

FINALISTS 2012

Stockholm Junior Water Prize

**ARGENTINA
AUSTRALIA
BELARUS
CANADA
CHILE
CHINA
CYPRUS
FINLAND
FRANCE
GERMANY
GHANA
ISRAEL
ITALY
JAPAN
LATVIA
MEXICO
NETHERLANDS
NORWAY
REPUBLIC OF KOREA
RUSSIAN FEDERATION
SINGAPORE
SLOVAK REPUBLIC
SOUTH AFRICA
SRI LANKA
TURKEY
UKRAINE
UNITED KINGDOM
UNITED STATES**



The Stockholm Junior Water Prize

Each year, the international Stockholm Junior Water Prize competition brings together young scientists and innovators from around the world who have created new solutions to the planet's growing water challenges. Each of the finalists represented in Stockholm are the champions of national competitions, who have been selected as the winners from a field of thousands of entries.

This year we are very proud to host the 16th annual competition and welcome the winners of national competitions from 28 countries: Argentina, Australia, Belarus, Canada, Chile, China, Cyprus, Finland, France, Germany, Ghana, Israel, Italy, Japan, Latvia, Mexico, Netherlands, Norway, Republic of Korea, Russian Federation, Singapore, Slovak Republic, South Africa, Sri Lanka, Turkey, United Kingdom, Ukraine and USA.

The Stockholm Junior Water Prize competition proves that brilliant young minds can find inspiration in some unlikely places. Ingenious teams from the world over have shown how to clean water and protect marine environments with everything from oysters to eggshells. They also see opportunity and hope where most find challenges and have developed solutions that are cost-efficient,

immediate, and applicable the world over. In this catalogue, you can learn more about the innovative research and inventions that earned each of the 2012 finalists a chance to compete for this international honor.

During their time in Stockholm, all of the finalists have the special opportunity to meet and learn from the present leaders of the global water community and make life-long friendships with international compatriots who share a passion for water and science. This includes a chance to receive the international prize from H.R.H. Crown Princess Victoria of Sweden, during an exciting ceremony, which will be held this year on Wednesday August 29.

You also have the opportunity to meet this next generation of water leaders by visiting their booths in the exhibition area T.

About the Stockholm Junior Water Prize Competition

The competition is open to young people between the age of 15 and 20 who have conducted water-related projects focusing on local, regional, national or global topics of environmental, scientific, social or technological importance. The international winner receives a USD 5,000 award and a prize sculpture. As a result of the competitions, thousands of young people around the world become interested in water.

H.R.H. Crown Princess Victoria of Sweden is the Patron of the Stockholm Junior Water Prize.

Xylem is the global sponsor of the Stockholm Junior Water Prize.

The International Jury

The International Jury includes experts within the field of water who, by committee consensus, appoint the winner of the international final. The decision is based on the written report, a short presentation of the display material and interviews with the finalists. The Stockholm International Water Institute Board appoints the Jury members.

THE 2012 INTERNATIONAL JURY MEMBERS ARE:

DR. FREDRIK MOBERG, (CHAIR), SWEDEN; DR. JOHAN GROEN, USA, MS. CHARLOTTE DE FRAITURE, NETHERLANDS; MS. EILEEN O'NEILL, USA; DR. PIET LENS, NETHERLANDS; MS. SUSANA SANDOZ, CANADA; MR. ALEX SIMALABWI, SWEDEN AND MS. LINE LÖVAAS (SECRETARY), SIWI, SWEDEN.

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ARGENTINA

H₂O as Fuel

By Ramiro Hernan Olivera Fedi, Alan Milton Patricio & Camila Micaela Rodriguez

The delegation from Argentina developed an innovative method to reduce pollution from vehicles. The team has invented a new solution that will enable a car engine to run on water. They use an electric current to break the water molecules down into hydrogen and oxygen gases, which are then injected into an internal combustion engine. This improves performance, lowers the emissions of pollutants and reduces the consumption of fossil fuels.

NATIONAL ORGANISER: AIDIS ARGENTINA (ASOCIACIÓN ARGENTINA DE INGENIERÍA SANITARIA Y CIENCIAS AMBIENTE).

