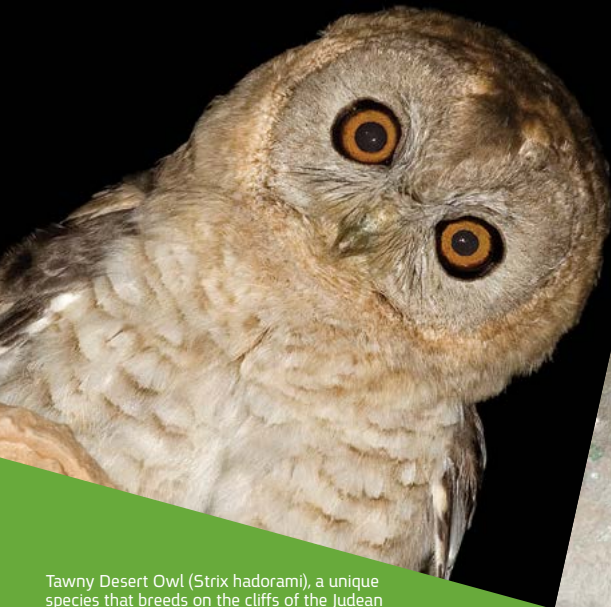
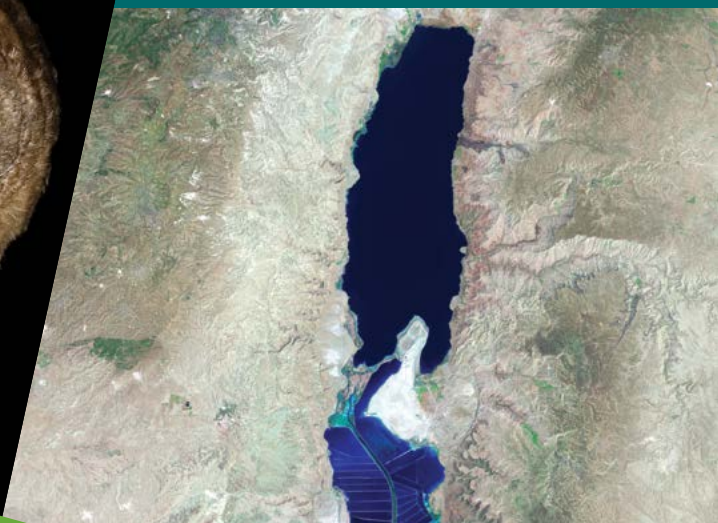




A flock of migrating White Storks (*Ciconia ciconia*) at their night stopover site; about 600,000 storks migrate above the Great Rift Valley in their autumn migration (Photo: Thomas Krumenacker)



Tawny Desert Owl (*Strix hadorami*), a unique species that breeds on the cliffs of the Judean Desert adjacent to the Dead Sea (Photo: Roni Livne)



Satellite photo of the Dead Sea (Courtesy of: NASA)

## 2nd German-Israeli Climate Talks:

Climate Change in the Lowest Place on Earth, the Dead Sea, Great Rift Valley – Bird Migration and DESERVE Project

September 1st - 3rd, 2015, Tel Aviv University and Ein Gedi, the Dead Sea Region



LEGACY  
HERITAGE  
FUND  
LIMITED



1965 - 2015  
50 שנה  
חמישים שנים  
למדינת ישראל  
50 Jahre  
Diplomatische Beziehungen  
Deutschland-Israel



Society for the  
Protection of Nature in Israel  
Israel Ornithological Center  
Educate. Love. Protect.



Pallid Scops Owl (*Otus brucai*) found injured near the Dead Sea. The previous sightings of nesting individuals were by the zoologist, Israel Aharoni, in the year 1911! A survey carried out by Israeli birders in the summer of 2015 located about 80 pairs in date plantations between the Dead Sea and the Beit Shean Valley (Photo: Yossi Leshem)



Satellite photo of the region (Courtesy of: NASA)

The "Hoopoe Foundation" of the Society for the Protection of Nature in Israel was established with a generous donation by Racheli and Moshe Yanai, as well as additional donors. The aim of the foundation is to strengthen the subject of birding in Israel with the emphasis on education, the protection of birds and their habitat, research as well as the promotion of joint projects with our neighbors, the Jordanians and Palestinians.

Editors: **Sorrel Ritter and Yossi Leshem**

Our website: [www.birds.org.il](http://www.birds.org.il)



# Climate Talks Objectives

- To learn and discuss the impact of climate change on bird migration.
- To discuss sustainable politics and policy in the framework of “research for the people”.
- To expose the subject to the academia, conservationists, decision-makers, the public and the media.

