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Winning Water Conservation

Allison Greco, Energy Manager, Travis AFB

Travis AFB Water Saving Initiatives

- Water Consumption Historical Data
- Computerized Irrigation System
- Dormitory Water Conservation

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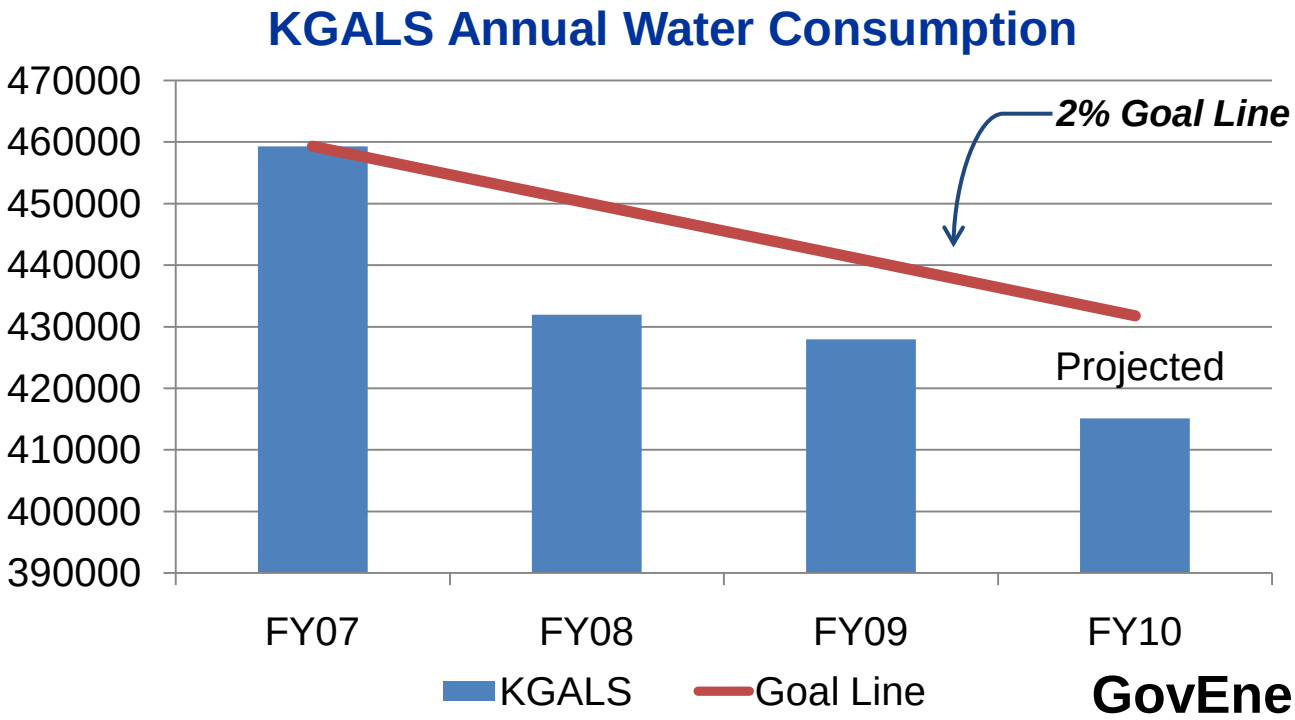
Travis AFB Water Savings

- Goal: 2% reduction per year from FY07 baseline thru FY20
  - 44,000 Kgal saved since FY07, ~10% reduction
  - Over 100 Mgal saved over three years
- Installed computerized irrigation system in FY08
  - Expansions in FY09 and FY10, reduced total acreage irrigated