SPONSORS: AYSA, ECOPRENEUR, XYLEM WATER SOLUTIONS ARGENTINA, ENERSYSTEM ARGENTINA.

AUSTRALIA

Polymer Power: The Extraction of Divalent Heavy Metal Ions from Aqueous Solutions Using Sodium Polyacrylate to Treat Contaminated Waterways

By I-Ji Jung

Heavy metal contamination of waterways is a serious problem that can lead to both environmental and human health problems. The Australian project investigated the inadequate treatment of wastewater and how this affects the heavy metal contamination of waterways. The conventional method utilised in heavy metal treatment is often very expensive and requires an extensive amount of energy. The Australian delegate discovered that sodium polyacrylate, a super-absorbent polymer, could be used as a more effective and economical alternative treatment method to revitalise waterways around the world.

NATIONAL ORGANISER: AUSTRALIAN WATER ASSOCIATION.

SPONSORS: XYLEM, UNITY WATER.



BELARUS

Bioassay as a Mode of Wastewater Control

By Aleksandra Kirilchik

The Belarusian project demonstrates how the usage of bioassay is the best method of wastewater control. By using a culture of freshwater crustaceans – Daphnia Magna (Strauss) – that are sensible to low concentrations of toxic substances, the Belarusian team found several points of toxic pollution in the main river of Minsk – the Svisloch River. The technique of using bioassay was also successfully applied at a local wastewater treatment station, which is situated at the shore of the biggest lake in Belarus – Naroch Lake.

NATIONAL ORGANISER: THE REPUBLIC ECOLOGICAL CENTER OF CHILDREN AND YOUTH.

SPONSORS: COCA-COLA BEVERAGES, BELARUS.

CANADA

Multi-Walled Carbon Nanotubes Bioremediation

By Arnaud Desrosiers

In 2011, 10 million tons of carbon nanotubes (CNT) were produced while there was not any process made to degrade them effectively. CNT are nanoparticles that are easily spread in water and transport pollutants. This project tested the capacity of hemin and several bacteria to degrade multi-walled carbon nanotubes (MWCNT) by exposing the MWCNT to seven bacterial cultures and one hemin solution. While the bacteria were unable to degrade the MWCNT, the hemin solution showed strong potential with an average degradation rate of 14.6 per cent over 7 days. These results open possibilities for a degradation process of MWCNT on large scale applications, including wastewater or industrial waste treatment.

NATIONAL ORGANISER: WESTERN CANADA WATER ENVIRONMENT ASSOCIATION.

SPONSORS: ATLANTIC CANADA WATER WORKS ASSOCIATION, BRITISH COLUMBIA WATER AND WASTEWATER ASSOCIATION, WATER ENVIRONMENT ASSOCIATION OF ONTARIO, RESEAU ENVIRONNEMENT-QUEBEC, WESTERN CANADA WATER ENVIRONMENT ASSOCIATION, CANADA WATER AND WASTEWATER ASSOCIATION.

► CANADA: **PREVIOUS WINNER 2010**



CHILE

Chilean Salmon: Sustainable Car Food – Reducing Seawater Pollution Through the Use of Aquaculture Industry Waste

By Alonso Alvarez & Daniel Barrientos

Chile is the world's second-largest exporter of marine resources, but the fishing industry is beset by complex social and environmental challenges. Following preliminary studies that helped rule out other fish, the Chilean team investigated how salmon waste, that was otherwise unsellable, could be used for biofuel production and bring added value to the industry. Their project showed that, in addition to cutting down on seafloor pollution and ensiling costs, salmon oil could produce enough biodiesel to fuel 78 vehicles over 100 km a day.

NATIONAL ORGANISER: CHILEAN ORGANIZING COMMITTEE.
SPONSORS: CHILEAN CHAPTER OF THE INTERNATIONAL
HIDROLOGICAL PROGRAMME, GENERAL WATER DIRECTORATE,
AGUAS ANDINAS, COCA-COLA, COLBUN, SODIMAC, NESTLE,
AIDIS, SOCHID Y ALHSUD.

