



FINALISTS 2013

STOCKHOLM JUNIOR WATER PRIZE

ARGENTINA • AUSTRALIA • BELARUS • BELGUM • CANADA • CHILE • CHINA • CYPRUS • FINLAND • FRANCE
GERMANY • HUNGARY • ISRAEL • JAPAN • LATVIA • MEXICO • THE NETHERLANDS • NORWAY • REPUBLIC OF KOREA
RUSSIAN FEDERATION • SINGAPORE • SOUTH AFRICA • SRI LANKA • SWEDEN • THAILAND • TURKEY • UKRAINE
UNITED KINGDOM • UNITED STATES OF AMERICA

STOCKHÖLM
JUNIOR
WATER PRIZE

THE STOCKHOLM JUNIOR WATER PRIZE

Each year, the Stockholm Junior Water Prize international 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 their national competitions, and have been selected as winners from thousands of entries.

This year we are very proud to host the 18th annual competition and welcome the winners of national competitions from 29 countries: *Argentina, Australia, Belarus, Belgium, Canada, Chile, China, Cyprus, Finland, France, Germany, Hungary, Israel, Japan, Latvia, Mexico, The Netherlands, Norway, Republic of Korea, Russian Federation, Singapore, South Africa, Sri Lanka, Sweden, Thailand, Turkey, Ukraine, United Kingdom and United States.*

The Stockholm Junior Water Prize competition proves that brilliant young minds can find inspiration in unlikely places.

Ingenious teams from the world over have shown how to clean water and protect marine environments with substances ranging from oysters to eggshells. They see opportunity and hope where others find challenges and have developed cost-efficient and immediate solutions, applicable the world over. In this catalogue, you can learn more about the innovative research and inventions that earned each of the 2013 finalists a place in competing for this international honour.

All the finalists were invited to Stockholm for the special opportunity of meeting and with present leaders of the global water

community and making life-long friendships with international compatriots who share a passion for water and science. This visit includes the 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 September 4.

World Water Week participants have the opportunity to meet this next generation of water leaders at this year's conference by visiting their booths in Hall B.

THE INTERNATIONAL JURY

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

THE 2013 INTERNATIONAL JURY MEMBERS

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; DANKA THALMEINEROVA, SWEDEN AND MS. CAJSA LARSSON (SECRETARY), SIWI, SWEDEN.

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 at local, regional, national or global levels on 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.

INDEX

ARGENTINA	4	GERMANY	9	SINGAPORE	14
AUSTRALIA	5	HUNGARY	9	SOUTH AFRICA	15
BELARUS	5	ISRAEL	10	SRI LANKA	15
BELGIUM	5	JAPAN	11	SWEDEN	15
CANADA	6	LATVIA	11	THAILAND	16
CHILE	7	MEXICO	11	TURKEY	16
CHINA	7	THE NETHERLANDS	12	UKRAINE	17
CYPRUS	7	NORWAY	13	UNITED KINGDOM	17
FINLAND	8	REPUBLIC OF KOREA	13	UNITED STATES	17
FRANCE	9	RUSSIAN FEDERATION	13		



ARGENTINA

Technological advances for the Treatment of Industrial Effluents

By Ezequiel Solis & Julian Zuñiga

The Argentinian delegation proposes a breakthrough in the use of photo-active catalysts irradiated with ultraviolet light. In combination with oxygen from the air, catalysts can be used to treat industrial effluents carrying organic and inorganic pollution, inducing the oxidation of the organic loads and the reduction of the inorganic of metal ions. The scheme proposed was tested with a prototype, simulating industrial effluents, and achieved mineralisation of organic substances as well as reduction of metal ions.

NATIONAL ORGANISER

AIDIS ARGENTINA (ASOCIACIÓN ARGENTINA DE AINGENIERÍA SANITARIA Y CIENCIAS AMBIENTE)

SPONSORS

AYSA, ECOPRENEUR, XYLEM WATER SOLUTIONS ARGENTINA S.A., ENERSYSTEM ARGENTINA S.A.

AUSTRALIA

Facing the Reality of Ground-water Salinity

By Declan Fahey

Undertaken in Tasmania, Australia's most southern state, the delegation from Australia set out to model the effects of salinisation on soil from water movement in potato crops. This was utilised by an examination of water movement in potato cells due to variations in salt concentration in extra-cellular fluids. From such a model, one could infer the likelihood of successful large-scale crop production in Tasmanian soils in areas affected by groundwater salinity, and by extension, in salinity-prone areas across the globe.

