



**UNAM committed to efficient water  
management**



# Aim



**To implement an integrated program of management, use and reuse of water at UNAM, with the participation of the entire community**

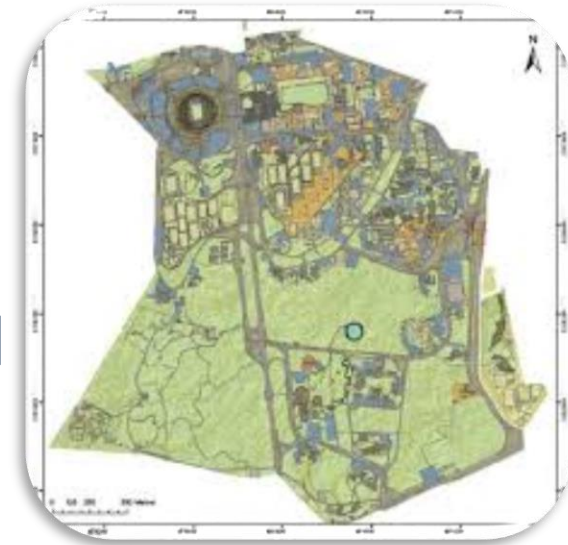
# Goals

- 💧 **To decrease water supply by 50%**
- 💧 **To comply with water quality regulation for drinking water and treated wastewater**
- 💧 **To involve the entire community in efficient water management and use**



The Program was launched at the University City and has extended to

- 💧 5 campus of UNAM
- 💧 8 medium size cities (PADHPOT) and
- 💧 other universities





# University city

💧 **Population : 185, 000 (students, academics, maintenance and administrative staff) + visitors**

💧 **Area: 700 hectares**

240 ha: ecological reserve

150 ha: gardens

310 ha: construction (over 400 buildings)



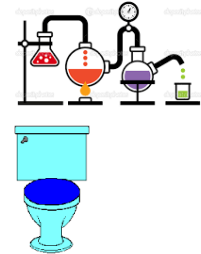
# Water uses

**41% irrigation**  
**49% consumption inside buildings**

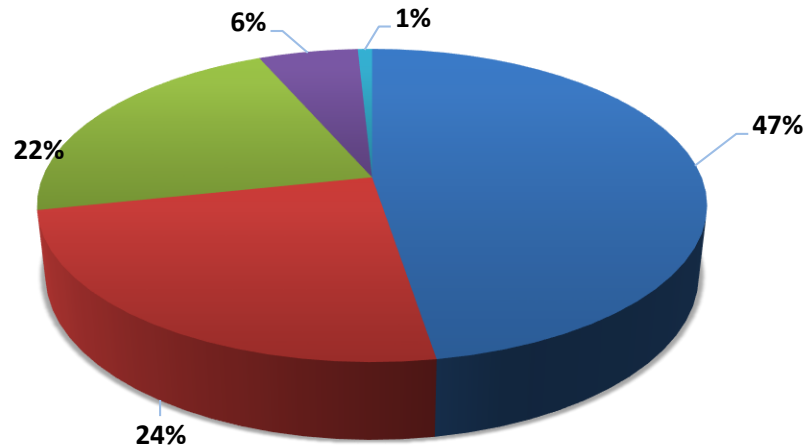
Laboratories

Toilets

Cleaning activities



## Water consumption by type of building



● SCHOOL  
 ● RESEARCH INSTITUTE  
 ● ADMINISTRATIVE UNIT

● SERVICE UNITS  
 ● CULTURAL VENUES

# Diagnosis in 2008



Lack of hydraulic infrastructure plans



No water consumption metering



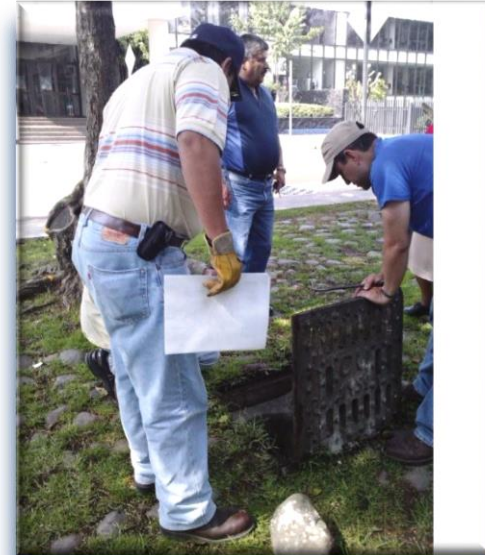
Water losses of nearly 60%



30% of broken toilet furniture



Drinking water and treated wastewater not complying with regulation



# Diagnosis in 2008



Bad water use practices



Lack of training of maintenance staff



Inexistence of a water program enhancing good practices in every university unit





# Water quantity

## Strategies

- Mathematical modelling
- Sectorization of water network
- Water metering
- Saving strategies
  - ✓ Leak control
  - ✓ Toilet retrofit
  - ✓ Vegetation substitution