CHINA

Water Robot Cleaner – Garbage Collecting Ship

By Yige Liu & Fang Liu

The Chinese delegation's invention, Water Robot Cleaner, has a core of a microcomputer-controlled system and can operate automatically through the wireless manipulation of a multi-channel remote control. The Water Robot Cleaner combines the advantages of a remote controlled, unmanned driving and automated work system. The innovation transforms a labor-intensive and physically demanding job into a less strenuous and more effective process.

NATIONAL ORGANISER: CENTER FOR ENVIRONMENTAL
EDUCATION & COMMUNICATIONS OF MINISTRY OF
ENVIRONMENTAL PROTECTION OF CHINA.
SPONSORS: XYLEM CORPORATION.

► CHINA: **PREVIOUS WINNER 2006**





FINLAND

How to Increase Dissolved Oxygen in a Stream – Determining Oxygen Concentration of Finnoonoja with the Winkler Titration

By Pibla Ruohonen

In order to maintain a healthy aquatic community, the concentration of dissolved oxygen in the water should be above 6 ppm. One way to increase oxygen is by adding rocks and gravel to a river bottom, which was done in a stream in Espoo. The Winkler method was used to analyse samples collected from both treated and untreated parts of the stream to see if reconditioning has a positive effect on the dissolved oxygen. It did not seem to have a significant effect, but another possible solution was found.

NATIONAL ORGANISER: WATER ASSOCIATION FINLAND.

SPONSORS: THE LAND AND WATER TECHNOLOGY FOUNDATION FINLAND, KEMIRA CHEMICALS LTD., EKOKEM LTD., HSY WATER SERVICES, UPONOR FINLAND LTD.

CYPRUS

Surface Oxygenation of Water Bodies by Solar-Wind Oxygen Mill – Case Study of Polemidia Water Dam

By Mario Christou, Georgios Menelaou & Andreas Tiofi

Water pollution, eutrophication and related causes of anoxic conditions are among the most serious problems related to water bodies. Aeration is required to eliminate these anoxic conditions. The team from Cyprus endeavored to build and test a new kind of aerating machine. The invention utilises green energy, solar and wind power, and introduces oxygen into the surface of the water in order to increase the water body's oxygen level.

NATIONAL ORGANISER: WATER MUSEUM OF LEMESOS.

SPONSORS: HELLENIC BANK, PRICE WATER HOUSE COOPERS, I.E. MUHANNA & CO. ACTUARIAL SERVICES, PHILELEFTHEROS NEWSPAPER.

FRANCE

Acting Simply or Utilizing Green Seaweeds

By Pauline Cazeneuve, Nolvenn Gomez & Pierre Ollivier

Ulvea is a type of seaweed that generates toxic gases when it dries. Ulvea can accumulate in holes in the sand on beaches, and emit poisonous gas within three days. The French delegation has aspired to find a use for the ulvea as an organic fertiliser for local farmers. By collecting the ulvea from the ocean while it is still fresh and then quickly dehydrating it, the release of toxic gases can be avoided. This innovative yet simple process makes productive use of the seaweed that is safer for people and better for the environment.

NATIONAL ORGANISER: FEEF.

SPONSORS: FRENCH MINISTRY OF ECOLOGY, SIAAP, HYDROPLUS.

Photos: Edelpix

GERMANY

The Behavior of Diclofenac in Surface Water as Examined in the Municipalities of Gerolstein

By Florian Müller

With an annual consumption of 85 tonnes in Germany, Diclofenac is the most used non-steroidal anti-inflammatory drug (NSAID). Negative effects on organisms (such as fish) can arise if specific thresholds of concentrations of the substance are exceeded. The German project investigates the presence of Diclofenac residue in the rural area of the administration district of Gerolstein in Germany. The drug was detected in all samples taken out of the sewage works, in the small river Kyll, as well as in drinking water.

NATIONAL ORGANISER: STIFTUNG JUGEND FORSCHT E.V.

SPONSORS: STIFTUNG JUGEND FORSCHT E.V.

