the international water association

Advancing Water Safety Planning: Global Practices & Challenges

23 MAY 2024

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AGENDA

- **Introduction**
  Philip de Souza, Atom Consulting, Australia
- **Water Safety Planning: Global trends and updates**
  Rory McKeown, World Health Organisation, International
- **Case Study 1: Australia**
  Annette Davison, The Risk Edge Group, Australia
- **Case Study 2: Uruguay**
  Alejandro Iriburo, Obras Sanitarias del Estado (OSE), Uruguay
- **Case Study 3: Brazil**
  Mara Ramos, Departmento de Águas e Energia Eléctrica, Brazil
- **Q&A Panel Discussion**
  Speakers & Moderators
- **Close**
  Philip de Souza

Gertjan

WEBINAR INFORMATION

- This webinar will be **recorded and made available "on-demand"** on the IWA Connect Plus platform and IWA Network website, with presentation slides, and other information.
- The **speakers** are responsible for **securing copyright permissions** for any work that they will present of which they are not the legal copyright holder.
- The opinions, hypothesis, conclusions or recommendations contained in the presentations and other materials are the **sole responsibility of the speaker(s)** and do not necessarily reflect IWA opinion.

WEBINAR INFORMATION

- **'Chat' box**: please use this for general requests and for interactive activities.
- **'Q&A' box**: please use this to send questions to the panelists. (We will answer these during the discussions)

Please Note: *Attendees' microphones are muted. We cannot respond to 'Raise Hand'.*

Welcome Committee Abstract Submission Registration Technical tour Venue Hotels About Uruguay Contact us

https://watersafety2024.org

6th International Conference for Water Safety

4-6 September, 2024 | Montevideo, Uruguay.

Welcome

We are thrilled to announce the 6th International Conference for Water Safety, a collaboration between the International Water Association (IWA), Obras Sanitarias del Estado (OSE), Facultad de Ingeniería, Universidad de la República (FING) and its Fundación Julio Ricaldoni (FJR) in Uruguay. The conference will take place from 4-6 September, 2024 in the vibrant city of Montevideo, Uruguay.

Continue reading

Abstract submission

Deadline on 1 May, 2024

Submit

Registration

Opens on 18 March, 2024

Know more

SPEAKERS & MODERATORS

Philip de Souza
Australia

Rory McKeown
International/Ireland

Mara Ramos
Brazil

Annette Davison
Australia

Alejandro Iriburo
Uruguay

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Water safety planning

Global trends and updates

RORY MOSES MCKEOWN

TECHNICAL OFFICER

World Health Organization

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Sustainable Development Goals continue to drive global WSP uptake

WSPs are being supported by an increasingly robust enabling environment

Credit: Gerardo Pesantez/World Bank

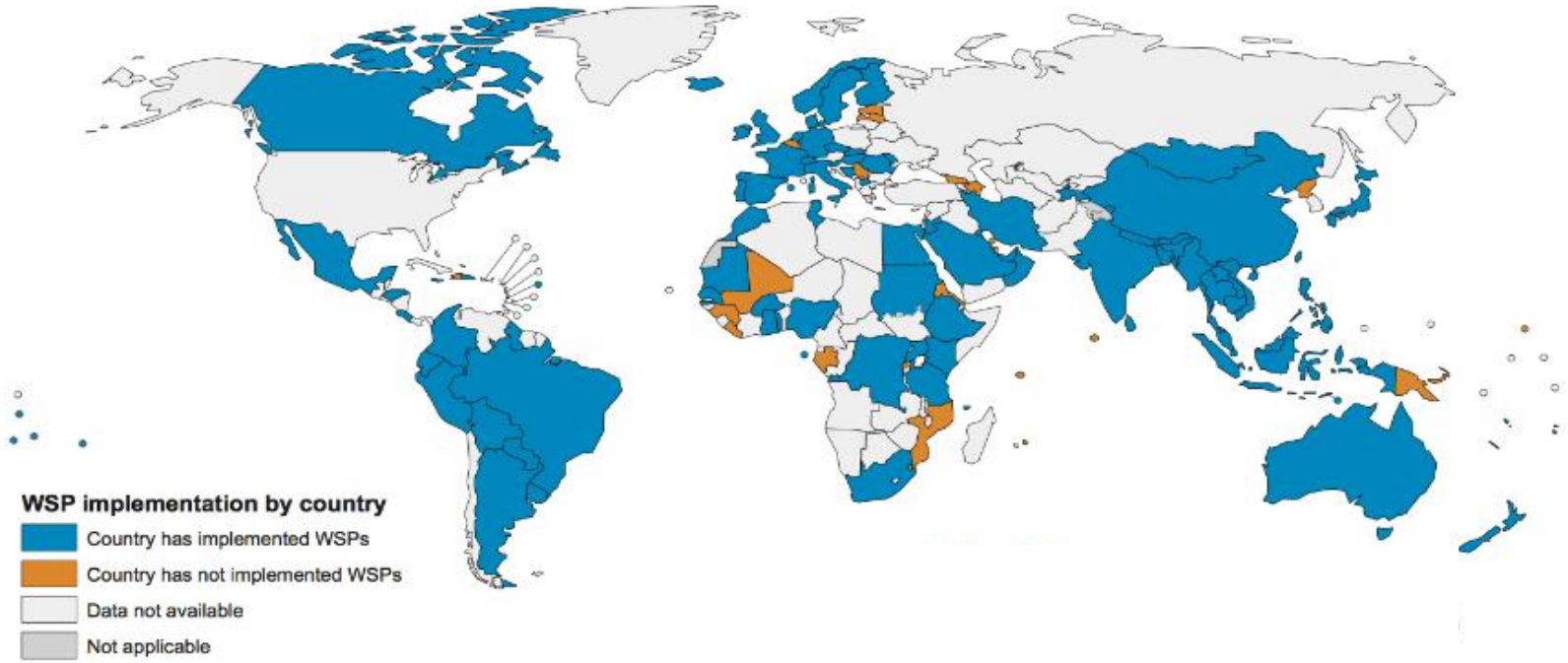

WSPs are being applied to strengthen the equitable delivery of water services
Credit: Allison Kwesell /World Bank


Water safety planning for enhanced resilience
is a key entry point
Credit: Rexness/flicker.com

External pressures are driving a more wholistic approach to safe drinking-water and sanitation risk management

Credit: M-Production/flicker.com

WATER SAFETY PLANNING – GLOBAL SNAPSHOT



93 countries have implemented WSPs

80 countries have WSP policies or regulations in place

Source: WHO WSP tracker database (as at May 2024).

Greater interest in developing national WSP auditing schemes

An **independent** and **systematic check** of a WSP to confirm its:

- ☑ completeness
- ☑ adequate implementation in practice
- ☑ effectiveness

"Critical element for the effective and sustainable implementation of any WSP"

WHO (2015)

WSP AUDITING

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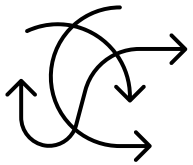
Challenges

Countries identify a **lack of enforcement** of WSPs as a current and future challenge to WSP implementation



Impacts

Many WSP implementing countries are **not actively practising** WSP auditing

Opportunities

Opportunity to strengthen WSP implementation, impact and sustainability through ***increased attention to auditing***

WATER SAFETY PLAN MANUAL – SECOND EDITION

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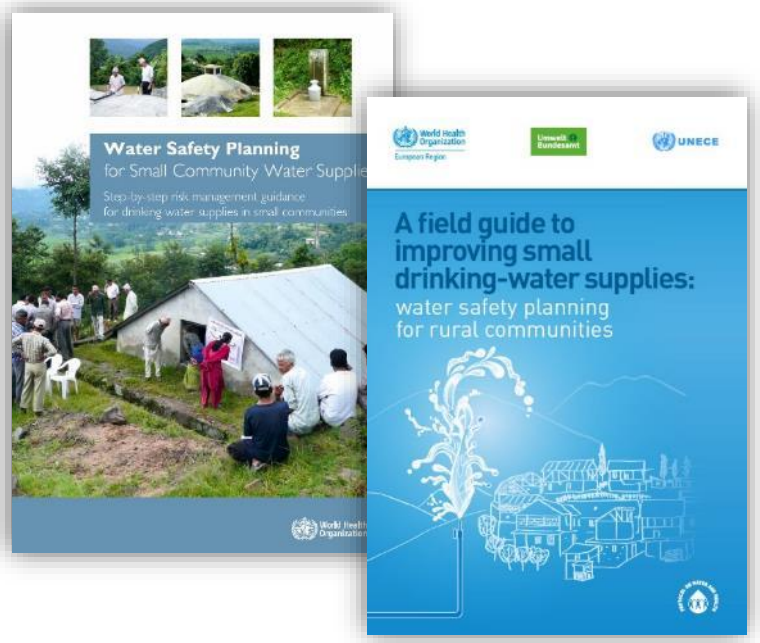
- Strong global uptake (> 6k downloads in last 6 months)
- Translation underway (Chinese, French, Spanish…)



NEW GUIDANCE FOR WSP IN SMALL SUPPLIES

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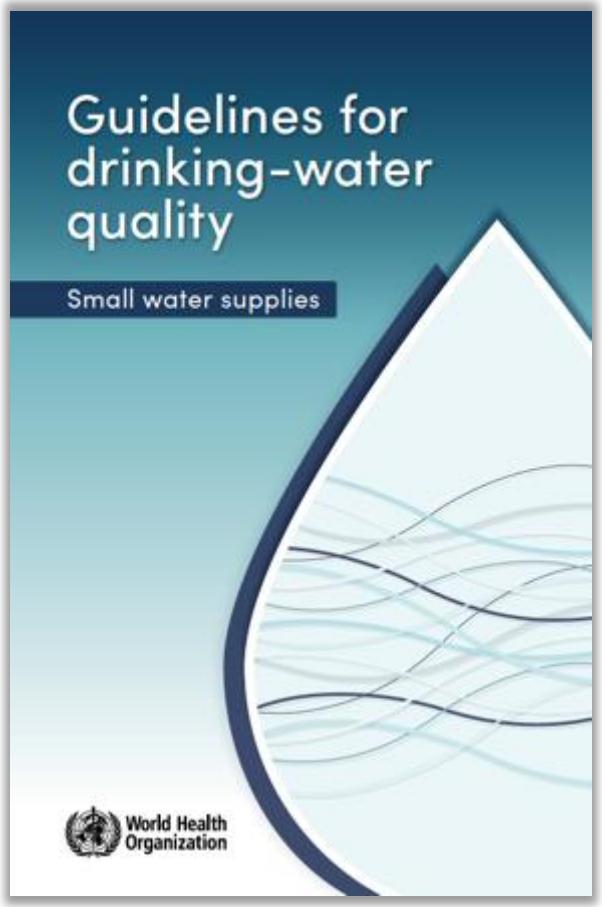
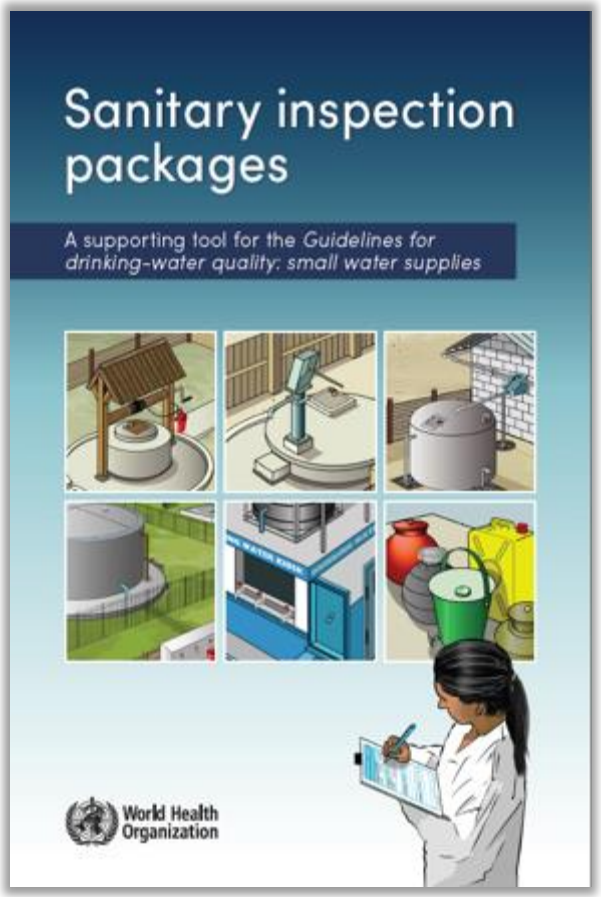
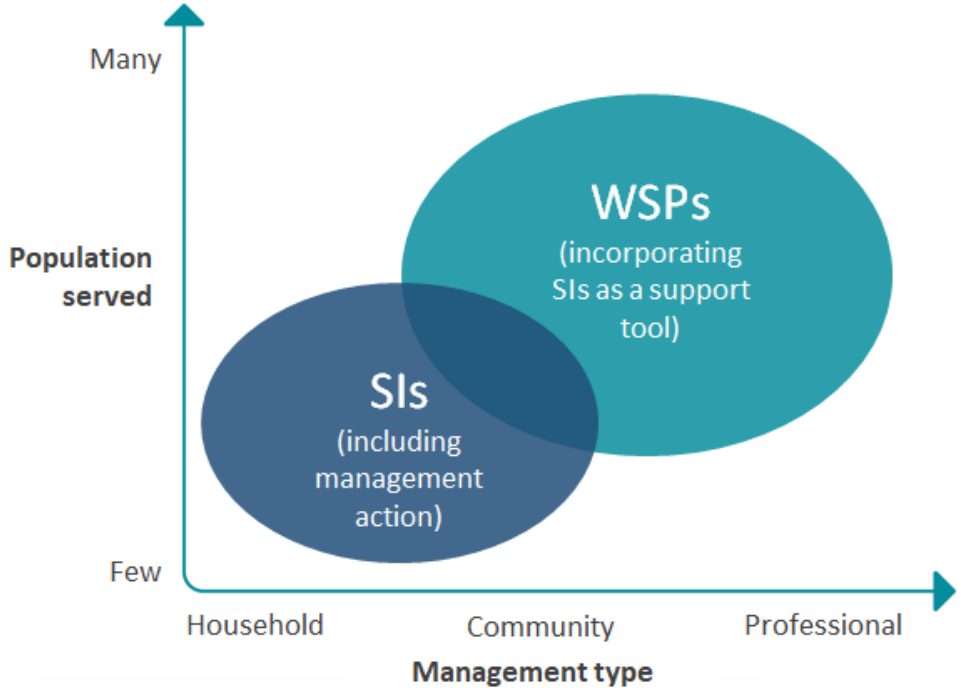
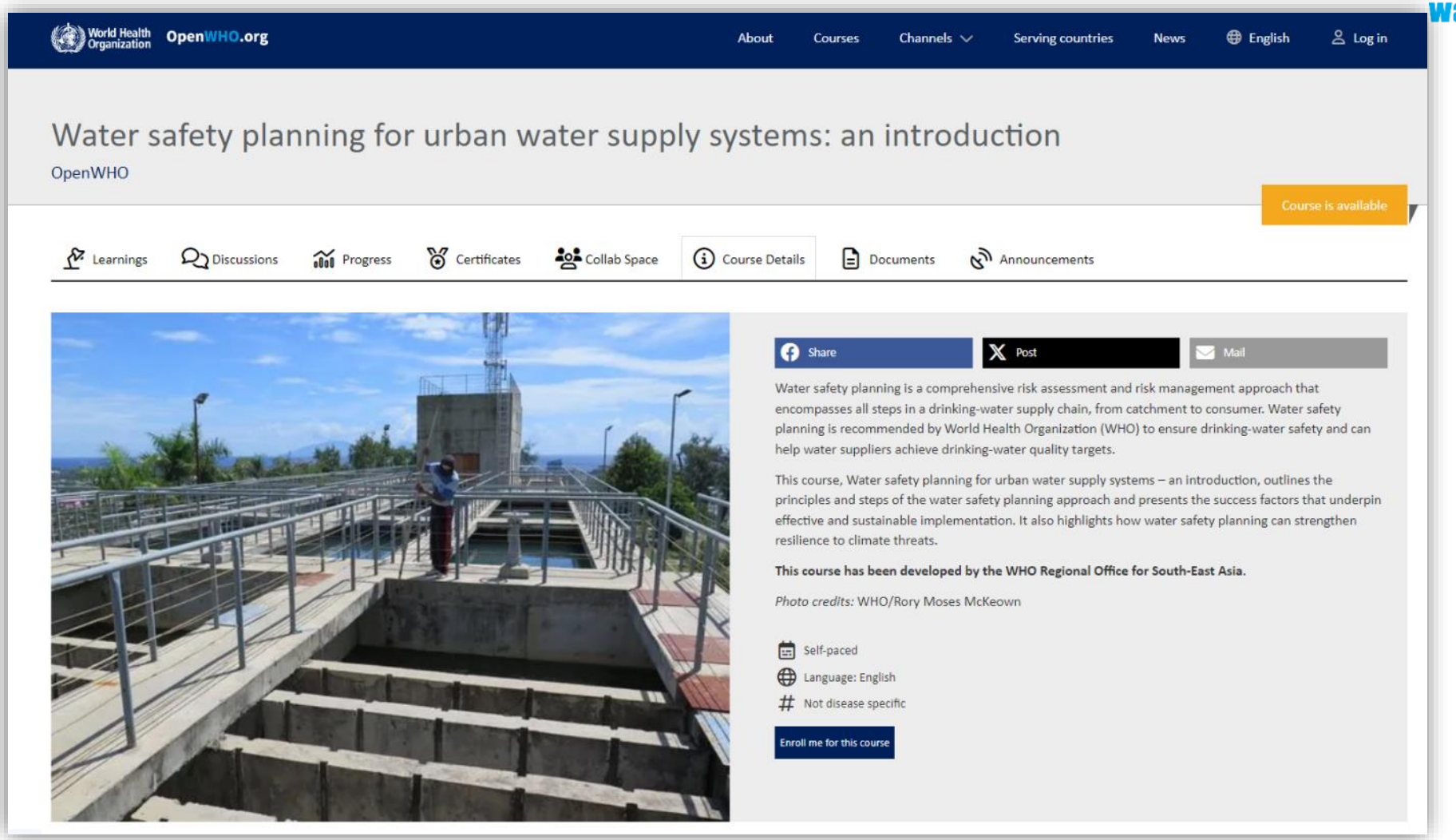