## Climate Talks Organizers

- German Embassy Tel Aviv, Israel
- Tel Aviv University, Faculty of Life Sciences, Department of Zoology
- The Society for the Protection of Nature in Israel (SPNI)

## Sleeping Arrangements

September 1st, 2015 - Tel Aviv, Dan Panorama Hotel

September 2nd, 2015 - Kibbutz Ein Gedi Hotel (<http://www.ein-gedi.co.il/en/>)

## Invited Guests

- **Prof. Franz Bairlein**, Director of the Institute of Avian Research, Vogelwarte Helgoland, Germany, migration expert
- **Prof. Christoph Kottmeier**, Karlsruhe Institute of Technology (KIT), Germany
- **Prof. Amnon Ginati**, European Space Agency (ESA), Germany
- **General (Ret.) Mansour Abu Rashid**, Chairman, Amman Center for Peace and Development (ACPD), Jordan
- **Adnan Budieri**, Ecologist, ACPD, Jordan
- **Mr. Thomas Krumenacker**, Reuters Journalist and Bird Photographer, Berlin, Germany

## Speakers and Experts from Israel

- **Prof. Zvi Ben-Avraham**, Department of Geophysical, Atmospheric and Planetary Sciences, Tel Aviv University and Haifa University
- **Mr. Eli Raz**, Dead Sea & Arava Science Center, Kibbutz Ein Gedi
- **Prof. Pinhas Alpert**, Department of Geophysical, Atmospheric and Planetary Sciences, Tel Aviv University
- **Dr. Nir Sapir**, Animal Flight Laboratory, Department of Evolutionary and Environmental Biology, University of Haifa
- **Mr. Gidon Bromberg**, CEO EcoPeace, Israel
- **Shmulik Yedvab**, Manager of the SPNI Mammals Center
- **Prof. Marcelo Sternberg**, Department of Molecular Biology & Ecology of Plants, Faculty of Life Sciences, Tel Aviv University
- **Prof. Yoram Yom-Tov**, Department of Zoology, Tel Aviv University
- **Prof. Uriel Safriel**, Hebrew University, Jerusalem
- **Dr. Sinaia Netanyahu**, Chief Scientist, Ministry of Environmental Protection
- **Mr. Robin Twite**, Director, Environmental Diplomacy, Arava Institute for Environmental Science

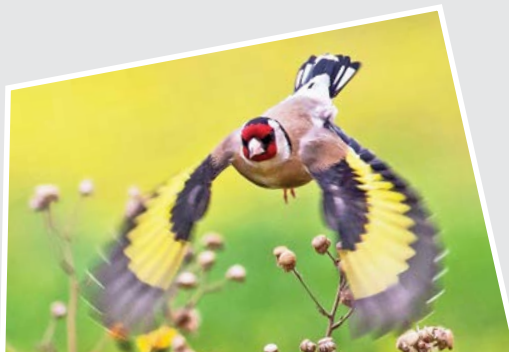


Pied Kingfisher (*Ceryle rudis*), a species of African origin that breeds in Israel (Photo: Aharon Shimshon)

## Climate Talks Contact Persons

- **Prof. Yossi Leshem**, Tel Aviv University and SPNI, Director of the International Center for the Study of Bird Migration, yleshem@post.tau.ac.il, +972-3-6407963, (mobile) +972-52-3257722
- **Ms. Gabriele Hermani**, Science Counselor at the German Embassy, Israel, wiss-1@tela.auswaertiges-amt.de
- **Ms. Sorrel Ritter**, Tel Aviv University (Organizer), yleshem@post.tau.ac.il
- **Mr. Dan Alon**, Head of Israel Ornithological Center, SPNI, ioc@inter.net.il

The population of the Goldfinches (*Carduelis carduelis*) in Israel has been significantly diminished, mainly due to the reduction in the open areas and illegal hunting (Photo: Aharon Shimshon)



# Participants in Workshop



**MK Ayoob Kara** is the Deputy Minister of Regional Cooperation. He was born in the Israeli Druze town of Daliat el-Carmel. He holds an LLB degree from Ono Academic College and an MA in Public Policy from Tel Aviv University. Kara was a Member of Knesset from 1999 until 2006, serving as Chairman of the Committee on Foreign Workers and of the Committee on Drug Abuse, and was also a member of many additional committees. He served as Deputy Speaker of the 15th Knesset. Ayoob Kara was re-elected to the 18th Knesset in February 2009. In April 2009 he was appointed Deputy Minister of the Development of the Negev and the Galilee, serving until February 2013.