NATIONAL ORGANISER
AUSTRALIAN WATER ASSOCIATION

SPONSORS
XYLEM, AUSTRALIAN SCIENCE
TEACHERS ASSOCIATION

BELARUS

Sorption Properties of Alginic Acids Originated from Laminaria and Its Usage in Water Treatment

By Sviatlana Kazlova

In order to treat contaminated waters naturally, the delegation from Belarus set out to establish the sorption properties of natural materials, such as alginic acids. Alginic acids were collected from the Laminaria thalli and tested for quality. The Belarusian delegation found that alginic acids have very good sorption capacities. Furthermore, an additional beneficial quality of alginic acids was found; due to its excellent sorption qualities, the acids can also be used as antiseptic combines, for example in adhesive plasters.

NATIONAL ORGANISER
THE REPUBLIC ECOLOGICAL
CENTER OF CHILDREN AND YOUTH

SPONSOR
COCA-COLA BEVERAGES BELARUS

BELGIUM

Water, Source of Life, Can it be a Source of Energy?

By Alexis Pierson & Loïc Preud'homme

The Belgian delegation has created an ecological, economical and sustainable battery that runs on water. The battery is based on the oxidation-reduction process and constitutes an alternative to currently used batteries that are a major source of pollution, significantly reducing their environmental impact. The reaction takes place between a metal electrode, made out of zinc or magnesium, and water. The electrode releases electrons which induces an electric current that supplies energy to the electric circuit of the device.

NATIONAL ORGANISER
JEUNESSES SCIENTIFIQUES
DE BELGIQUE

SPONSORS
VIVAQUA, BELGIAN SCIENCE
POLICY OFFICE, MILSET

CANADA

Eggshells: Simple, Practical, Cost Efficient Remedy to Address Cadmium Pollution

By Hannah Landry

In many countries around the world, the levels of Cadmium (Cd) pollution have increased to hazardous levels. The goal of the Canadian delegation was to discover a low cost, practical, viable water filtration system working to remove Cd from water in developing nations. The study examined the efficiency of eggshells from six breeds of chickens in their ability to remove Cd from drinking and waste water. Results proved the capacity of eggshells to remove Cd from water and determined the Hungarian Yellow to be the most efficient.

NATIONAL ORGANISER
WESTERN CANADA WATER
ENVIRONMENT ASSOCIATION

SPONSORS
CANADIAN WEF MA'S, CANADIAN
WATER AND WASTEWATER ASSOCIATION,
XYLEM, PROMINENT FLUID
CONTROLS LTD., ERAMOSIA ENGINEERING
INC., AMERICAN WATER
TERRATEC ENVIRONMENTAL

CHILE

Psychobacter: Antarctic Co-operation on Bioremediation of Oil-Contaminated Waters

By Naomi Estay & Omayra Toro

The delegation from Chile have identified Antarctic psychophiles that are capable of metabolising phenanthrene (a polycyclic aromatic hydrocarbon, PAH) as the sole source of carbon for use in bioremediation of contaminated waters in extreme low-temperature zones. The research conducted by the Chilean delegation yielded twelve bacterial strains capable of degrading phenanthrene.

NATIONAL ORGANISERS

**MINISTRY OF PUBLIC WORKS,
GENERAL WATER DIRECTORATE,
INTERNATIONAL HYDROLOGICAL
PROGRAMME (IHP), UNESCO
CHILEAN CHAPTER, AIDIS, SOCHID**

SPONSORS

**AQUAS ANDINAS, COLBUN,
SODIMAC, NESTLÉ**

CHINA

Development and Test of Robot for Prevention and Control of Water Bloom

By Qian Dashi, Li Chang & Feng Yikai

Blue algae water bloom proposes a serious environmental hazard and creates the need for eutrophication prevention and treatment of water. The robot developed by the Chinese delegation is designed to control water bloom. The robot adopts solar energy as an auxiliary power, uses new water pressure filters and possesses several innovative functions, including anti-blockage. This creative innovation can automatically work in waters, removing floating algae and preventing its burst in large areas.