Guidance on when to use different risk management approaches and tools

OPENWHO.ORG – INTRODUCTION TO WSP FOR URBAN SUPPLIES



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Thank you!

FURTHER INFORMATION AT:

https://www.who.int/teams/environment-climate-change-and-health/water-sanitation-and-health/water-safety-and-quality

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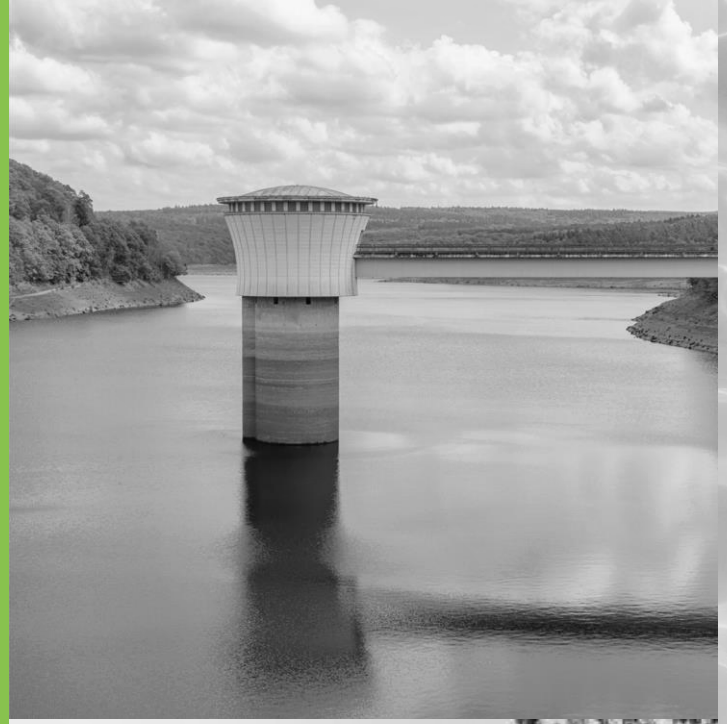
Water Safety Planning – A View from Australia

IWA Webinar May 2024



Dr Annette Davison

HND, BSc(Hons), MEnvLGovLaw, PhD, GAICD, PMAWA

Overview

- A Potted History
- It’s Complicated!
- Where is Australia Now?
- Case Study
- Wrap-up

A POTTED HISTORY

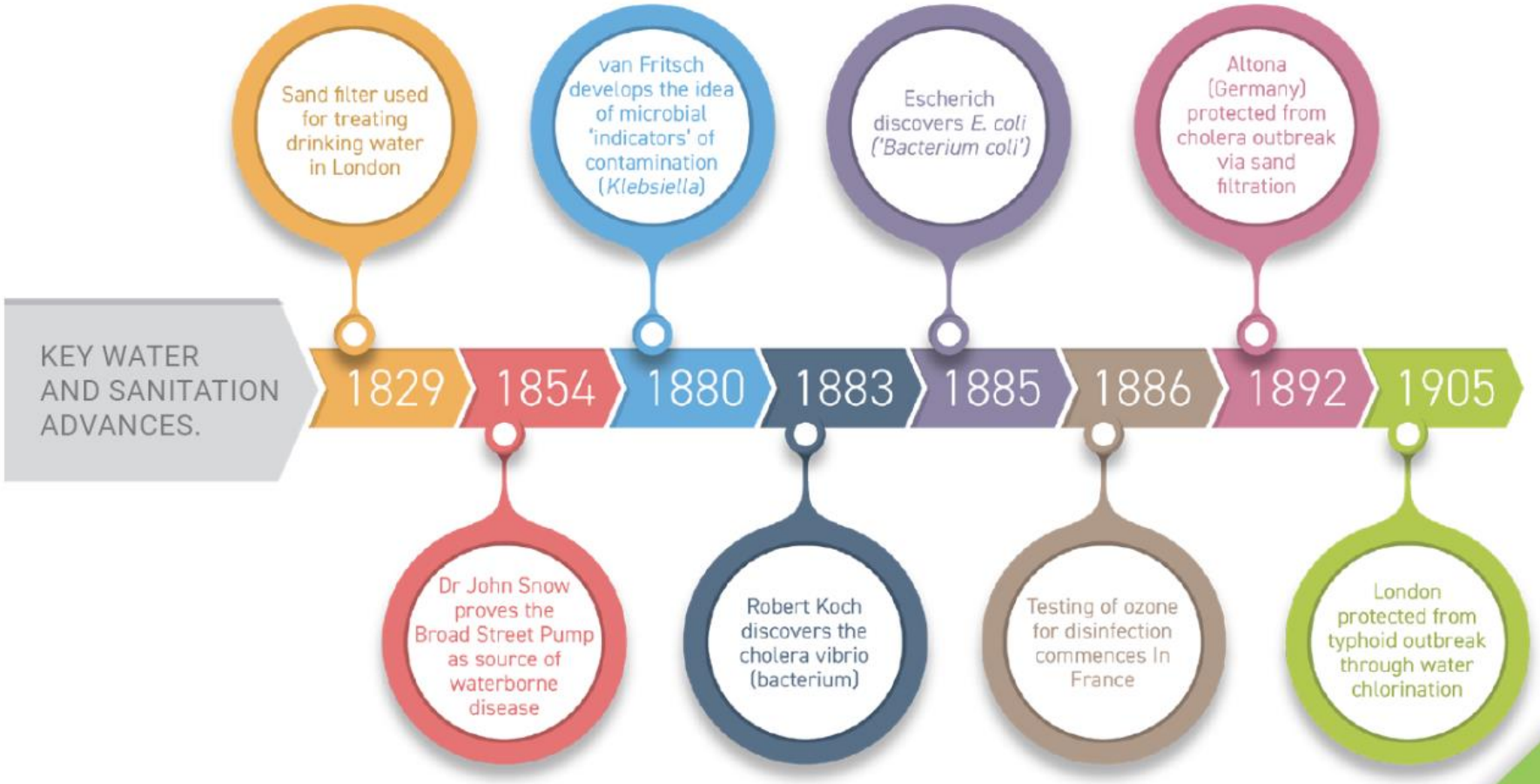
The Rise of Sanitation

Move from QC to QA (Risk Management)

A Brief History

2 HISTORICAL PERSPECTIVES IN DRINKING WATER QUALITY RISK MANAGEMENT

Chapter Summary



- Early 2000s, risk introduced to drinking water guidelines:
  - WHO WSP
  - ADWG
  - Bonn Charter
- Risk = impact of uncertainty on [achieving your] objectives
- Reduce uncertainty
- Use a risk-informed approach
- Implement continuous improvement

?

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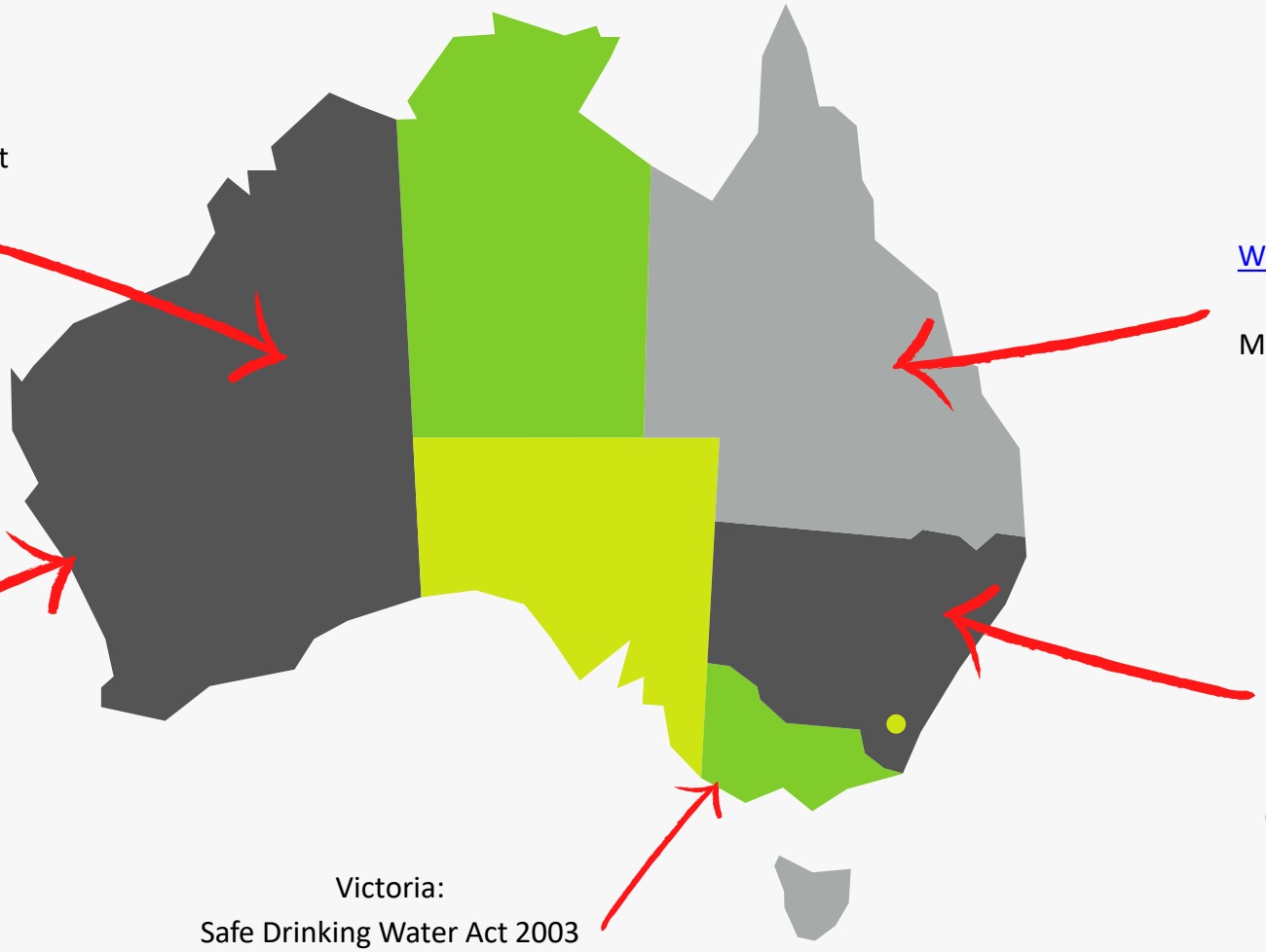
IT’S COMPLICATED!

