Presentation to the Academic Senate:

Possible Emergency Water Conservation Actions

CALIFORNIA STATE UNIVERSITY, CHICO
VPBF Overview
Governor Brown Has Declared a Continued Drought Emergency

EXECUTIVE ORDER B-29-15

WHEREAS on January 17, 2014, I proclaimed a State of Emergency to exist throughout the State of California due to severe drought conditions; and

WHEREAS on April 25, 2014, I proclaimed a Continued State of Emergency to exist throughout the State of California due to the ongoing drought; and

WHEREAS California’s water supplies continue to be severely depleted despite a limited amount of rain and snowfall this winter, with record low snowpack in the Sierra Nevada mountains, decreased water levels in most of California’s reservoirs, reduced flows in the state’s rivers and shrinking supplies in underground water basins; and

WHEREAS the severe drought conditions continue to present urgent challenges including: drinking water shortages in communities across the state, diminished water for agricultural production, degraded habitat for many fish and wildlife species, increased wildfire risk, and the threat of saltwater contamination to fresh water supplies in the Sacramento-San Joaquin Bay Delta; and

WHEREAS a distinct possibility exists that the current drought will stretch into a fifth straight year in 2015 and beyond; and

WHEREAS new expected actions are needed to reduce the harmful impacts from water shortages and other impacts of the drought; and

WHEREAS the magnitude of the severe drought conditions continues to present threats beyond the control of the services, personnel, equipment, and facilities of any single local government and require the combined forces of a mutual aid region or regions to combat; and

WHEREAS under the provisions of section 65568(b) of the Government Code, I find that conditions of extreme peril to the safety of persons and property continue to exist in California due to water shortage and drought conditions with which local authority is unable to cope; and

WHEREAS under the provisions of section 8571 of the California Government Code, I find that strict compliance with various statutes and regulations specified in this order would prevent, hinder, or delay the mitigation of the effects of the drought.

NOW, THEREFORE, I, EDUARD G. BROWN JR., Governor of the State of California, in accordance with the authority vested in me by the Constitution and statutes of the State of California, in particular Government Code sections 6507 and 8571 of the California Government Code, do hereby issue this Executive Order, effective immediately.

IT IS HEREBY ORDERED THAT:

1. The orders and provisions contained in my January 17, 2014 Proclamation, my April 25, 2014 Proclamation, and Executive Orders B-29-14 and B-25-14 remain in full force and effect except as modified herein.

SAVE WATER

2. The State Water Resources Control Board (Water Board) shall impose restrictions to achieve a statewide 25% reduction in potable urban water usage through February 28, 2016. These restrictions will require water suppliers to California’s cities and towns to reduce usage as compared to the amount used in 2013. These restrictions should consider the relative per capita water usage of each water supplier’s service area, and require that those areas with high per capita use achieve proportionally greater reductions than those with low use. The California Public Utilities Commission is requested to take similar action with respect to investor-owned utilities providing water services.

3. The Department of Water Resources (the Department) shall lead a statewide initiative, in partnership with local agencies, to collectively replace 50 million square feet of lawns and ornamental turf with drought-tolerant landscapes. The Department shall provide funding to allow for lawn replacement programs in underserved communities, which will complement local programs already underway across the state.

4. The California Energy Commission, jointly with the Department and the Water Board, shall implement a time-limited statewide appliance rebate program to provide monetary incentives for the replacement of inefficient household devices.

5. The Water Board shall impose restrictions to require that commercial, industrial, and institutional properties, such as campuses, golf courses, and cemeteries, immediately implement water efficiency measures to reduce potable water usage in an amount consistent with the reduction targets mandated by Directive 2 of this Executive Order.