**H.E. Dr. Clemens von Goetze** is the German Ambassador to Israel as of July 2015. He obtained his doctorate in law from the University of Erlangen. Before coming to Israel, he was the Director General for Africa, Asia, Latin America, Near- and Middle East in the Ministry of Foreign Affairs, and the Head of the Foreign Affairs Department in the Office of the President, both in Berlin. Previous posts include Brussels (as Permanent Representative to the EU Political and Security Committee), Ankara and Manila.



**Professor Zvi Ben-Avraham**, Head of the Mediterranean Sea Research Center of Israel, Founding Director of the Leon H. Charney School of Marine Sciences at the University of Haifa, Professor Emeritus at Tel Aviv University, the Department of Geosciences and Director of Dead Sea Research Center. Prof. Ben-Avraham is a member of the Israel Academy of Sciences and several other academies of sciences worldwide and was awarded numerous prizes including the prestigious Israel Prize in Science in 2003 and has served as a Scientific Advisor to the President of the State of Israel.



**Paul Winter** is one of the leading artists worldwide composing and playing earth music. He has produced 45 albums, seven of which have won Grammy Awards. He has performed in Israel in a number of large concerts (including with the Dalai Lami for the 40-year anniversary of the SPNI before an audience of 23,000). His new composition "Flyways" celebrates bird migration and the countries through which they fly along the Great Rift Valley, and is integrated with ethnic music from these countries and the calls of the birds that migrate along this route.



**Prof. Noga Kronfeld-Schor** is the chair of the department of Zoology and the head of the Ecological and Evolutionary Physiology Laboratory at Tel Aviv University. She is a Fulbright, Rothschild and Alon fellow. She published over 80 papers which were cited over 1500 times, and mentored over 25 MSc and 10 PhD students and post-docs. Her research focuses on mechanisms and ecological significance of biological rhythms (both daily and annual) and on ecology of thermoregulation.



**General Mansour Abu Rashid General (Ret.)** is the Chairman of the Amman Center for Peace & Development (ACPD). In the past he served as the Jordanian Chief of Intelligence and was the top security official responsible for preparing the peace agreement between Israel and Jordan in 1994 together with Brig. Gen. Baruch Spiegel. Today the General is a leading figure in the project with the Barn Owls and the farmers, in educational projects and the conservation of bats in the Jordan Valley, and more.



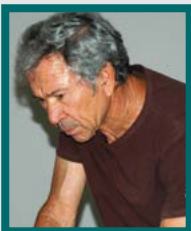
**Yossi Sarid** is a columnist and commentator for the Israeli newspaper Haaretz and lectures in the Education Department of the Tel-Hai Academic College. He has authored six books. During his 32-year tenure as a member of the Knesset, Sarid served as Environment Minister, Education Minister and leader of the Opposition, as well as a member of various parliamentary committees. Sarid was also the head of the Meretz party from 1996 to 2003. He holds an MA in political science from New School for Social Research in New York.



**Prof. Franz Bairlein** is Director of the Institute of Avian Research in Wilhelmshaven, Germany, and professor at the University of Oldenburg. He served as President of the German Ornithologists' Society and the International Ornithologists' Union, and is currently President of the European Union for Bird Ringing. Franz's research focus is bird migration ranging from field studies along the migration routes to the physiological control and molecular mechanisms of migratory behavior.



**Prof. Amnon Ginati** was one of the initiators and the programme manager of the TUBSAT (Technical University Berlin SATellites) programme. He joined OHB-System, Germany in 1990 where he was Director of Advanced Systems, Satellites & Probes. In Oct 2000 he joined the European Space Agency (ESA) as Head of the Earth Observation Future Programmes Department. Thereafter he was special adviser to ESA Director General, Head of the Inter Directorate Taskforce responsible for the initiation and creation of the Integrated Applications Promotion (IAP) programme. He is currently Head of the Integrated & Telecommunications related Applications Department.



**Eli Raz, M.Sc.** is a geologist and biologist at Israel's Dead Sea & Arava Science Center, and has studied the Dead Sea sinkhole problem in depth and regarded as an expert on this subject. His research interests are environmental changes accompanying the drop in the Dead Sea's level, enhancing multi disciplinary studies for choosing the best solution for the Dead Sea crisis, and the nature and heritage in the Dead Sea region. He is currently carrying out the sinkholes development routine follow-up survey, as well as predicting their appearance.



**Prof. Dan Rabinowitz** (PhD Cambridge University, 1991), teaches at the department of Sociology and Anthropology at Tel-Aviv University, where he specializes in ethnicity, nationalism, Middle East studies and the nexus between society and the environment. Dan has published several books and scientific articles. He served as President of the Israeli Anthropological association, Chairman of Life and Environment - the umbrella organization of Environmental NGOs in Israel, Chairman of Greenpeace Mediterranean, Vice Chair of Greenpeace UK, and is currently chairman of the Israeli Association for Environmental Justice.



