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# Maximizing Climate Based Irrigation Efficiencies

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**Abstract.** *After nearly 20 years of utilizing an Et based central irrigation control platform, the economic conditions profusely compelled us to maximize the potential savings, whether technology driven, educational pieces, or other means deemed worthy of assessment to enhanced our water management program.*

*At the forefront, staff education, involvement, and support was determined to be of the utmost importance, as well as elaborating on strategies developed by Portland Parks & Recreation over the past several years to achieve higher levels of irrigation effectiveness for both new and existing systems.*

*Being one of the largest water users in Portland and having the luxury of our water provider being a sister bureau, various pilot programs have been developed. Testing of numerous devices, software platforms, and most importantly, development of educational pieces have produced significant water and cost savings.*

*Based on the Irrigation Association's Best Practices and Standards, an entire process of integration between software, hardware, and people has created a successful water management program.*

**Keywords.** Climate Based Irrigation Efficiencies, Water Management, Water Savings, Water Conscience Education, Water Conservation Software, Water Conservation Hardware, Water Conservation Education

## **Beyond the Technology:**

As one of the first public entities in the Pacific Northwest to get started in the central control mindset, Portland Parks & Recreation has learned not only by education but by the oldest method, that of trial and error. The success we are encountering today is in direct response to the forward thinking and perseverance of longtime staff. While others have struggled, PP&R has made climate based irrigation a successful standard throughout the park system.

Currently, 80 of our 150 irrigated parks are controlled by Et or moisture sensors. Our directive is such that each year, 6 to 12 of the remaining stand alone controller parks are brought into the climate based system. Also, all new park facilities are required to install the necessary equipment allowing them to be centrally controlled as well.

With a dedicated Irrigation Services workgroup as the backbone, the installation process of the sophisticated control equipment is straightforward and predictable. But, beyond the actual hard goods mounted on the wall or buried in the ground, the need to gather the required data, work through technical difficulties, and keep up with other daily work orders for all elements of responsibility of the Irrigation Services workgroup prove challenging.

It was determined a few years back, that for our control systems to continue to be truly beneficial, the support from the Park Technicians and Horticulturalist whose responsibilities it is to take care of the day to day maintenance requirements at their assigned facilities was needed.

After years of seeing savings in water use by central monitoring it was dramatic when the savings stopped and actually started to reverse. After a few season and countless hours spent analyzing data, the truth finally was obvious that our delivery systems now being 8 to 10 years old, were aging and becoming less efficient.

### **Enlisting the Daily Maintenance Staff:**

Given the findings, a program was developed that would garner the necessary support from the specific zone personal that would get us back on the water savings track.

Starting in 2009, an audit completion was developed that provided valuable insights to the park staff. Conducted by local CLIA's, a series of workshops were conducted, both in the classroom and in the field. Each of our 6 zones was attached to a park that had shown signs of declining water savings.

A pre-audit was conducted, system enhancements suggested, and each team was allowed to determine how best to capture the greatest savings gain while being cost conscience. When the post audits were conducted, the most improved efficiency team was rewarded with PP&R wearables.

This initial, albeit simplistic step, was amazingly a huge eye opener for the park field staff. Yes, they had been to numerous local distributor trainings but to actually have hands on experience and see the physical changes that afforded a higher level of irrigation efficiency was undeniably a breakthrough.

Since this time, the phrase "Tune Up" has been uttered daily throughout our PP&R staff. The solid proof (fig. 1 below) has convinced not only those responsible for the daily maintenance activities at the park facilities but their direct supervisors and upper management. This became extremely true this past year as looming budget cuts had all areas of our park system looking for savings.

Water is a large cost item, especially when all water aspects of the bureau are rolled up under this line item. From 2010 to 2011, Portland water users experienced a 15% increase in water alone not to mention the increase in sewer and storm water fees.

A program was launched at the end of last year and carried through this irrigation season that not only continued the focus on "Tune Ups" at our centrally controlled parks but on the stand alone parks as well. Added to the "Tune Up" was a Water Allocation component where Park Tech's and Horticulturalist were challenged with the concept that they were required to determine the volume of water their facilities would require.

Utilizing current, readily available and accessible technologies within the City of Portland those participating attended a series of workshops to introduce them to the next step in our water conservation efforts and the functionality of technological aids.