# Water quantity

## Achievements



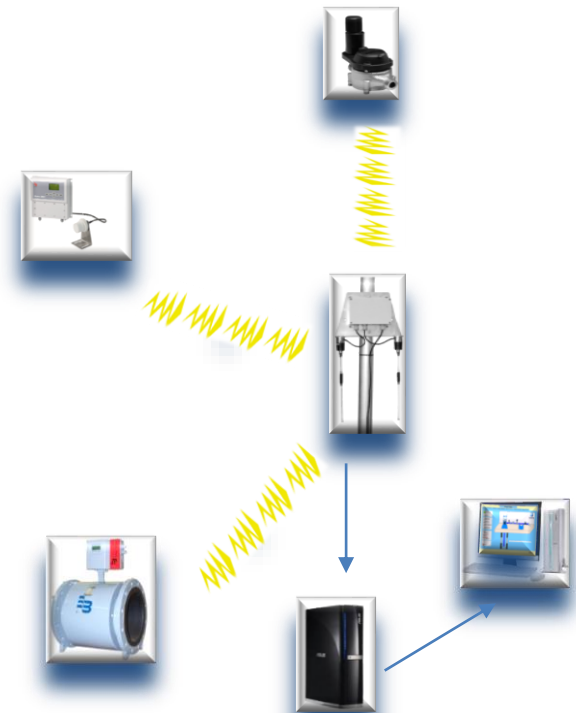
**Water supply decrease of 23%.**



**Real time water consumption  
metering system**



**Installation of 5,600 units of water  
saving toilets (up to 40% saving)**



# Cantidad de agua

## Achievements



**26 university units with native vegetation**

**PUMAGUA** collaborates with the Ecological Reserve of San Angel Stony Ground (**REPSA**) to convert high water consumption gardens into **low water consumption gardens**



# Water quality

## Strategies

Treated wastewater

- Inspection of water disinfection systems
- Analysis of wastewater quality according to Mexican regulation.
- Analysis of water quality according to Mexican regulation
- Monitoring of microorganisms additional to official regulation

Drinking water



# Water quality

## Achievements

✓ Installation of automatic disinfection system

✓ Drinking water that complies with official regulation

✓ 3 models of water fountains (2 of which were designed for PUMAGUA)

✓ 18 water fountains already installed



# Water quality

## Achievements



**Refurbishing of wastewater treatment plant,  
including ultrafiltration membranes**



**Treated wastewater that complies with Mexican  
regulation**



# Social participation

Strategies

Mapping of actors

Diagnosis of knowledge, attitudes, perceptions and proposals

Communication strategies, capacity building

Students



Workers



Academics



Authorities




# Social participation

## Achievements

- ✓ Students of 13 careers participating in researches and proposals
- ✓ 80% of UNAM units implementing at least one PUMAGUA action
- ✓ Communication campaign to enhance good practices
- ✓ Over 30 articles published in journals, and national and international events
- ✓ Workshops for maintenance staff and gardeners

### PUMAGUA actions

-  Toilet retrofit
-  Water meters
-  Communication activities
-  Workshop attendance
-  Water fountains
-  vegetación nativa





# Water Observatory for divulgation and participation



## OBSERVATORIO DEL AGUA

Nuestro propósito es mejorar el sistema de manejo de agua en la UNAM.

¡Involúcrate!

- Conoce el **consumo y la magnitud de las fugas** de tu entidad/dependencia.
- Infórmate sobre la calidad de agua en **bebederos y puntos de la red** de agua potable.
- Conoce la **calificación de tu entidad/dependencia; responde nuestras encuestas.**



