



iWATERMAP
WATER TECHNOLOGY INNOVATION ROADMAPS
Kick-off meeting, Leeuwarden 24-27 September 2018





Crete at a glance...

- **location:** eastern Mediterranean
- **area:** 8.332 km²
- **highest elevation:** 2.456m
- **4 prefectures**
- **capital city:** Heraklion
- **population:** 624.340
- **annual rainfall:** Nov. – Feb.
- **unemployment:** 22% (2016)
- **agricultural area:** 3.205 km²
- **water need:** 81% agriculture, 15% domestic & tourism, 4% industry





ekathimerini.com

NEWS BUSINESS COMMENT LIFE WHAT'S IN SPORTS COMMUNITY

NEWS 14.05.2018

Southern parts of Greece to face water shortages

GEORGIOS GIALKOS



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Weather Tourism

Ahead of the tourist season, large parts of southern Greece are expected to face water shortages, according to a report by the Ministry of Agriculture, Food and Rural Affairs.

Greek news Economy Cyprus Life Entertainment Sports Opinion

Home > Business > Agriculture > Drought-Hit Cretan farmers braced for 40% loss of 2018's crop

Business Agriculture Society Environment

Drought-Hit Cretan Farmers Braced for 40% Loss of 2018's Crop

By guest - May 26, 2018

271 271 271 271 271 271



The Cretan landscape may be beautiful but it is vulnerable to drought, which can hurt its farmers.

LOCAL SOCIETY TRAVEL FOOD & WINE POLITICS ECONOMY CULTURE

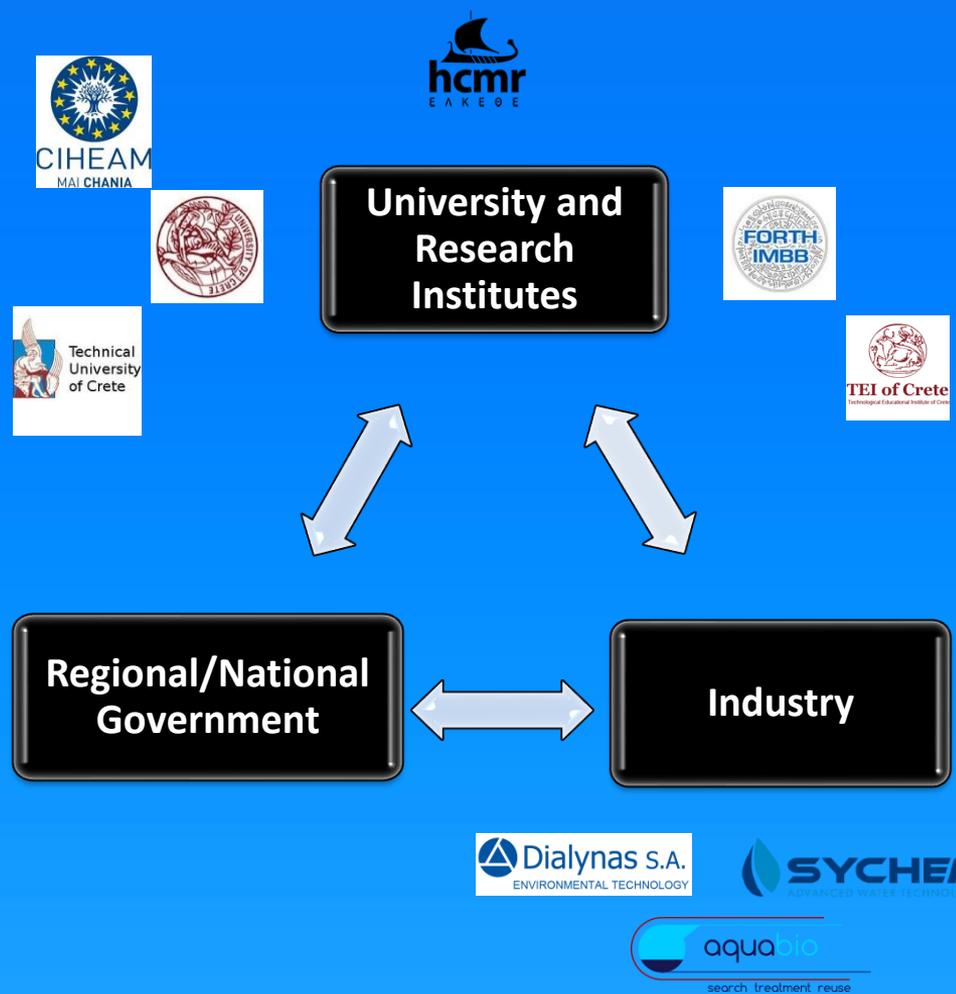
Crete is facing water shortages after the dries more than almost thirty years