6. The Water Board shall prohibit irrigation with potable water of ornamental turf on public street medians.

7. The Water Board shall prohibit irrigation with potable water outside of newly constructed homes and buildings that is not delivered by drip or microspray systems.
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- Signed Executive Order on April 1, 2015

- Directed State Water Board to impose restrictions that achieve 25% reduction in potable urban water use through February 28, 2016
  - Targeted reductions compared to 2013 usage

- Specifically addressed watering frequencies and campus water usage
  - Local regulations are forthcoming
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- Initial campus planning efforts are intended to achieve immediate water conservation results
  - Initial focus towards reduction of Cal Water usage
  - Cal Water Board to finalize local regulations on May 5

- Analysis of regulatory impact on well water and agricultural use is still ongoing

- Campus will adjust savings targets and methods as necessary based on results and clear regulatory guidance
2013 Campus Water Usage

Campus Cal Water meters reflected 65M gallons annual billed total usage in 2013:

- Cal Water Irrigation: 10.2M Gal
- Main campus: 17.9M Gal
- Housing: 25M Gal
- Farm: 7.45M Gal
- AS: 4.4M Gal
We need to save **16.25M gallons** through February 2016

- Cal Water Irrigation: 2.6M Gal
- Main campus: 4.5M Gal
- Housing: 6.2M Gal
- Farm: 1.8M Gal
  - *Pending regulatory interpretation*
- AS: 1.1M Gal
Priorities of the Irrigation Savings Program

- Reduce impact to academic programs
  - “Is this our first priority?” consideration process
- Athletics?
- Kendall Lawn?
- Other considerations:
  - Who should we work/consult with over the summer?
Proposed Irrigation Savings

Through improved watering schedules we can achieve potential campus wide irrigation savings of 43.4M Gal/yr. (13M Gal from Cal Water meters)

- 2013 Irrigation water used campus wide (includes irrigation well):
  - Planting beds: 8.5M Gal
  - Turf areas: 56.5M Gal
Proposed Irrigation Savings

- Reduced usage through modified irrigation schedules:
  - Reduces watering times,
  - Improves “soak” periods,
  - Limits watering to 2x per week per zone.

- Modified schedules will result in new, lower usages:
  - Planting beds usage: 4.0M Gal
  - Turf areas usage: 17.5M Gal
Additional irrigation savings can be achieved through elimination of select turf areas

- **Total Area:** 1,359,072 ft.² (31.2 acres)

- **Total projected additional irrigation water savings:** 16M gallons annually
Possible Turf Reduction Water Savings

Acker Gym

- **792 ft.² (.018 ac)**
- **E. side at the crosswalk between Lassen and Acker**
- **Condition: Fair**
- **Contributing factor for removal: size**
- **Emission devices: Sprays (14,064 gal/ac/week)**

- **Projected irrigation water savings** **253 gallons/week (9,867 gallons annually)**
Possible Turf Reduction Water Savings

Albert E Warren’s Center (AEW)

- 13,734 ft.² (.32 ac)
- All lawns outside the backyard gates. (south and west sides of the yard) Additionally, all lawns along the parking meter side of the sidewalk, and the large lawn between AEW and UHFS facilities.
- Condition: Poor to Fair
- Contributing factor for removal: size, excess pest and weed pressure, poor irrigation
- Emission devices: H.E. (20,544 gal/acre/week)
- Projected irrigation water savings 6,574 gallons/week (256,386 gal. annually)
Possible Turf Reduction Water Savings

Aymer J. Hamilton

- **27,682 ft.² (.63 ac)**
- All lawns in the front of the building, extending out to Arcadian Ave. Additionally, all lawns along the S.W. side of the building and the N.W. lawn between Bidwell Mansion and AJH as well as the lawn along the N.E. side of the building along the fence
- **Condition:** Poor
- **Contributing factor for removal:** excess gopher and weed pressure
- **Emission devices:** Sprays (14,064 gal/ac/week)
- **Projected irrigation water savings:** **8,860 gallons/week (345,540 gal. annually)**
Olive Turf reduction Water Savings

- **9,998 ft.² (.23 ac)**
- All lawns to the N of the building, including new lawns installed last summer. The new lawns never got established well enough to survive the upcoming water restrictions and are very small
- **Condition:** Fair to good
- **Contributing factor for removal:** shade/establishment/size
- **Emission devices:** H.E. (20,544 gal/acre/week)
- **Projected irrigation water savings:** 4,725 gallons/week (184,275 gallons annually)
Possible Turf Reduction Water Savings

