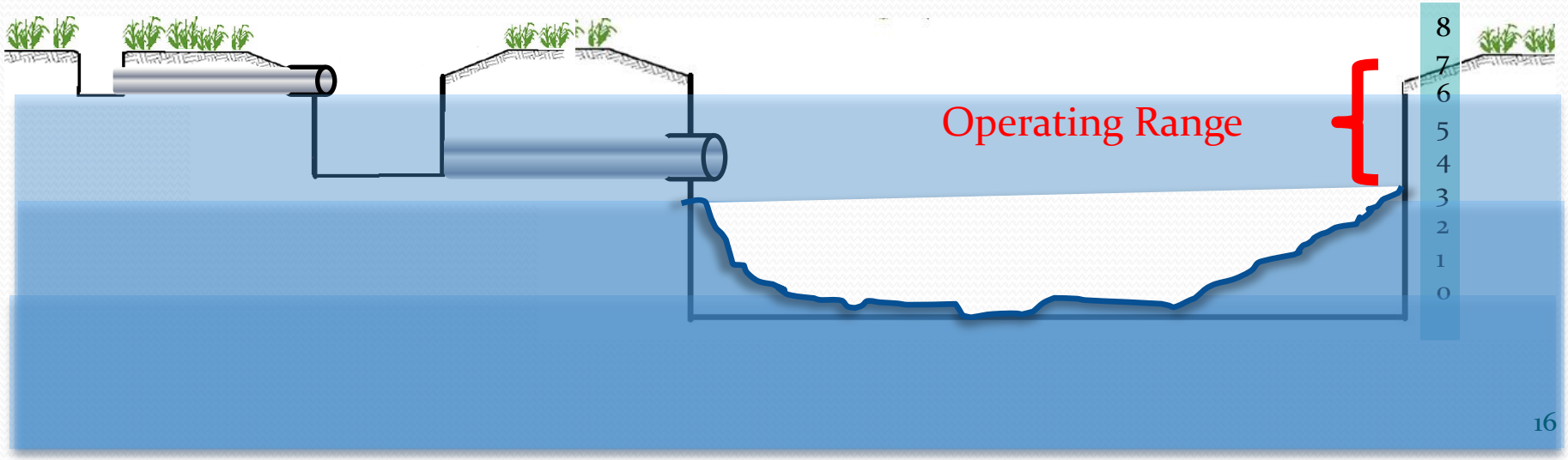
Water Levels in South Florida
Start & Stop Elevations



Water Levels in South Florida
Start & Stop Elevations

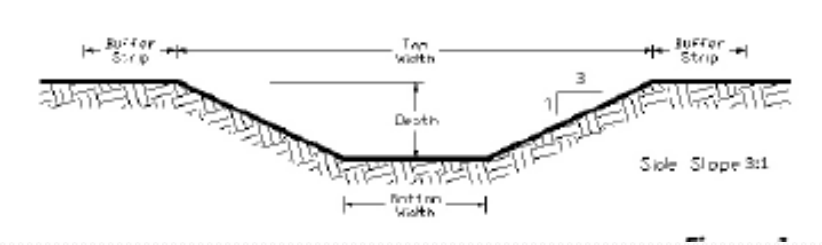
When we lower the canals,
How much are we draining?

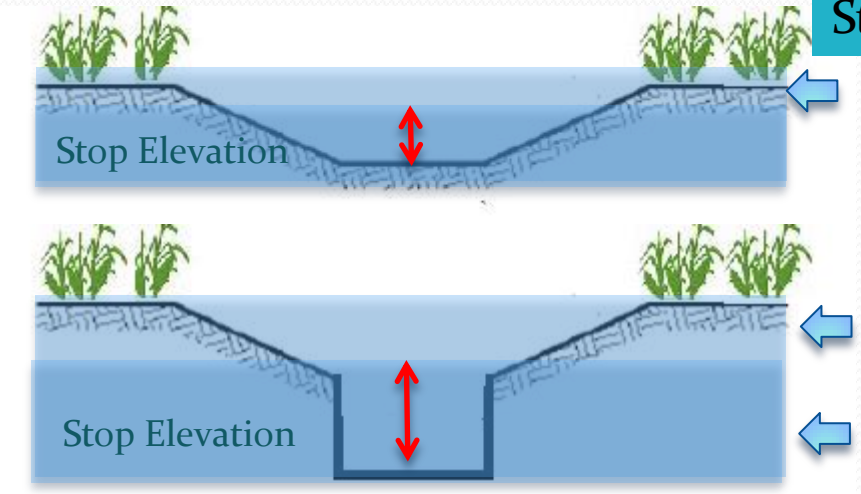
Field Ditch		Secondary Canal			Primary Canal
79 %	+	20 %	=	99 %	1 %



Stop Elevations

Ditches and Canals Design





Start Elevation Reached

Wet Conditions

Dry Conditions

High Conveyance

Water in the Ditches ≠ Wet Conditions for the Crop

Stop Elevations
Canals & Ditches Design

- Case 1:
- Stop Elevation Below Rock Level
- Culvert is submerged
- Water in the fields
- Why?

Stop Elevations
Canals & Ditches Design

Case 2:

Stop Elevation Below Rock Level

Culvert is above water level

Water in the fields and ditches

Why?

Management Practices to avoid Particulate P (Brainwashing)

- Soil Erosion
  - Fallow fields Flooding
  - Land Leveling
  - Sediment Sump in Culverts
  - Canal Berms
- Erosion of Canal Bottom
  - Slow velocity when draining
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