NATIONAL ORGANISERS

**CENTER FOR ENVIRONMENTAL
EDUCATION & COMMUNICATIONS
OF MINISTRY OF ENVIRONMENTAL
PROTECTION OF CHINA**

SPONSOR

XYLEM

CYPRUS

Creating a Sustainable Desalination System Through Renewable Energy Generation Using Brine as an Energy Storage Medium

By Antonis Antoniadis

Desalination is from its nature a very energy-dependent process. The delegation from Cyprus, aiming to curb the large energy demand for this activity, has devised a new model that fits right into the desalination system. This brand new, innovative model provides renewable energy and uses it to create electricity. In addition, this method allows for the use of solar energy in daylight as well as at night.

NATIONAL ORGANISER

WATER MUSEUM OF LEMESOS

SPONSORS

**HELLENIC BANK, PRICEWATER-
HOUSECOOPERS, GREEN DOT,
CYPRUS TECHNOLOGICAL
UNIVERSITY, PHILELEFTHEROS
NEWSPAPER**

FINLAND

Determining The Viability of Struvite Precipitation as an Alternative Method for Phosphate Ion Removal from Wastewater

By Filip Soich

The aim of the Finnish delegation was to quantitatively determine, under laboratory conditions, whether dissolved phosphate could be removed from water and thus recovered through the precipitation of struvite. The practical component showed that there was over 99 per cent decrease in remaining phosphate levels in the solution. The benefits as well as the difficulties of precipitating struvite to remove phosphate from wastewater were also qualitatively discussed throughout the work.

NATIONAL ORGANISER
WATER ASSOCIATION FINLAND

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

FRANCE

Tip Tap Top: Water Saves, Save Water!

By Robin Menelot, Olivier Arconte & Lucas Baraize

How many children waste water while washing their hands every day around the world? Too many! Kids, do you always wash your hands as you are told? Not always... The delegation from France and Tip Tap Top teaches this task in a new and amusing way, reducing water waste by up to 70 per cent while increasing sanitation and hygiene. Through a jolly jingle, Tip Tap Top guides children and shows them how fun it can be to wash their hands. Last but not least, the device is totally autonomous! Water saves, save water.

NATIONAL ORGANISER
FRENCH OFFICE OF THE
FOUNDATION FOR ENVIRONMENTAL
EDUCATION IN EUROPE (FEEE)

SPONSORS
FEEE, FRENCH MINISTRY OF
SUSTAINABLE DEVELOPMENT,
FRENCH WATER AGENCY OF
SEYNE-NORMANDY

GERMANY

Detector for Finding the Optimum Washing-Performance of Washing Machines Based on Impedance-Spectroscopy

By Dana Tran & Wolfgang Köbele

In the washing machines of today, washing powder is added manually, and often, too much is added. This not only leads to a higher consumption of washing powder, but also to a higher consumption of water when rinsing. This presents an environmental issue in a time where preservation of water is more important than ever. The full washing power of a machine is only achieved around about the critical micelle formation concentration (CMC). The delegation from Germany aimed to find the optimum washing powder-concentration by applying the Impedance-Spectroscopy to the washing solution.

NATIONAL ORGANISER
STIFTUNG JUGEND FORSCHT E.V.

HUNGARY

The Importance of the Szinva-Stream – Biological and Chemical-Physical Examinations

By Péter Polák, Jr, Dézi Kakas & János Béri

The Hungarian delegation presents a small part of a research project that began in 2010. The Hungarian students have investigated the water quality of their local stream, the Szinva, whose water is used by the city for the production of drinking water as well as for industrial purposes. The delegation from Hungary has made measures with credible devices and methods in order to present feedback to the local authorities. The delegation is hoping that the results generated can assist in the improvement of the water quality and preserve their biggest treasure – the Szinva.

NATIONAL ORGANISER
GLOBAL WATER PARTNERSHIP
(GWP)

SPONSORS
WATER FOR LIFE FOUNDATION,
COCA-COLA HBC, GE WATER &
PROCESS TECHNOLOGIES,
BUDAPEST WATERWORKS,
HUNGARIAN WASTEWATER
ASSOCIATION, PUBLIC UTILITY
EVALUATION CLUSTER, HAURATON

ISRAEL

Ever Green: Smart Irrigation in the Palm of Your Hand

By Yeari Vigder & Noam Arye Nassi

The project presented by the Israeli delegation proposes a cheap and easy way to use a remote sensing system for farmers in developing countries. This inspiring innovation provides a plug-in and a smartphone application that delivers an immediate field condition feedback that allows for water saving. The plug-in sensors are mounted on a moving platform that takes snapshots of the crops and calculates the field's "Water Index", indicating what areas need more or less water. The delegation from Israel has constructed a working prototype by using a small helicopter, a tablet and sensor units. This prototype has been tested on real fields.