**Prof. Christoph Kottmeier** works at the Karlsruhe Institute of Technology (KIT) and is head of the Institute of Meteorology and Climate Research (IMK-TRO). He is the spokesperson of the international research project DESERVE (Dead Sea Research Venue), funded by the Helmholtz Association and from DESERVE partners own contributions. As a meteorologist, his scientific interests focus on measuring wind systems and turbulence as well as on atmospheric modelling. Outcome of his research are improved scenarios of climate change beneficial for adaptation in region particularly affected.



**Prof. Pinhas Alpert**, Chair Professor in Geodynamics at the Department of Geosciences in Tel-Aviv University, Faculty of Exact Sciences. Served as Head of the Porter School for Environmental Sciences at Tel-Aviv University (2008-2013) and former Israel representative to IPCC WG1. He is NASA Goddard Fellow and Honorary Member of the World Jewish Academy of Sciences.



**Dr. Nir Sapir** is currently a senior lecturer at the Department of Evolutionary and Environmental Biology, University of Haifa. Until November 2014 he was the curator of birds for the National Natural History collections, Hebrew University. Until 2012 he did his post-doctorates at the University of California, Berkeley, Max Planck Institute for Ornithology, Radolfzell, and Tel Aviv University. He did his Ph.D. at the Hebrew University on "The effects of weather on European bee-eater (*Merops apiaster*) migration", and his M.Sc. at Ben-Gurion University on "Stopover ecology of autumn migratory passerines in a man-made wood at a desert edge".



**Gidon Bromberg**, Co-Director of EcoPeace Middle East, is an attorney by profession and previously worked in public interest environmental law. He holds a Bachelor of Economics and a law degree from Monash University in Australia. He completed a master's degree in international environmental law at the American University in Washington D.C. and is a fellow of Yale University's World Leadership Program. Mr. Bromberg co-founded EcoPeace Middle East in 1994, a unique regional organization that brings together Jordanian, Palestinian and Israeli environmentalists to promote sustainable development and advance peace efforts in the Middle East. Mr. Bromberg was honored by TIME Magazine as Environmental Hero of 2008, and granted the prestigious Skoll Award for Social Entrepreneurship in 2009.



**Adnan Budieri**, Ecologist at the ACPD, Jordan, was head of the Middle East and Central Asia Division of Birdlife International. He has worked at a national and regional level in many positions, for example, as a member of the Jordanian National Biodiversity Committee and the team leader in Biodiversity Conservation and Protected Area Management and self-assessment of national capacity building need in Jordan to manage global environmental issues. He represented Jordan in several Ramsar COP meetings. Mr. Budieri also represented Jordan and the region in several CITES conventions and regional meetings.



**Prof. Yossi Leshem** is a professor in the Department of Zoology at Tel Aviv University. He has worked since 1971 at the Society for the Protection of Nature in Israel (SPNI), the leading NGO in Israel, and was the CEO between 1991-1995. The founder and Director of the International Center for the Study of Bird Migration, he acts as the Secretary of the Hoopoe Foundation. He is involved in a variety of activities in bird migration research, in educational activities, and cooperation with the Palestinians and the Jordanians, titled "Migrating Birds Know No Boundaries". He leads a regional project using Barn Owls and Kestrels as biological pest control agents.



**Shmulik Yedwab** has been serving as the Manager of the Mammals Center of the Society for the Protection of Nature in Israel since 2013. He served as the general curator of the Tisch Family Zoological Gardens in Jerusalem since 1998 and as the Chair of the Taxonomic advisory group for Falconiformes in the European Association of Zoos and Aquariums.



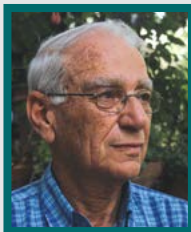
**Gabriele Hermani** was born 1960 in Frankfurt am Main. She studied Political Sciences at the Free University in Berlin and Theater Sciences at the Johann-Wolfgang von Goethe University in Frankfurt. The former journalist (Frankfurter Allgemeine Zeitung F.A.Z) and spokeswoman wrote several books about economic and political issues. As October 2013 she is working as science councillor at the German Embassy in Tel-Aviv, Israel.



**Thomas Krumenacker** is a journalist working with Reuters in Germany for more than 20 years. He is also a member of the German Association of Nature Photographers, a columnist for birding magazines and nature photography publications and member of the scientific board of Der Falke, the leading German-language journal for birdwatchers. Thomas visited Israel more than 20 times in the recent years. His work has been published widely in books and magazines and has been put on exhibition in various places internationally, among them the Israeli Knesset. In cooperation with the IOC Thomas recently published an analysis of 30 years of systematic bird counts in Israel.