► GERMANY: **PREVIOUS WINNER 1998**

GHANA

Greywater Recycling System for Toilet Flushing in PRESEC

By Derrick-Brown Akolbire & Kwabena Owusu Boateng

In this study, the potential of using grey water generated from the bathroom and laundry to flush toilets in a dormitory of a local senior high school was assessed. Grey water collected from wastewater outlets is treated in a four step process in order to eliminate contaminants and making it suitable for non-contact use. The system was capable of removing bacteria, odor and almost 90 per cent of the turbidity in grey water, making it a suitable alternative to obtain water for non-contact use, such as flushing toilets.

NATIONAL ORGANISER: SWITCH.

SPONSORS: MINISTRY OF WATER RESOURCES WORKS AND HOUSING, UNICEF GHANA, RCN.



ISRAEL

Smart Heater: A Device for Controlling Conventional and Solar Domestic Water Heaters and Increasing Their Efficiency

By David Rafael Agassi & Bashan Yehezkel

Though alternative energy sources are promoted, they are not perfected. In solar and non-solar water heaters today, there is no system for measuring water temperatures in the heater and using this information. As a result, considerable amounts of water and energy are wasted. The Israeli delegation has invented a system that provides this missing information and that prevents the waste of water and energy.

NATIONAL ORGANISER: FACULTY OF ENGINEERING TEL AVIV.

SPONSORS: TEL AVIV UNIVERSITY, THE ISRAELI WATER AUTHORITY, THE MELLANOX TECHNOLOGY COMPANY.

ITALY

Fluoride in Drinking Water? Past History!

By Arianna Broggi & Lara Nonis

The presence of fluoride in drinking water is a serious problem in less developed areas of the world, where the technological methods used for years in affluent areas are not applicable. The Italian team investigated new low-cost methods for the removal of fluoride, using materials that were available but not used in less developed areas. After a lengthy trial, they found that eggshells and Spirogyra (a form of freshwater algae) can effectively remove fluorides.

NATIONAL ORGANISER: FEDERAZIONE DELLE ASSOCIAZIONI SCIENTIFICHE E TECNICHE.

SPONSORS: AICA, FOIST, FONDAZIONE CARIPLO, INTEL, XYLEM.

JAPAN

Soil Rehabilitation by Using Micro Bubbles

By Ai Hemmi, Ami Hizawa & Kazuma Komachi

In March of 2011, a 9.0-magnitude earthquake hit Japan. A large tsunami followed and left 21,476 acres of salt affected farmland behind. The Japanese team sought to find an effective way to desalinate land by using water which contains more than 1 million micro bubbles in 1 cc. The experiments suggest that micro-bubble water leaches out salt more efficiently than ordinary water. Using water with micro bubbles to desalinate also uses less water, which is beneficial to water conservation.

NATIONAL ORGANISER: JAPAN WATER PRIZE COMMITTEE.

SPONSORS: LION CORPORATION, CTI ENGINEERING CO., TD, NIPPON KOEI CO., LTD, TOKYO CONSTRUCTION CONSULTANTS CO., LTD, EXECUTIVE COMMITTEE OF RIVER DAY.

► JAPAN: **PREVIOUS WINNER 2004**





LATVIA

Wastewater Treatment to Reduce Phosphate Ions Using Local Clay Granules

By Agnija Kivrane & Ramona Sunepa

The Latvian delegation has explored the properties of Latvian clay to absorb phosphate ions in order to reveal the possibilities of using local natural resources in domestic wastewater treatment. According to the results, it is possible to create treatment equipment using the locally available clay as a raw material. This system would be efficient enough to treat wastewater from phosphate ions, thus reducing the risk of eutrophication in water bodies.

NATIONAL ORGANISER: EDUCATION, CULTURE AND SPORTS DEPARTMENT OF RIGA CITY COUNCIL.

SPONSORS: SIA "RIGAS UDENS", EDUCATION, CULTURE AND SPORTS DEPARTMENT OF RIGA CITY COUNCIL.

MEXICO

A Didactic Module for the Conservation and Recharge of an Aquifer in a Desert Zone

By Erick Alejandro Manríquez Peña, Santa Michelle Barrera Salazar & Nadia Yunuen Díaz Ramírez

The Mexican delegation started an educational module for conservation and aquifer recharge of a desert zone in northern Mexico. The aim was to promote a culture of environmental awareness and sustainable water management. The Mexican team developed solutions through a variety of water catchment works, such as ditches, arranged stone dams, perimeter fences, gauges, individual terraces and a nursery for reforestation with a supply tank for providing water.