Australian Context

A Universal Framework Required

FORMAL REQUIREMENTS

Generally the Framework applies, with each Australian jurisdiction having its own DWQ risk management requirements and nuances - some examples



Western Australia:
Model drinking water quality management plan

Queensland:
Water Supply (Safety and Reliability) Act 2008 and Drinking Water Quality Management Plan Guideline Supporting Information

NSW:
Operating Licence Requirements (metro utilities)
Water Industry Competition Act requirements (private utilities)
Public Health Regulation 2022 - Quality Assurance Program based on the Framework for Management of Drinking Water Quality (water suppliers not exempted by other formal requirements)

National:
ISO 31000 / Framework for Management of Drinking Water Quality (Australian Drinking Water Guidelines)

Victoria:
Safe Drinking Water Act 2003
Safe Drinking Water Regulations 2015

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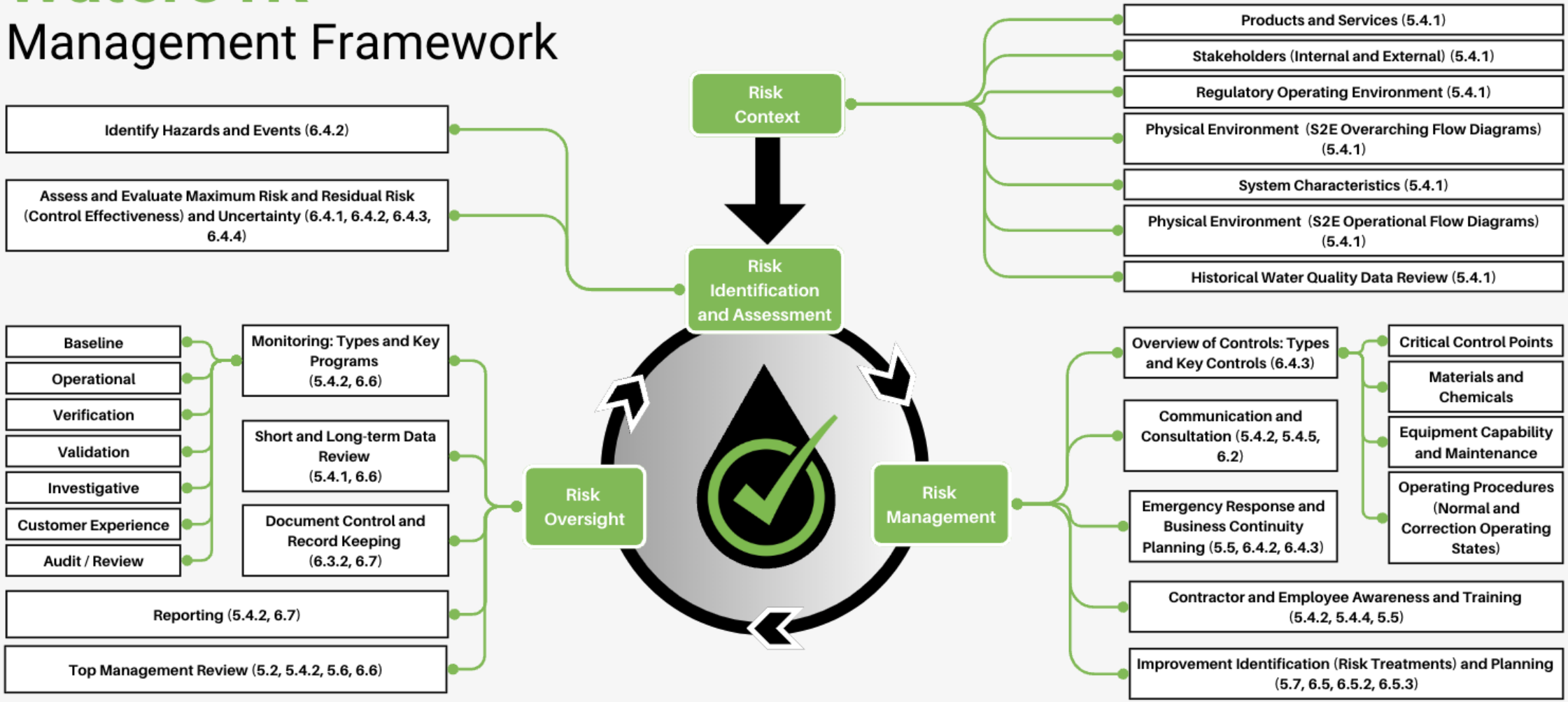
Water31K™
Management Framework



Figures in brackets are clause numbers from ISO 31000

(Source: Modified from Davison, A. (2020) The Application of ISO 31000 to Drinking Water Quality Risk Management: A Practical Approach)

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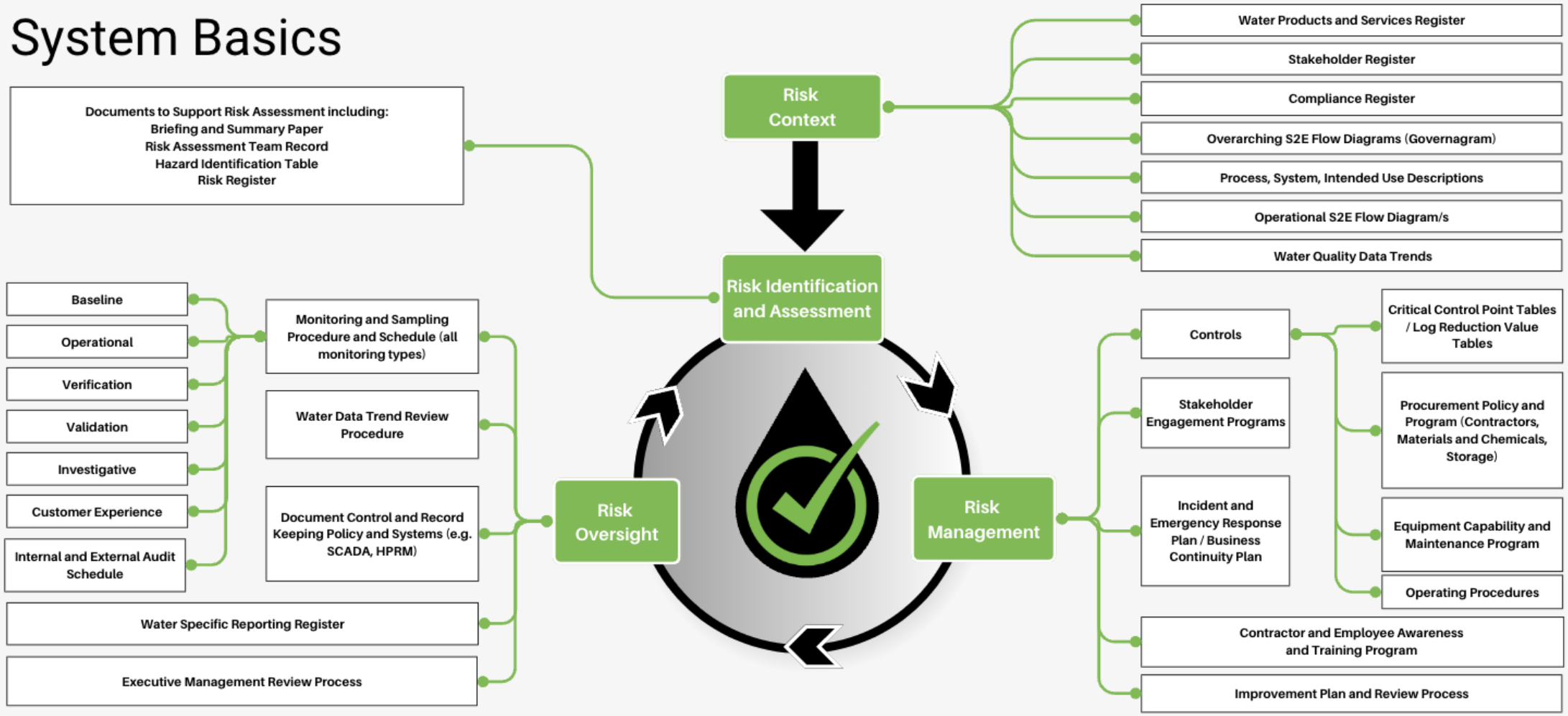
WHERE IS AUSTRALIA NOW?

Expected Practices

Water Management System Maturity Journey

Water31K™
System Basics



Risk Foundations

- Water Specific Risk Policy / Procedure
- Water Specific Policy / Statement
- Water Specific Risk Team Document and Links to Corporate Team Established Capex, Opex, Human Resources Budgeting Framework
- Water Risk Management Responsibilities Documented Position Descriptions with Water Risk Management Documented

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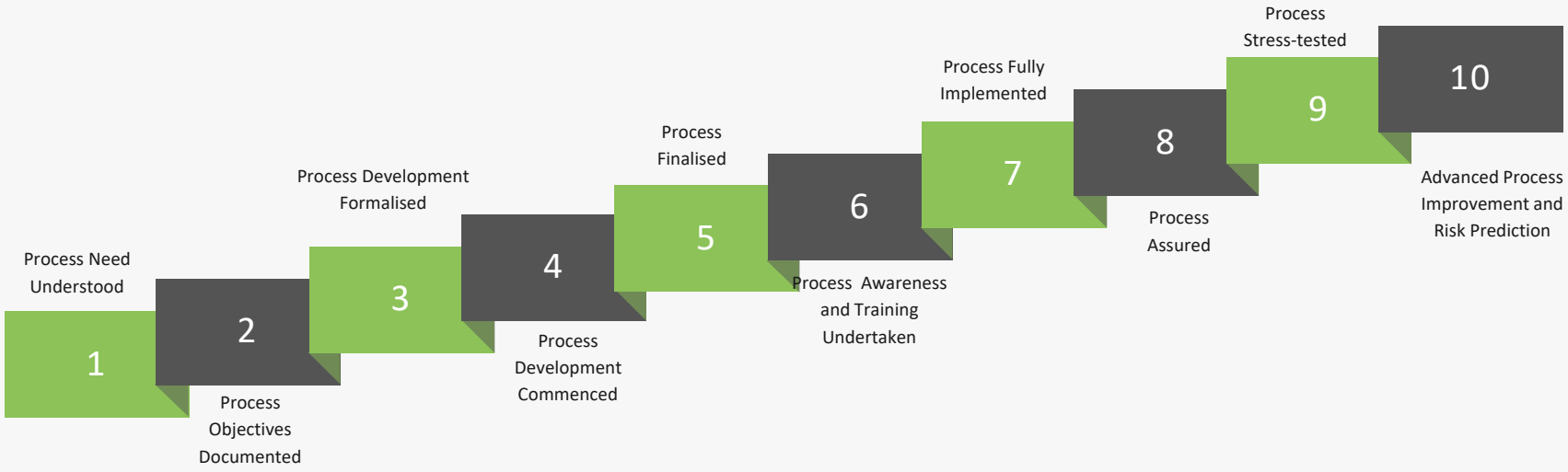
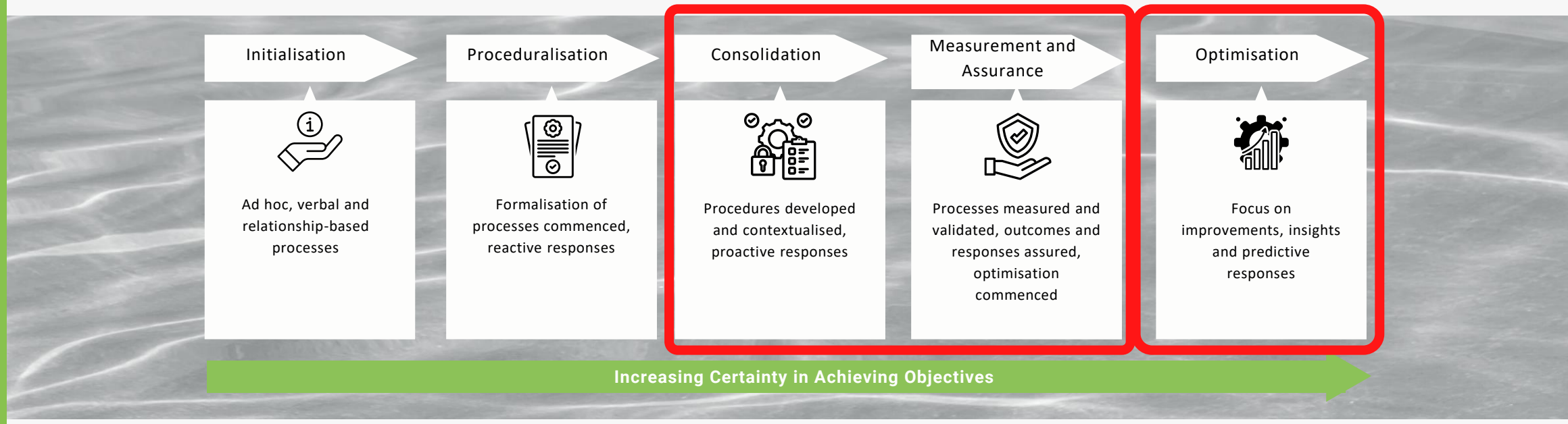
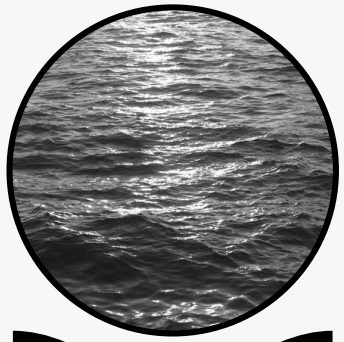
WMS Maturity Journey





Multiple Water Products



Source

Marine catchment.
Surface water catchment.
Sewer catchment.
Groundwater catchment.
Urban catchment.

Collection

Dam.
Lake.
Weir pool.
Aquifer.
Sewerage system.
Ocean.
Sea.
River.
Drainage system.

Transfer

Pipes.
Pumps.
Channelised systems.
Natural water courses.