**Prof. Marcelo Sternberg** works at the Department of Molecular Biology and Ecology of Plants at Tel-Aviv University, and served as Chairman of the Israel Society of Ecology and Environmental Sciences from 2010 to 2012. He is the team leader of the Biodiversity section at the Israel Climate Change Information Center. Marcelo is an ecologist interested in the effects of global climate change on natural ecosystems.



**Prof. Yoram Yom-Tov** is a professor emeritus at the Department of Zoology in Tel-Aviv University. He served as advisor to dozens of graduate students working on their master and Ph D. theses. He published several books and more than 200 scientific articles on zoogeography, bird migration, behavioral ecology, and comparative zoology of birds and mammals. He is deeply involved in nature conservation in Israel.



**Prof. Uriel Safriel** is a professor emeritus at the Department of Ecology, Evolution and Behavior of the Hebrew University in Jerusalem, Head of the Center for Environmental Conventions of the Blaustein Institutes of Desert Research and Chair of the Committee of Science and Technology of the UN Convention to Combat Desertification and is currently leading the Israel National Ecosystem Assessment project.



**Dr. Sinaia Netanyahu** is the Chief Scientist in the Ministry of Environmental Protection. In this capacity, her office supports academic and applicative driven environmental research, climate change, etc. Previously, Sinaia served as a lecturer in both the Ben-Gurion University and the Hebrew University, and was the Director of Environmental Sustainable Finance at TAHAL Group. Sinaia holds a Ph.D. in Agricultural and Resource Economics from the University of Maryland, USA.



**Robin Twite** is currently director of environment diplomacy at the Arava Environmental Institute in the south of Israel. He was for thirty years a career official in the British Council. He served in Israel, India, Portugal and Ethiopia and was director of the Council's world wide network of libraries and information. Subsequently, he came to Israel and spent five years at the Hebrew University working on conflict resolution. For seventeen years he was director of the Environment Program at the Jerusalem based Israel Palestine Center for Research and Information, where he took an active part in GLOWA, a major German financed cross-border study of the impact of climate change on the Jordan River.



# Program

## Tuesday, September 1st 2015

Arrival in Israel. Overnight: Dan Panorama Hotel, Tel Aviv

- 19:00** Opening first evening session in the Tamar Hall at the Dan Panorama Hotel, under the auspices of the German Ambassador to Israel, **H.E. Dr. Clemens von Goetze** (get-together cocktail including dinner).  
Lecture: **Prof. Zvi Ben-Avraham**, winner of the Israel Prize, on "The Dead Sea fault: a unique global site".

## Wednesday, September 2nd 2015

Lecture Day for the public on the subject of the seminar at Tel Aviv University, the Porter School of Environmental Studies

- 07:30 - 08:30** Gathering and refreshments
- 08:30 - 08:35** Opening video "The Effects of Climate Change on Birds and Bird Migration" - **Eyal and Tal Bartov**
- 08:35 - 08:50** An excerpt from the musical composition FLYWAYS on bird migration along the Great Rift Valley, performed by **Paul Winter**, composer of the work and other earth music, and seven times winner of Grammy Awards
- 08:50 - 09:15** **Greetings:**  
**Deputy Minister Ayoob Kara**, the Israeli Minister of Regional Cooperation  
**H.E. Dr. Clemens von Goetze**, German Ambassador to Israel  
**Prof. Noga Kronfeld-Schor**, Chair of the Zoology Department, Tel Aviv University  
**General Mansour Abu Rashid**, Chairman Amman Center for Peace and Development (ACPD), Jordan  
Conveners: **Prof. Yossi Leshem**, **Ms. Gabriele Hermani**
- 09:15** **First Session: Chairman - Mr. Yossi Sarid**, formerly Israeli Minister for the Environment and Minister of Education
- 09:20 - 09:50** **Prof. Franz Bairlein** - Migrating birds and the Mediterranean - hospitality in danger
- 09:50 - 10:20** **Prof. Amnon Ginati** - Space Eco System and the Space for Mediterranean Program
- 10:20 - 10:45** **Eli Raz** - The Dead Sea - Crisis and Solutions
- 10:45 - 11:15** Coffee break
- 11:15** **Second Session: Chairman - Prof. Dan Rabinowitz**, Chairman of the Porter School of Environmental Studies
- 11:20 - 11:45** **Prof. Christoph Kottmeier** - The Dead Sea Research Program DESERVE: the benefit of cross-disciplinary research on a complex natural system
- 11:45 - 12:10** **Prof. Pinhas Alpert** - Regional Climate Changes and Potential Impacts on Bird Migration based on: Predictions from TAU/RCM runs
- 12:10 - 12:35** **Dr. Nir Sapir** - The effects of atmosphere dynamics on long-distance flight
- 12:35 - 13:00** **Gidon Bromberg** - A Water Energy Nexus Across the Jordan for Stability and Climate Change Mitigation
- 13:00 - 14:00** Lunch break at Tel Aviv University