APR 28, 2018

Bill Dornan and Kostas... distribution
Airports in C... Passenger... January: Au...
Greece Press... European U... Minister K...
Expert says... aviation M...

STAKEHOLDERS



Municipal companies



Challenges



- Small number of knowledge-intensive businesses
- Limited cooperation between businesses and research institutions and thus low networking level between the entrepreneurial world and knowledge institutions (clustering)
- Lack of innovation culture
- Research work of low orientation towards the needs of the regional economy
- Enhanced agriculture activities and increased number of tourists result to high demand of water
- The Mediterranean islands are among the most vulnerable regions to climate change

Goals



- Development of innovative methodologies and projects in respect to the regional needs for a more effective, adaptable and eco-reliable solution for water management
- Collaboration and exchange of good practices
- Raising awareness of the scientific personnel to redesign their scientific focus on water technologies
- Motivating the local industry to concentrate on products that meet the regional needs
- Better governance systems
- New investment tools in an effort to confront the pressure on water resources





SMART SPECIALISATION STRATEGY OF CRETE REGION

The Agro-alimentary Complex

- Related to activities linked to Crete's primary sector (rearing/growing, processing/formulation and distribution/commercialization of agricultural products)

The Cultural-Touristic Complex

- tourism sector (attraction, reception, hospitality, transportation, nutrition, recreation and touring of visitors)
- cultural sector (protection - enhancement and promotion of cultural resources, supporting visits to
- monuments - museums, interconnection of cultural resources with the society and the local economy, development of high added value international cultural activities)