Butte

- 27,573 ft.² (.63 ac)
- All lawns on the S. side of the building, between Butte and Chico Creek
- Condition: Poor
- Contributing factor for removal: poor irrigation/shade/establishment
- Emission devices: Rotors (12,336 gal/acre/week)
- Projected irrigation water savings 7,772 gallons/week (303,108 gallons annually)
Possible Turf Reduction Water Savings

**Continuing Ed**

- **23,780 ft.$^2$ (.55 ac)**
- All lawns to the N. of the building, extending to Chico Creek
- **Condition:** Poor to Fair
- **Contributing factor for removal:** Poor irrigation/excessive run-off & overspray/poor quality lawns/pest & weed pressure
- **Predominant emission devices:** Rotors (12,336 gal/acre/week)
- **Projected irrigation water savings** 6,785 gallons/week (264,615 gallons annually)
Possible Turf Reduction Water Savings

**Fields 6 & 7**

- **5.47 acres**
- **Condition:** Poor to Fair
- **Emission devices:** Rotors (12,336 gal/acre/week)
- **Projected irrigation water savings:** 64,478 gallons/week (2,631,639 gallons annually)
Possible Turf Reduction Water Savings

**Field 10B**

- **3.34 acres**
- **Condition: Poor**
- **Emission devices: Rotors (12,336 gal/acre/week)**
- **Projected irrigation water savings: 41,202 gallons/week (1,606,887 gallons annually)**
Possible Turf Reduction Water Savings

FMS Yard

- 2,800 ft.² (.064 ac)
- The lawn area on the W side of the yard, along HWY 32
- Condition: poor
- Contributing factor for removal: poor irrigation/poor quality lawn/pest & weed pressure
- Emission devices: Sprays (14,064 gal/acre/week)

- Projected irrigation water savings 900 gallons/week (35,100 gallons annually)
Possible Turf Reduction Water Savings

Gateway Science

- 5,950 ft² (.14 ac)
- The large lawn on the E. side of the property, parallel with Esplanade
- Condition: poor
- Contributing factor for removal: poor quality lawn/pest & weed pressure
- Emission devices: H.E. (20,544 gal/acre/week)

- Projected irrigation water savings **2,876 gallons/week (112,164 gallons annually)**
Glenn Hall

- 8,148 ft.² (.19 ac)
- All lawns around the entire building, including the mounded lawns on the W. side and the lawns on the N. side of the building extending to Chico Creek
- Condition: Poor to Fair
- Contributing Factors: poor irrigation, size, shade, pest & weed pressure
- Emission devices: Spray (14,064 gal/acre/week)

- Projected irrigation water savings: 2,672 gallons/week (104,208 gallons annually)
Possible Turf Reduction Water Savings

Holt Hall

- **27,895 ft.² (.64 ac)**
- All lawns around the entire building
- Condition: poor
- Contributing factors for removal: poor irrigation/poor quality lawn/heavy pest & weed pressure/establishment problems/pedestrian traffic
- Predominant emission devices: Rotors (12,336 gal/acre/week)
- Projected irrigation water savings **7,895 gallons/week (307,905 gallons annually)**
Possible Turf Reduction Water Savings

- **Kendall Hall**

- **82,607 ft.² (1.89 ac)**
- All lawns
- Condition: Fair to Great
- Contributing factor for removal: poor irrigation/pest & weed pressure
- Predominant emission devices: Rotors (12,336 gal/acre/week)
- Projected irrigation water savings **23,315 gallons/week (909,287 gallons annually)**
Possible Turf Reduction Water Savings

**Langdon/O’Connell**

- **5,995 ft.² (.14 ac)**
- The lawn on the E. side of O’Connell and S.E. corner of Langdon
- Condition: Fair-poor
- Contributing factor: size, shade, pedestrian traffic, weed pressure, run-off into the street
- Emission devices: H.E. (20,544 gallons/acre/week)
- Projected irrigation water savings **2,876 gallons/week (112,164 gallons annually)**
Possible Turf Reduction Water Savings

Laxson Auditorium

- 2,904 ft.$^2$ (.07 ac)
- The single lawn at the S. side of the building and the mow-strip between Laxson and Taylor II site
- Condition: Poor - Good
- Contributing factor for removal: inefficient irrigation
- Emission devices: H.E. (20,544 gal/acre/week)

