UF Frog Pond Hydrology Network:

Monitoring groundwater flow and water quality along the eastern boundary of Everglades National Park

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Objectives

- Study hydrology and water quality at the farm scale
- Establish the reach of canal elevations and their seasonal relationship to field water table depth (WTD) on a 1-mile transect between two canals, and how WTD affects soil moisture
- Determine direction and speed of groundwater and chemical flow in the field and their seasonal changes
- Calibrate and test field/farm scale computer models to aid in evaluating management scenarios that are developed based on regional scale models
- Bridge the gap between the current regional model (2x2 mi) and the field scale

(Objectives, cont.)

- Assess water quality by bi-weekly sampling at canals, ditches and wells (F, Cl, Br, SO4-S, NH4-N, NO3-N, PO4-P, pH, EC, Ca, Cd, Co, Cr, Cu, Fe, K, Mg, Na, Ni, P, Pb, Zn, Al, As, Mn, Mo, Se).

- Aid in "adaptive management" and RECOVER processes.

- Make results and recommendations accessible to stakeholders through the University of Florida Extension

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Frog Pond hydrological monitoring network

- Distributed throughout the Frog Pond to monitor the hydrological components that best explain water and chemical flow in the area.

- Supported by a Geographical Information System (GIS) to allow study of interactions between hydrology and land type/use

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UF Monitoring Network

Everglades National Park

New CERP storage pond

USGS, SFWMD wells

Phase I:
- sampling at ditch
- transect for '02 study

Phase II:
- spatially distributed stations '03

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Cell 1 ← Pumping

CERP Modifications to Frog Pond
and
Monitoring Locations

N

Scale 1:20 000

500   0   500 Meters

Projection UTM - Zone 17 - NAD83

Cell 2

Cell 3

Spillway

Wells
  Known
    UF transect well
    USGS well
  Unknown
    [O Well has recorder]
    Well location by GPS
    Well location visually estimated
    Six wells together, location visually estimated

Other Hydrological Features
  U   Lysimeter
       Culverts
  S   Canal stage logger(?)
  s   Approximate location of old station(?)
  u   UF Platform at L-31W and C-111
       Reference points along Tracy ditch
  ☐   Cell 1
  ☐   Cell 2
  ☐   Cell 3
  ──   Levee boundary
  ----- Spillway
       Structure (SFWMD)
  ──   Canal (SFWMD)
       Degraded levee
       Ditch

Other Features
  ──   Agricultural parcel boundary
       Area of natural vegetation

★ **New wells 2003**

Data sources: South Florida Water Management District;
'Central and Southern Florida Project for Flood Control and
other purposes - Plans for IOP Emergency Contract', Dept.
of the Army, Jacksonville District, Corps of Engineers -
D.O. file no. 402-38,278