The Environmental Complex

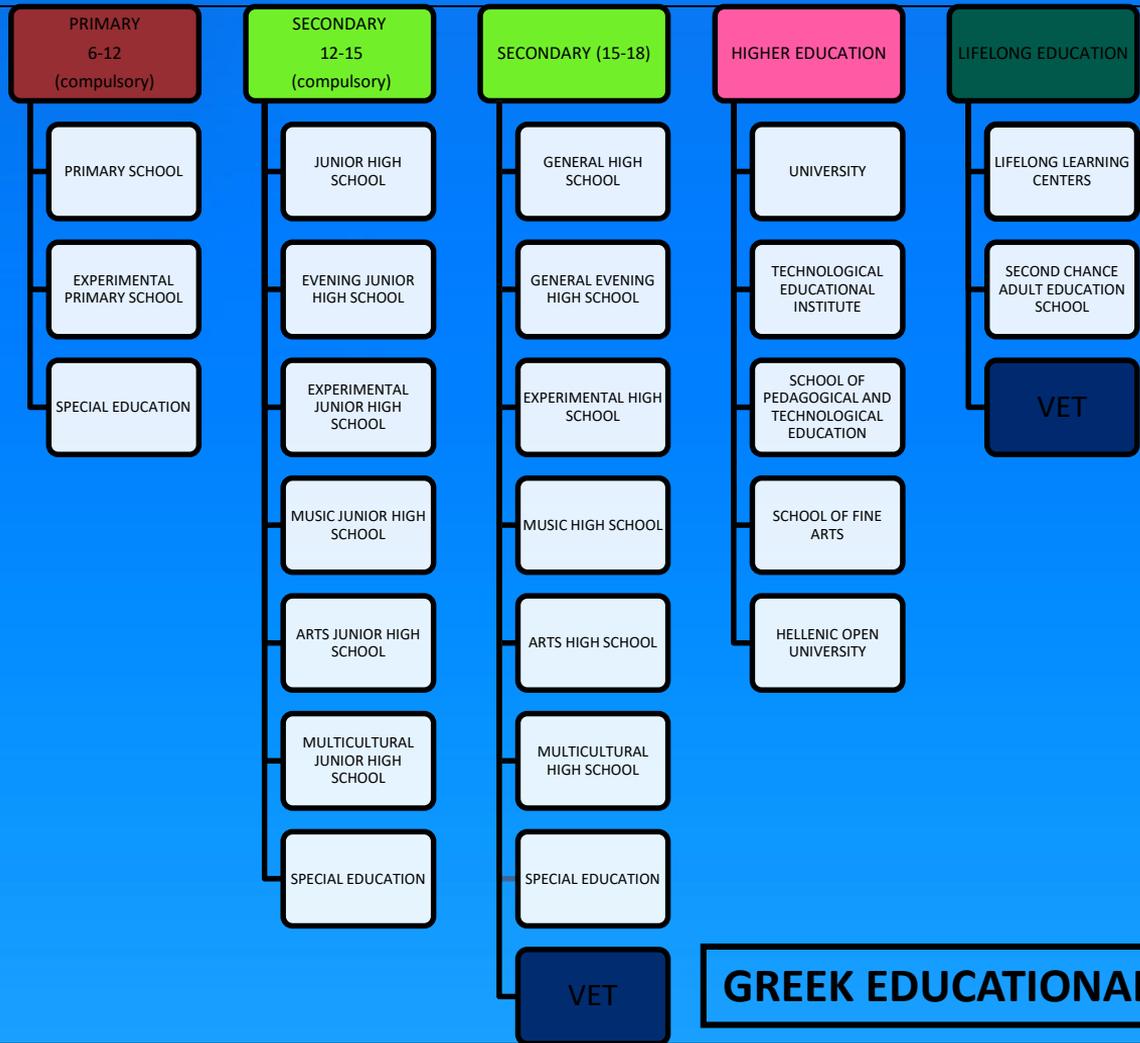
- decrease in CO₂ emissions
- rational use of Crete's natural resources, especially water resources and
- tackling of climate change consequences

The Knowledge Complex

- research activities within the research and university institutions of Crete which could support the development of new entrepreneurial activities in emerging sectors and expand Crete's productive base in terms of competitiveness
- education and training activities based on research and university institutions of Crete



EDUCATION



GREEK EDUCATIONAL SYSTEM



EQF=6,7,8

HIGHER EDUCATION

EQF=5

VOCATIONAL TRAINING INSTITUTES (IEK)