- Projected irrigation water savings **1,438 gallons/week (56,082 gallons annually)**
Possible Turf Reduction Water Savings

Modoc

- **46,393 ft.² (1.07 ac)**
- The lawn on the W. side of the building, the large lawn to the S. and some lawns to the N & N.E. corners
- Condition: Poor to Fair
- Contributing factor for removal: poor quality lawn/pest & weed pressure
- Predominant emission devices: Rotors (12,336 gal/acre/week)
- Projected irrigation water savings **13,200 gallons/week (514,800 gallons annually)**
**Possible Turf Reduction Water Savings**

**Nettleton Stadium**

- **2.15 acres**
- **Condition:** Good to Great
- **Emission devices:** Rotors (12,336 gal/acre/week)
- **Projected irrigation water savings:** 26,522 gallons/week (1,034,358 gallons annually)
Possible Turf Reduction Water Savings

Parking Structure I

- **8,646 ft.² (.2 ac)**
- All lawns around the exterior, including city mow-strips and the interior lawn
- Condition: Poor
- Contributing factor: size, poor quality lawn, poor irrigation system, establishment, weed pressure
- Emission devices: H.E. (20,544 gal/acre/week)
- Projected irrigation water savings **4,109 gallons/week (160,251 annually)**
Possible Turf Reduction Water Savings

**Physical Sciences**

- **2,025 ft.² (.05 ac)**
- The single lawn on the S. side of the building between the church
- Condition: Poor
- Contributing factor: poor quality lawn, un-used area, poor irrigation
- Emission devices: Sprays (14,064 gal/acre/week)
- Projected irrigation water savings **703 gallons/week (27,417 gallons annually)**
Possible Turf Reduction Water Savings

Rose Garden

- **3,465 ft.² (.08 ac)**
- All the lawns along the perimeter of the Rose Garden
- **Condition:** Poor to Fair
- Contributing factor: size/inefficient irrigation/weed pressure
- **Emission devices:** H.E. (20,544 gal/acre/week)
- **Projected irrigation water savings:** **1,644 gallons/week (64,116 annually)**
Possible Turf Reduction Water Savings

Sapp Hall/Sierra Hall

- **2,756 ft.² (.06 ac)**
- All lawns around building including city mow-strips
- **Condition:** Poor to fair
- **Contributing factor for removal:** size/shade/establishment
- **Emission devices:** H.E. (20,544 gal/acre/week)

- **Projected irrigation water savings 1,233 gallons/week (48,087 annually)**
Possible Turf Reduction Water Savings

Selvester’s Café

- **1,469 ft.$^2$ (.03)**
- The small lawn at the S. side of the building, and the small lawn at the S.E. corner with the ‘Smale’ memorial bench
- Condition: Poor
- Contributing factor: size, poor irrigation
- Emission devices: H.E. (20,544 gal/acre/week)

- Projected irrigation water savings **616 gallons/week (24,024 gallons annually)**
Possible Turf Reduction Water Savings

*Shurmer Gym*

- 2,279 ft.² (.05 ac)
- The two lawns at the S.E. corner of the gym
- Condition: poor to fair
- Contributing factor: size/weed pressure
- Emission devices: H.E. (20,544 gal/acre/week)

- Projected irrigation water savings **1,027 gallons/week (40,053 annually)**
Siskiyou

- 8,166 ft.$^2$ (.19 ac)
- All lawns around entire building
- Condition: Poor
- Contributing factor: poor quality lawn, poor irrigation, size of lawns, traffic on lawns, pest & weed pressure
- Predominant emission devices: H.E. (20,544 gal/acre/week)
- Projected irrigation water savings 3,903 gallons/week (152,217 annually)
Possible Turf Reduction Water Savings

Soccer Stadium

- **3 acres**
- **Condition:** Fair
- **Emission Devices:** Rotors (12,336 gal/acre/week)
- **Projected irrigation water savings:** 37,008 gallons/week (1,443,312 gallons annually)
Possible Turf Reduction Water Savings