Treatment

Various, depending on the quality/type of the source water and the end-use requirement.
Examples include engineered and nature-based solutions such as wetlands, filtration, disinfection.

Distribution

Large transfer mains.
Pumped and gravity-fed networks.
Distribution reservoirs.
Disinfection boosting (to maintain fitness for purpose).

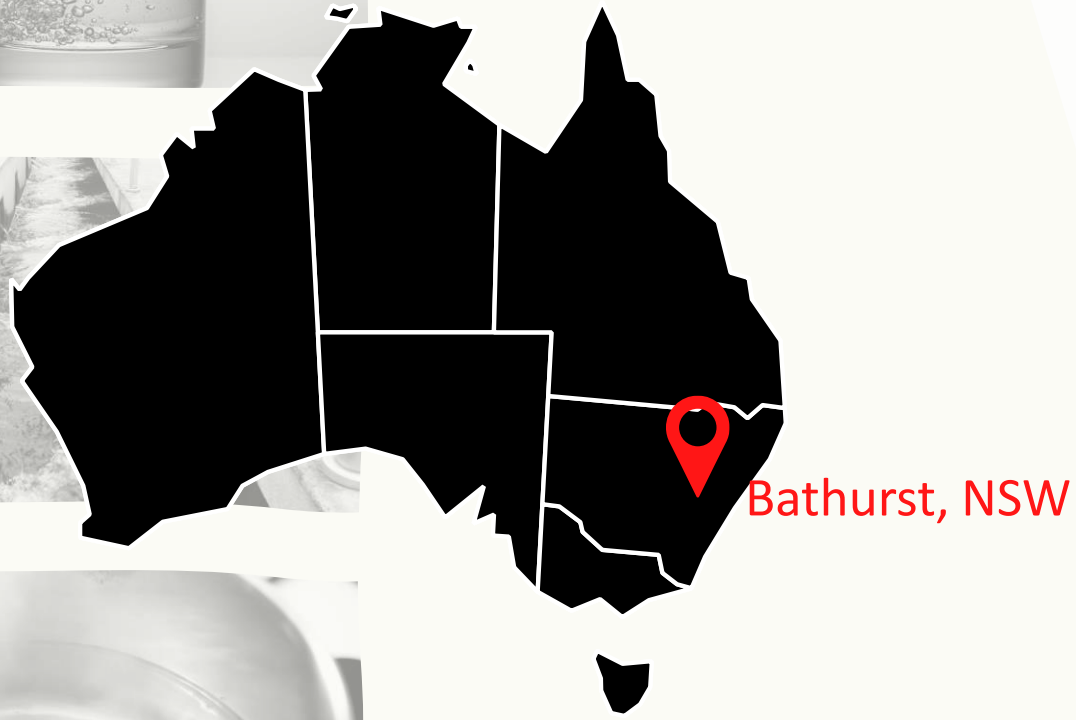
End Point

Meter and/or customer's tap or other handover point as agreed.
Standpipe.
Back to source.

CASE STUDY

Bathurst Regional Council

Context



Bathurst Regional Council is a local water utility, located in central NSW, Australia.

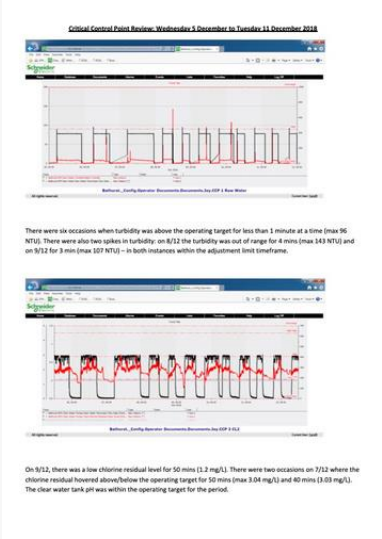
In 1886, Bathurst became the first regional town with a piped town-water supply.

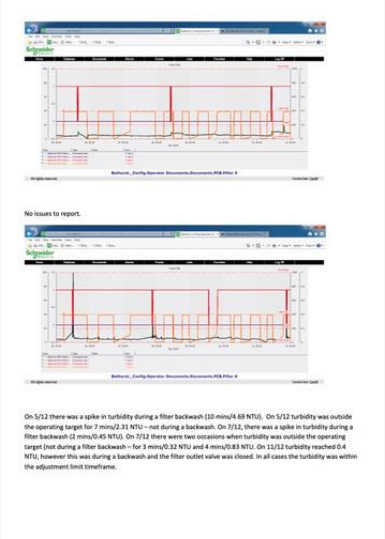
It provides a range of water products and services including drinking water and sewerage services, to approximately 43,000 residents.

Council operates under the Public Health Act 2010 (NSW).

In 2019, it embarked on a digital maturity journey.

CCP Oversight



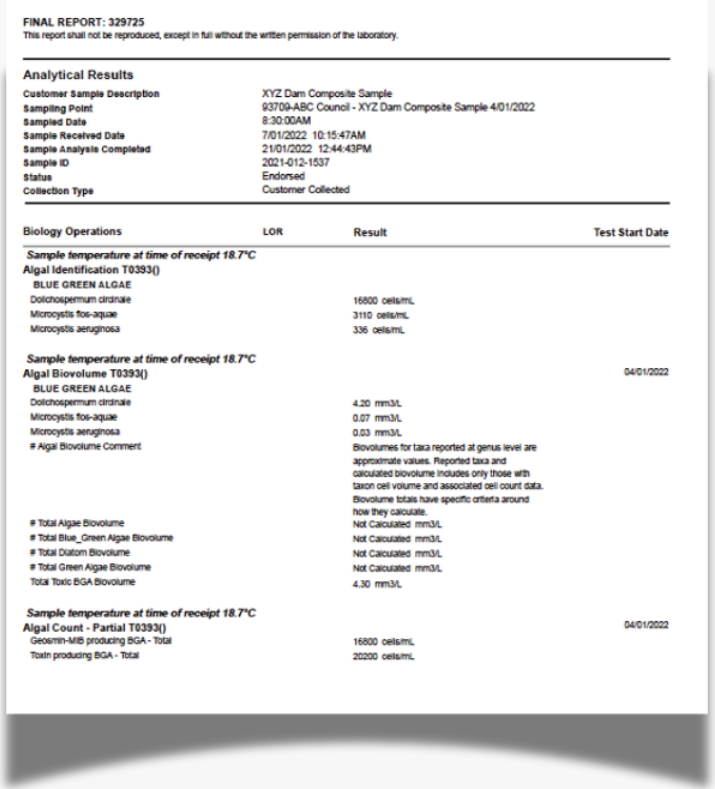


1 FTE, 1 day a week

Weekly report generated in seconds, a >99.9% efficiency increase

Acknowledgements to BRC and D2K Information

HAB Oversight



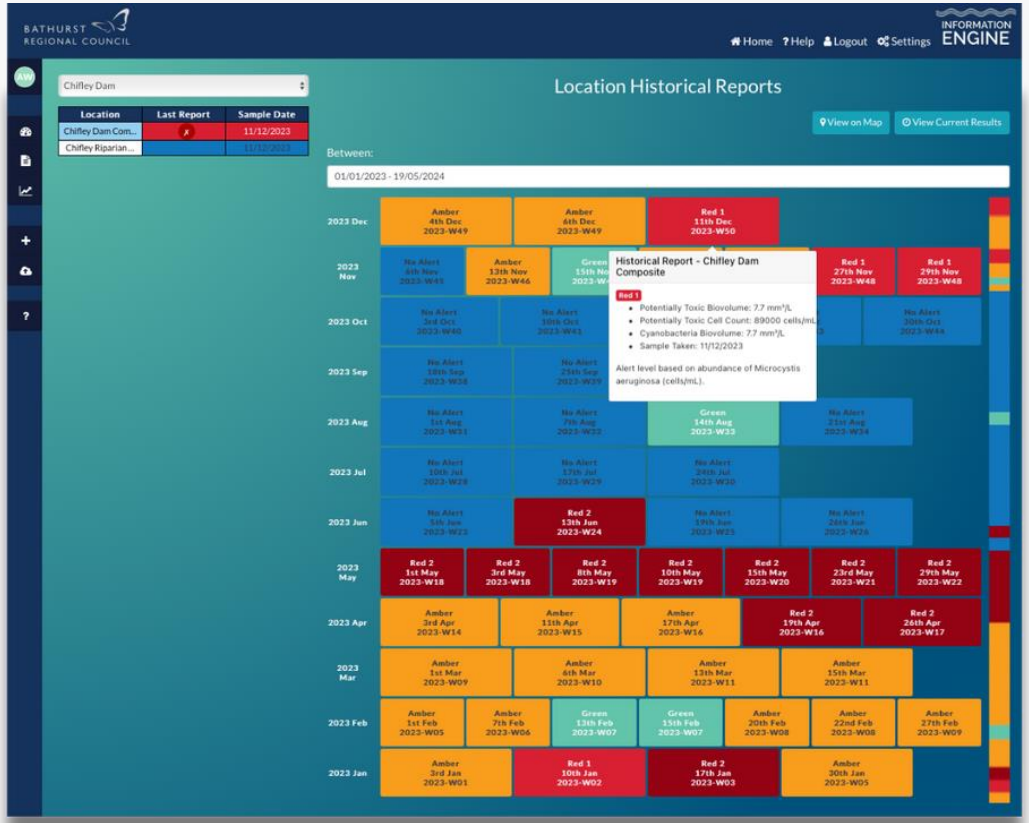
FINAL REPORT: 329725

This report shall not be reproduced, except in full without the written permission of the laboratory.

Analytical Results

Customer Sample Description	XYZ Dam Composite Sample
Sampling Point	93709-ABC Council - XYZ Dam Composite Sample 4/01/2022
Sampled Date	8:30:00AM
Sample Received Date	7/01/2022 10:15:47AM
Sample Analysis Completed	21/01/2022 12:44:43PM
Sample ID	2021-012-1537
Status	Endorsed
Collection Type	Customer Collected

Biology Operations	LOR	Result	Test Start Date
Sample temperature at time of receipt 18.7°C			
Algal Identification T0393()			
BLUE GREEN ALGAE			
Dolichospermum circinale		16800 cells/mL	
Microcystis flos-aquae		3110 cells/mL	
Microcystis aeruginosa		336 cells/mL	
Sample temperature at time of receipt 18.7°C			
Algal Biovolume T0393()			04/01/2022
BLUE GREEN ALGAE			
Dolichospermum circinale		4.20 mm3/L	
Microcystis flos-aquae		0.07 mm3/L	
Microcystis aeruginosa		0.03 mm3/L	
# Algal Biovolume Comment		Biovolumes for taxa reported at genus level are approximate values. Reported taxa and calculated biovolume includes only those with taxon cell volume and associated cell count data. Biovolume totals have specific criteria around how they calculate.	
# Total Algae Biovolume		Not Calculated mm3/L	
# Total Blue_Green Algae Biovolume		Not Calculated mm3/L	
# Total Diatom Biovolume		Not Calculated mm3/L	
# Total Green Algae Biovolume		Not Calculated mm3/L	
Total Toxic BGA Biovolume		4.30 mm3/L	
Sample temperature at time of receipt 18.7°C			
Algal Count - Partial T0393()			04/01/2022
Geosmin-MIB producing BGA - Total		16800 cells/mL	
Toxin producing BGA - Total		20200 cells/mL	



1 FTE, 0.25 day a week (depending on season and number of samples)

'No touch' of data once sample sent to lab, risk status automated with results in seconds, heat map automated

Acknowledgements to BRC and D2K Information

WRAP-UP

Summary of Key Takeaways

Key Point Summary

We have come a long way!

A risk management focus has really changed the way we provide water products and services

It’s important to understand context when water safety planning

We now have a leading and smart practice playbook for water products and services

Even smaller utilities can lead the way in moving long the water management system maturity journey

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Water Safety Plans in Uruguay

FROM RECOMMENDATION TO REQUIREMENT, TOWARDS UNIVERSALIZATION

ALEJANDRO IRIBURO

OBRAS SANITARIAS DEL ESTADO

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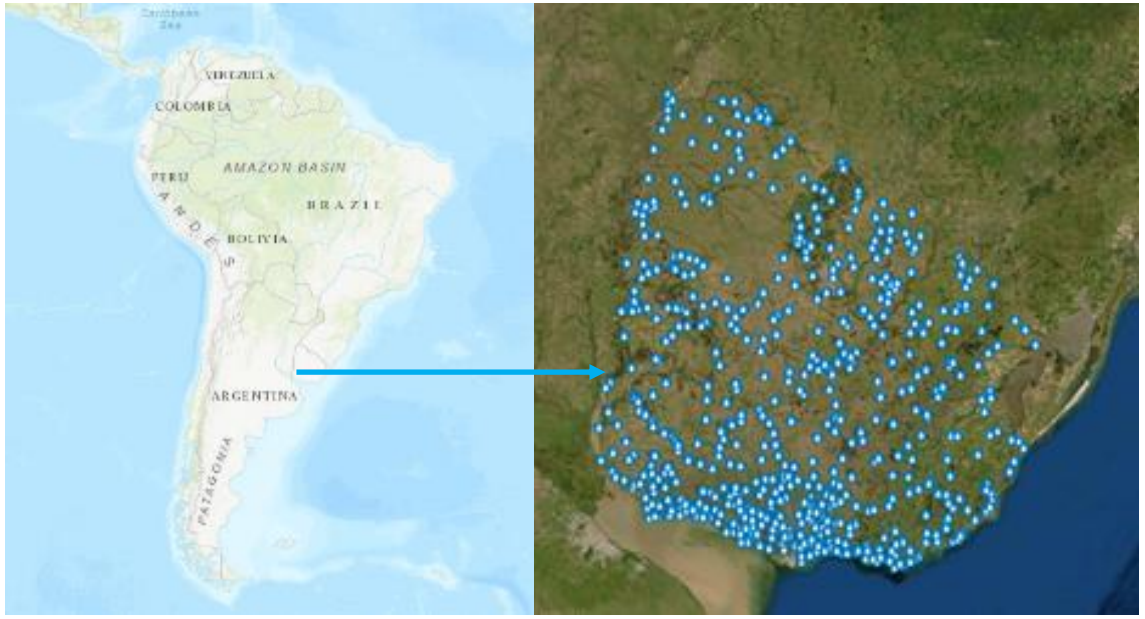
URUGUAY: GEOGRAPHY AND DRINKING WATER SUPPLY

- Located in South America, Uruguay covers an area of 176,220 km^2 and has a population of 3.44 million inhabitants, with 98% drinking water supply coverage.
- The supply is in charge of the Water and Sanitation utility OSE, which manages almost 570 water supply systems (WSS) of which 90% have less than 5,000 inhabitants and 50% have less than 100 inhabitants. Small systems include Rural Schools and Small Rural Towns.