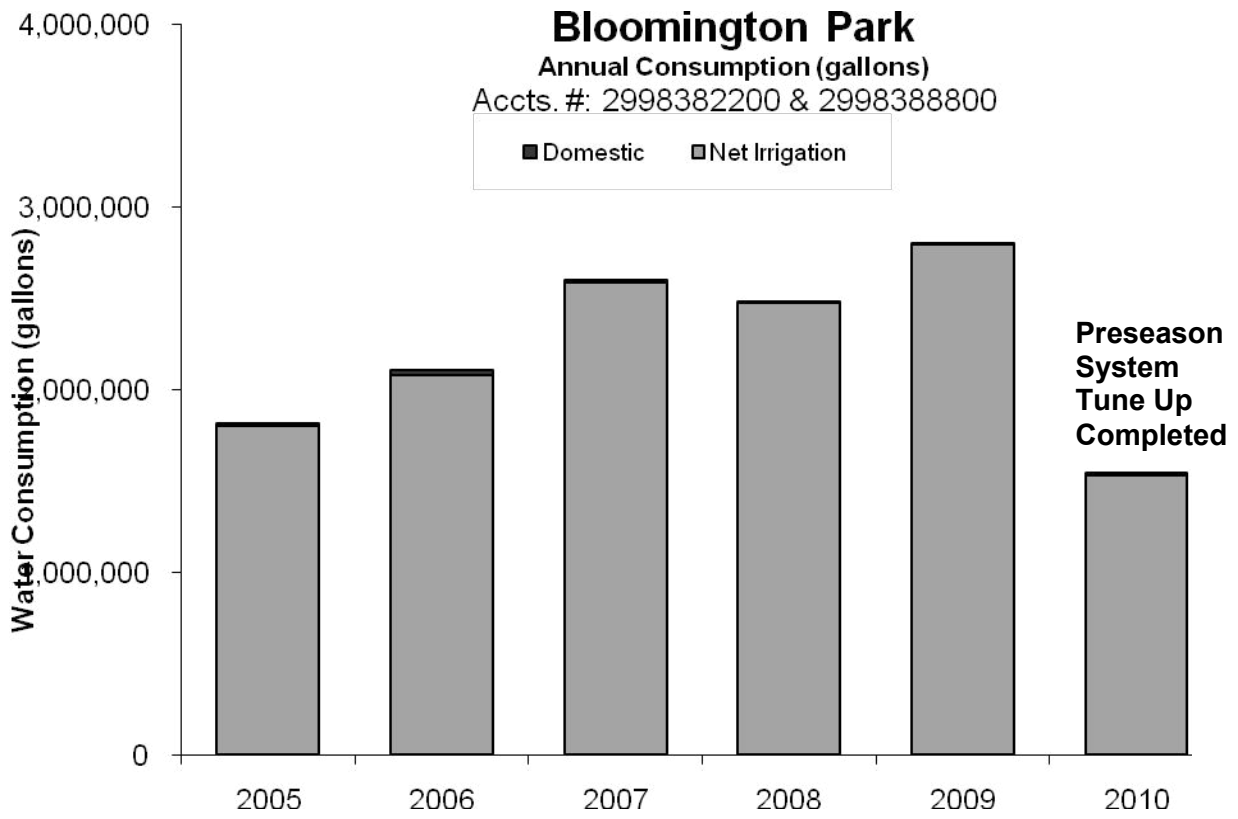
The first step was introducing the water budget components. Modeled after the EPA's online calculator, data was collected for 12 parks representing 2 in each service zone.

Once the concept of water budgeting was digested, the "what next" was entertained. To provide a true and meaningful learning experience that could be easily conveyed and demonstrated, the need for timely water use amounts was discussed. A workshop was held on meter reading and a part time position was funded by the Water Bureau that would not only allow the meters to be read on a weekly basis, data inputted into usable spreadsheets, but also provide guidance during the irrigation season.