NATIONAL ORGANISER: MEXICAN ACADEMY OF SCIENCES.
SPONSORS: MEXICAN ACADEMY OF SCIENCES, CONAGUA, IMJUVE, UNAM, GDF, SWEDEN EMBASSY IN MEXICO, MEXICO-SWEDEN CHAMBER OF COMMERCE, COCA-COLA, KEMIRA, ERICSSON, SANDVIK, ALFA LAVAL, XYLEM, TETRAPAK, GRUPOURREA.

► MEXICO: **PREVIOUS WINNER 2007**



NORWAY

Examinations of Benthic Fauna in Connection with Rotenone Treatment of Skeelva, Nome Municipality, Norway

By Espen Hovland, Marie Ellinor Saeterdal & Aleksander Skugstad

In 2011 the Norwegian Directorate for Nature Management decided that the river Skeelva, located in Nome municipality, Norway, should be treated with rotenone. In this context, the Norwegian delegation decided to conduct a project on the rotenone treatment and investigate the extent to which the treatment will impact the aquatic ecosystem and biodiversity in the river. The results indicate that the rotenone treatment has had a very small negative effect on the benthic fauna in the Skeelva River.

NATIONAL ORGANISER: NORWEGIAN HYDROLOGICAL COMMITTEE, NORWEGIAN WATER ASSOCIATION, VA-YNGRE.

SPONSORS: NORWEGIAN WATER RESOURCES AND ENERGY DIRECTORATE, STATKRAFT, CLEAN WATER NORWAY, GODT VANN DRAMMENSREGIONEN.

NETHERLANDS

Desalination for a Better Life – Converting Seawater into Fresh Water

By Jolet Mimpem & Annelisa Cornel

The Dutch delegation sought to create a solution that could be used to desalinate water in developing countries that is easy to implement, does not require electricity and can be executed using locally available resources. They designed a glass house with two tanks, one for seawater and one for freshwater. Through the evaporation of the sea water, freshwater will eventually fall into the second smaller tank, which has a small opening to slow evaporation once the freshwater is stored within it. The salt removed from the seawater can be then taken out and used, or can be sold in local markets.

NATIONAL ORGANISER: WETSUS.

SPONSORS: NETHERLANDS WATER PARTNERSHIP (NWP), PARTNERS VOOR WATER AND WETSUS.

REPUBLIC OF KOREA

Enhancing EM's Oil Decomposition Ability with Rice Hay

By Jiseong Hab, Donhyeon Nam & Eunseok Oh

Oil spills continue to increase each year. Each drop of oil dissolved in water causes a myriad of problems and has catastrophic consequences on ecosystems. Efficient methods to remove oil that has been dissolved in water are needed. The Korean delegation has studied how to eliminate oil efficiently in an ecofriendly way using a micro-organism (EM) with hay. The results of using this new solution had very much improved from the results of previously used methods.

NATIONAL ORGANISER: KOREA WATER FORUM.

SPONSORS: KOREA WATER FORUM, MINISTRY OF LAND TRANSPORT AND MARITIME AFFAIRS, WOONGJIN COWAY, MINISTRY OF ENVIRONMENT, MINISTRY OF PUBLIC ADMINISTRATION AND SECURITY, EMBASSY OF SWEDEN IN SEOUL, THE HWAJEONG PEACE FOUNDATION.

RUSSIAN FEDERATION

Developing a Device for Water Reservoir Monitoring

By Kirill Ilin & Denis Merkulov

There is no current routine in place to monitor small water bodies in Moscow, despite the fact that they have exceptionally high value to society. The Russian delegates designed and field tested an autonomous automatic laboratory (AAL) on two small reservoirs in Moscow, where they conducted an environmental assessment and follow up plan to maintain the health of the water bodies. They also designed two devices to monitor water in the reservoirs – a small radio-controlled speed boat and a PC tablet, NOVA 5000. Using these inventions, they were able to collect primary water quality data easily, quickly and accurately, which they believe can be used to enable effective research planning on small water bodies on a wider scale.

