

SEASONAL SCHOOL

WAT-CHANGE - Water-related ecosystem services for adapting societies to climate change

A one-week crash-course on nature-based solutions at Scuola Superiore Sant'Anna – Pisa (Italy)

While **climate change** is posing at risk traditional **water resources management**, there is the urgent need to devise **low-energy** and **low-impact solutions** to adapt the environment, societies and economies to this threat.

The **WAT-CHANGE Seasonal School** aims at introducing the participants to the new growing area of **nature-based solutions** providing **water-related ecosystem services**.

In particular, we will deal with nature-based solutions for water supply, treatment of polluted water, and flood risk mitigation such as managed aquifer recharge, river restoration, constructed wetlands, sustainable drainage systems, and remediation of contaminated sites using phytoremediation techniques.

At the end of the course the students will have acquired the knowledge and skills that will allow them to understand impact and functions of the main nature-based solutions for solving the most common water resources management problems and to start their design.

The course is based on **20 hours of interactive and cross-disciplinary learning** from academia and professional world along with **8 hours of laboratory exercises** or with the aid of PCs and free and open source software. **A field trip will take place to visit the ecohydrological infrastructures of the Val di Cornia area.** This area has recently been recognized by UNESCO's International Hydrology Program as a site of global importance for ecohydrology.

A final 4-hour workshop (*Nature-based solutions in the real world. Application, case studies and market perspectives*) will allow showcasing technical solutions, along with the market and the regulatory perspective and the state of the application of nature-based solutions in the real world.

WHAT IS A SEASONAL SCHOOL AT SCUOLA SUPERIORE SANT'ANNA

The Seasonal Schools are short, intensive, excellence training programmes, strongly interdisciplinary, and focused on the Scuola Superiore Sant'Anna frontier research topics. They are open to University students enrolled in Bachelor Degree, Masters' Degree and PhD courses, with same grade characteristics as the School's students. The Seasonal Schools are also opportunities for meetings and exchanges with other high-performing students from all Italy as well as from abroad, to get experience of Scuola Superiore Sant'Anna facilities and laboratories.

Course scheduled for October 16th-20th, 2023

Course location: Scuola Superiore Sant'Anna, Pisa (Italy)

For further information please write to: rudy.rossetto@santannapisa.it (course coordinator)



Seasonal School WAT-CHANGE 2023 – COURSE PROGRAMME

Date	Time	Lecturer	Institution/company	Lecture/Activity	Room
October 16 th	10:00 – 11:00	Pietro Tonutti	Scuola Superiore Sant'Anna	Welcome by the Coordinator of the Crop Science Research Center	
October 16 th	10:00 – 11:00	Rudy Rossetto	Scuola Superiore Sant'Anna	Course introduction	Aula 3 - Main building
October 16 th	11:00 – 13:00	Rudy Rossetto	Scuola Superiore Sant'Anna	Nature-based solutions and water-related ecosystem services to adapt to climate change	Aula 3 - Main building
October 16 th	13:00 – 14:30			Lunch pause and transfer to the Crop Science Research Center	
October 16 th	14:30 – 16:30	Alessandra Francini	Scuola Superiore Sant'Anna	Lab activity: Determination of nutrients in surface water	Lab.- Via Alamanni 22 SGT
October 16 th	16:30 – 18:30	Alessandra Francini	Scuola Superiore Sant'Anna	Lab activity: Microwave mineralization	Lab.- Via Alamanni 22 SGT
October 17 th	9:00 – 11:00	Laura Ercoli	Scuola Superiore Sant'Anna	The soil resource	Aula 5 - Main building
October 17 th	11:00 – 13:00	Rudy Rossetto	Scuola Superiore Sant'Anna	Design and operation of managed aquifer recharge schemes	Aula 5 - Main building
October 17 th	13:00 – 14:30			Lunch pause and transfer to the Crop Science Research Center	
October 17 th	14:30 – 16:30	Alessandra Francini	Scuola Superiore Sant'Anna	Lab activity: Organic molecules extraction from plant tissues for UPLC/MS-MS analysis	Lab.- Via Alamanni 22 SGT
October 17 th	16:30 – 18:30	Luca Sebastiani	Scuola Superiore Sant'Anna	Lab activity: UPLC_MS_MS determination of Organic molecules	Lab.- Via Alamanni 22 SGT
October 18 th	9:00 – 11:00	Fabio Masi	Iridra	Treatment wetlands as nature-based solutions for water pollution control: typologies and sizing methods	Aula 5 - Main building
October 18 th	11:00 – 13:00	Diego M. Garcia De Jalon Lastra	Universidad Politécnica de Madrid	Giving space to rivers. River restoration techniques and case studies.	Aula 5 - Main building
October 18 th	13:00 – 14:15			Lunch pause	
October 18 th	14:15 – 19:15	Workshop		Nature-based solutions in the real world. Application, case studies and market perspectives.	Aula 3 - Main building
October 18 th	19:15			WAT-CHANGE Seasonal School Social Dinner	
October 19 th	8:15 – 19:15	Rudy Rossetto	Scuola Superiore Sant'Anna	Field trip to Val di Cornia (visit to Managed Aquifer Recharge scheme, River Restoration works, tertiary treatment schemes for water reuse, land reclamation works)	
October 20 th	9:00 – 11:00	Anacleto Rizzo	Iridra	Sustainable drainage systems: nature-based solutions for urban runoff management	Aula 5 - Main building
October 20 th	11:00 – 13:00	Marco Frey	Scuola Superiore Sant'Anna	Greening and Sustainability in the business environment	Aula 5 - Main building
October 20 th	13:30 – 14:15			Lunch pause	
October 20 th	14:15 – 16:15	Marco Falconi	ISPRA	Phytoremediation and biological techniques for remediation of contaminated sites	Aula 5 - Main building
October 20 th	16:15 – 17:15	Rudy Rossetto	Scuola Superiore Sant'Anna	Final assessment	Aula 5 - Main building
October 20 th	17:15 – 18:15	Rudy Rossetto	Scuola Superiore Sant'Anna	Final discussion	Aula 5 - Main building