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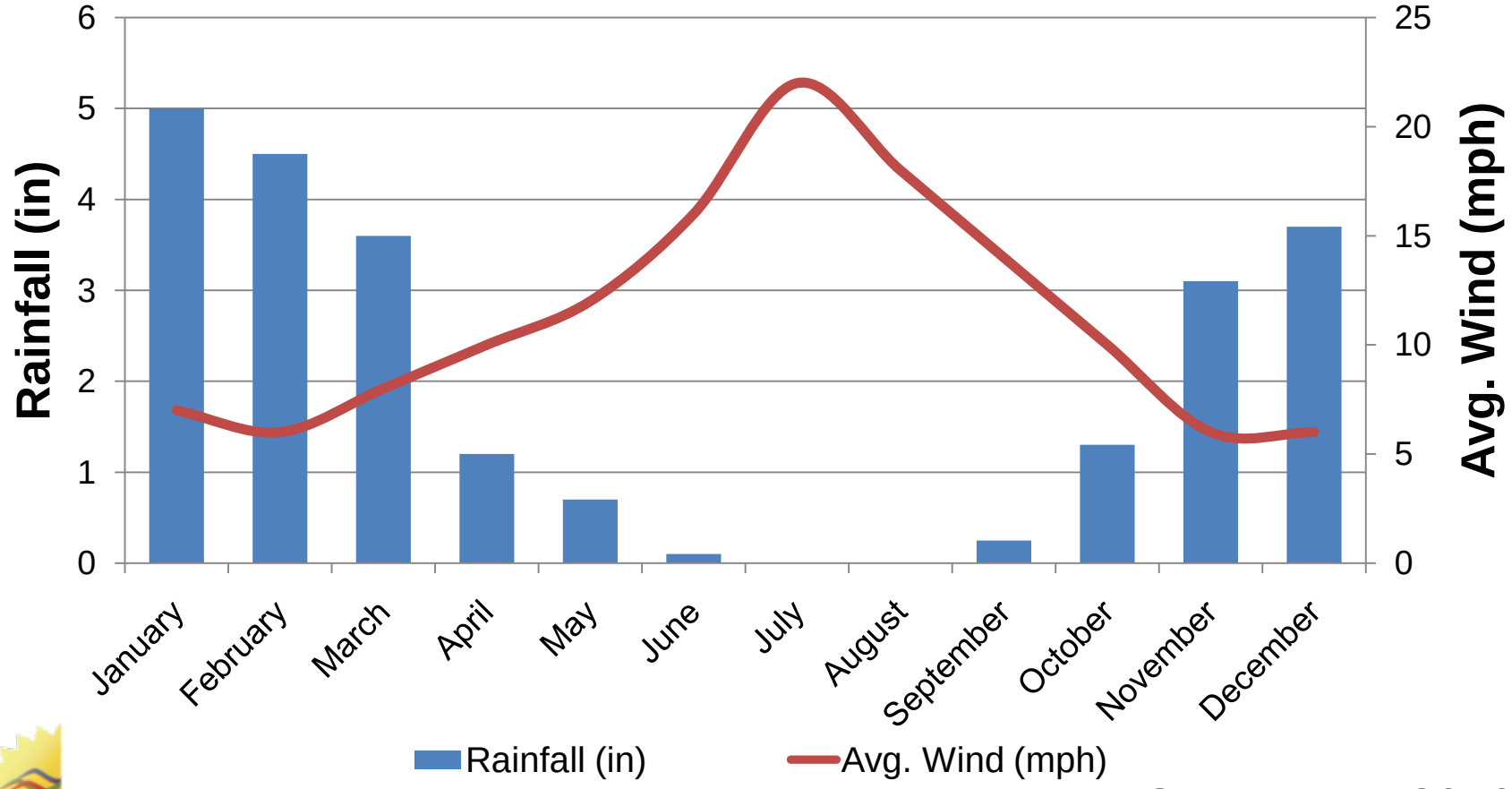
Computerized Irrigation System

- Why we need it:
  - Travis AFB Average Monthly Rainfall & Wind Speed



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Computerized Irrigation System

- Central computer controls 60 stations covering 100 acres
- Two weather stations constantly monitor climate
  - Temp, wind, humidity, evaporation rate, rainfall
  - Turns off valves during rain, high winds
- “Smart” system adapts to trends, patterns
- Initial savings of 20%, now save approx. 40%
- Upgrading to “smarter” engineered system
  - Anticipated savings 50%
  - Updates from weather station every 15 seconds
  - Wireless communication (instead of modem based)