NATIONAL ORGANISER
FACULTY OF ENGINEERING,
TEL AVIV

SPONSORS
THE ABY AND ALADAR FLEISCHMAN
FACULTY OF ENGINEERING IN
TEL AVIV UNIVERSITY, MANUEL
AND RAWUEL KLACHKY FUND,
WATER AUTHORITY

JAPAN

A Challenge to Reduce Seabed Litter in the Seto Inland Sea by Two Activities Gathering and Education

By Yua Yamaguchi, Ayumi Inoue & Shiho Tsukiji

It is estimated that over 13,000 tonnes of garbage is piled up at the bottom of the Seto Inland Sea. The Japanese students have tackled this problem in two ways. First, they have removed garbage from the sea bed through the use of large trawling fishing nets attached to fishing boats. Furthermore, the Japanese delegation has strived to educate the public about the damage caused to the Seto Inland Sea through garbage waste. By taking these two steps, the Japanese delegation hopes to significantly reduce the garbage located at the bottom of the Seto Inland Sea.

NATIONAL ORGANISER
JAPAN WATER PRIZE COMMITTEE

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

LATVIA

Wastewater Purification From Phosphates Using Various Materials

By Arturs Janis Petersons & Rolands Capars

The Latvian delegation has aimed to determine the ability of various materials, such as dolomite, red brick, travertine and gravel, to sorb phosphate ions. The delegation used prepared phosphorus containing solutions as well as wastewater samples from washing machines in order to investigate the different sorb abilities. Final results showed that travertine was the most effective material to sorb phosphates, with the ability to sorb about 95 per cent of phosphates from wastewater. However, other materials appeared to sorb phosphates as well and were found able to sorb phosphate ions below the permitted concentration in wastewaters.

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

Extraction and Purification of Cactus Mucilage and Its Effect as Coagulant-Flocculant to Produce Drinking Water for the Inhabitants of Rural Areas

By Clarissa Camargo Tapia, Doryan Brenda Laura Callejas López & Julisa Guadalupe Lugo Pacheco

The project presented by the delegation from Mexico was performed in a Mexican rural area using a local and biodegradable product known as mucilage (cactus fibre). The Mexican delegation tested three different water sources recharged by wastewater containing TC, FC, Na; As, F, Pb and TDS, which all exceeded the Mexican regulation. For each water source, 200, 300, 400 and 500 mg/L mucilage powder were applied. In addition, a control dose of Al (SO₄)₃ was added. Results showed that all parameters measured were similar in both cases, therefore safe drinking water might be obtained.

NATIONAL ORGANISER
MEXICAN ACADEMY OF SCIENCES

SPONSORER
ACADEMIA MEXICANA DE CIENCIAS, ALFA LAVAL S. A. DE C. V., CÁMARA DE COMERCIO SUECO-MEXICANA, COLEGIO DE INGENIEROS AMBIENTALES DE MÉXICO AC, COMISIÓN NACIONAL DEL AGUA-CONAGUA, EMBAJADA DE SUECIA, ERICSSON TELECOM S. A. DE C. V., FUNDACIÓN COCA COLA, GRUPO URREA, INSTITUTO MEXICANO DE LA JUVENTUD, KEMIRA DE MÉXICO S.A. DE C.V, SANDVIK DE MÉXICO, S.A. DE C.V., SISTEMA DE AGUAS DE LA CIUDAD DE MÉXICO, TETRA PAK, S.A. DE C.V., XYLEM WATER SOLUTIONS MÉXICO S DEL RL DE CV

THE NETHERLANDS

Green Cities

*By Kimberly Schoenmaker &
Lotte Hoes*

The delegation from the Netherlands shows how it is possible to design an apartment building with a green roof as efficiently and inexpensively as possible. This building would be especially built for the purpose of water storage in cities. The Dutch students touch upon the issues of mass calculation, types of soil and the possibilities of green roofs. This project also discusses the main issue of how green cities can help city management in their fight against rising water consumption.