## Excursion

- 14:00 - 14:30** Drive to Latrun to visit the Russian bird radar
- 14:30 - 15:00** Observing bird migration by the Russian radar MRL-5 at Latrun
- 15:00 - 16:45** Drive to Ein Gedi Spa, on the shore of the Dead Sea
- 16:45 - 18:30** Initial acquaintance with the DESERVE project at the meteorological station inside the Ein Gedi Spa - **Prof. Christoph Kottmeier and Prof. Pinhas Alpert**
- 18:30** Check in to Ein Gedi Hotel
- 19:30 - 20:30** Dinner

## After Dinner

- 20:45 - 22:00** Second evening session under the auspices of **Dov Litvinoff**, Mayor of the Tamar Regional Council, who will give an introduction to the cooperation with Jordan  
Lecture: **Prof. Yossi Leshem**, **General Mansour Abu Rashid and Adnan Budieri** - The Barn Owls, bird migration and bats as a model for extending regional cooperation



## Thursday, September 3rd 2015

- 06:15 - 07:15** Ringing of migrating birds at the Ein Gedi Botanical Gardens
- 07:15 - 08:00** Breakfast
- 08:00 - 11:00** Departure for Mitzpe Shalem for observing the storks and raptor migration on the backdrop of the Dead Sea and Judean Desert, and discussing regional cooperation and climate change
- 11:00 - 13:00** Tour of the DESERVE project, with **Eli Raz** from the Dead Sea & Arava Science Center who will present the sinkholes issue
- 13:00 - 14:00** Lunch at Ein Gedi
- 14:45 - 15:45** Visit to Qasr Al-Yahud to learn about the insectivorous bat project in the abandoned bunkers on both sides of the Jordan Valley, and the effect of climate change on their populations, with **Shmulik Yedvab**, Manager of the SPNI Mammals Center, and **Adnan Budieri**, ACPD, Jordan
- 15:45 - 17:00** Drive to Ben Gurion Airport



The Palestine Sunbird (*Nectarinia Osea*), a species that has spread throughout the country via the Great Rift Valley since the establishment of the State of Israel  
(Photo: Aharon Shimshon)



A pair of courting European Bee-eaters (*Merops apiaster*)  
(Photo: Aharon Shimshon)



The Spectacled Bulbul (*Pycnonotus xanthopygos*), a species of African origin, has spread from the Ein Gedi region in the Great Rift Valley throughout Israel due to the extensive gardening in Israel (Photo: Aharon Shimshon)

# The Dead Sea fault: a unique global site

## Zvi Ben-Avraham

E-mail: [zviba@post.tau.ac.il](mailto:zviba@post.tau.ac.il)

The Dead Sea Fault is an active transform fault linking opening in the Red Sea with collision in the Taurus/Zagros Mountains. Motion is left-lateral and estimated at approximately 5-7mm/year. The fault is seismically active, and can be divided into two distinct structural segments. This study focuses on the southern segment based mainly on the wealth of geophysical data. Owing to transtension caused by oblique slip and the overlapping of en-echelon fault strands, a series of pull-apart basins were formed along the fault's length. These basins are long and deep-reaching in places more than 10 km deep. They are characterized by extensional, compressional, and asymmetrical structures varying in size from large-scale (defining the general structure of the Dead Sea fault valley) to small-scale (defining the internal structure). The deepest and largest basin is the Dead Sea.

The area surrounding the Dead Sea was the locus of humankind's migration out of Africa and thus has been the home of peoples since the Stone Age. For this reason, understanding the climate and tectonic history of the region provides valuable insight into archaeology and studies of human history and helps to gain a better picture of future climate and tectonic scenarios. The deposits at the bottom of the Dead Sea are a geological archive of the environmental conditions (e.g., rains, floods, dust storms, droughts) during ice ages and warm ages, as well as of seismic activity in this key region. An International Continental Scientific Drilling Program (ICDP) deep drilling project was performed in the Dead Sea between November 2010 and March 2011. The data collected during the drilling provides valuable information on the paleoclimate and paleoseismicity of this region.