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UF Monitoring Network

Phase I: Transect for study
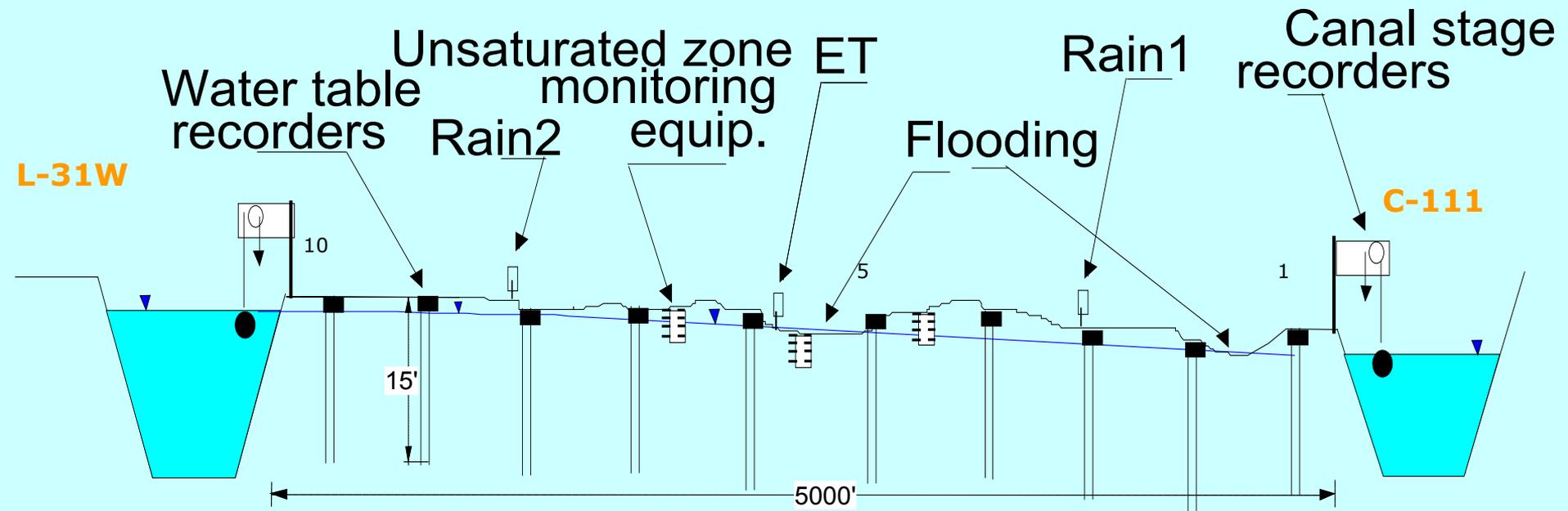
Installation of 10 monitoring wells (March'02)
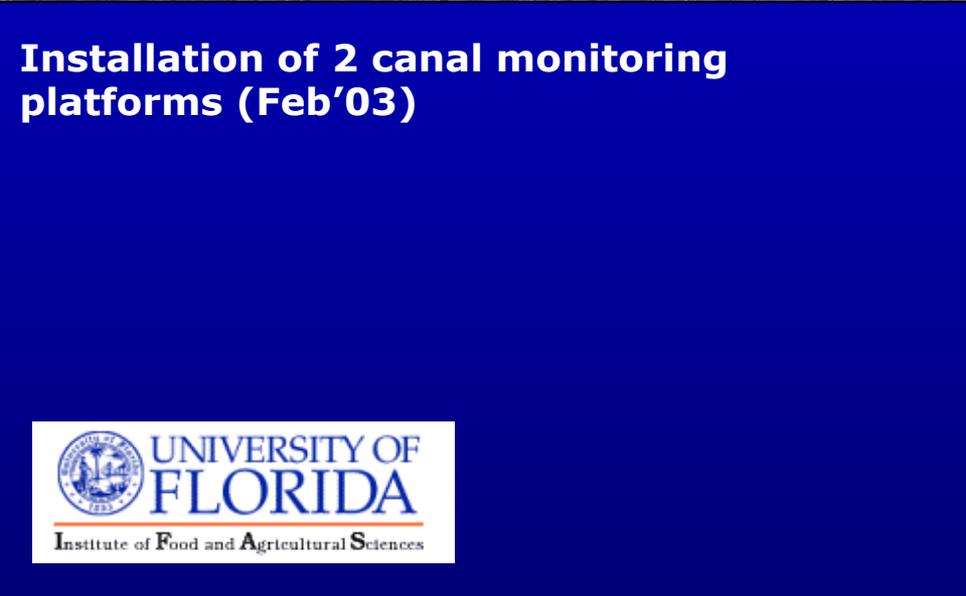
Installation of 2 canal monitoring platforms (Feb'03)

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Raingauge (2)

Well (10)

Pressure transducer

Canal platform (2)
(sampling and
stage recording)

ET weather
station (1)

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Preliminary results: canal/rainfall/field interactions
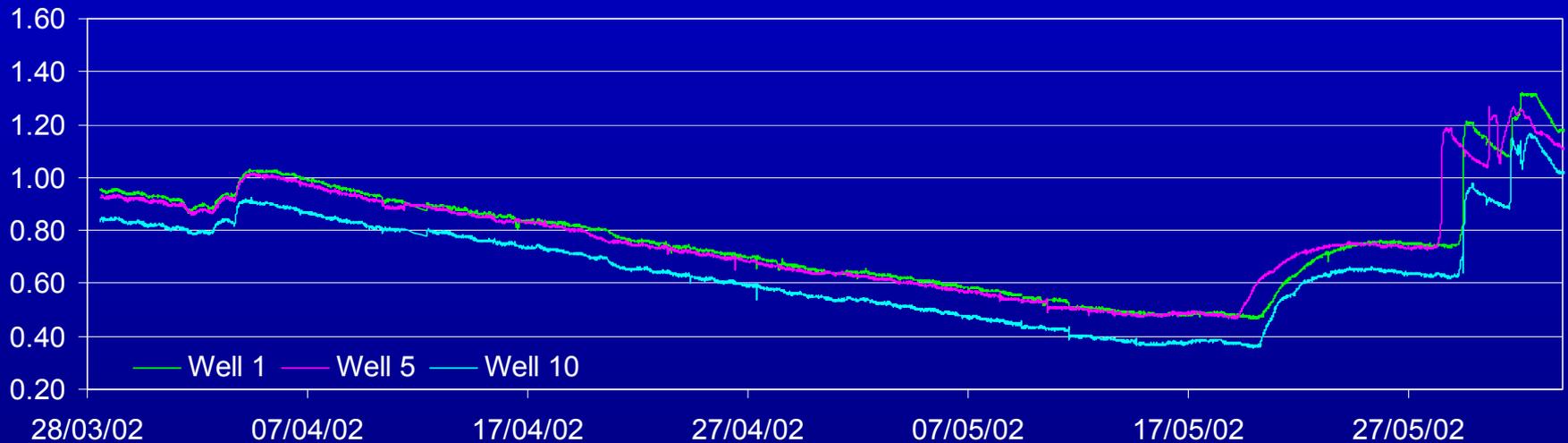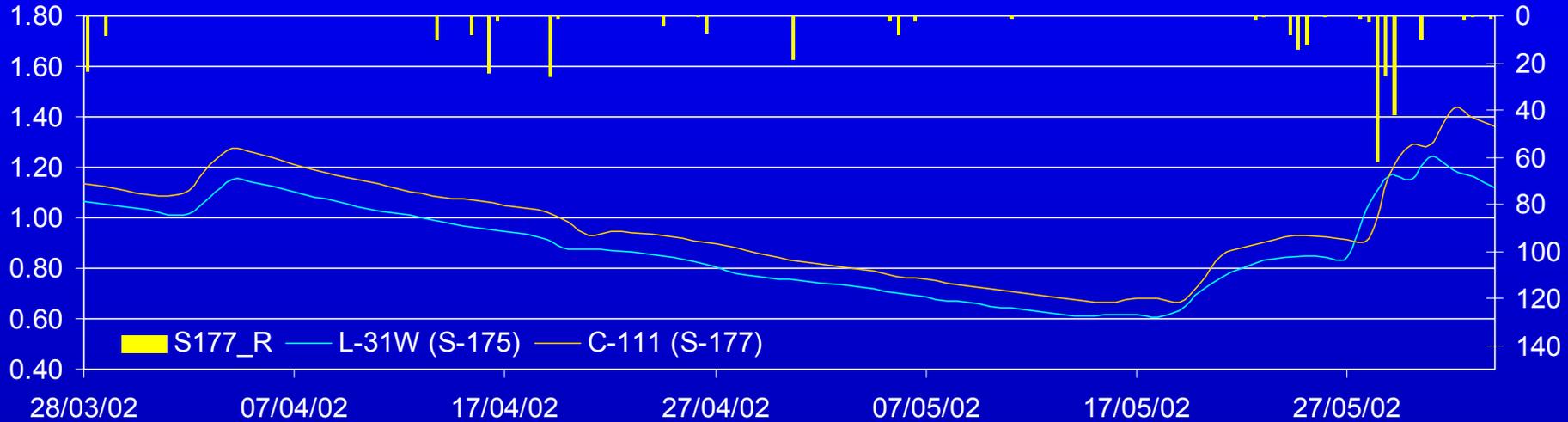
Groundwater Modeling in the Frog Pond