NATIONAL ORGANISER
WETSUS, NETHERLANDS WATER
PARTNERSHIP

SPONSORS
WETSUS, NETHERLANDS WATER
PARTNERSHIP, PARTNERS FOR
WATER, RIJKS WATERSTAAT

NORWAY

The Impact of De-Icing Road Salt on Surface Water – Focusing on the Drinking Water Supply Gjersjøen

By Hanne Minken Farestveit, Johannes Nyland Tandberg & Anna Grønning

The use of de-icing road salts to improve winter road conditions is linked to an increasing salinity in nearby lakes. This increase in salinity can lead to changes in density gradients, stratification as well as circulation patterns, resulting in oxygen depletion. The Norwegian delegation has investigated the current situation as well as the long-term development of the lake Gjersjøen. The lake's salinity is increasing, but the circulation is not yet affected. The Norwegian project presents several recommendations to prevent a further negative development.

NATIONAL ORGANISER
NORWEGIAN HYDROLOGICAL COMMITTEE, NORWEGIAN WATER ASSOCIATION, VA-YNGRE, NORWEGIAN WATER RESOURCES AND ENERGY DIRECTORATE

SPONSORS
CLEAN WATER NORWAY, BRIMER, GODT VANN DRAMMENS-REGIONEN

REPUBLIC OF KOREA

Producing Reusable Photocatalyst and Its Application

By Seohee Kim & Isabella Kim

Photo catalysts, especially the TiO_2 , present a promising way of decomposing pollutants. However, there is one major issue preventing this method from being adopted in reality; photo catalysts are too small to be separated from a solution. Therefore, the delegation from the Republic of Korea has developed a new type of photo catalyst that is produced by synthesising TiO_2 with Fe_3O_4 . This innovative type of photo catalyst can be separated from a solution through the use of a magnet. The new photo catalyst has been investigated for both properties and application.

NATIONAL ORGANISER
KOREA WATER FORUM

SPONSORS
KOREA WATER FORUM, MINISTRY OF LAND INFRASTRUCTURE AND TRANSPORT, MINISTRY OF SECURITY AND PUBLIC ADMINISTRATION, MINISTRY OF ENVIRONMENT, DAEGU METROPOLITAN CITY, PROVINCE OF GYEONGSANGBUK-DO, DAEGU METROPOLITAN OFFICE OF EDUCATION, GYEONGSANGBUK-DO OFFICE OF EDUCATION, ANDONG CITY, K-WATER, SWEDISH EMBASSY IN SEOUL

RUSSIAN FEDERATION

Geophysical Methods of Ground Water Monitoring

By Vadim Tereletsky

The delegation from the Russian Federation has conducted a geophysical survey of an area around a well to assess the risks of potential infiltration of oil products from a new gas station into the drinking water. The assessment was conducted from a novel method of joint interpretation of results using electric tomography and electric charge measurements. The direction of laminar groundwater flow was established by a sanitary-topographic survey of the geological structure of the area. Results showed that the gas station could not be the source of well water pollution. A computer analysis of field measurements detected other potential sources of well water pollution, which originated in the communal sector.

NATIONAL ORGANISER
ENVIRONMENTAL PROJECTS CONSULTING INSTITUTE

SPONSORS
ENVIRONMENTAL PROJECTS CONSULTING INSTITUTE, STATE GRANT OF THE RUSSIAN FEDERATION, FEDERAL MINISTRY OF NATURAL RESOURCES AND ECOLOGY, THE STATE ATOMIC ENERGY CORPORATION "ROSATOM", COCA-COLA HELLENIC IN RUSSIA, STATE RESEARCH CENTER "PLANETA", ROSVODOKANAL GROUP, GOOGLE GRANTS

SINGAPORE

Use Of Recycled Clam Shells In Water Purification

By Yinn Jaye Ong, Kang Le Yeo & Wei Jin Gong

Water polluted by heavy metal ions poses significant health risks. The delegation from Singapore has set out to compare the effectiveness of the lala clam, blood cockle and mussel shells in removing heavy metal ions under different pH levels. An easy-to-construct, cheap and eco-friendly filter capable of removing close to 100 per cent of metal ions was constructed using the more effective lala and blood cockle clam shells, low-cost charcoal, recycled bottles and sand. This filter can be used by those in poverty-stricken areas to obtain clean, potable water.

