

Water

Introduction

Water, a vital element for life and all economic development, is a major strategic issue for many countries in the 21st century. Both the environment and our health are fundamentally dependent on water, which creates a need for advanced techniques for treating and distributing drinking water. Knowledge of all types of aquatic environments (groundwater, rivers, freshwater lakes and ponds, wetlands, coastal zones, and marine environments) constitutes the basis of adapted water management.

Large-scale water-based industrial activities affect resources, agriculture, aquatic biodiversity, health, urban areas, estuaries, and coastal zones. As a renewable energy source, water allows for the development of geothermal energy, which uses the earth's internal heat to produce energy in the form of vapor and hot water. This energy is then collected and distributed to heating networks incorporated in the construction of buildings and housing.

Today's training and education programs in the water industries and water management focus on environmental protection, including water, sewage and waste management, soil remediation, environmental quality measurement (air, water, soil), and optimization of water treatment plants. In marine and coastal science, marine biology promotes the preservation of marine resources and coastal environments. More than 250 programs are offered, with the treatment and distribution of drinking and industrial water as the basis of training for careers in water collection, sanitation, and purification of wastewater.

Water by the numbers

- 5.8 billion m³ of water carried
- 24 million subscribers to drinking water services in France
- 906,000 km of water pipes
- 160,000 people employed in the drinking water sector

Sources: INSEE - www.insee.fr
- www.statistiques.developpement-durable.gouv.fr

INTERNATIONAL

Suez Environnement, Vivendi Water, and Veolia Environnement (Générale des Eaux, a division of Veolia, which provides water services in France) are among world leaders in environmental services (water, sanitation, energy, and distribution) developing operations in Eastern Europe and Asia (China, South Korea, Malaysia, the Philippines, Taiwan, and Thailand).

France has also seen the commercialization of spring water by 70 brands, some of which are sold around the world by large food corporations, including Danone (Badoit, Evian), Nestlé (Contrex, Perrier, Quézac, Vittel), and Castel (Vichy Célestins and Saint-Yorre).

Related fields

Agriculture – Aquaculture – Marine biochemistry – Biology – Construction and public works – Chemistry – Climatology – Ecology – Energy – Water engineering – Geosciences – Geotechnics – Geothermal energy – Environment – Meteorology – Marine science – Public health – Water sports – Tourism

Subfields

Agrobiology – Agricultural resources – Aquarium studies – Irrigation – Sanitation – Rowing – Dams – Basins – Aquatic biodiversity – Canals – Cruises – Water levels – Spa treatments – Water cycle – Soil remediation – Levees – Drainage – Carbonated water – Mineral water – Water pollution – Locks – Renewable energy – Tidal power – Estuaries – Water use – Water geopolitics – Water management – H₂O – Hydraulics – Hydroelectricity – Hydrogeology – Hydrography – Hydrology – Hydrosphere – Hydrosystems – Floods – Irrigation – Coastal zones – Microbiology – Aquatic environments – Swimming – Boating – Water navigation – Pools – Diving – Water quality – Rafting – Marine resources – Droughts – Spas – Spa towns – Treatment plants – Thalassotherapy – Thermal baths – Pipework – Urban planning – Waterways – Coastal zones –

Useful links

- Water agencies: www.lesagencesdeleau.fr
- Water agencies, international projects (ACODIA): www.aquacoope.org/ACODIA
- Association Scientifique et Technique pour l'Eau et l'Environnement (ASTEE): www.astee.org
- Comité National de l'Eau (CNE): www.comitenationaldeleau.org
- The World Water Council (headquartered in Marseille): www.worldwatercouncil.org
- Eau dans la Ville: www.eaudanslaville.fr
- Freshwater: www.cnrs.fr/cw/dossiers/doseau
- Water and health: www.invs.sante.fr/surveillance/eau_sante/index.htm
- Eau France: www.eaufrance.fr
- Gest'eau Outils de Gestion Intégré de l'Eau: www.gesteau.eaufrance.fr
- International Institute for Water and Environmental Engineering: www.2ie-edu.org
- Institut Méditerranéen de l'Eau (IME): www.ime-eau.org
- French Ministry of Agriculture, Agrifood, and Forestry: <http://agriculture.gouv.fr/Enseignementagricole>
- French Ministry of Ecology, Sustainable Development, and Energy (MEDDE): www.developpement-durable.gouv.fr/+Eau.22+.html
- Environmental Statistics and Observations - Water: www.ifen.fr/acces-thematique/eau.html
- International Office for Water: www.oieau.org
- Office National de l'Eau et des Métiers Aquatiques (ONEMA): www.onema.fr
- French Water Partnership (PFE): www.partenariat-francais-eau.fr
- Programme Solidarité Eau (PSEau): www.pseau.org
- Service Hydrographique et Océanographique de la Marine (SHOM): www.shom.fr
- Voies Navigables de France: www.vnf.fr

CHOOSE YOUR PROGRAM

- Campus France program catalogue: www.campusfrance.org>Trouvez votre formation
- Catalogue of programs taught in English: www.campusfrance.org>Programs Taught in English
- Catalogue of short academic programs and language courses: www.coursdete.campusfrance.org
- CampusBourses, financing your studies in France: www.campusfrance.org>Financez vos études

Licence level

Brevet de Technicien Supérieur (BTS, higher technical certificate)

(Secondary diploma +2 years of higher education) – L2

20 schools (public or private high schools and apprentice training centers) offer the **BTS** in water management. Students acquire technical and practical knowledge about water treatment, distribution, and purification.