NATIONAL ORGANIZER: ENVIRONMENTAL PROJECTS CONSULTING INSTITUTE.

SPONSORS: STATE GRANT OF THE RUSSIAN FEDERATION, COCA-COLA HELLENIC RUSSIA, FEDERAL MINISTRY OF NATURAL RESOURCES AND ECOLOGY, XYLEM INC., STATE RESEARCH CENTER "PLANETA", ROSVODOKANAL GROUP AND EVRAZIYSKIY JSC.

SINGAPORE

Investigation of the Use of Sodium-Activated Bentonite Clay in the Removal and Recovery of Non-Ionic Surfactants from Wastewater

By Luigi Marshall Cham, Jun Yong Nicholas Lim & Tian Ting Carrie-Anne Ng

The feasibility of the use of sodium-activated Bentonite Clay in removal and recovery of non-ionic surfactants that cause clogging of sewer systems was studied using Triton X-100 as test surfactant. A novel flocculation-flushing method was used. The feasibility of recovery of non-ionic surfactants from the Bentonite Clay mixture using alcohols was established. A 90 per cent recovery of the alcohol was achieved.

NATIONAL ORGANISER: LIEN FOUNDATION & Ngee ANN POLYTECHNIC.

SPONSORS: Ngee ANN POLYTECHNIC, LIEN FOUNDATION, PUBLIC UTILITIES BOARD (PUB), SINGAPORE'S NATIONAL WATER AGENCY.



SLOVAK REPUBLIC

Isolation of Microorganism from the Environment Able to Degrade Selected Pharmaceuticals

By Kristina Hanusová & Michal Radó

Human pharmaceutical compounds are emerging environmental contaminants that have become a growing concern in recent years. Metabolised or original pharmaceuticals are often not eliminated in wastewater treatment plants, and consequently they enter surface waters. Taking the above into account, the main objective of this project was to isolate the microorganisms from the natural waters, which are affected by municipal wastewater – preferably directly from the recipient.

NATIONAL ORGANISER: YOUNG SCIENTISTS OF SLOVAKIA.
SPONSORS: BRATISLAVA WATER COMPANY, SLOVAK RESEARCH AND DEVELOPMENT AGENCY, MINISTRY OF EDUCATION, SCIENCE, RESEARCH AND SPORT OF THE SLOVAK REPUBLIC, MINISTRY OF ENVIRONMENT OF THE SLOVAK REPUBLIC, SODA STREAM SLOVAKIA.

SOUTH AFRICA

Rain Water Protection and Gas Storage

By Mvumikazi Mcelwane

The South African project is inspired by the way that the earth turns industrial emissions into liquids. This innovation will do the same thing, only in an enclosed structure that will prevent emissions from escaping into the atmosphere. It will replicate the way in which acid rain is made, but also include the recycling of decay products. The objective is to reduce the amount of greenhouse gases, create jobs and solve other environmental problems such as alkaline water runoff from construction sites. This innovation will not only provide local jobs, but will benefit the whole of South Africa by ensuring cleaner air, reducing respiratory health problems and cutting the costs required to purify acid rainwater in water treatment plants.

NATIONAL ORGANISER: DEPARTMENT OF WATER AFFAIRS.

SPONSORS: WATER RESEARCH COMMISSION, UNIVERSITY OF KWA-ZULU NATAL, CAPE PENINSULA UNIVERSITY OF TECHNOLOGY.

► SOUTH AFRICA: **PREVIOUS WINNER 2003, 2005**

SRI LANKA

Removal of Harmful THM Traces in Drinking Water Using Iron Pyrites as a Low Cost Material

By Kasun Chandeepe Jayakody, Helamba Arachchige Hiran Perera & Bharatha Madusanka Ranakothge

One of the problems associated with pipe-borne water is the presence of harmful by products from disinfection (DBPs) or Trihalomethanes (THM). These are formed as a result of Chlorinating agents reacting with naturally occurring organic materials or humic substances that are present in water. The Sri Lankan delegates tested the effectiveness of Iron Pyrites (FeS_2) as a cost effective material in removing traces of harmful THM in drinking water.

