

RECAP

Winter 2000

For People Who Monitor the Weather. From the Manufacturers of Capricorn™ Reliable Weather Stations

▼ Clackamas County, Oregon *Columbia Weather Systems offers "an elegant solution"*



Wind sensors are mounted high over the waste water treatment facility.

"In our line of work tech support is really important." Michael Trent is an Operator II at the Tri Cities Waste Water Treatment Plant in Oregon City, Oregon. He continues, "A lot of people sell you things. And when you run into some unique problems, they say they can't help you. Columbia Weather Systems was able to offer solutions."

A Problem and a Solution

Clackamas County Department of Water Environment Services called on CWS when their previous weather station was having problems. "The last weather station that we had quit on us and nobody knew quite how to fix it," Trent explains. "I called the original company and they were located in California. They wanted \$2000 just for someone to come up and take a look at it and tell us what we needed."

Instead, the county purchased a Capricorn 2000 weather station from Columbia Weather Systems. "I call it an elegant solution to my problem," Trent says. "They've taken a real complex thing and made it fairly simple to set up. That's what I like about it."

Waste Water Treatment

The TriCities plant treats sewage from Gladstone, Oregon City, and West Linn, Oregon. They've recently added a diversion from the Clackamas area. Volume runs as low as 3 million gallons a day during the summer and averages 10-12 million gallons per day in the winter. "We've had peak flows as high as 35-40 million gallons because of the rain," Trent says.

Sewage is processed through screens, digestors and aeration basins. Sludge from the digestors is hauled away for application on grass and hay fields. ("Nothing for human consumption," Trent confirms.) Effluent is chlorinated and dechlorinated before being dumped in the Willamette River. Every aspect is carefully regulated by the Department of Environmental Quality (DEQ). "We're supposed to have minimal or no impact on the river. It looks like we don't have any impact, but we're having a study done to make sure," Trent adds.

Rainfall Data Aids Operations

Rainfall is the most important weather parameter for treatment plant operations. They use rainfall data to anticipate increased flows and modify the system to increase capacity. "We keep track of the rainfall and we know if it's been raining for so long the ground reaches a saturation point. That means that there will be more infiltration into the pipes and increase our flows. We prepare for that using rainfall data and we modify the system so we don't lose solids out," Trent says.

Additionally, he says, "We use rainfall for the truck drivers who haul biosolids from our treatment plants to the farmer's fields to determine whether they can haul that day or not. If we get more than an inch of rain in a 24-hour period, they can't put any biosolids on the fields. That's a DEQ rule."

Rainfall data is also used by engineers upgrading the plant and infrastructure. "The design engineers use rainfall to see how tight our system is and what goes on in relation to rain - how high our flows go up," Trent explains.

Wind Direction Important

"The other critical piece is wind direction," he adds. "It's real important to



Rainfall is a critical measurement.

▼ Weather Watching

Value of accurate weather information far surpasses the cost



by George Miller,
Consulting
Meteorologist

"The public's increasing awareness of environmental issues makes real time weather information mandatory..."

It was not an unusually heavy rain by any means, but it was heavy enough to cause the water in Bull Run Reservoir to become somewhat murky. That was November 1999 and Bull Run supplies the water to a vast majority of the citizens of the Portland, Oregon metropolitan area. What it exemplifies is the need for accurate rainfall data to assess how much runoff will affect operations.

Such a system, the Capricorn 2000, is installed at the TriCities Waste Water Treatment Facility in Clackamas County, Oregon. Here, accurate measurements of rainfall, wind speed and direction are factored into daily operations. Rain, especially a lot of rain, impacts water volume.

Additionally, chemical tanks on site house chlorine and other chemicals that are used in water treatment, making the water acceptable to the user. Thus, accurate measurements of wind speed and direction are an integral part of the plant's operations.

Increased Public Awareness

The public's increasing awareness of environmental issues makes real time weather information mandatory for a facility such as the treatment plant. Plant managers with similar operations need to ensure that this information is available.