NATIONAL ORGANISER
LIEN FOUNDATION, Ngee Ann Polytechnic

SPONSORS
Ngee Ann Polytechnic, Lien Foundation, Public Utilities Board (PUB), Singapore's National Water Agency

SOUTH AFRICA

Evolution of Water Access and Usage

By Ayanda Tsitsa

The South African project addresses the issue of water waste by introducing a paddle system that will recycle water wasted through dripping. The system will reduce dripping water wastage, promote efficiency and minimise the risk of waterborne diseases generated in water pools created around taps where water is dripping. This new innovation consists of a tap, paddle, underground filter tank and a reservoir. The filter and the reservoir address the issue of dripping water by recollecting, purifying and reusing the water. This innovation could become very useful in rural and informal settlements where the effects of drip water waste are evident.

NATIONAL ORGANISER
DEPARTMENT OF WATER AFFAIRS

SPONSORS
WATER RESEARCH COUNCIL,
UNIVERSITY OF KWAZULU NATAL,
CAPE PENINSULA UNIVERSITY
OF TECHNOLOGY

SRI LANKA

Optimizing Soil Moisture for Higher Yield Using Solar Evaporation with Minimum Water

*By Navaretnarajah Kishoth,
Shanthalingam Hisbanth &
Nadarajah Viththiyakaran*

As of today, the methodologies used for watering crops in agriculture are driven by manually set times, irrespective of the individual plants' needs. However, in a time where water conservation is crucial, a better approach would be to use water crops based on the individual needs of the plants rather than on a set frequency. Thus, the Sri Lankan delegation introduces a novel methodology suggesting to water crops depending on ambient soil and temperature conditions. By applying this method to modern agriculture, farmers will be able to not only conserve water. This method further proposes an opportunity to use sea water for watering crops.

NATIONAL ORGANISER
COMMUNITY LED ENVIRONMENTAL
AWARENESS NETWORK (CLEAN)

SPONSORS
XYLEM INC. USA, INDUSTRIAL
SOLUTIONS LANKA (PVT) LTD. (ISL)
SRI LANKA, COMMUNITY LED
ENVIRONMENTAL AWARENESS
NETWORK (CLEAN), SRI LANKA.
MINISTRY OF EDUCATION,
SRI LANKA

SWEDEN

An Investigation of Harmful Substances in Ordinary Garden Hoses by XRF Spectrometer Analysis

By Emil Johansson

The Swedish project has investigated the existence of environmentally harmful substances in ordinary garden hoses. The analysis of the hoses reveals that the inner PVC plastic contains substantial amounts of lead, antimony and barium. The highest amount of lead found in the PVC plastic was 1,251 ppm. Concentrations of lead over 100 ppm were found in four out of six of the hoses tested. Previously conducted studies have found that lead has neurotoxic properties that affect cognitive abilities. Low concentrations of lead in the blood of children have been linked to reduced IQ levels. In addition, both antimony and barium compounds can be poisonous to humans. The project highlights the potential health risks related to the presence of lead, barium and antimony in garden hoses. Essential in the risk evaluation is the chemical constellation in which the substances are found.

NATIONAL ORGANISER
STOCKHOLM INTERNATIONAL
WATER INSTITUTE (SIWI)

SPONSORS
XYLEM INC., TYRÉNS, URBAN
WATER, VATTENMYNDIGHETERNA

THAILAND

A Novel Bioabsorption Instrument for Removal of Heavy Metals from Wastewater

*By Cattliya Laohapotjanart,
Thanwarat Jantiwatkun &
Patnarin Kattiyasuwong*

The delegation from Thailand has aimed to investigate the heavy metal removal capabilities of natural absorbents to discover a cleaner, safer, more cost efficient and feasible alternative to wastewater treatment. The bio absorbents chosen were sawdust, coconut fibre and rice husk as they are in abundance and otherwise wasted by products. Results showed that the studied bio absorbents were extremely effective, up to 98 per cent, in the removal of copper, lead and cadmium ions.

NATIONAL ORGANISER
THAI TAP WATER SUPPLY PCL
(TTW)

SPONSORS
THE INSTITUTE FOR THE PROMO-
TION OF TEACHING SCIENCE AND
TECHNOLOGY (IPST)

TURKEY

Common Structures, Common Solutions – from Water Scales to Water Towers

By Günnur Tekşen

In the Ottoman Empire, water distribution towers were used to decrease the pressure of water flowing from higher altitudes, as well as to share that water. However, these structures are not under protection in Turkey today although the information about these designs is considered a guiding element for the use of old technologies in the construction of new projects. Because of this, the Turkish delegation advises that the properties of these structures are to be taught in the physics, history and architectural departments of universities.