The Dead Sea (Photo: Eyal Bartov)



# Migrating birds and the Mediterranean – hospitality in danger

**Franz Bairlein**

E-mail: [franz.bairlein@ifv-vogelwarte.de](mailto:franz.bairlein@ifv-vogelwarte.de)

Many Palearctic migratory birds rely on habitats in the Mediterranean either for temporary stopover and fueling on their ways to and from sub-Saharan Africa or for wintering. However, many habitats are deteriorating or are even gone, mainly due to human activities, and the remaining ones are increasingly challenged by continuing human land use as well as climate change. Temporal and regional changes in rain fall patterns and the amount of precipitation in the Mediterranean are the most likely climate factors affecting migratory birds. At the same time, however, we have only limited knowledge about the habitat and ecological requirements of migratory birds in the Mediterranean, in particularly for landbirds, in which the required habitats are more difficult to target than in waterbirds. Therefore, still existing habitats need to be preserved and there is urgent need for more detailed studies. Climate change mitigation activities should include restoration of habitats for migratory birds. In addition, immediate actions are needed to stop illegal killing of migratory birds around the Mediterranean with millions of migrants taken.



Black Storks (*Ciconia nigra*) in a fishpond stopover site during their migration over the Great Rift's Beit Shean Valley  
(Photo: Thomas Krumenacker)

# Space Eco System and the Space for Mediterranean Program

**Amnon Ginati**

E-mail: [amnon.ginati@esa.int](mailto:amnon.ginati@esa.int)

## Introduction

The Integrated Applications Promotion (IAP) programmes focuses on the development of user-driven space applications and services that exploit 50 years of investment in space by ESA. The IAP programme places a strong emphasis on sustainable applications and service business cases, where close partnerships with service customers and end-users foster new and wider utilisation of existing space capacity and capability. The resulting services rely on the most appropriate technologies, drawn from space systems and terrestrial in-situ systems and a service delivery model to best meet user needs in an economically viable and cost effective manner. The technologies involved should be mature enough so that the service or product can be brought to market in the short term. The current IAP portfolio of activities already includes 315 projects, covering an extremely diverse range of sectors such as environment, health, agriculture & forestry, energy, development, water management, transport, tourism, safety & security, media & broadcasting and maritime. Several activities addressing climate change effects on environment, migrating birds and other relevant aspects direct or indirect.

## Strategic Partnerships

The IAP programme have entered into strategic partnerships with a number of third parties in order to increase the available funding and enable insertion of activities in key market sectors, as summarized below. One of the first examples was the “eHealth for sub-Saharan African programme” (eHSA), where ESA partnered with the EU-Africa Infrastructure Trust Fund (EU-Africa ITF) and the Luxembourg Agency for Development Cooperation (LuxDevelopment) to explore the market of eHealth services in Africa supported via satellite. ESA’s partnership with the European Investment Bank (EIB) has led to the programme “**Space for Med**”, focused on the potential of space-based services to provide economic development in the countries of the southern and eastern Mediterranean regions. Following the “**Space for Med**” initiative, a “**Space for Med. Acceleration Programme**” (SMAP) is now being developed, offering an opportunity for the European space applications industry to expand their export potential. Partnership with the European Maritime Safety Agency has enabled IAP to interact more effectively with users in the maritime community and to identify needs that led to definition of the SAT-AIS programme. This in turn has led to the development of operational services and their supporting space infrastructure, as well as to partnerships between players from different parts of the space industry.

## Socio-Economic Benefit Analysis

As the IAP programme has become established, a growing number of projects are generating operational services. Although often still in an early stage, many of these new ventures are now generating revenues and results which enable both their individual socio-economic impact and that of the overall programmes to be assessed.

The methodology adopted for assessing the socio-economic impact takes into account the approaches and lessons learned by OECD, national governments, consultants and ESA itself. The initial assessment was done to identify market success rates based on 168 completed projects. Based on this assessment 54% of projects have led to operational services, with 36% already generating revenue.

## Summary

In summary, ESA’s IAP programme has proven to be highly effective in transforming R&D activities into operational, profitable and self-sustaining products and services. Moreover, the large diversity of thematic areas addressed by IAP is in itself an indication of the value of space in everyday life. Application and service developments can be realized without expensive qualification and investment efforts, and it has been shown that related expenditures result in a fast ‘Return on Investment’ for the involved companies, user communities and society. The success of IAP has been the result of partnerships that involve both public and private players, and which engage not only the space industry but also developers, service providers, users and paying customers across many diverse market sectors. The success of the ARTES Applications programme in demonstrating the previously untapped commercial benefits of space has now been duly recognized by the receipt of ESA’s Teamwork Excellence Award 2014.