APPRENTICESHIP

EQF=4

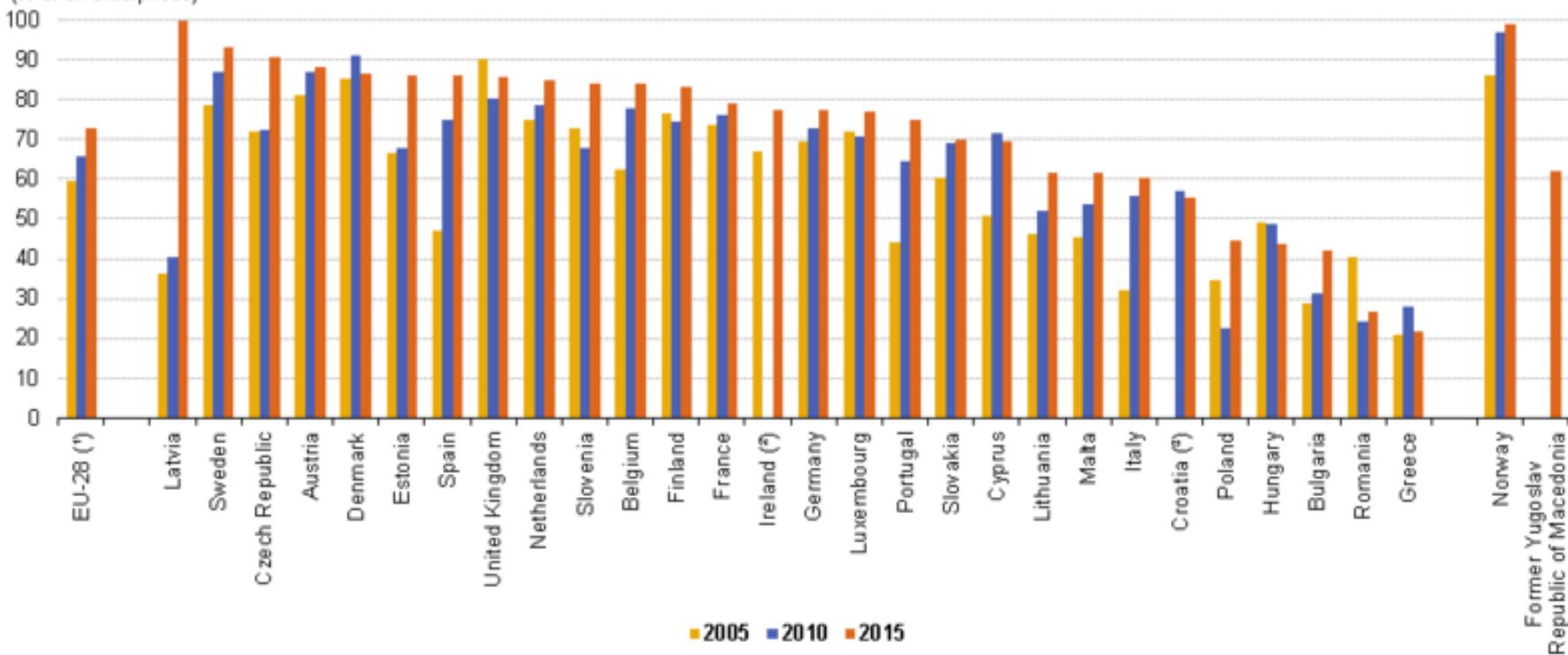
VOCATIONAL TRAINING SCHOOLS (EPAS)

VOCATIONAL HIGH SCHOOLS (EPAL)
(+EVENING HS)

VOCATIONAL EDUCATION & TRAINING

Enterprises providing CVT, 2005, 2010 and 2015

(% of all enterprises)

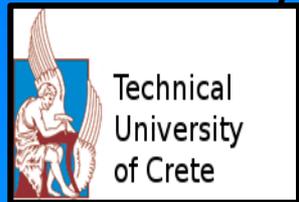


(*) 2005 and 2010: estimate.

(†) 2010: not available.

(‡) 2005: not available.

Source: Eurostat (online data code: trng_cvt_01s)



Technical
University
of Crete

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MANAGEMENT**

**RENEWABLE AND SUSTAINABLE
ENERGY SYSTEMS LABORATORY**

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**WATER RESOURCES MANAGEMENT &
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Marine Resources