Images: South América (left), Water Supply Systems managed by OSE (right), source GIS OSE.

WATER MANAGEMENT SCHEME

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The Executive Branch (PE) is the National Water authority. Has the power to formulate the National Water Policy

EXECUTIVE

Responsible for the regulation and control of the water and sanitation sector..

Responsible for proposing the National Water Policy. The administration, use and control of water resources through and the control of compliance with environmental protection standards (particularly water quality).

MINISTRY OF ENVIRONMENT

Ministry of Public Health

URSEA

Ministry of Livestock, Agriculture and Fisheries (MGAP)

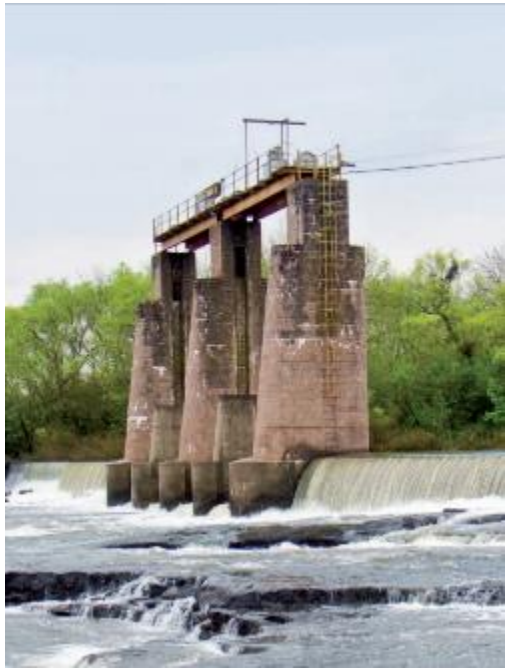
Responsible for establishing environmental health control standards. Attend and control the water supply throughout the country.

Responsible, among others, for approving plans for the use and management of soil and water in relation to agricultural activities

OSE

Departmental Governments

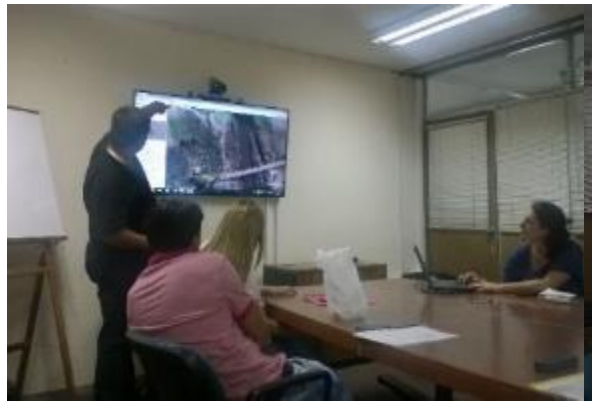
Responsible for providing the public drinking water service throughout the country and sanitation (with the exception of Montevideo)



1ST PHASE: LEARN, RAISE AWARENESS AND ENCOURAGE ADOPTION

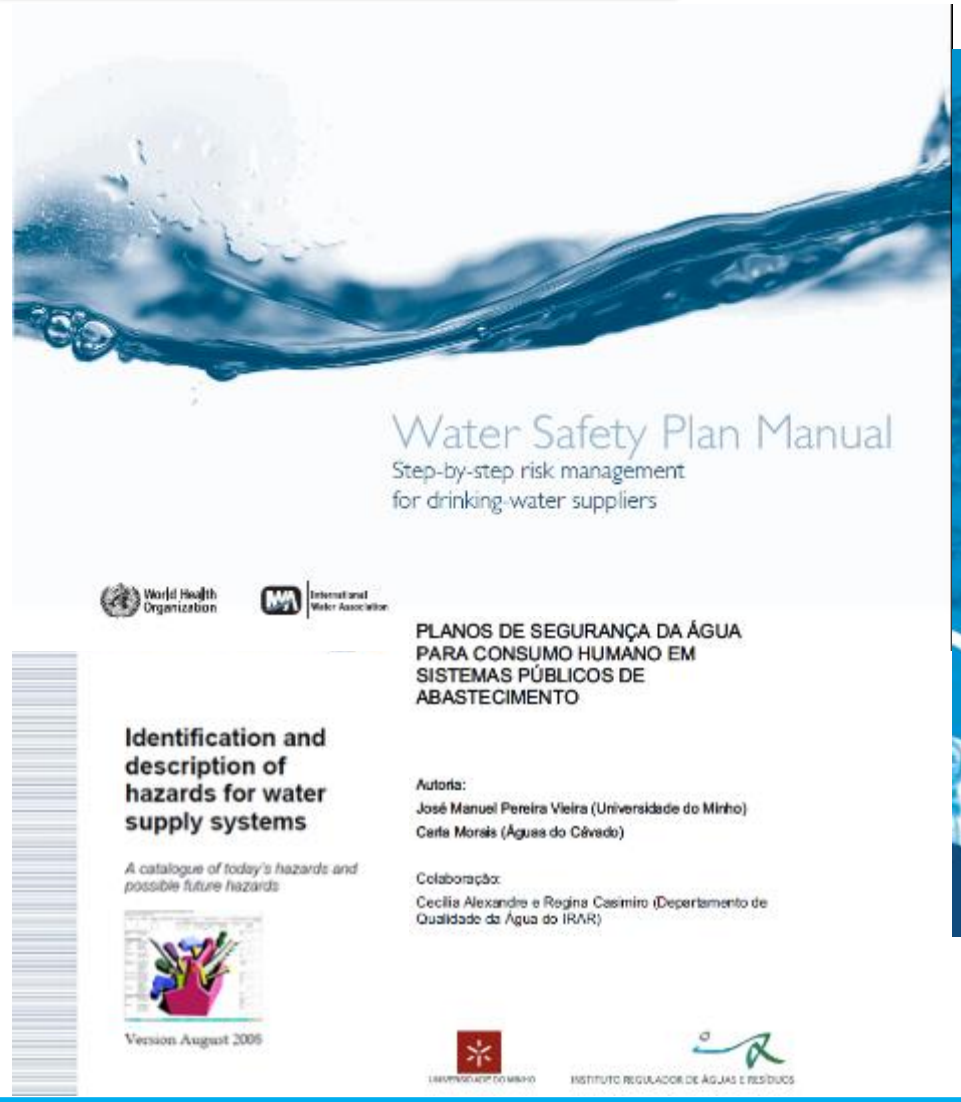
2006 - 2011

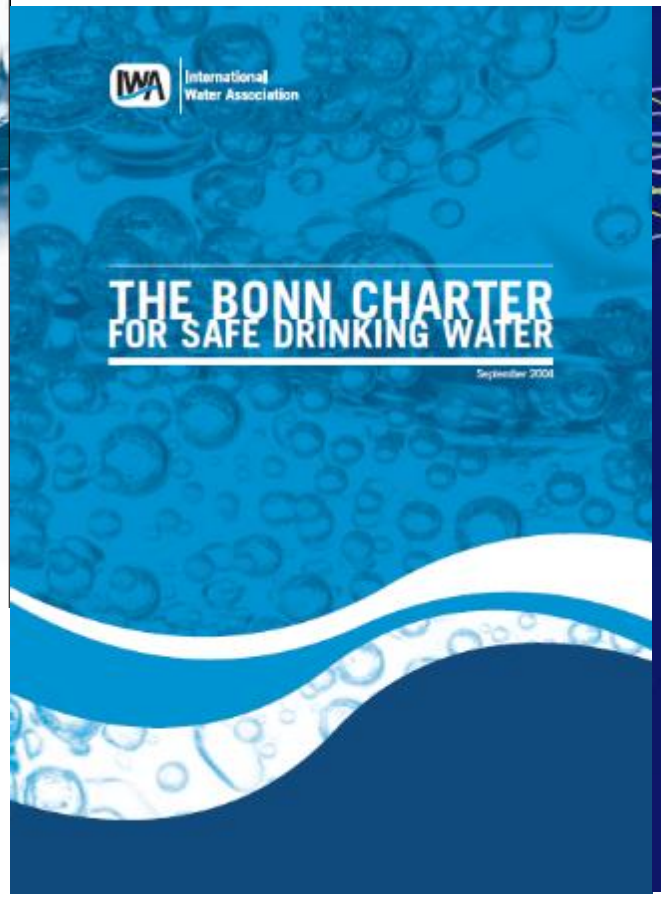
- The first phase focused in learn, raise awareness and encourage adoption of the WSP approach (2006-2011) including the study of the WHO and IWA documents as well as technical publications written by experts, companies and associations, progress was also made in the training of staff in HACCP (as a theoretical basis) and ISO 9001 in addition to certifying a water treatment plant with the aforementioned ISO management system.

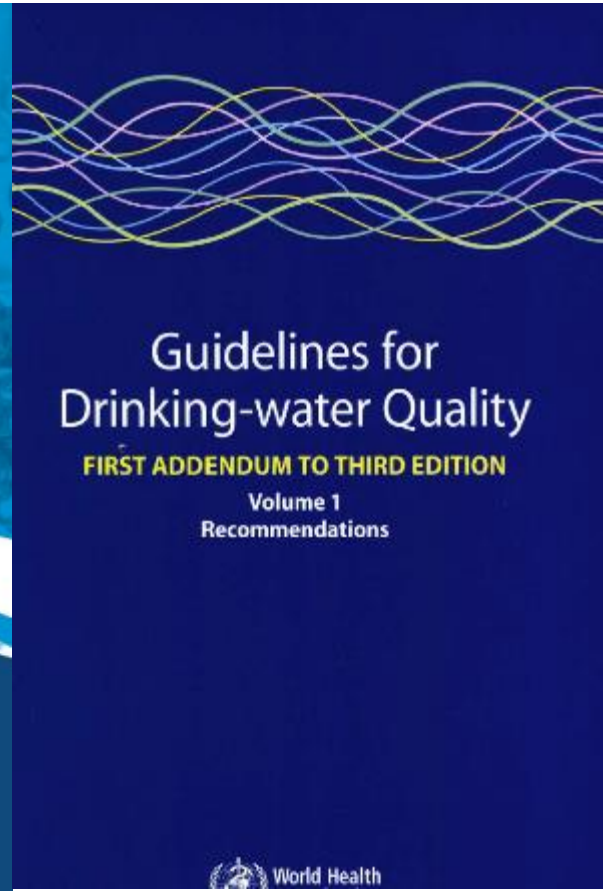


1ST PHASE: LEARN, RAISE AWARENESS AND ENCOURAGE ADOPTION

2006 - 2011







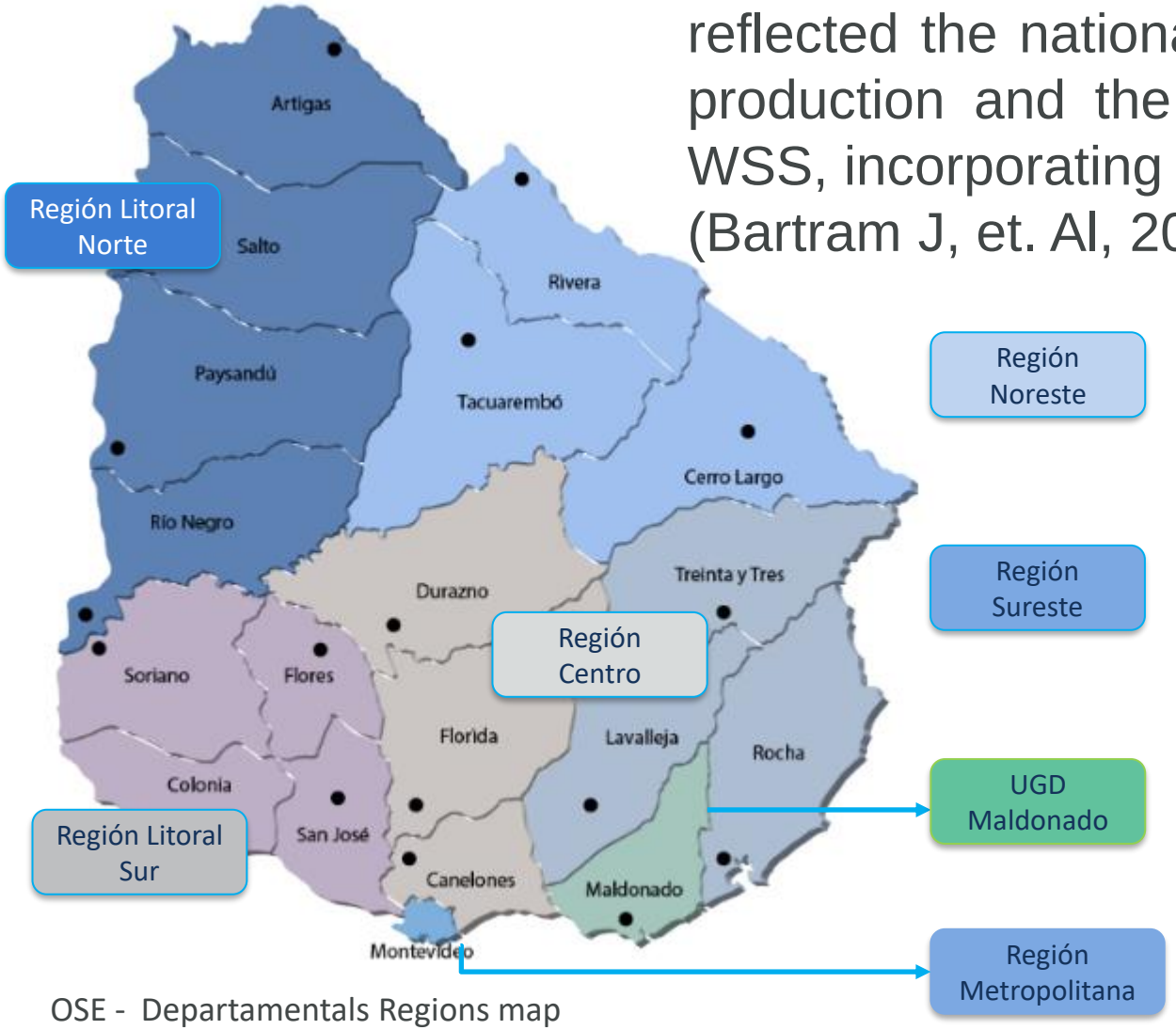
2ND PHASE: VOLUNTARY IMPLEMENTATION OF WSP