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Computerized Irrigation System

- Additional benefits:
  - System identifies & isolates leaks, detects line breaks
    - Flow sensor monitors pressure, changes trigger auto shut-off
    - Self-diagnostic runs to isolate problem, sends trouble ticket to maintenance
    - Huge maintenance savings!
  - Remote controls allow easy adjustment of sprinkler heads
  - Focus irrigation on high visibility areas
    - Reduce or eliminate irrigation in low visibility areas
  - Modify watering schedules for special activities & functions

Computerized Irrigation System

- Ultimate Control/Worst Case Scenario:
  - Base fire started on a Saturday night in August, burning hundreds of homes
  - Tremendous strain on water pressure
  - Base employee instantly & remotely turned off irrigation system
    - Diverted water from for improved fire fighting
    - Saved several hours over manual shut-off

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Travis AFB Water Saving Initiatives

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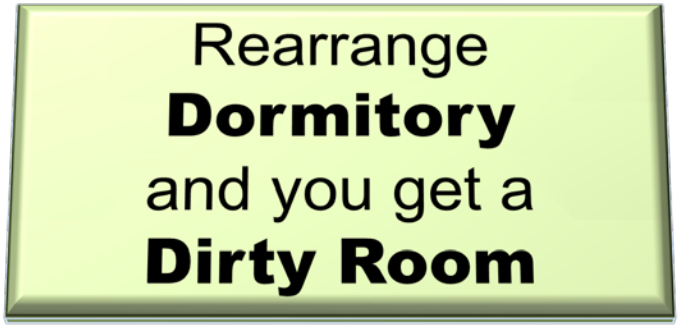
Dorm Water Conservation

- 16 total dormitory buildings
  - 1215 single occupancy rooms
  - 1215 vanities with sinks
  - 610 bathrooms

  (toilet & shower shared by 2 residents)



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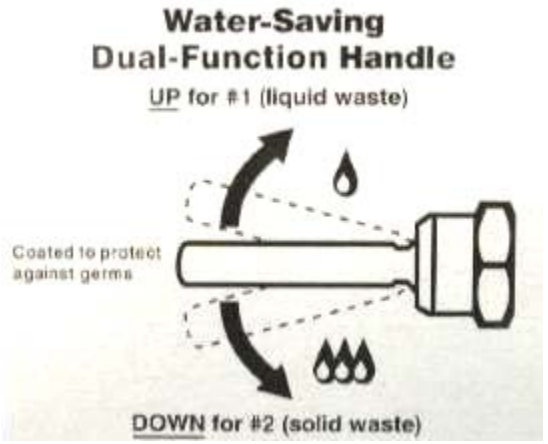
Dorm Water Conservation

- In house retrofits
  - Replaced 610 showerheads – *from 2.2 gpm to 1.5 gpm*
  - Replaced 1215 aerators – *from 2.2 gpm to 1 gpm*

- Contracted bathroom renovation
  - Installed 148 dual flush toilets – *from 3.5 gpf to dual 1.6/0.9 gpf*



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Water & Energy Savings

Conservation Measure	Annual Water Savings		Annual Energy Savings		Total Cost Savings
	Gallons	$	MMBtu	$	
Aerators	5,100,000	$15,300	1580	$14,200	$29,500
Showerheads	4,270,000	$12,800	3050	$27,450	$40,250
Dual Flush Toilet	1,300,700	$3,900	0	0	$3,900
TOTAL	10,670,700	$32,000	4630	$41,650	$73,650

**assuming faucet running 10 min/day, showerheads 20 min/day*

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Project Payback

Conservation Measure	Quantity	Cost	Savings	Simple Payback (years)
Aerators	1215	$1,120	$29,500	0.04
Showerheads	610	$21,350	$40,250	0.53
Dual Flush Toilets	148	$35,520	$3,900	9.10
TOTAL		$57,990	$73,650	0.79

**Note: cost is for materials only*

Summary

- Computerized Irrigation System
  - 100 Mgal saved, reduced maintenance costs
- Dormitory Water Conservation
  - Quick and easy - 10.6 Mgal projected savings!