What's all the Fuss About ET Controllers?

- Why the Need
- Public Agency Studies
- What's Next
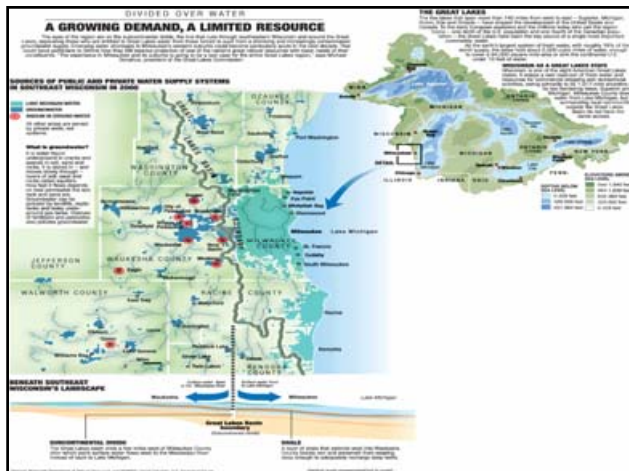
Tom Ash
HydroPoint Data Systems
tash@hydropoint.com

HydroPoint
data systems, inc.
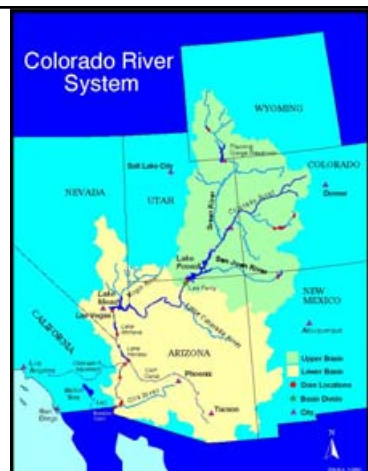

The Current State of Landscapes

36 States will have water shortages even with average rainfall within 5 years.

US GAO

HydroPoint
data systems, inc.

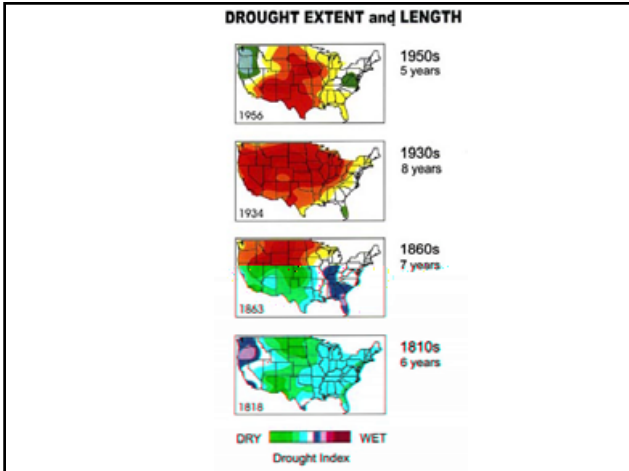DIVIDED OVER WATER
A GROWING DEMAND, A LIMITED RESOURCE

Colorado River

- Sustains over 20 million people and the US's most productive agriculture
- 5 years of below normal runoff
- 2002 lowest flow in over 1,400 years; just 26% of average.
- Current storage about 60 percent of capacity
- 2003 runoff about 65 percent of normal
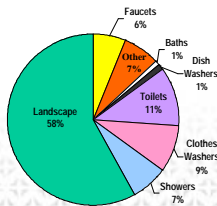