NATIONAL ORGANISER: CLEAN.

SPONSORS: XYLEM INCORPORATION-USA, INDUSTRIAL SOLUTIONS LANKA (PVT) LTD. (ISL), NATIONAL SCIENCE FOUNDATION (NSF), COMMUNITY LED ENVIRONMENTAL AWARENESS NETWORK (CLEAN).

Photos: Edelpix





TURKEY

Dyestuff Treatment through Using Column System for Wastewaters

By Alana Safak

The Turkish project aims to prevent the environmental pollution caused by dyestuff. This was done through a biological method which includes absorbing wastes with the help of a column system that uses polymer (a fungal product) and montmorillonite (a natural clay). The Turkish team concluded that because the feed lot of the polymer is the same as sugar and cheese plants that produce glucose-rich wastewater, the cost of this solution will be low.

NATIONAL ORGANISER: GENERAL DIRECTORATE OF STATE HYDRAULIC WORKS.

SPONSORS: DSI.

► TURKEY: **PREVIOUS WINNER 2009**

UKRAINE

Crustaceans of the Black Sea as Biomarkers of Heavy Metal Pollution

By Andriy Andrusyshyn

Anthropogenic pressure has become a serious threat to both sea biodiversity and human health all over the world. This threat is aggravated by the ability of certain compounds, such as heavy metals, to accumulate at all levels of the ecological pyramid. It is well known that crustaceans play an important role in the destruction of organic matter and the functioning of the sea biocoenosis. The Ukrainian project suggests that crustaceans can be used as biomarkers of seawater pollution and explains how this would help us better monitor and maintain ecosystem health in the sea.

NATIONAL ORGANISER: ECOINFORM.

SPONSORS: DOW EUROPE GMBH, ECOSOFT, ECOINFORM.

Photo: Edelpix

UNITED KINGDOM

The Foundations of Aquatic Biodiversity

By Sam Cook

Photosynthetic microorganisms constitute the basis of aquatic biodiversity; they are invisible to the naked eye, but very important to their habitat. Diatoms, a key component of this biodiversity, are an indicator of water quality and ecosystem health. This project developed a new classification system for Diatoms and for the first time explored their value in wetland aquatic ecosystems, which is fundamental to environmental and river basin management.

NATIONAL ORGANISERS: THE CHARTERED INSTITUTION OF WATER AND ENVIRONMENTAL MANAGEMENT (CIWEM).

SPONSORS: THE CHARTERED INSTITUTION OF WATER AND ENVIRONMENTAL MANAGEMENT (CIWEM).

UNITED STATES

Modeling and Environmental Analysis of Hydraulic Fracturing in Upstate New York

By Kunal Sangani

The development of hydraulic fracturing, or “hydrofracking,” has made natural gas stored in shale rock accessible. However, environmentalists fear the process may contaminate shallow water aquifers. The US project has investigated these concerns by developing a mathematical model for the process and testing the toxicity of hydrofracking wastewater. The US delegate found that lower fracturing pressures can be used to mitigate the effects of hydrofracking on water supplies while producing equivalent amounts of natural gas.

NATIONAL ORGANISER: WATER ENVIRONMENT FEDERATION.
SPONSORS: WATER ENVIRONMENT FEDERATION, XYLEM INC., COCA-COLA COMPANY.

► UNITED STATES: **PREVIOUS WINNER 1997, 2000, 2002, 2008 & 2011**



Stockholm Junior Water Prize Winner 2011



Alison Bick, USA, receiving the 2011 Stockholm Junior Water Prize from H.R.H. Crown Princess Victoria.