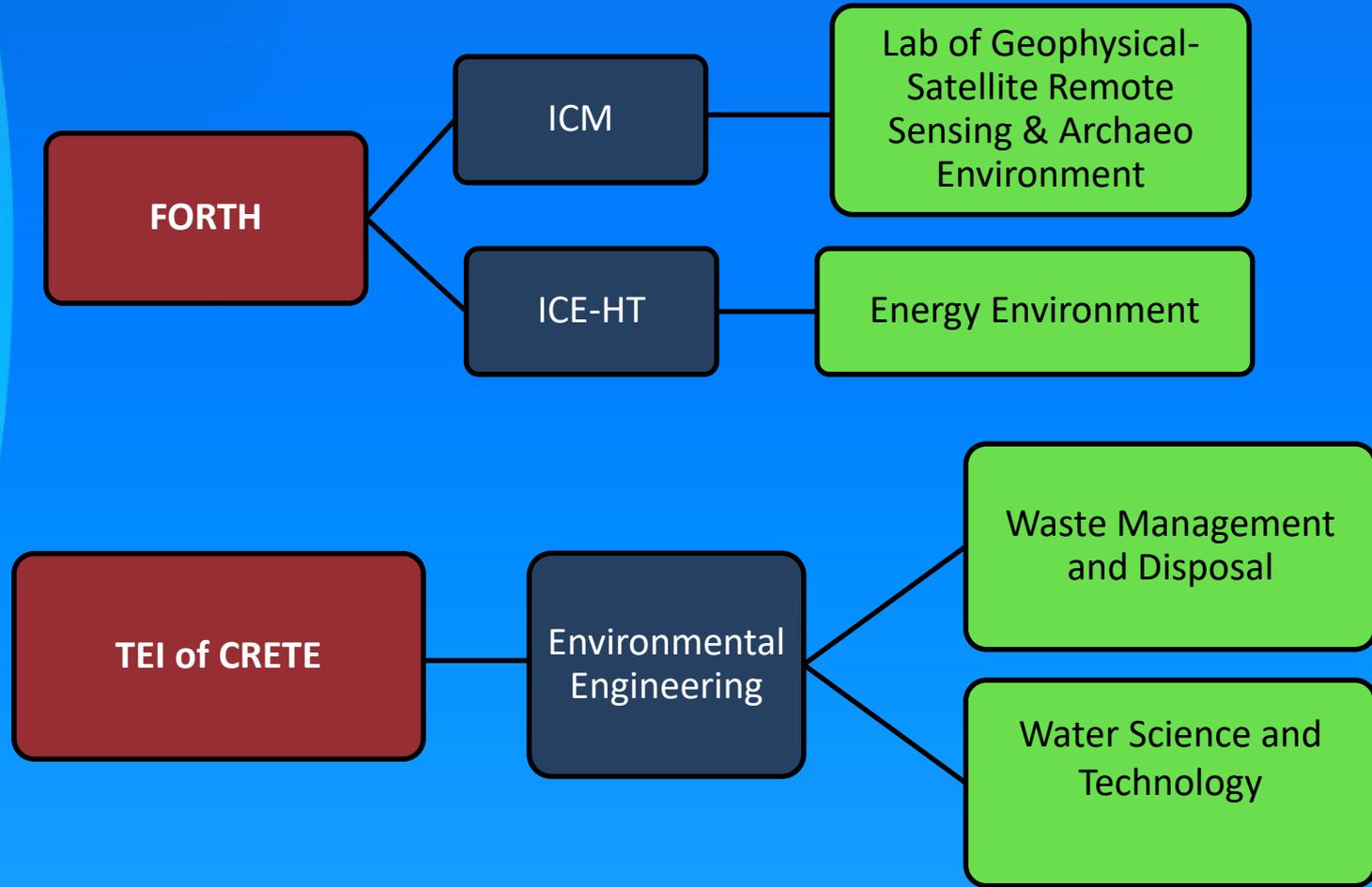
**CHEMISTRY
DEPARTMENT**

Science of
Environmental
Engineering

Technologies for
Environmental
Protection

**JOINT GRADUATE
PROGRAM
BIOETHICS**

Environmental Ethics



Science of the Total Environment
Volume 615, 15 February 2018, Pages 381-389

Groundwater footprint methodology as policy tool for balancing **water** needs (agriculture & tourism) in **water** scarce islands - The case of Crete, Greece (Article)

Kourgialas, N.N.^a , Karatzas, G.P.^b, Dokou, Z.^c, Kokorogiannis, A.^d 

^aNAGREF - Hellenic Agricultural Organization (H.A.O.-DEMETER), Institute for Olive Tree Subtropical Crops and Viticulture, **Water** Recourses-Irrigation & Env. Geoinformatics Lab, Agrokipio, Chania, Greece

^bSchool of Environmental Engineering, Technical University of Crete, Polytechnioupolis, Chania, 73100, Greece

^cDepartment of Civil and Environmental Engineering, University of Connecticut, Storrs, CT, United States

Water Policy
Volume 20, Issue 1, February 2018, Pages 175-188

Alternatives for domestic **water** tariff policy in the municipality of Chania, Greece, toward **water** saving using game theory (Article)

Varouchakis, E.A. , Apostolakis, A., Siaka, M., Vasilopoulos, K., Tasiopoulos, A. 