**Softball Field**

- .65 acres
- Condition: Good to Great
- Emission devices: Rotors (12,336 gal/acre/week)
- Projected irrigation water savings: **8,018 gallons/week (476,956 gallons annually)**
Possible Turf Reduction Water Savings

**Student Health Center**

- **8,235 ft.² (.19 ac)**
- All lawns around entire building
- Condition: Poor to Fair
- Contributing factor: Poor quality lawn, size of lawn, inefficient irrigation, pest & weed pressure
- Predominant emission devices: Sprays (14,064 gal/acre/week)
- Projected irrigation water savings **2,672 gallons/week (104,208 gallons annually)**
Possible Turf Reduction Water Savings

Student Services Center

- 1,056 ft.² (.02 ac)
- The single lawn at the N.W. corner near the Warner st./1st St. intersection
- Condition: Fair
- Contributing factor: size, traffic on lawn
- Emission devices: H.E. (20,544 gal/acre/week)
- Projected water savings 411 gallons/week (16,029 gallons annually)
Possible Turf Reduction Water Savings

**Tehama**

- 938 ft.² (.02 ac)
- The lawn at the N.E. corner
- Condition: Fair
- Contributing factor: size
- Emission devices: H.E. (20,544 gal/acre/week)

- Projected irrigation water savings: **411 gallons/week (16,029 gallons annually)**
Possible Turf Reduction Water Savings

Trinity and Trinity Commons

- **12,784 ft.² (0.3 ac)**
- All lawns around the building
- Condition: Poor to Good
- Contributing factor: size, poor quality lawn, poor irrigation, shade, establishment
- Emission devices: H.E. (20,544 gal/acre/week)
- Projected irrigation water savings **6,132 gallons/week (240,365 gallons annually)**
Possible Turf Reduction Water Savings

*University Stadium Field*

- 2.4 acres
- Condition: Fair to Good
- Emission devices: Rotors (12,336 gal/acre/week)
- Projected irrigation water savings: **32,006 gallons/week (1,248,250 gallons annually)**
Possible Turf Reduction Water Savings

Yolo Hall

- **21,939 ft.² (.5 ac)**
- All lawns around entire building, including the lawn between Yolo and Shurmer Gym
- **Condition:** Poor to Good
- **Contributing factor:** size, shade, poor quality lawn, poor quality irrigation, establishment, pest & weed pressure
- **Predominant emission devices:** H.E. (20,544 gal/acre/week)
- **Projected irrigation water savings:** **10,272 gallons/week** (**384,584 gallons annually**)
Possible Turf Reduction Water Savings

Yolo South Fields

- 5 acres
- Condition: Poor to Fair
- Emission devices: Rotors (12,336 gal/acre/week)
- Projected irrigation water savings: 61,680 gallons/week (2,405,520 gallons annually)
Possible Plumbing Fixture Savings

- Savings can be attained by changing 200 toilets from 3.6 gal/flush to 1.6 gal/flush low flow fixtures:
  - 700,000 Gal/yr

- Savings can be attained by changing 90 1 gal/flush urinals to 1 pint/flush ultra low flow fixtures:
  - 200,000 Gal/yr
Possible A/C Cooling Water Savings

- Savings can be attained through installation of controls and modified cooling tower treatment processes:
  - 300,000 Gal/yr.
AS Possible Savings: WREC

- Eliminate towel service – saves approximately 625 gallons a day (2500 loads a yr. or 225,000 gallons yr. or 625 gallons a day.)

- Keep tarps on pool at night (reduce evaporation) 600-800 gallons a day savings. (pool can lose ¾ inch of water per day or 2500 gallons a day. Eliminating ¼ to 1/3 of evaporation = 600-800.)

- Encourage “Navy showers” could save 900 gallons a day if shower time is cut in half. (based on 8 min shower @ 1.5 gal/minute @ 300 showers a day)

- WREC has waterless urinals
AS Possible Savings: BMU

- No power washing
- Reduce dishwashing
- Per CA. law: bans all restaurants, bars and hotels (anywhere food is served) from serving water unless customers ask for it. No pitchers or glasses pre-filled at catered events etc.
- Landscape water monitored and set by campus
- BMU already has low flow faucets
Additional campus actions

- Housing
- Farm
Questions?