Colorado River System

03.17.2004

DROUGHT EXTENT and LENGTH

1950s
5 years

1956

1930s
8 years

1934

1860s
7 years

1863

1810s
6 years

1818

DRY ▬▬▬▬ WET
Drought Index

04.25.2004

Public Perception of Landscapes…

URBAN WATER USE LANDSCAPE IRRIGATION

58% of all urban water use goes to landscape irrigation

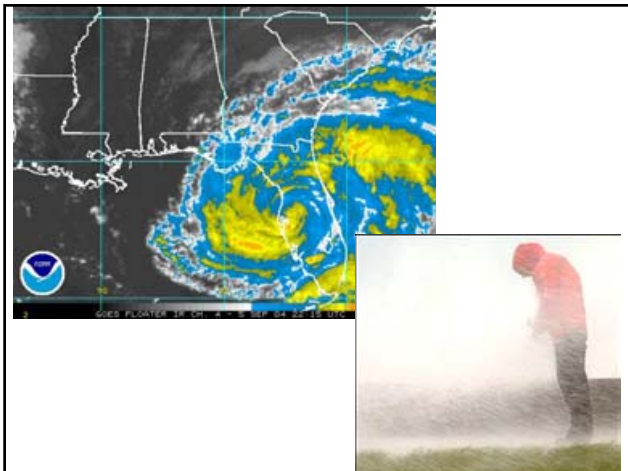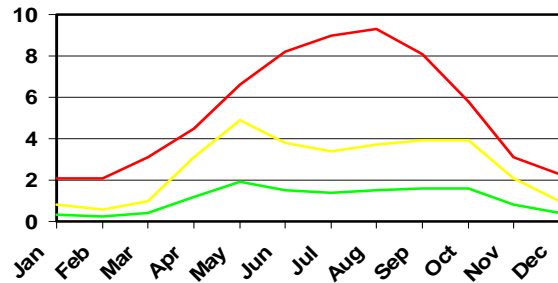(American Water Works Association)

Pie chart: Faucets 6%, Baths 1%, Dish Washers 1%, Other 7%, Toilets 11%, Landscape 58%, Clothes Washers 9%, Showers 7%

HydroPoint data systems, inc.

Tampa ET & Estimated Rain Adjusted Irrigation

Line chart legend: ET, Turf Irrig, Shrub Irrig
Months: Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, Dec
Y-axis: 0, 2, 4, 6, 8, 10

Florida

Residential Irrigation Efficiency Assessment

Dr. David Dukes, Univ. of Florida

- 61% of home water goes to landscapes
- GW withdrawls increasing at a 135% rate
- Turf homes use 82% more water than needed
- Xeriscape homes use 29% more water than needed
- Average irrigation system efficiency was 45%

Result? Limits on Landscaping...

HydroPoint data systems, inc.

How Much Water Is Wasted in Landscapes?

- Irvine Landscape water reduced **58%**
- Denver homes use about **48%** more water
- Utah Extension measures **53%** over-water
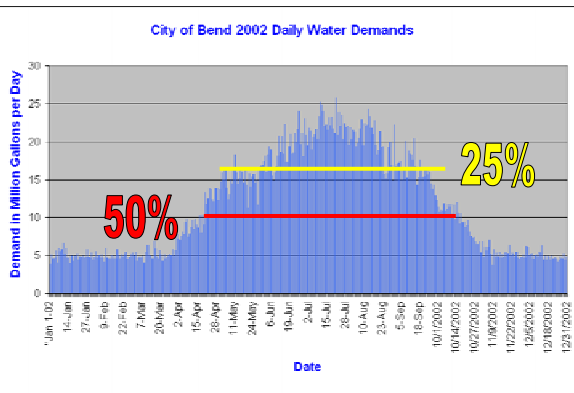- Florida study shows **29%-82%** over watering

50%

HydroPoint
data systems, inc.

How Much Water Should a Landscape Use?
Contractor: 1" ET, Turf, Clay Loam, Spray, Full Sun, Flat?

7-20 Minutes	4.2 Minutes
4 Days / Week	2/3 Days / Week
1 Cycle	2/3 Cycles

HydroPoint
data systems, inc.

City of Bend 2002 Daily Water Demands

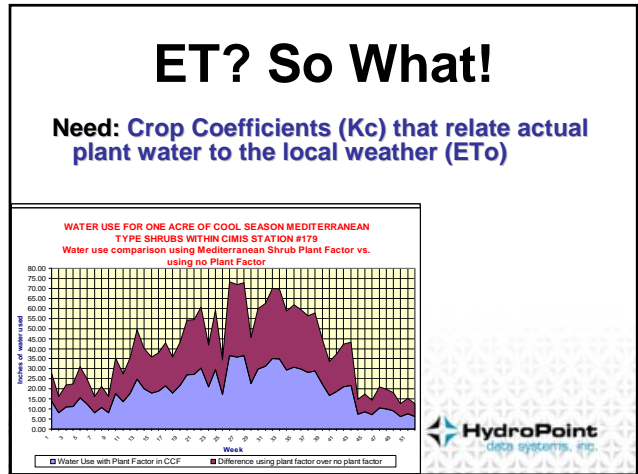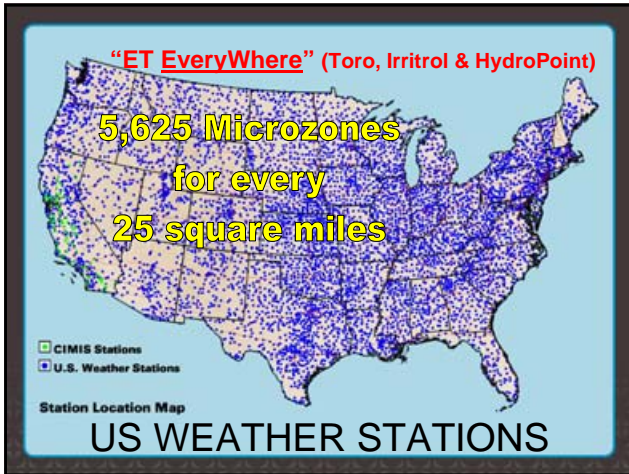**50%** **25%**