- Modeling with Visual MODFLOW

- First estimation of parameters from values derived from studies in the area

- Calibration and optimization of parameters from:

  - inverse modeling

  - field tests
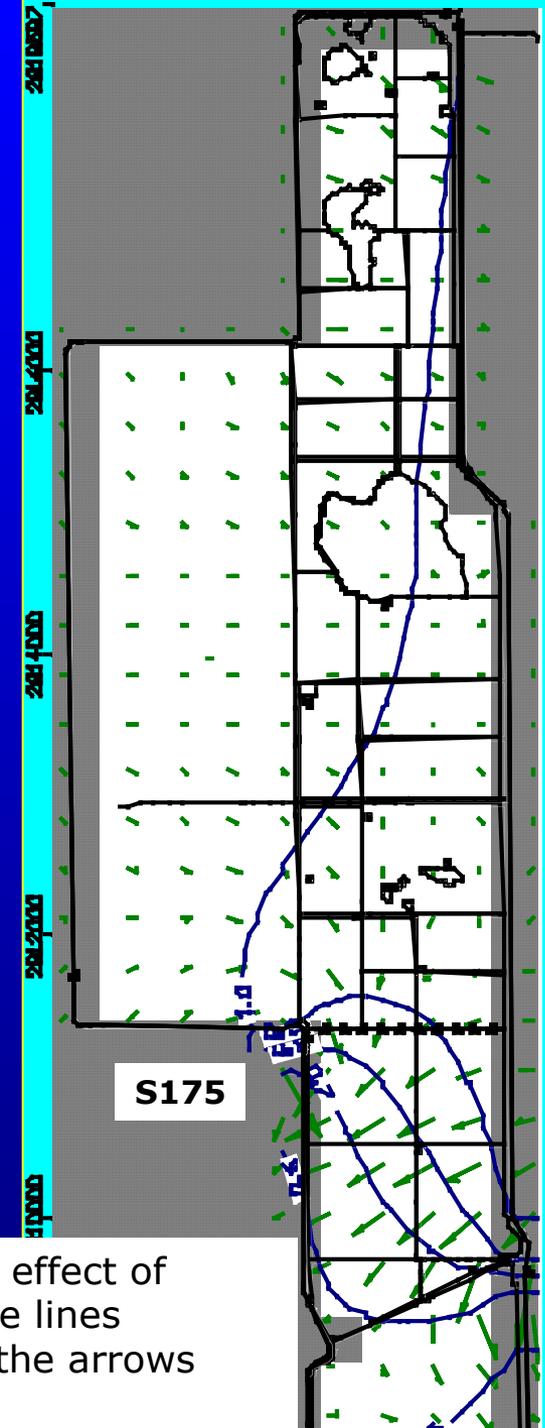
S175

Results from a simulation showing effect of closed gate at structure S-175. The lines indicate piezometric surfaces and the arrows show flow direction and velocity

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