Brevet de Technicien Supérieur Agricole (BTSA, agricultural technician certificate)

(High school diploma +2 years of higher education) – L2

30 public and private high schools offer the **BTSA** with a concentration in **water management** with 12 offering a concentration in **aquaculture**.

The **Brevet de Technicien Supérieur Maritime** (BTSM, maritime technician certificate) in **fisheries and marine environment management** is offered by the Lycée professionnel Maritime Paul Bousquet in Sète and Boulogne-sur-mer.

• www.campusfrance.org>Espace documentaire>Offre de formation> Fiches diplômes>BTSA

Diplôme d'Études Universitaires Scientifiques et Techniques (DEUST)

(Secondary diploma +2 years of higher education) – L2

The Université du Littoral Côte d'Opale offers the DEUST in **marine and coastal sciences** with two concentrations available:

- environmental and coastal management and planning
 - marketing and production of aquatic bio resources
- www.univ-littoral.fr

Professional licence (bachelor's degree)

(Secondary diploma +3 years of higher education) – L3

30 **professional licences** in **sciences, technologies, and health** are offered. These focus on environmental protection. The following concentrations are available:

- water, sludge, and waste management and treatment;
- water sports;
- water use and infrastructure, including factory use, water networks, rural and urban use, quantity, and quality;
- spa and wellness center management;
- technology and clean water management.

Agronomics, aquaculture, and aquarium studies also focus on water use in sustainable agriculture.

• www.campusfrance.org>Espace documentaire>Offre de formation> Fiches diplômes>Licences professionnelles

Master level

Master

(Secondary diploma + 5 years of higher education) – M2

Master's programs in **science, technology, and health** are available to students with a bachelor's degree in earth and environmental sciences and law.

- 50 master's programs are offered:
 - more than 30 in science, technology, and health with concentrations in earth and environmental science, ecology, and hydrology;
 - 12 in agronomics (agricultural resources), biology (forestry ecology and water microbiology), and chemistry (medications, physics, and industrial chemistry);
 - 12 in **marine and coastal science** with a focus on physics, geoscience, and coastal management and expertise.

- The following master's programs are research-oriented:
 - ecosystem biology, microbiology, medications, and health;
 - law, economics, and management with specializations in public and private law, business law, and risk management;
 - earth and environmental science: groundwater, chemical and physical hydrogeology, hydrosystem and drainage basin engineering;
 - humanities and social sciences with a focus on history and the geography of territories.

• www.campusfrance.org>Trouvez votre formation>Licence

Programs taught in English:

- *International Executive Masters Program OpT:*

www.agroparistech.fr/OpT-WaterforAll-.html

- *Master of Science and Techniques of Urban Environment on Atmosphere, Water and Urban Environment:*

www.ec-nantes.fr/master

Diplôme d'ingénieur (engineering degree) / Master

(Secondary diploma +5 years of higher education) – M2

French engineering schools issue degrees accredited by the CTI (*Commission des Titres d'Ingénieur*), granting students qualifications as engineers at the master's level:

- École Polytechnique Universitaire de Montpellier (Polytech Montpellier):
 - Water and civil engineering
 - Water sciences and technology
- www.polytech.univ-montp2.fr >Formation

Diplôme d'ingénieur (engineering degree) / Master's

(Secondary diploma +5 years of higher education) – M2

- École Nationale du Génie de l'Eau et de l'Environnement de Strasbourg (ENGEES): <http://engees.unistra.org>
Civil engineering - geotechnics, water, and risks:
<http://engees.unistra.org>>Formation initiale
- École Nationale du Génie Rural des Eaux et des Forêts - AgroParisTech Institut des Sciences et Industries du Vivant et de l'Environnement - École Nationale du Génie Rural des Eaux et des Forêts, Clermont Ferrand, Montpellier, Nancy, Paris (ENGREF):
 - Water and agriculture (Montpellier)
 - Water and society (Montpellier)
 - Continental environments & hydrosociology (Paris)

www.agroparistech.fr>Formation >Masters
- École Nationale Supérieure de l'Énergie, l'Eau et l'Environnement (Ense3) - Grenoble INP:
 - Master's in hydraulic and civil engineering

<http://ense3.grenoble-inp.fr>>Formation >Master's degrees
- École Nationale Supérieure d'Ingénieurs de Limoges (ENSI), specialization in water and the environment:
 - Water and civil engineering:

www.ensil.unilim.fr>La Formation>L'offre de formation
- École Nationale Supérieure d'Ingénieurs de Poitiers (ESIP), specialization in water and civil engineering:
<http://esip.univ-poitiers.fr>>Espace formation

Beyond the master

Mastère Spécialisé (specialized master's degree)

(Master +1 year of higher education)

The title of specialized master's degree is accredited by the Conférence des Grandes Écoles.

- Water for All (AgroParisTech in Montpellier):
www.agroparistech.fr
- Drinking water and sanitation (ENGEES Strasbourg):
<http://engees.unistra.org>
- Water engineering (Polytech Lille): www.polytech-lille.fr
- Water management (AgroParisTech in Montpellier):
www.agroparistech.fr
- Wastewater and surface water management (EIVP Paris):
www.eivp-paris.fr