ET Data?

- **State systems** (CIMIS, AgriMet)
  - Penman Montieth modified equation
  - Solar Radiation
  - Wind
  - Humidity
  - Temp

How Many Do You Need?

Slide 1

Slide 2

ET? So What!

Need: Crop Coefficients (Kc) that relate actual plant water to the local weather (ETo)

WATER USE FOR ONE ACRE OF COOL SEASON MEDITERRANEAN
TYPE SHRUBS WITHIN CIMIS STATION #179
Water use comparison using Mediterranean Shrub Plant Factor vs.
using no Plant Factor

☐ Water Use with Plant Factor in CCF   ☐ Difference using plant factor over no plant factor

HydroPoint data systems, inc.

Slide 3
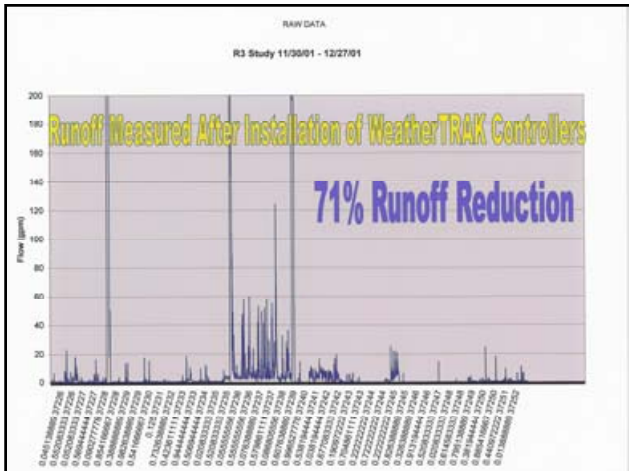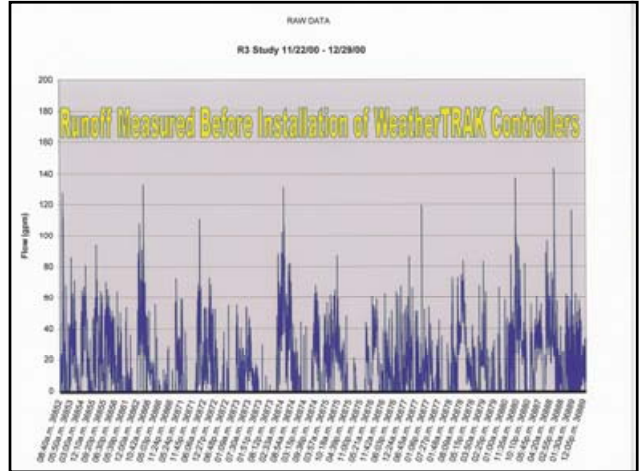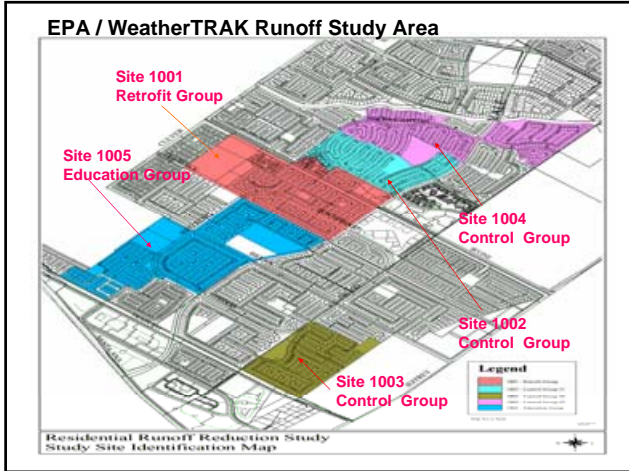
Irrigation Association:
Steps for a Proper Schedule

- **Soil type** (infiltration rate, h2o holding capacity)
- **Sprinkler type** (precipitation rate, uniformity)
- **Plant type** (Kc, root depth)
- **Slope** (for runoff control)
- **Sun / shade**
- **Allowable moisture depletion value**

"Smart" Irrigation

HydroPoint data systems, inc.