NATIONAL ORGANISER
GENERAL DIRECTORATE OF STATE
HYDRAULIC WORKS

UKRAINE

Autonomous Device that Prevents Fish Smothering

By Zenoviya Shvayka

Fish smothering is a great ecological problem in ponds, rivers and lakes, and is caused by oxygen scarcity during freezing-over periods. Ice holes have been a previous solution to this problem. However, once mechanically drilled, the ice holes require systematic renovation. These known solutions are both dangerous and energy consuming or require special chemicals. The device developed by the Ukrainian delegation utilises wind energy to create vertical water flow in the ice holes, thus preventing its freezing and providing good aeration to overcome oxygen deficiency in the water.

NATIONAL ORGANISER
ECOINFORM

SPONSORS
DOW EUROPE GMBH, ECOSOFT, WATERNET, SANTECHPLAST

UNITED KINGDOM

Measuring the Hydrodynamic Load on Wave Energy Structures

By Astrid Blee, Elena Stronach & Leah Edwards

Alstom are involved in the development of a device to generate electrical power from ocean waves. This innovation, created by the delegation from the United Kingdom, concerns small scale measurement of the forces on a wave device. This provides fundamental information requested by the designers of the device, who are working towards a full scale prototype, due to enter sea trials at Costa Head, Scotland, in 2014.

NATIONAL ORGANISER
THE CHARTERED INSTITUTION OF WATER AND ENVIRONMENTAL MANAGEMENT (CIWEM)

SPONSORS
CIWEM

SPONSORS
JBA TRUST, THE WORSHIPFUL COMPANY OF WATER CONSERVATORS

UNITED STATES OF AMERICA

Sulfidation as a Novel Method to Reduce Toxicity of Silver Nanoparticle Pollution

By Anirudh Jain

Explosive growth in the use of silver nanoparticles in consumer products is increasing their concentration in wastewater. If the nanoparticles are released untreated after wastewater treatment, they can adversely impact benign microorganisms in our ecosystem. The study conducted by the delegation from the United States of America investigated sulfidation as a viable treatment method for reducing the toxicity of silver nanoparticles. It established that exposure to sulfides effectively reduced the biotoxicity of silver nanoparticles by altering their properties.

NATIONAL ORGANISER
WATER ENVIRONMENT FEDERATION

SPONSORS
WATER ENVIRONMENT FEDERATION, XYLEM INC.

2012 STOCKHOLM JUNIOR WATER PRIZE WINNER



Photo: Cecilia Östhammar, Exray

Luigi Marshall Cham, Jun Yong Nicholas Lim and Tian Ting Carrie-Anne Ng, Singapore, receiving the 2012 Stockholm Junior Water Prize from H.R.H. Crown Princess Victoria.

The 2012 Diploma of Excellence was awarded to Alonso Alvarez and Daniel Barrientos from Chile.

HOW DO YOU SOLVE WATER?



Xylem Watermark provides and protects safe water resources in communities around the world.

School and Community Projects | Water, Sanitation and Hygiene Education | Emergency Response



Xylem congratulates all participants in the 2013 International Stockholm Junior Water Prize competition!

STOCKHOLM JUNIOR WATER PRIZE WINNERS

- 2012** | Luigi Marshall Cham, Jun Yong Nicholas Lim and Tian Ting Carrie-Anne Ng, Singapore
"Investigation of the Use of Sodium-Activated Bentonite Clay in the Removal and Recovery of Non-Ionic Surfactants from Wastewater"
- 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 Polystyrene"
- 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"



WWW.SIWI.ORG/
STOCKHOLMJUNIORWATERPRIZE



2012 STOCKHOLM JUNIOR WATER PRIZE CONTESTANTS



Do you want to be part of the Stockholm Junior Water Prize?

If you are interested in leading a national competition in your country or would like to learn more about sponsorship opportunities for the Stockholm Junior Water Prize, please contact cajsa.larsson@siwi.org.

Global Sponsor



Official Suppliers



Trosa Tryckeri
People Travel Group

Official Supporters



SAS & Coca-Cola
Environmental Foundation



STOCKHOLM INTERNATIONAL WATER INSTITUTE, SIWI
DROTNINGGATAN 33, SE-111 51 STOCKHOLM, SWEDEN
PHONE +46 8 121 360 00 + FAX +46 8 121 360 01 + siwi@siwi.org + www.siw.org