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Trosa Tryckeri

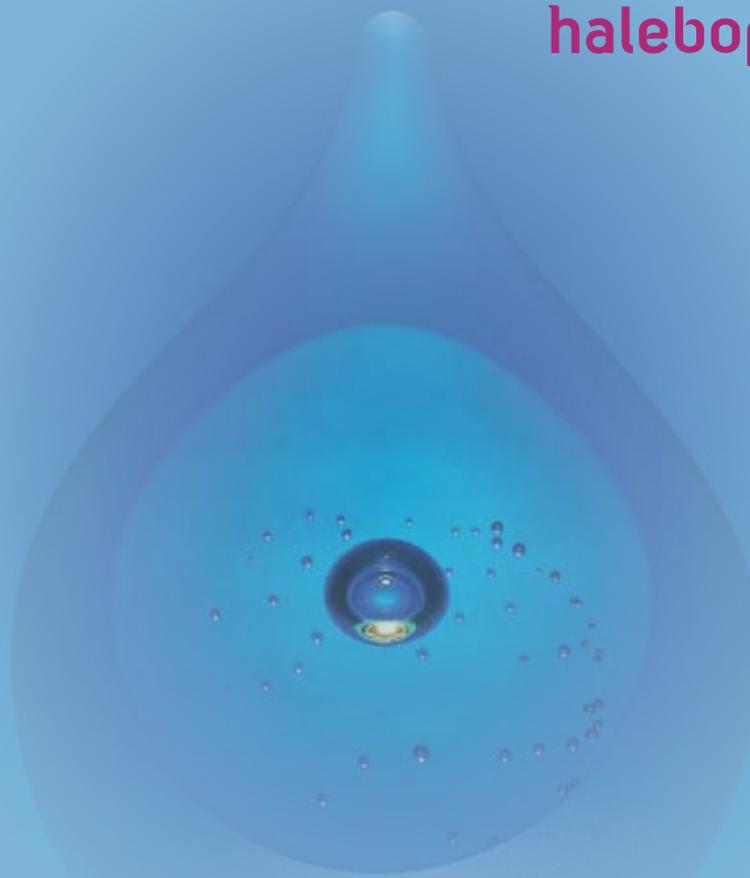
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Let's Solve Water

Stockholm Junior Water Prize Winners

- 2011** | Alison Bick, USA
Development and Evaluation of a Microfluidic Co-Flow Device to Determine Water Quality
- 2010** | Alexandre Allard and Danny Luong, Canada
"Research on Biodegradation of the Plastic Polyesterene"
- 2009** | Ceren Burçak Dag, Turkey
"A Solution to Energy-Based Water Contamination: Rain as an Alternative Environmentally Friendly Energy Source"
- 2008** | Joyce Chai, USA
"Modelling the Toxic Effects of Silver Nanoparticles Under Varying Environmental Conditions"
- 2007** | Adriana Alcántara Ruiz, Dalia Graciela Díaz Gómez and Carlos Hernández Mejía, Mexico
"Elimination of Pb(II) From Water Via Bio-Adsorption Using Eggshells"
- 2006** | Wang Hao, Xiao Yi and Weng Jie, China
"Application Research and Practice of a Comprehensive Technology for Restoring Urban River Channels Ecologically"
- 2005** | Pontso Moletsane, Motebele Moshodi and Sechaba Ramabenyane, South Africa
"Nocturnal Hydro Minimiser"
- 2004** | Tsutomu Kawahira, Daisuke Sunakawa and Kaori Yamaguti, Japan
"The Organic Fertilizer – an Alternative to Commercial Fertilizers"
- 2003** | Claire Reid, South Africa
"Water Wise Reel Gardening"
- 2002** | Katherine Holt, USA
"Cleaning the Chesapeake Bay with Oysters"
- 2001** | Magnus Isacson, Johan Nilvebrant and Rasmus Öman, Sweden
"Removal of Metal Ions from Leachate"
- 2000** | Ashley Mulroy, USA
"Correlating Residual Antibiotic Contamination in Public Water to the Drug Resistance of *Escherichia coli*"
- 1999** | Rosa Lozano, Elisabeth Pozo and Rocío Ruiz, Spain
"Echinoderms as Biological Indicators of Water Quality in the Alborán Sea Coast".
- 1998** | Robert Franke, Germany
"The Aquakat – a Solar-Driven Reactor for the Decontamination of Industrial Wastewater".
- 1997** | Stephen Tinnin, USA
"Changes in Development, Sperm Activity and Reproduction Across a 105 Exposure Range in *Lytechinus Variegatus* Gametes Exposed to Pesticides in Marine Media".

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