Slide 4

ET Controller Studies

1st Study in 1998:
- 16% - 25% Savings
- 97% customer satisfaction
- 97% reported plant appearance good or better

2nd Study in 2001
- Residential Runoff Reduction / EPA
- 71% reduction in the test neighborhood
- Same findings on landscape appearance

Led to $5 million in state grants

HydroPoint data systems, inc.

EPA / WeatherTRAK Runoff Study Area

Site 1001 Retrofit Group
Site 1005 Education Group
Site 1004 Control Group
Site 1002 Control Group
Site 1003 Control Group

Residential Runoff Reduction Study
Study Site Identification Map

RAW DATA

R3 Study 11/22/00 - 12/29/00

Runoff Measured Before Installation of WeatherTRAK Controllers

RAW DATA

R3 Study 11/30/01 - 12/27/01

Runoff Measured After Installation of WeatherTRAK Controllers

71% Runoff Reduction

Agency Studies: "ET" Controllers

- **Irvine (2)** (field test)
- **Los Angeles DWP** (field test comparing 2 products)
- **Metropolitan Water District of So. Calif.** (bench test w/ 3 products)
- **UC Riverside** (bench test comparing 4 products)
- **Santa Barbara Water District** (field test)
- **Colorado** (field tests with 3 products)
- **Lake Arrowhead, Ca. / USBR** (field test)
- **Seattle** (field test)
- **Univ. Nevada Reno / UNLV** (field tests)
- **Utah** (field test with 2 products)
- **Univ. of Arizona** (field test with 3 products)
- **Santa Rosa/Sonoma Co.** (field test)
- **Marin, Ca.** (field test with 2 products)

EPA "Water Star" Labeling

Center for Irrigation Technology
(bench testing to "certify" products)
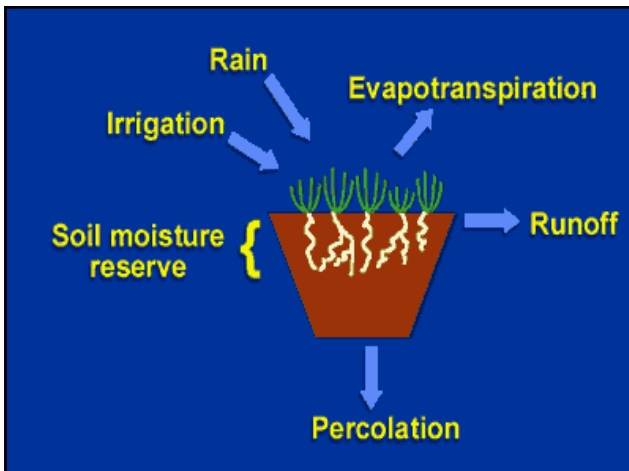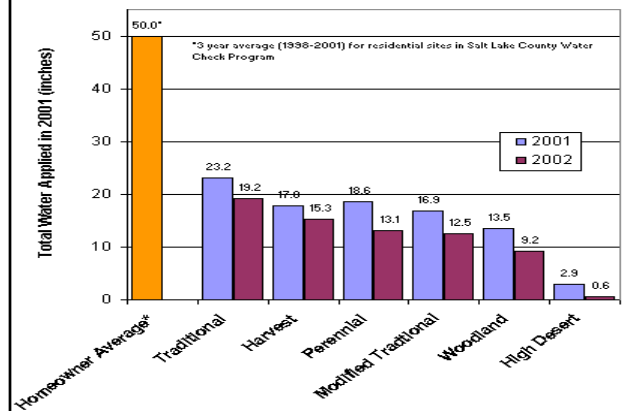
HydroPoint
data systems, inc.

ET Controllers: Next Steps

- **Center for Irrigation Technology (CIT) Bench Testing Certification**
- **EPA "Water Star" Labeling Program**

HydroPoint
data systems, inc.

