2024 STATE OF GROUNDWATER INVERTEBRATE CULTURE IN THE EARP

Braden West

Biologist - USFWS

PREVIOUSLY AT THE EARP

- Larger recirculating systems
- Large sumps
  - Greater temperature modulation
  - Allows water treatment
- Walchem controller
  - First one installed in 2022

OVERVIEW

- CO2 system
- Walchem controllers
- Accessory boxes

CO2 AT THE SMARC

- CO2 lines throughout refugia
- Expandable, easy to remove
- Safety
- Nonreactive material

CO2 SYSTEM AT UNFH

- Lack of calcium buildup
- Extremely solid pH control
- Applied through biofilter
  - Slow dissolving

CO2 SYSTEM CONSTRUCTION AT THE SMARC

- Tank and cage outside
- 3/8” main supply line
- ¼” dropper lines
- Check valves

WALCHEM INTUITION 9 CONTROLLERS

- Purchased initial 15 in 2023
- Purchased another 15 in 2024
- Installed on about 50% of refugia systems, all inverts
- Uses relays, live monitoring

CONTROLLER CAPABILITIES

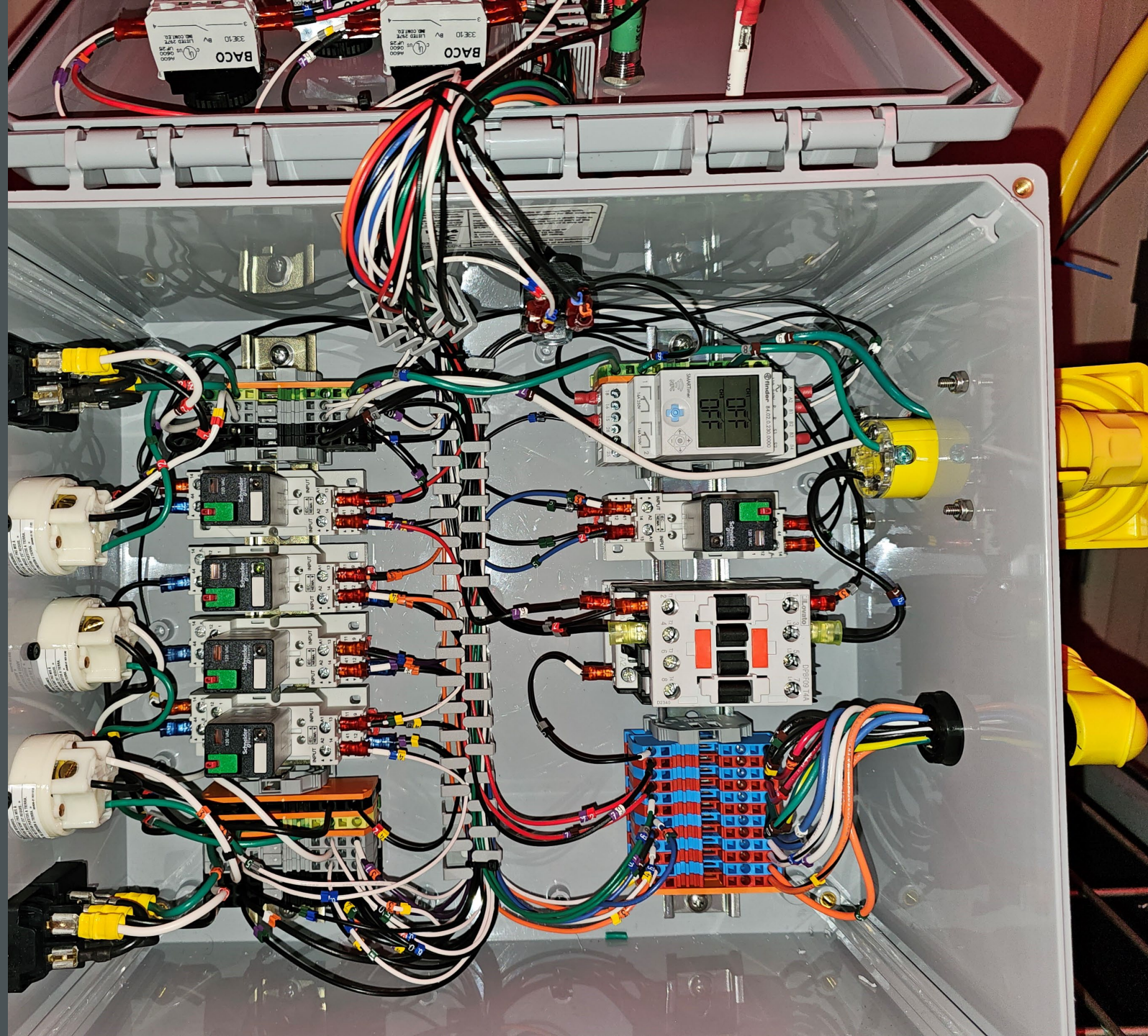
- Dual WiFi and LAN connections
  - E-mails sent to preselected staff for different types of alerts
- Analog 4-20mA connections
  - Tank level, temperature, pH, pressure
- Digital RS-485 connections
  - Flow meters
  - TAN sensors
- Controls two accessory boxes
  - *current design

ACCESSORY BOXES

- Custom-designed by Adam Daw
- Improved upon by Braden and Jon
- Controls equipment
  - Pump, UV, CO2 doser, heater, chiller

ACCESSORY BOX CAPABILITIES

- Equipment safety
- Personnel safety
- Animal safety



WHAT'S NEXT FOR US?

- Connecting CO2 system to every culture unit
- Ammonia sensing
  - Maximize the capabilities of our controllers
- Emergency water supply