As a certified consulting meteorologist, I have been hired to evaluate the impact of weather on chemical spills. In these cases it has been apparent to me that the value of accurate weather information in determining the extent of the spills far surpasses the cost of the weather equipment. It is a wise investment for any operation that incorporates chemicals that could escape into the atmosphere perhaps triggered by some malfunction or perhaps even a severe weather event itself.

Severe Weather In Every Season

Heavy rain, as we well know does not just happen in the fall and winter. Summer can bring episodes of very heavy precipitation, many times associated with tropical disturbances in the southeast portion of the United States. The emergency preparedness folks in North Carolina are well aware of this. The rains of late last summer in that area set records that will last for many years.

Spring, also, brings with it the enhanced possibility of those severe weather episodes, be it in the form of rain, wind, hail, tornadoes, or flash floods. These events peak in the spring and summer, depending on your location. One reason for this is the air's capacity for "holding" moisture.

Warm air has a much greater potential for containing moisture than cold air. Thus, as the temperature increases, so does the air's ability to "hold" moisture. And then, so do the chances for that severe thunderstorm with its torrential rain to deluge your area, perhaps accompanied by strong winds.

If I was a plant manager in charge of an operation that utilizes chemicals, I would want the satisfaction of knowing that I had a source of accurate weather information, just in case one of those severe weather episodes hit my location.



The control module and power supply are contained in weather-proof enclosures.

▼ Treatment Plant continued...

know wind direction because we use chlorine. If we ever had a chlorine leak and we had to report it, the first thing the agency would say is 'What's your wind direction?'"

Trent admits that the potential problem is miniscule. The chlorine is contained in a building and a leak would set off alarms and a scrubber system. It would probably be contained before it got anywhere, he says, but the risk is there. "You can't say it's never going to happen. If you do, you end up eating your words," he concludes.

Constant Monitoring

Trent installed the Capricorn system with the assistance of Randy Conover, automation technician. "I am really impressed with their installation," says Nader Khoury, president of CWS. The control module is mounted outside in a weather-proof enclosure and connected through a programmable logic controller (PLC) to the facility's computer system.

Customized Wonder Ware™ software integrates the Capricorn data into the plant's operating system. Daily monitoring reports are compiled and submitted monthly to DEQ.

▼ Capricorn 2000™ Updates: New Display and RH Sensor

► Capricorn 2000 Display Monitor

The new Capricorn 2000 Weather Display uses an “intelligent” touch screen display. With its programmable microprocessor and abundant memory, the Capricorn 2000 Weather Display can display weather information, perform complex computations and store relatively large amounts of weather data.

The new display features a graphic LCD (320 x 240 pixels) monitor with a white background and blue text. The displays are designed to be viewed clearly from a distance. Screen size is 4.8 x 3.6 inches. The text and graphics can be factory-modified to meet special market and industry needs.

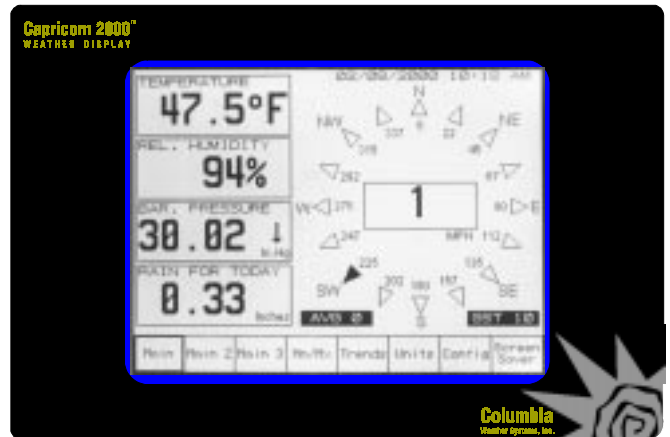
Features and capabilities

- Display date and time
- Display the values of all the sensors connected to the Capricorn 2000 Control Module
- Calculate wind chill, dew point, heat index and rain rate
- Display the barometric pressure trend
- Display the rain for today, the week, the month and the year
- Display one minute wind speed average and wind speed gust
- Display min/max values and time for all the parameters for the current day and previous six days
- Display 24-hour trend graphs for all the parameters
- Display weather data in metric or English units

The display unit incorporates a screen saver that turns off the backlight to the LCD screen by the touch of a button. The backlight is turned back on by touching any part of the screen.