JVWCD Demonstration Garden - Total Water Applied to Each Landscape in 2001 and 2002

*3 year average (1998-2001) for residential sites in Salt Lake County Water Check Program

Legend: 2001, 2002

Values: Homeowner Average* 50.0"; Traditional 23.2 / 19.2; Harvest 17.0 / 15.3; Perennial 18.6 / 13.1; Modified Traditional 16.9 / 12.5; Woodland 13.5 / 9.2; High Desert 2.9 / 0.6

Rain, Irrigation, Evapotranspiration, Soil moisture reserve, Runoff, Percolation

100%	75%	50%	25%	0%
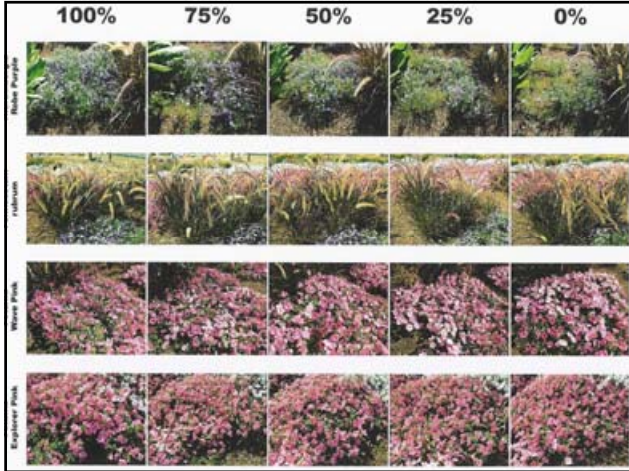
ET Controllers Are Not Created Equal!

Group 1: Real Time ET, ET Everywhere, Automatic Scheduling Engine (IA Steps), Subscription Fee

Group 2: Real Time ET (existing stations), Managed Schedules, Initial User Schedule, Mgt. Service Fee
  Sub-group: On/off signals to existing controllers

Group 3: Historical ET, Pre-Set Changes, Initial User Schedule, No Service Fee

Group 4: Single Sensor(s) linked to Schedule Changes, Initial User Schedule, No Service Fee

HydroPoint data systems, inc.

Expectations of ET Controllers…

- They <u>will</u> save water…
  - Water can only be saved if there is wasted water
- They will save _____% of your landscape water…
  - They will only save some portion of the wasted water
- "Set it" and "forget it"…
- Most units need an initial schedule; what if the schedule is inaccurate; what if someone changes something...

*Anything that goes wrong in the Landscape will be blamed on the "New" Controller…

HydroPoint data systems, inc.

---

02. 06. 2004

Issues Raised by Agencies, Experts & the Public?

- **User schedules** (quality of schedules)
- **Maintenance of sensors** (who, who much, etc.)
- **Placement of sensors** (creates poor data)
- **Size of companies with the technologies**
- **Ability to change controller settings**
- **Customer Service ability** (does the business model support long-term support?)
- **Acceptance of subscription/service fees**
- **Need for weather stations/communications infrastructure**
- **Buy or lease the equipment**
- **Rain recognition**

HydroPoint
data systems, inc.

What Have Studies Shown?

- **Water that is wasted can be saved**
- **Water use can also go up** (one study found 40% of participants water bills went up)
- **Studies can be poorly designed or have inaccurate set-up** (one study put controllers into homes that had prior deficit irrigation; another study set up controllers w/ inaccurate data; one study placed sensors in the wrong locations…)
- **Studies show that applying the right amount of water (ET x Kc) exposes poor irrigation systems**

HydroPoint
data systems, inc.

Landscape Industry Opportunity

1. **Use** proven smart controllers to save water…and help avoid landscape restrictions
2. **Use** certified controllers to apply the right amount of water…and expose poor irrigation systems
3. **Provide** services to fix/upgrade poor irrigation systems

HydroPoint
data systems, inc.

Benefits of "Transformation"

- Protects landscapes and the landscape industry by using the right amount of water & reducing water runoff
- Offers increased business opportunity

$$$$$

Risk?

- Poorly performing products hurt the "transformation" to significantly improved landscape water management
- Industry needs to fully understand the products, the issues and the business opportunities

HydroPoint
data systems, inc.

What to Do Right Now!

- Visit product booths out on the trade show floor
- Assist local agencies and universities w/ studies on plant water needs (Kc)
- Try products on your sites to become an expert

HydroPoint
data systems, inc.

Current State of Landscapes

- **Landscapes waste water**
- **Precise water management will be required** (or landscapes will be regulated)
- **Water supply and water waste will force changes in the way landscapes are designed, maintained, irrigated, etc.**

"Water shortages will create crisis management and conflict."
US Dept. of Interior

HydroPoint
data systems, inc.