

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** following a **cross-disciplinary approach**.

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, and sustainable drainage systems.

The course is based on **20 hours of interactive and cross-disciplinary learning** from academia and the professional world along with **hours dedicated to field work and performing chemical analyses**. **Two site visits will put in touch the students with real blue-infrastructure**s. In particular, we will visit:

- **the Massaciuccoli wetland and the phytotreatment area for treating the nutrient-rich rural drainage;**
- **the ecohydrological infrastructures of the Val di Cornia area.** This area has recently been recognized by UNESCO's Intergovernmental Hydrological Program as a site of global importance for ecohydrology.

During the field visits we will learn how to monitor and to sample surface water and groundwater.

A 4-hour workshop (*Nature-based solutions in the WEFE NEXUS 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.

At the end of the course the students will have the knowledge and skills 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.

This year the themes of the Seasonal School will be covered within the Water-Energy-Food NEXUS in the context of the EU [PRIMA NEXUS–NESS](https://prima-nexus-ness.org/) project (<https://prima-nexus-ness.org/>).

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-students from all Italy as well as from abroad, to get experience of Scuola Superiore Sant'Anna facilities and laboratories.

Course scheduled for October 21st-25th, 2024

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

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

Seasonal School WAT-CHANGE 2024 – COURSE PROGRAMME

Date	Time	Lecturer	Institution/company	Lecture/Activity
October 21 st	9:00 – 11:00	Pietro Tonutti	Scuola Superiore Sant'Anna	Welcome by the Coordinator of the Institute of Crop Science
October 21 st	10:00 – 11:00	Rudy Rossetto	Scuola Superiore Sant'Anna	Course introduction - Nature-based solutions and water-related ecosystem services to adapt to climate change
October 21 st	11:00 – 13:00	Luca Sebastiani	Scuola Superiore Sant'Anna	Phytotreatment of inorganic and organic xenobiotics
October 21 st	13:00 – 14:30			Lunch pause
October 21 st	14:30 – 16:30	Fabio Masi	Iridra	Treatment wetlands as nature-based solutions for water pollution control: typologies and sizing methods
October 21 st	16:30 – 18:30	Rudy Rossetto	Scuola Superiore Sant'Anna	Design and operation of managed aquifer recharge schemes
October 22 nd	9:00 – 13:00	Rudy Rossetto	Scuola Superiore Sant'Anna	Field trip to the Massaciuccoli Lake Basin (visit to the phytotreatment schemes for rural drainage water and the wetland, sampling and monitoring of surface water)
October 22 nd	13:00 – 14:30			Lunch pause and transfer to the Institute of Crop Science
October 22 nd	14:30 – 16:30	Alessandra Francini	Scuola Superiore Sant'Anna	Lab activity: Determination of nutrients by Photometer analyses in surface water
October 22 nd	16:30 – 18:30	Alessandra Francini	Scuola Superiore Sant'Anna	Lab activity: Determination of heavy metals by Microwave Plasma-Atomic Emission Spectroscopy analyses in surface water
October 23 rd	9:00 – 11:00	Marco Frey	Scuola Superiore Sant'Anna	Greening and Sustainability in the business environment
October 23 rd	11:00 – 13:00	Andrea Mandarino	Università degli Studi di Genova	River restoration: principles, techniques and case studies
October 23 rd	13:00 – 14:15			Lunch pause
October 23 rd	14:15 – 19:15	Workshop		Nature-based solutions in the WEFE NEXUS real world. Application, case studies and market perspectives.
October 23 rd	19:15			WAT-CHANGE Seasonal School Social Dinner
October 24 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 plant for water reuse, sampling and monitoring of groundwater)
October 25 th	9:00 – 11:00	Anacleto Rizzo	Iridra	Sustainable drainage systems: nature-based solutions for urban runoff management
October 25 th	11:00 – 13:00	Anacleto Rizzo	Iridra	Sustainable drainage systems: overview of the most recent Italian examples
October 25 th	13:30 – 14:15			Lunch pause
October 25 th	14:15 – 16:15	Andrea Saba	Scuola Superiore Sant'Anna	Ecosystem Services, Water and Climate Change: Navigating the 2023-2027 EU Common Agricultural Policy
October 25 th	16:15 – 17:15	Rudy Rossetto	Scuola Superiore Sant'Anna	Final assessment
October 25 th	17:15 – 18:15	Rudy Rossetto	Scuola Superiore Sant'Anna	Final discussion