^aTechnical University of Crete, School of Environmental Engineering, Chania, 73100, Greece

Science of the Total Environment
Volume 637-638, 1 October 2018, Pages 991-1003

Characterization and monitoring of subsurface contamination from Olive Oil Mills' waste waters using Electrical Resistivity Tomography (Article)

Simyrdanis, K.^a , Papadopoulos, N.^a , Soupios, P.^b , Kirkou, S.^c, Tsourlos, P.^c 

^aLaboratory of Geophysical Satellite Remote Sensing and Archaeoenvironment (GeoSat ReSeArch), IMS, **FORTH**, Greece

^bDepartment of Environmental and Natural Resources Engineering, Technological Educational Institute of Crete, Greece

^cLaboratory of Applied Geophysics, Aristotle University of Thessaloniki, Greece

Single house on-site grey water treatment using a submerged membrane bioreactor for toilet flushing (Article)

Fountoulakis, M.S. , Markakis, N., Petousi, I., Manios, T. 

Department of Agricultural Technology, Technological Educational Institute of Crete, Heraklion, Greece

Sustainability (Switzerland) [Open Access](#)
Volume 10, Issue 1, 12 January 2018, Article number 181

Earth observation-based operational estimation of soil moisture and evapotranspiration for agricultural crops in support of sustainable **water** management (Review) ([Open Access](#))

Petropoulos, G.P.^{a,b} , Srivastava, P.K.^c , Piles, M.^d , Pearson, S.^e 

^aDepartment of Geography and Earth Sciences, University of Aberystwyth, Wales, SY23 2DB, United Kingdom

^bSchool of Mineral Resources Engineering, Technical University of Crete, Chania, 73100, Greece

^cInstitute of Environment and Sustainable Development, Banaras Hindu University, Varanasi, 221005, India

Farmers' Experience, Concerns and Perspectives in Using Reclaimed **Water** for Irrigation in a Semi-Arid Region of Crete, Greece (Article)

Petousi, I.^{a,b} , Fountoulakis, M.S.^a, Stentiford, E.I.^b, Manios, T.^a 

^aDepartment of Agricultural Technology, Technological Educational Institute of Crete, Heraklion, Greece

^bDepartment of Civil Engineering, University of Leeds, Leeds, United Kingdom



RELATED PROJECTS
Region of Crete as a partner

HORIZON 2020



Synergic Circular Economy across European regions



DownScaling CLIMATE IMPACTS and decarbonization pathways in EU islands, and enhancing socioeconomic and non-market evaluation of Climate Change for Europe, for 2050 and Beyond

INTERREG



Tourism Water Management For Sustainable Adrion Coastal Areas



Treating contamination through Nanoremediation and Beyond

LIFE



Adaptation to Climate change Impacts on the Mediterranean islands' Agriculture Areas



RELATED PROJECTS

Region of Crete not among the partners



Innovative solutions to climate change adaptation and governance in the water management of the Region of Crete



The general goal of this project is the development of innovative methodologies for integrated water resources management of Crete that take into account:

- Adaptation measures to climate change,
- Rational evaluation and prioritization of the Program of Measures
- Innovative governance approaches to water management



The main objective of the project is the improvement of management of inland water resources, through a smart, decision making environment, which will take into account every aspect of the involved systems. A direct consequence of the realization of such a holistic management scheme will be to ensure water quality, sustain water demand in Crete, minimize water resources losses, reduce operating costs and ultimately reduce the corresponding cost of water both for large consumers and for regular end users.



SPACE-O (Space Assisted Water Quality Forecasting Platform for Optimized Decision Making in Water Supply Services) integrates state-of-the-art satellite technology and in-situ monitoring with advanced hydrological, water quality models and ICT tools, into a powerful decision support system. This generates real-time, short- to medium-term forecasting of water flows and quality data in reservoirs, used to optimize water treatment plant operations and establish a complete service line from science to the water business sector.



The value of water



Thank you!