2012 - 2017

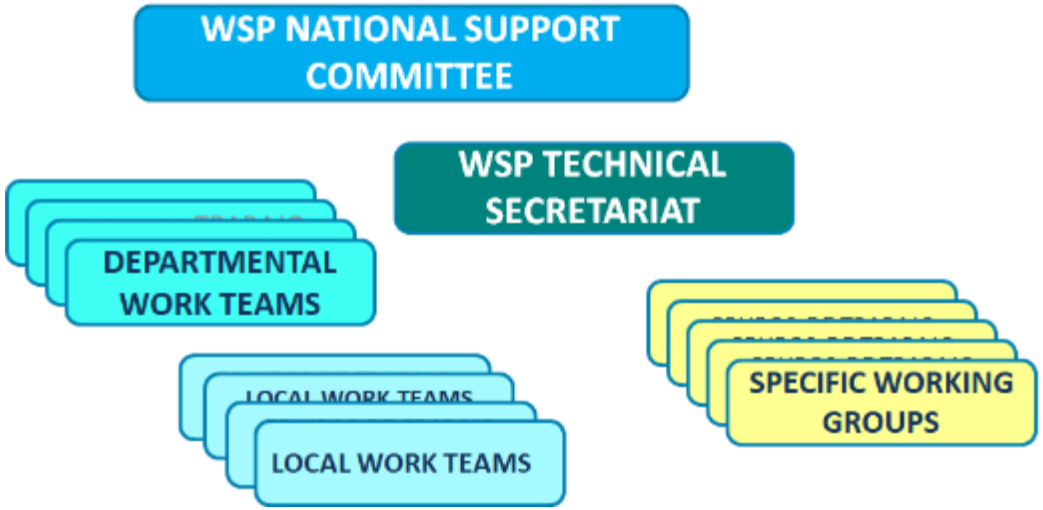
- The second phase of voluntary implementation of WSP started in 2012 through workshops that included, in addition to the work of local technicians, the participation of specialists with experience in the development of applied methodologies and implementation of WSP in Portugal.

STRUCTURE ADOPTED FOR THE DEVELOPMENT OF WSP

It was defined an organizational structure that reflected the national scale of OSE, its decentralized production and the existence of a large number of WSS, incorporating the model suggested by the WHO (Bartram J, et. Al, 2009) for a large utility.



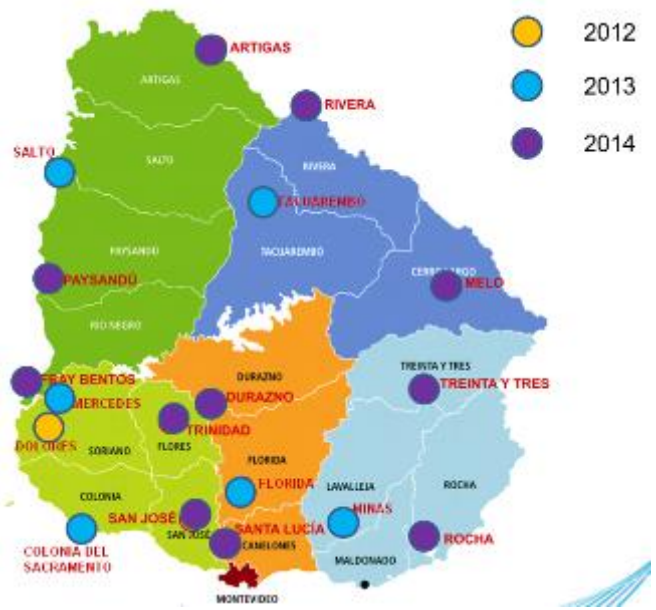
OSE - Departamentals Regions map



WSP Structure in OSE

2ND PHASE: VOLUNTARY IMPLEMENTATION OF WSP

2012 - 2017



PROGRAMA 02:PROGRAMA AGUA PAR USO HUMANO
PROYECTO P02/3:PLANES DE SEGURIDAD DE AGUA

RESPONSABLES: OSE. Actores clave: URSEA, MVOTMA. Intervienen SINAE, CECOED, C.C.A., actores locales
METAS Año 3: Aplicación de Planes de Seguridad de Agua en 15 sistemas nuevos, totalizando 22 sistemas. Años 8: Aplicación de Planes de Seguridad de Agua en 30 sistemas nuevos, totalizando 52 sistemas.
AÑO DE INICIO: Iniciado
DURACIÓN: Largo plazo

3RD PHASE: MANDATORY IMPLEMENTATION OF WSP

2018 - 2024

- Mandatory implementation phase started in 2018, when the Uruguayan regulator for energy and water services promulgated a regulation intended to ensure a strategy that supports and promotes the WSP implementation and auditing in all drinking water supply systems by 2030, considering the interim target for the implementation of WSP in 60% of water systems by 2025.

URSEA
Unidad Reguladora de Servicios de Energía y Agua

PRESIDENCIA
República Oriental del Uruguay

Montevideo-Uruguay

Marzo 2018

REGLAMENTO DE PLANES DE SEGURIDAD DEL AGUA

SUPPORTING PROGRAMMES

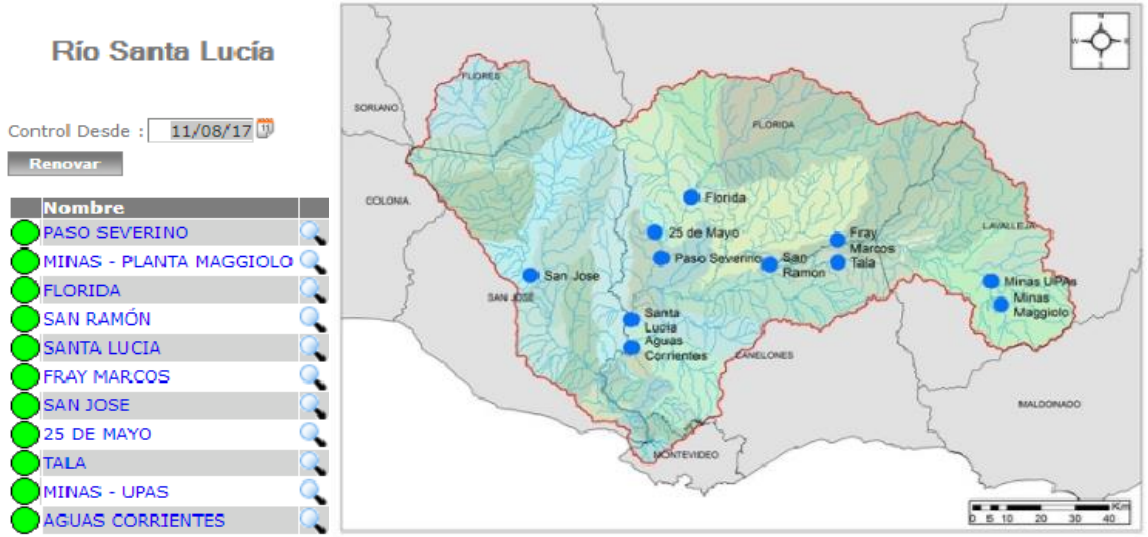
MANAGEMENT OF WSP DOCUMENTATION AND DATA COMPUTER APPLICATIONS

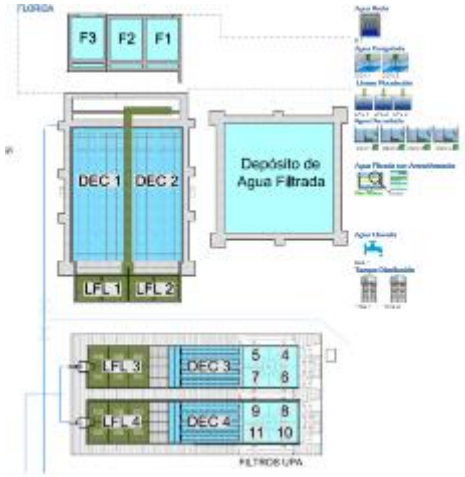
- “Ad hoc” computer applications were developed by the OSE Information Technology Management and staff was trained in their use; they enabled the management of operational data associated with the Source, Treatment and Distribution components, complementing and integrating the applications already active allowing, among other things, an early warning of water quality changes in sources.

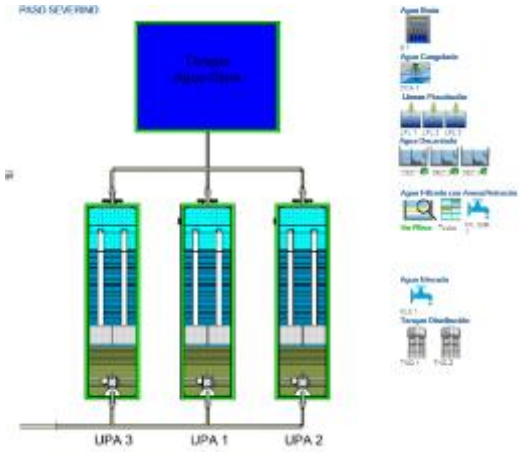
Surface Source Water Treatment Plants
Background image: Google Earth

SUPPORTING PROGRAMMES

MANAGEMENT OF WSP DOCUMENTATION AND DATA COMPUTER APPLICATIONS







Referencias

- El sistema se encuentra sin configurar
- No hay datos en el período de tiempo seleccionado y la planta esta apagada
- Hay datos en el período de tiempo seleccionado con alguna anomalía (*)
- No hay datos en el período de tiempo seleccionado y la planta se encuentra encendida
- Hay datos en el período de tiempo seleccionado y no presentan ninguna anomalía (*)

(*) Anomalía
- ph mayor a 8
- Olor del agua bruta "No característico"
- Color de membrana de agua bruta con algún tono de verde (Marrón Verdoso, Verde Claro, Verde Fluorescente, Verde Azulado)

SUPPORTING PROGRAMMES

TRAINING ON WATER SAFETY PLANNING

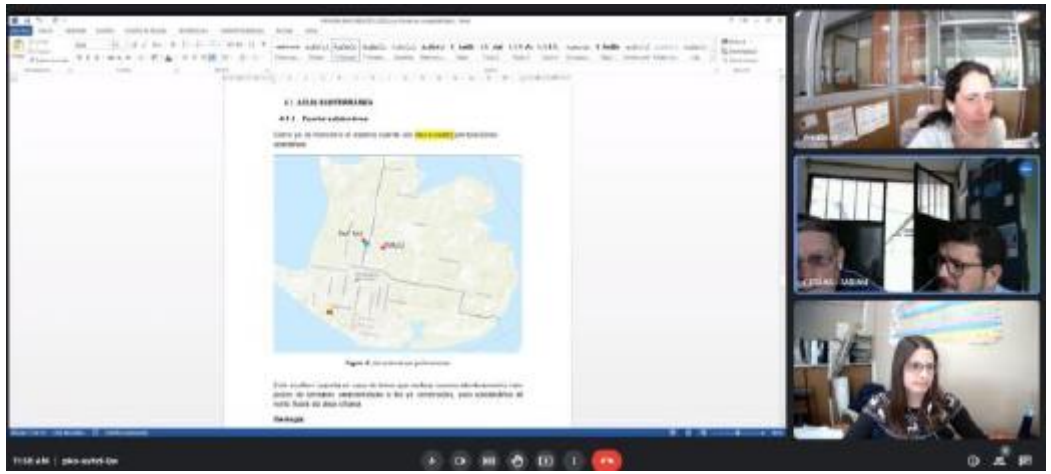
- A training program was established with courses on the WSP methodology since 2015 with an average of two editions per year, more than 120 participants have been trained.

SUPPORTING PROGRAMMES
TRAINING ON WATER SAFETY PLANNING

- Workshops and in-person and virtual meetings were held (established after the COVID19 pandemic) promoted by the Technical Secretariat with the Local work teams, deepening the role of each one of the actors and their responsibility in the sustainability of the program.
- An annual meeting of water production supervisors.

CONFERENCE PLATFORMS MEETINGS

- Learning and adaptation to the use of virtual meeting platforms by the company's staff has made it possible to intensify the frequency of meetings between the Technical Secretariat and the local work teams and move forward in an agile manner to be able to comply with the schedule of WSP implementation established by the Regulator.