Available in April at a price of \$1100, the Capricorn 2000 Weather Display will be offered in three formats:

1. Panel mount, (8" W x 5.4" H x 1.55" D)
2. Desktop chassis also suitable for wall mounting, and (8.9" W x 6.3" H x 1.87" D)
3. 19" rack mount, (19" x 6.7")



▼ New Humidity Sensor

Columbia Weather Systems is now offering a new thin-film capacitance relative humidity sensor. This sensor is compact and easy to use and maintain. The sensor incorporates an interchangeable sensor element, which allows field replacement in the event of failure or accuracy drift. The sensor no longer needs to be returned to the factory for calibration.

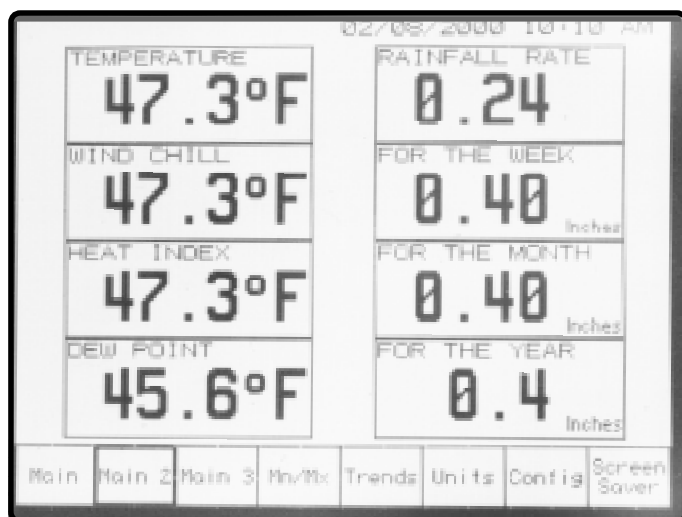
The sensor and its element are calibrated at the factory traceable to NIST.

The sensor assembly includes a self-aspirating radiation shield and a quick disconnect cable. The SARS will shelter the sensor from solar radiation and rain.

Specifications

- Size: 2.75" x 0.48" (not including the radiation shield)
- Accuracy: better than $\pm 3\%$ (from 10 to 90 % RH)
- Stability: $\pm 2\%$ RH over 2 years

The new sensor is priced at \$295. A self-aspirating radiation shield (SARS) is highly recommended unless the probe is to be mounted in a shelter. The new RH sensor can be mounted in CWS's standard SARS (price \$129). A new SARS is available for \$149 which can house both the humidity sensor and one Capricorn temperature probe.





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*An Elegant Solution
for Waste Water Plant*



*Product Updates:
RH Sensor and Display
for Capricorn 2000*

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▼ Product Update: WWT 2.0 Compatible with Capricorn II/II+



CWS president Nader Khoury visits with TriGeo co-founder John Shovic at a recent trade show. The new reader board option is visible above the TriGeo sign.

The new version of WeatherWeb Talker is compatible with Capricorn II/II+ as well as Capricorn 2000 weather stations. In addition to its unique voice synthesis capabilities, it now offers graphical desktop displays and graphs.

The new version supports optional Capricorn 2000 sensors including leaf wetness, soil moisture, soil temperature, and solar radiation. It also supports an optional external LED reader board.

Additional features include the following calculated parameters:

- Barometric pressure rate change (per hour)
- Wind direction average (15 minute and 60 minute)
- Wind gust for the day (calendar day and last 24 hours)
- Evapotranspiration (previous calendar day, previous 7 days)
- Degree-Day (previous day)
- Degree-Day graphs (previous 7 days, previous 30 days, calendar month, calendar year, annual accumulation graph)
- Rain graph (monthly totals)

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