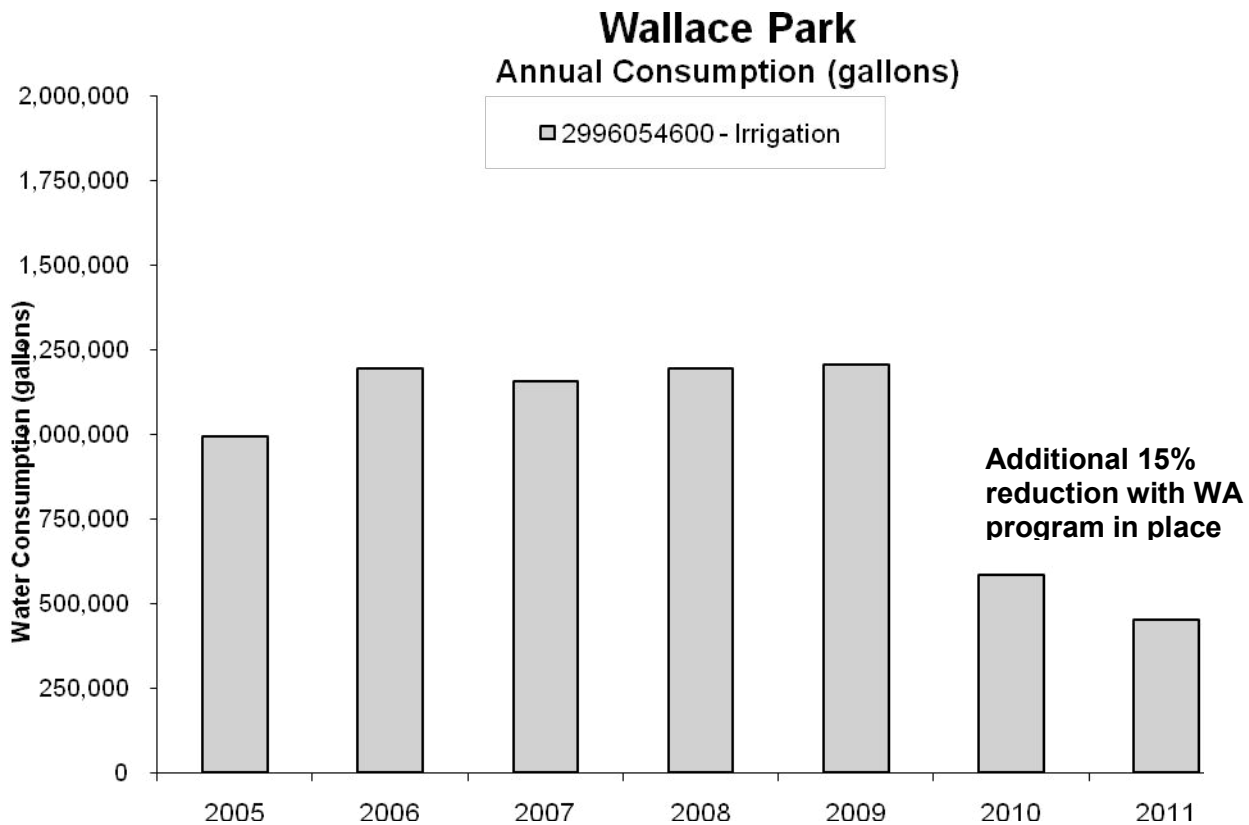
Providing all the tools necessary for each park staff member responsible for irrigation was critical to the success of the program and more importantly to meeting the budgetary limits imposed on water.

Knowing the anticipated amount of water, getting weekly input, understanding that efficient irrigation starts at the sprinkler, that the moisture in the ground is what really matters, are all educational elements that enhance what the technology side of irrigation cannot capture.

To date, the 12 parks in the pilot program have experienced a combined savings this year over last, with weather being similar, of 15% (fig 2 below). Part, indeed is due to the focus on each park, part being the message to stay under the fiscal budget from management, but the largest part is that the knowledge was given and supported with relevant, timely information. Portland Parks & Recreation understands that this is just the beginning. With a large and dynamic array of facilities and a diverse staff, ongoing education and systems refinement will continue.



**Fig 1 Et based control system steadily showed signs of increase water use prior to tune up.**



**Fig 2 Tune up and water allocation program in place, brought back to back years of savings.**

## Conclusion

Regardless of all the technological advances throughout the irrigation industry, it still comes down to the actual person or persons in the field. Whether daily, weekly, or sporadically through the season, the need for staff to have a working, hands on knowledge and grasp of the important functions they have control over, greatly impact the actual water required to maintain an expected aesthetic appearance of the areas requiring irrigation.

An unexpected result of the first year's program was the passion that was unleashed from the ranks. A consensus was voiced for the knowledge gained, supporting what some had been practicing, and served to enlist their support. In the field, the peer to peer transfer of knowledge is insurmountable at building the momentum necessary to keep our program moving forward.

As a special note, the one in the group that was the most skeptical by the end was the strongest advocate. The reality that simple instruction and provision of tools allows for a means to actually simplify the day, saving time, money and most importantly our most precious resource.