Virtual Meeting, Technical Secretariat and Local Team, preparation of WSP San Gregorio de Polanco

PREPARATION OF GENERAL; LOCAL DOCUMENTS AND SHARED REPOSITORY

the international water association

AGR - Aplicación de Gestión de Recursos — Bienvenido, ALEJANDRO IRIBURO

▼ Interfaz con AGR

- Loc V6 - AGR - Asociación V2
- RANC - AGR - Asociacion V2
- PPLER - AGR - Asociacion V2
- SDF - AGR - Asociacion V2
- SPA - AGR - Asociacion V2
- INE - Población por Localidad
- INE - AGR - Asociacion V2
- SGC - Conexiones
- SGC - AGR - Asociacion V2
- SGC-AGR-O3 - Conexiones Faltantes
- SGC-AGR-O3 - Conexiones Faltantes

Documentación

Ordenado por: Nombre Archivo
Nombre Archivo:
Categoría: Planes de Seguridad de Agua
Sub Categoría: Documentos Generales

Archivo	Categoría	Sub Categoría	Nombre	Código del Documento	Versión del Documento	Fecha de Aprobado
	Planes de Seguridad de Agua	Documentos Generales	DOCG.PSA.01 Ficha de Gestión V02	DOCG.PSA.01	02	27/08/2021
	Planes de Seguridad de Agua	Documentos Generales	DOCG.PSA.03 PSA Sistemas chicos	DOCG.PSA.03	01	16/12/2019
	Planes de Seguridad de Agua	Documentos Generales	DOCG.PSA.04 Planes de Contingencia_Estrategias para su formulación	DOCG.PSA.04	01	20/01/2020
	Planes de Seguridad de Agua	Documentos Generales	DOCG.PSA.06 Revisión mensual del PSA V02	DOCG.PSA.06	02	27/08/2021
	Planes de Seguridad de Agua	Documentos Generales	Matriz de Riesgos GENERAL con fichas			/ /
	Planes de Seguridad de Agua	Documentos Generales	MNG.PSA.01 Manual para la elaboración de PSA V03	MNG.PSA.01	03	07/09/2021
	Planes de	Documentos				

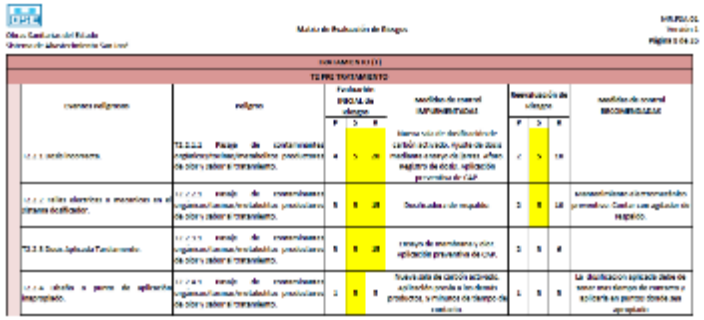
MANUAL PARA LA ELABORACIÓN DE PLANES DE SEGURIDAD DE AGUA

Obras Sanitarias del Estado
Sistema de Abastecimiento San José

Ficha de Gestión
Cuenca

REG.PSA.01
Versión 01
Página 1 de 1

F1 AGUA BRUTA	F1.1 AGUA SUPERFICIAL
EVENTOS PELIGROSOS	
F.1.1.1 Escorrentías provenientes de materiales almacenados o derrames accidentales. F.1.1.8 Emisiones y derrames accidentales (incendios, explosiones, accidentes de tráfico). F.1.1.12 Derrames de aguas residuales crudas por lluvias o fallas en el sistema de recolección o de tratamiento.	
PELIGROS	
Sustancias químicas en concentraciones que resulten peligrosas. Presencia de microorganismos patógenos, parásitos y/o que afecten las características organolépticas, toxinas. Aporte de materia otgánica y nutrientes.	



Obras Sanitarias del Estado

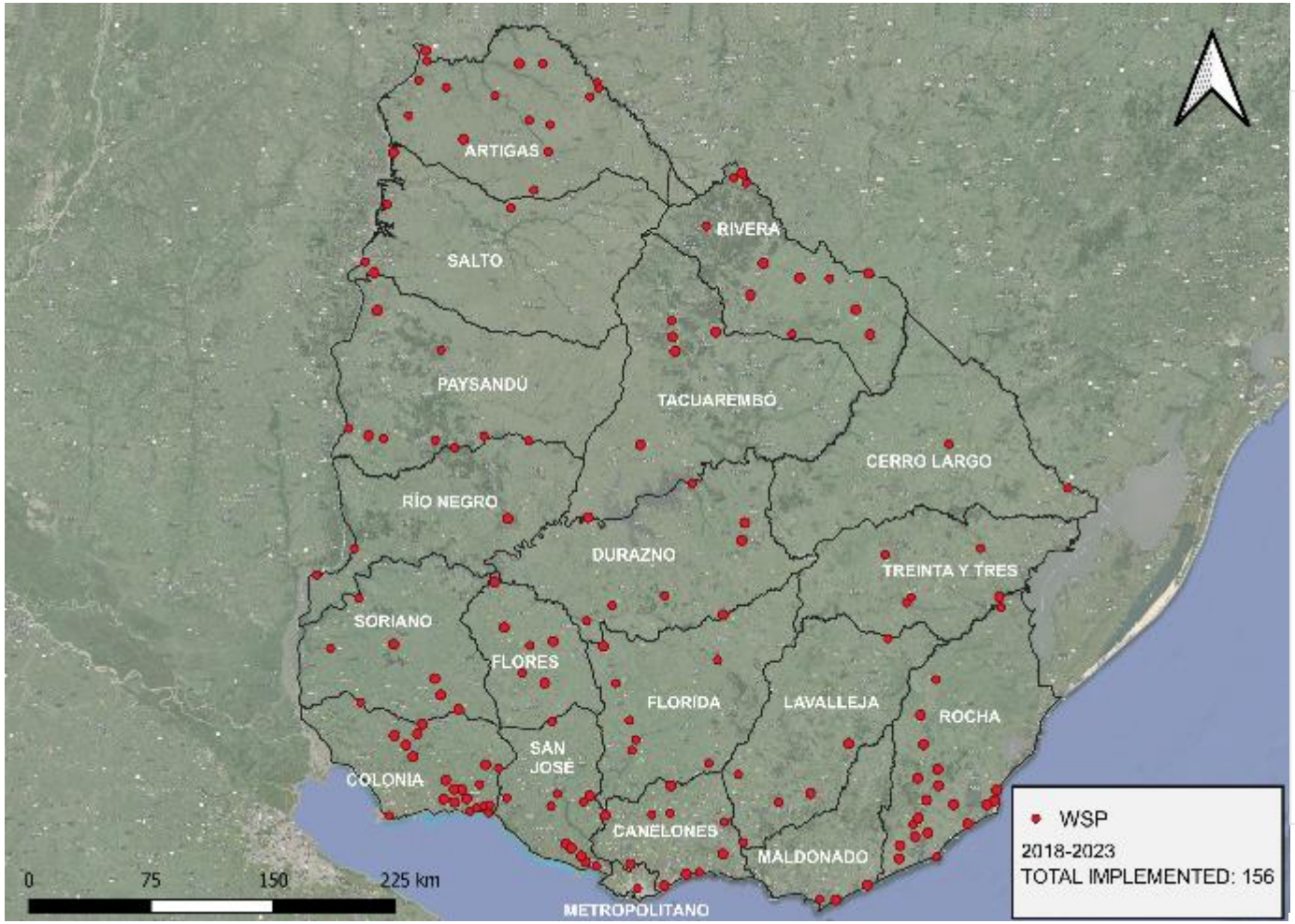
PLAN DE SEGURIDAD DE AGUA

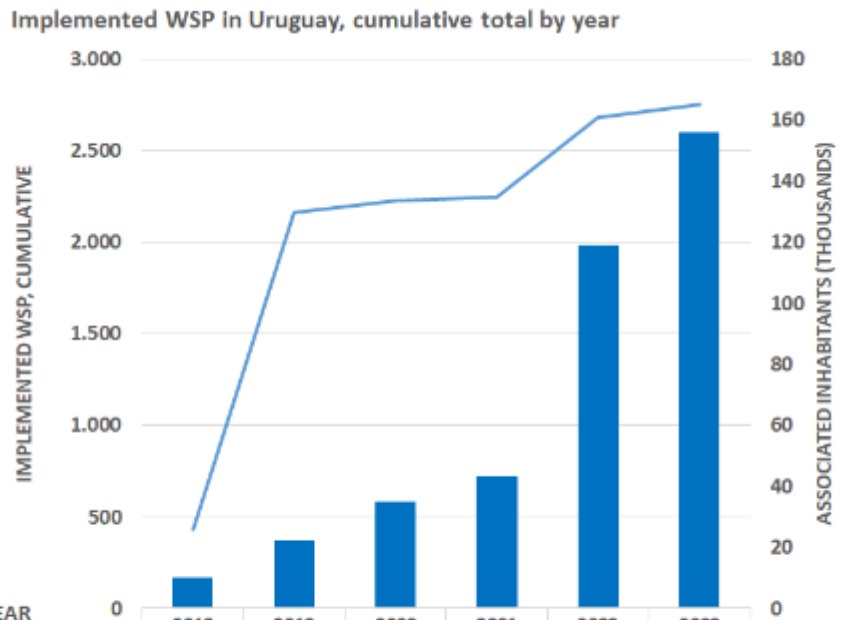
SISTEMA DE ABASTECIMIENTO SAN JOSÉ

Octubre 2018

RESULTS OBTAINED

WSP IMPLEMENTED IN URUGUAY PER YEAR FROM 2018 TO 2023

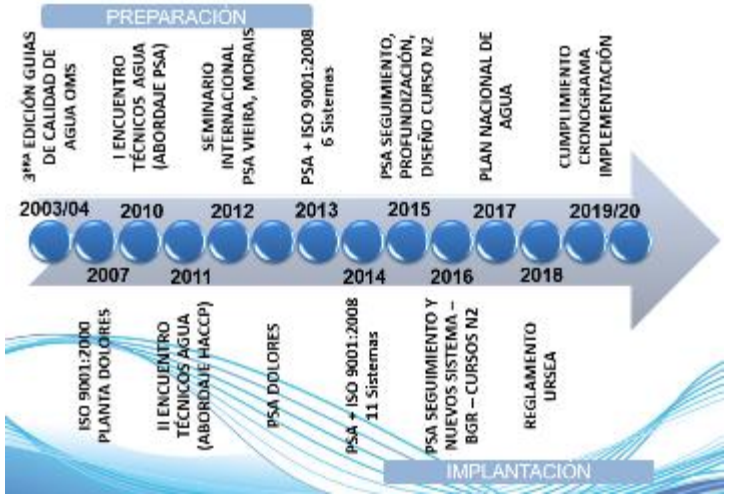




YEAR	2018	2019	2020	2021	2022	2023
IMPLEMENTED WSP, CUMULATIVE	10	22	35	43	119	156
ASSOCIATED INHABITANTS (THOUSANDS)	434	2.160	2.227	2.249	2.684	2.751

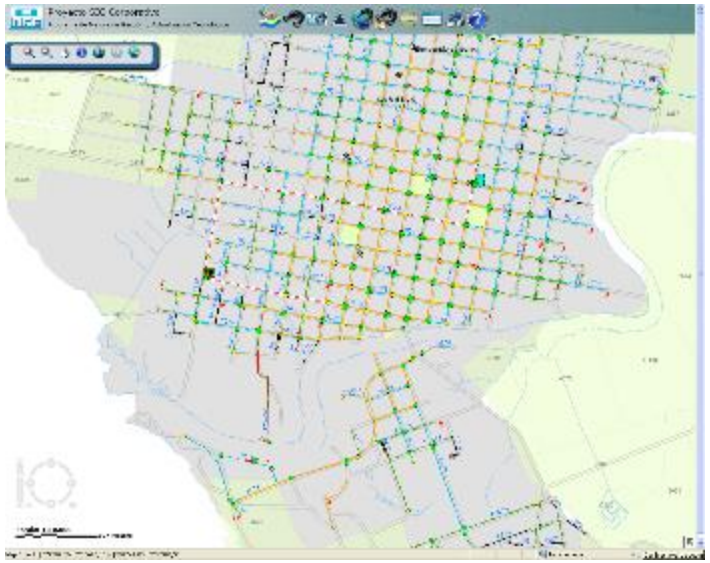
CONCLUSIONS

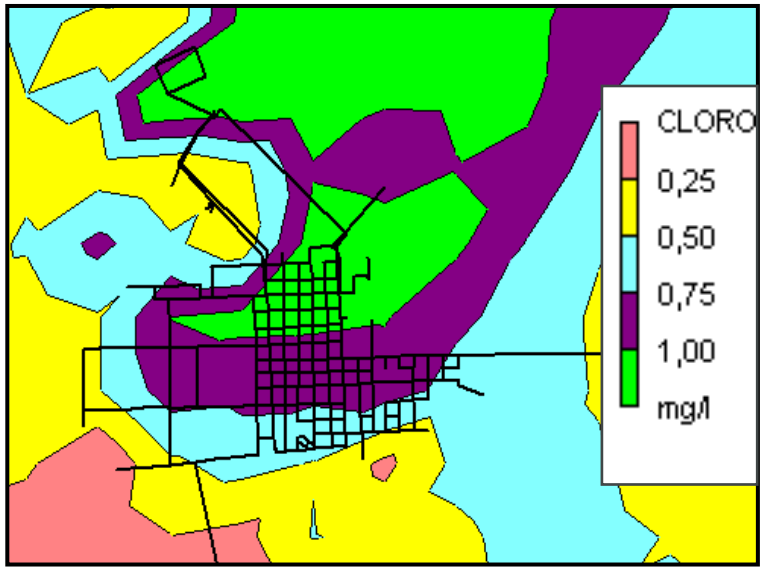
- The previous path taken by OSE with its first WSP pilot and its subsequent dissemination was key to meeting the initial goals set out by URSEA. Regulation of WSP approval by URSEA contributed to giving greater visibility to the WSP within OSE, fundamentally in the areas that are not directly involved with the operation of the purification process, valuing the WSPs in the management of the company.



CONCLUSIONS

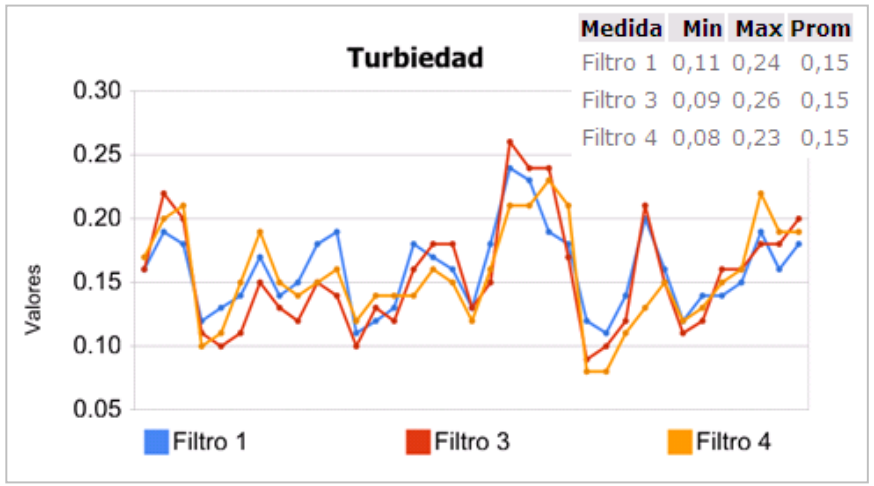
- Work of local and departmental work teams, that include personnel from the technical sector, commercial operations and regional laboratories, favors better synergy between related processes and promotes more efficient management.