# Water observatory

CONSUMO DE AGUA

CALIDAD DEL AGUA

COMUNIDAD PARTICIPATIVA



**CONSUMO.-** Muestra el consumo de un medidor en específico y se puede comparar con respecto a periodos pasados.

☒ Micromedidores

Campus

Dependencia

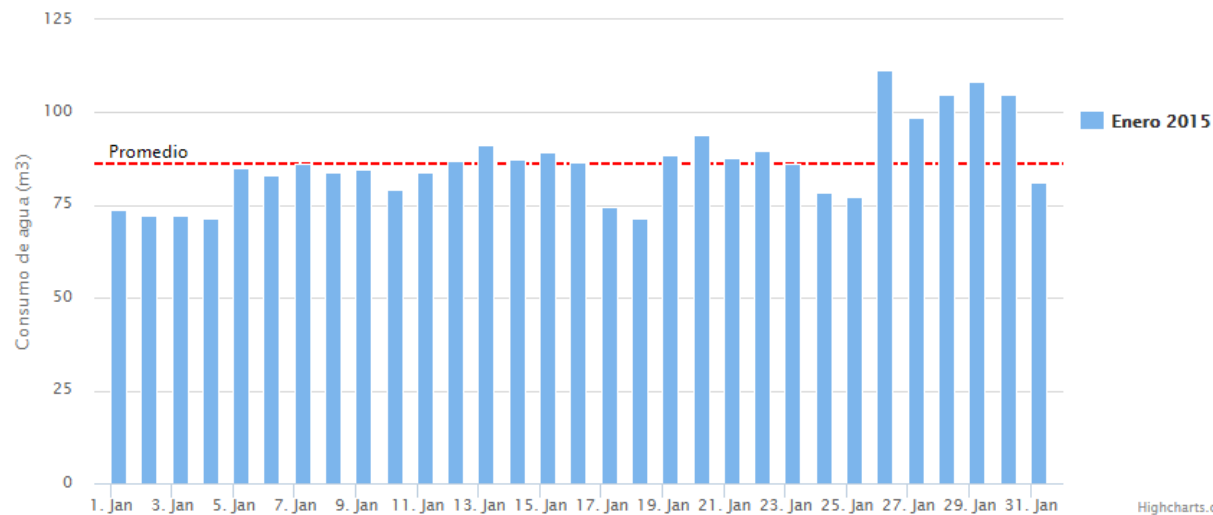
Diario

Periodo

Filtrar

Comparar con otro periodo ☐

Consumo de agua de la dependencia Facultad de Ciencias



# Water Observatory

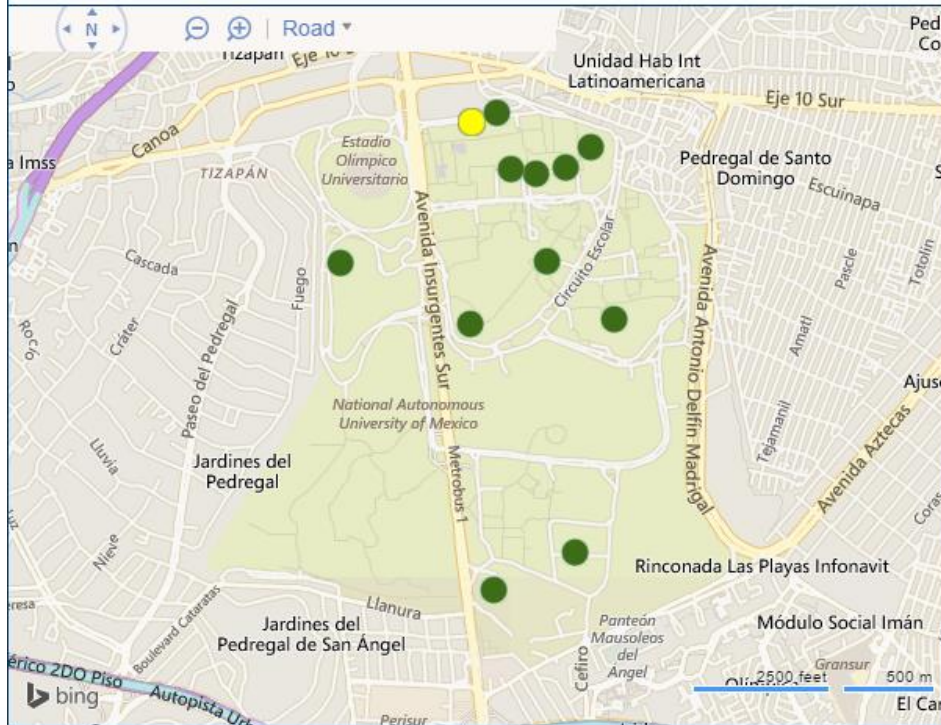
CONSUMO DE AGUA

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## CALIDAD DEL AGUA

### Todos los bebederos en Ciudad Universitaria



Seleccione de acuerdo a los siguientes criterios:

Campus: Ciudad Universitaria

Tipo de Agua: Agua potable

Uso del Agua: Para Uso y Consumo Humano

Etapas del sistema: Bebedero

Sitio de Monitoreo: Todos los sitios

Filtrar

# Water Observatory

CONSUMO DE AGUA

CALIDAD DEL AGUA

COMUNIDAD PARTICIPATIVA

## COMUNIDAD PARTICIPATIVA

Conoce qué acciones realizan las instituciones universitarias para mejorar el manejo y uso de agua en sus instalaciones. Te presentamos el Top 10 de las mejores:

### Top 10



Consulta el Mapa de Acciones



**PUMA Oro**  
Quien logre obtener más del 90% del puntaje total.



**PUMA Plata**  
Quien acumule entre 70 a 89% del puntaje total.



**PUMA Bronce**  
Quien acumule menos del 69% del puntaje total.

Última fecha de actualización para los datos de la gráfica: 08/04/2016 09:48:56 a. m.

ENCUESTAS

¿A qué sector perteneces?

Participa y Conoce los resultados





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