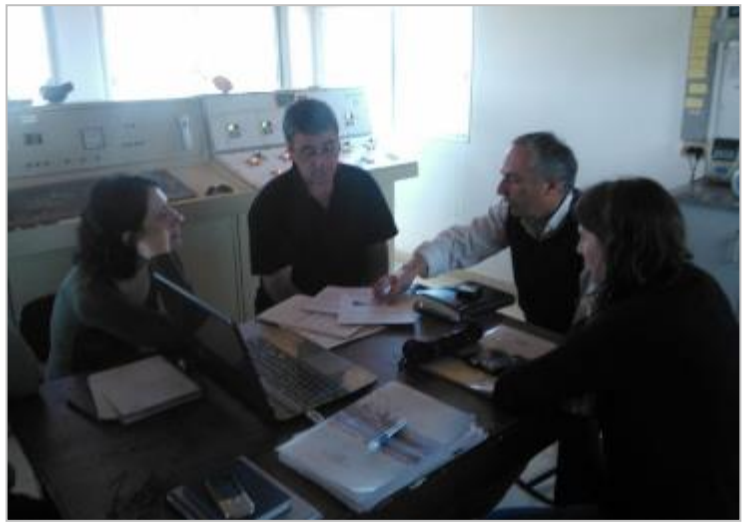
CONCLUSIONS

- Management of the results of operational monitoring constitutes an important challenge. In that sense the maintenance of the computer tools developed by the company, the management of the online equipment and the transmission of the results obtained, as well as the continuous training and motivation of staff, are keys to the sustainability of WSP.



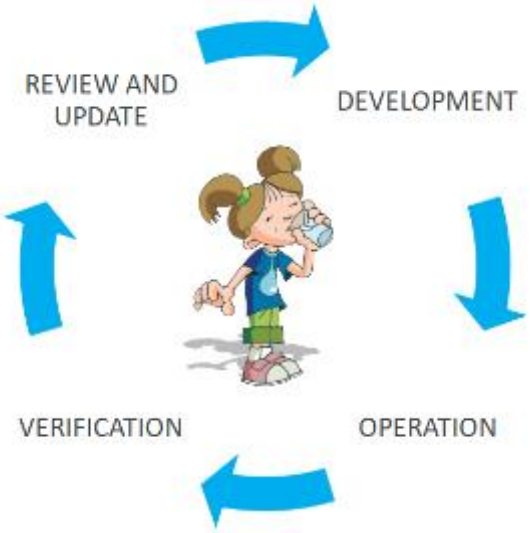
CONCLUSIONS

- Through the OSE Internal Audit program and the URSEA External Audits, it has been possible to detect opportunities for improvement in the WSPs already implemented, as well as in the documentation of general application.



KEEP MOVING FORWARD

WATER SAFETY PLANNING IN ACTION



6 CLEAN WATER AND SANITATION

SUSTAINABLE DEVELOPMENT GOALS 2015–2030

Goal 6: Ensure the availability and sustainable management of water and sanitation for all.

Target 6.1: By 2030, achieve universal and equitable access to safe and affordable drinking-water for all.

Priority indicator: Percentage of population using safely managed drinking-water services.

GOAL: UNIVERSALIZATION OF WSP IN URUGUAY 2030

THANK YOU!

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Advancing Water Safety Planning Global Practices & Challenges

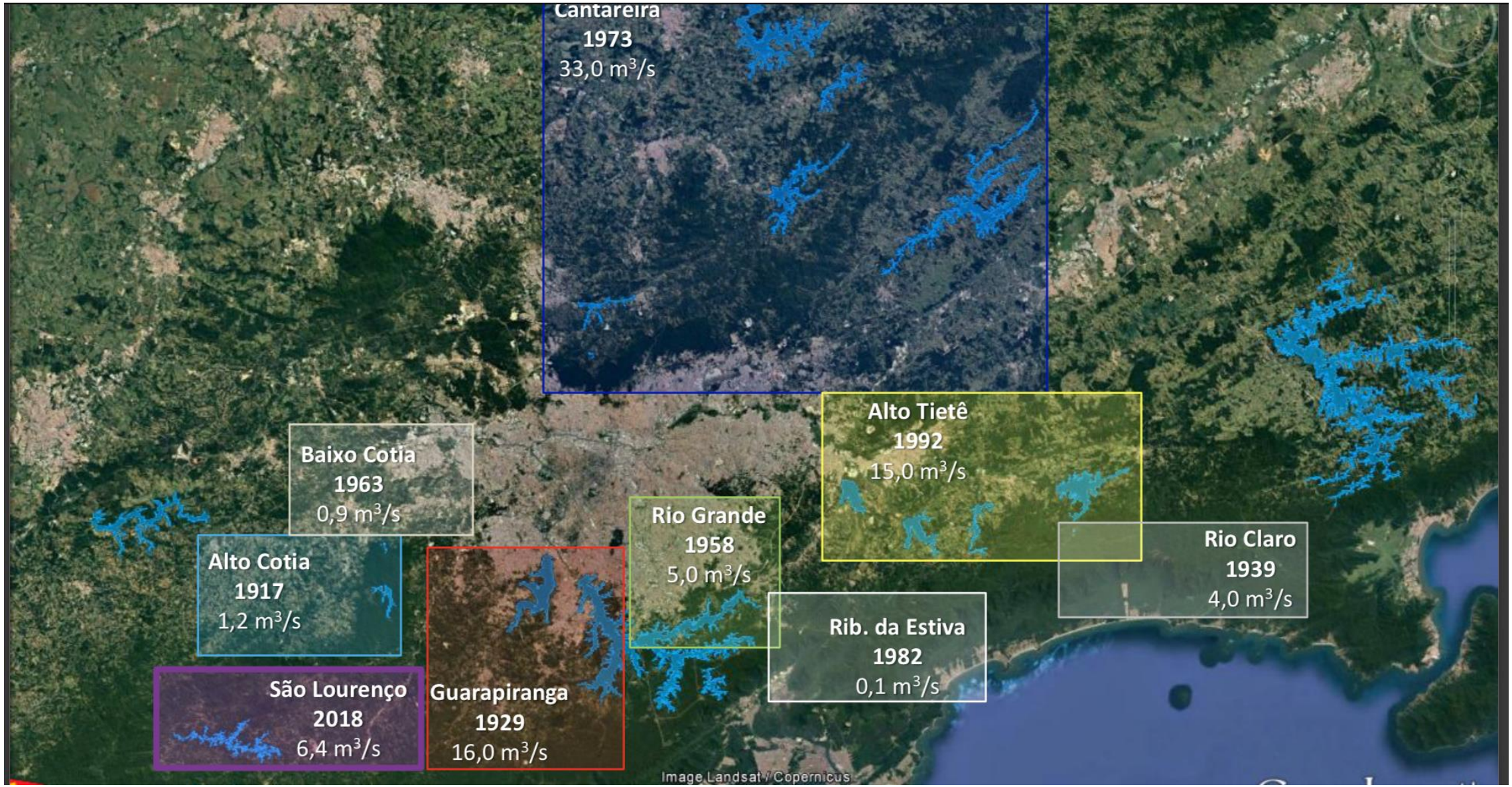
MARA RAMOS

DAEE

inspiring change

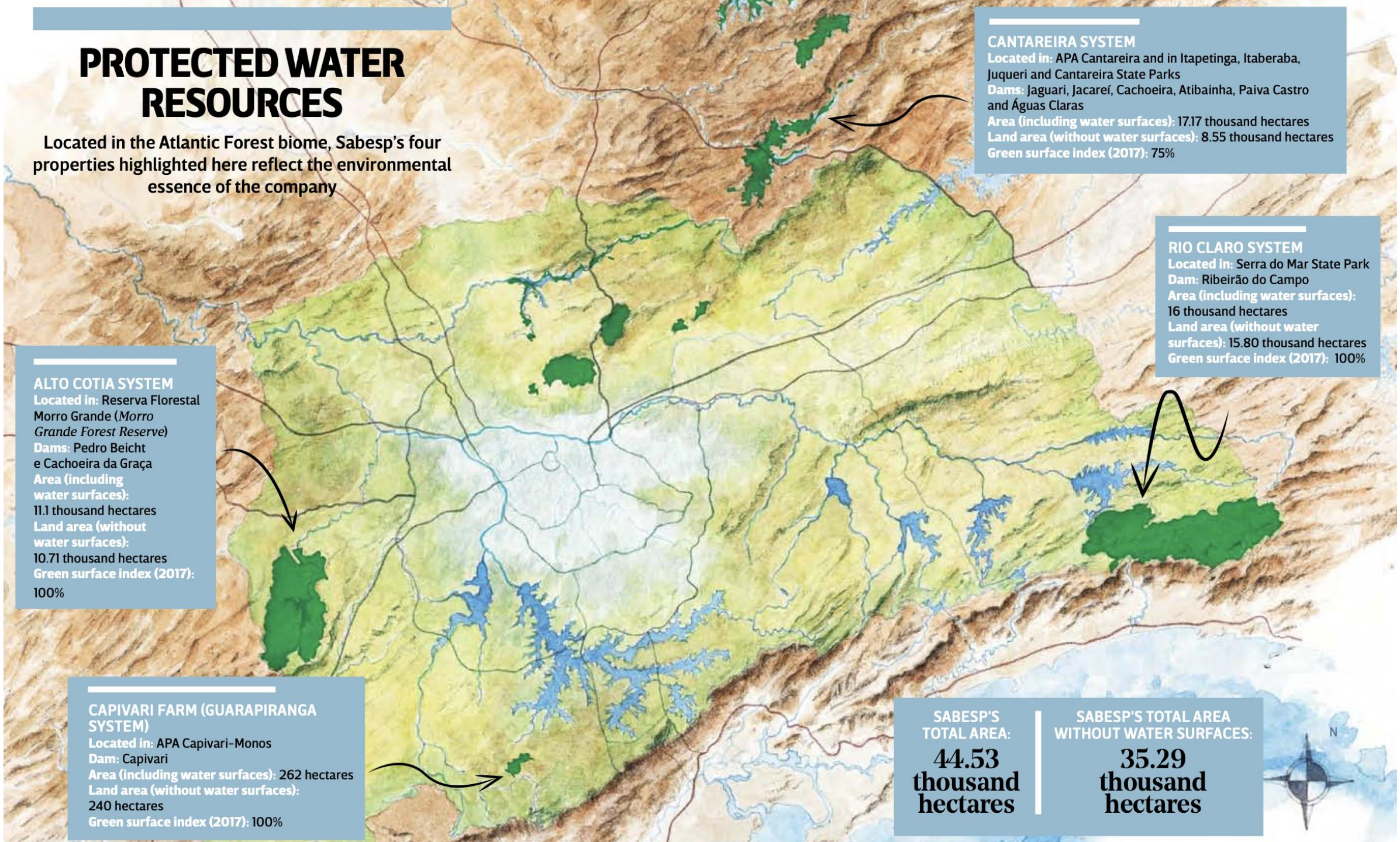
São Paulo State	177,4	inhab./km²
Metropolitan Region	2.714,45	inhab./km²

São Paulo Metropolitan Region – Main Water Supply Systems



PROTECTED WATER RESOURCES

Located in the Atlantic Forest biome, Sabesp's four properties highlighted here reflect the environmental essence of the company



CANTAREIRA SYSTEM

Located in: APA Cantareira and in Itapetinga, Itaberaba, Juqueri and Cantareira State Parks
Dams: Jaguari, Jacareí, Cachoeira, Atibainha, Paiva Castro and Águas Claras
Area (including water surfaces): 17.17 thousand hectares
Land area (without water surfaces): 8.55 thousand hectares
Green surface index (2017): 75%

RIO CLARO SYSTEM

Located in: Serra do Mar State Park
Dam: Ribeirão do Campo
Area (including water surfaces): 16 thousand hectares
Land area (without water surfaces): 15.80 thousand hectares
Green surface index (2017): 100%

ALTO COTIA SYSTEM

Located in: Reserva Florestal Morro Grande (*Morro Grande Forest Reserve*)
Dams: Pedro Beicht e Cachoeira da Graça
Area (including water surfaces): 11.1 thousand hectares
Land area (without water surfaces): 10.71 thousand hectares
Green surface index (2017): 100%

CAPIVARI FARM (GUARAPIRANGA SYSTEM)

Located in: APA Capivari-Monos
Dam: Capivari
Area (including water surfaces): 262 hectares
Land area (without water surfaces): 240 hectares
Green surface index (2017): 100%

SABESP'S TOTAL AREA: 44.53 thousand hectares

SABESP'S TOTAL AREA WITHOUT WATER SURFACES: 35.29 thousand hectares

Protected Water Sources

Vulnerable Water Sources

Regulatory Agenda – São Paulo State

Eixo Temático	Tema	Item	Previsão
1- Regulação de Uso de Recursos Hídricos	Atualização, simplificação e consolidação dos normativos relativos à regulação de usos e inferências.	1.1	**2024**
		1.2	**2024**
		1.3	**2024**
		1.4	**2024**
2- Segurança de Barragem	Atualização, simplificação e consolidação dos normativos relativos à fiscalização de uso de recursos hídricos e de segurança de barragem.	2.1	**2024**
3- Fiscalização	Atualização, simplificação e consolidação dos normativos relativos à fiscalização de uso de recursos hídricos e de segurança de barragem.	3.1	**2024**
		3.2	**2024**
4- Regras para operação dos Reservatórios e Estruturas.	Definição das condições de operação de sistemas hídricos prioritários	4.1	**2024**
		4.2	**2024**
		4.3	**2025**
5- Planejamento e Informação de Recursos Hídricos	Delimitação de áreas de Especial Interesse para a Gestão de Recursos Hídricos	5.1	**2025**
		5.2	**2025**
6- Monitoramento Hidrológico	Aprimoramento da Sala de Situação	6.1	**2024**

the international water association

Q&A Discussion

MODERATOR: PHILIP DE SOUZA

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https://watersafety2024.org

6th International Conference for Water Safety

4-6 September, 2024 | Montevideo, Uruguay.

Welcome

We are thrilled to announce the 6th International Conference for Water Safety, a collaboration between the International Water Association (IWA), Obras Sanitarias del Estado (OSE), Facultad de Ingeniería, Universidad de la República (FING) and its Fundación Julio Ricaldoni (FJR) in Uruguay. The conference will take place from 4-6 September, 2024 in the vibrant city of Montevideo, Uruguay.

Continue reading

Abstract submission

Deadline on 1 May, 2024

Submit

Registration

Opens on 18 March, 2024

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