Further information on the IAP and ARTES Applications programmes can be found on the ARTES Applications website: <https://artes-apps.esa.int/>.

# Sinkholes formation along the Dead Sea shore – a human induced environmental problem

**Eli Raz**

E-mail: [eliraz@ein-gedi.co.il](mailto:eliraz@ein-gedi.co.il)

The recent (summer 2015) level of the Dead Sea ( $-429.5$  m), represents a fall of 34 m along 50 years, at an increasing rate that has exceeded 1 meter a year on the average for the last decade.

The rapid drop is due to a deficit of  $\sim 1$  billion  $\text{m}^3/\text{y}$ , caused by domestic consumption from the watershed and pumping from the lake for industrial purposes. The drop of the lake's level is accompanied by environmental changes, one of which is the rapid sinkholes appearances, from zero (1980) up to several thousands today. The phenomenon (up to 50 m in diameter and 29 m depth) is resulting in severe economic loss, infrastructure collapse, injuries, life hazard and suspension of development plans. Sinkholes result from the collapse of the uppermost weakly consolidated Holocene sedimentary section, into underlying dissolution cavities within a subterranean salt layer. The subterranean interface between the saturated Dead Sea water and the overlaying ground water, follows the drop in the lake's level, sinks and triggers an aggressive dissolution of the salt, by exposing it to under saturated ground water.

During the last 7 years, part of the sinkholes sites are showing improvement in the correlation between timing of sinkholes appearances and development, with meteorological events, as well as between the annual rain fall changes and the annual new sinkholes appearances. This change might be attributed to the increasing dissolution potential of the salty, but not saturated, ground water ( $\sim 170$  gm/l T.D.S), that has been diluted, soon after meteorological events, by drainage through the increasing number of sinkholes.

Prediction attempts occupy a special attention in the sinkholes study. Neotectonic system as recognized on sinkholes walls is frequently responsible for linear patterns of distribution. Knowing the location and direction of such lineament is useful for predicting sinkholes appearance.

Long term observations in the field reveal that a new tiny sink might serve as a precursory for a coming sinkhole. Satellite radar interferometry (InSAR) method enables to reveal such tiny sinks in a huge area, within a short period of time. So far, several successful alerts, using this method, were already received and this is now the focus of the current research.



Sinkholes next to the Dead Sea partially filled with water  
(Photo: Eyal Bartov)



# The Dead Sea Research Program DESERVE: the benefit of cross-disciplinary research on a complex natural system

**Christoph Kottmeier**

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The Dead Sea Region with its unique landscape and cultural area is the central basis of life in the region and of great economic and ecological importance. The region is, however, also faced to hazardous natural phenomena and rapid environmental changes. The Dead Sea region is exposed to big water-related challenges. Among them are sea level decline, desertification, ascending brines polluting freshwater, sinkhole development, but also occasional flash floods. Climate change and extensive exploitation of groundwater and surface water even aggravate the situation. Within DESERVE, these challenges are addressed in an interdisciplinary research effort involving all riparian countries. DESERVE is designed as a cross-disciplinary and cooperative international project of German Helmholtz Centers with well-established partners from the Middle East. The project is offering the unique opportunity to integrate the scientific results already achieved or presently elaborated in the Dead Sea region into a joint scientific approach based on earth, water, and environmental sciences. It studies the coupled atmospheric, hydrological, and lithospheric processes, such as sinkholes, flash floods, and earthquakes. This interdisciplinary research approach contributes to a sound scientific understanding of the ongoing processes. Furthermore, it enables the development of predictive models, remediation strategies, and risk assessments with respect to environmental risk, water availability, and climate change. DESERVE is funded by the Helmholtz Association of German Research Centers.

Meteorological research is aimed on the evaporation from the Dead Sea water body, and on local and regional wind systems that govern atmospheric humidity transport processes and the particular wind climate. Wind systems develop in close interaction between Eastern Mediterranean pressure distributions, mesoscale phenomena like the Mediterranean sea breeze, and local effects of the valley and mountain circulations. They are of direct relevance for migrating birds and other animals and living conditions in general. Specific measurements by DESERVE in 2014 with new Lidar wind measurement systems provided detailed insight into the diurnal evolution of wind circulations both in summer and winter and will be discussed.



A view of the Dead Sea from the cliffs of the Great Rift Valley  
(Photo: Eyal Bartov)

# Regional Climate Changes and Potential Impacts on Bird Migration based on: Predictions from TAU/RCM runs

## Pinhas Alpert

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Birds are a most sensitive sensor to atmospheric conditions, often even more than what weather stations measure, like vertical wind (upward motion) which is a very problematic variable to measure in the atmosphere. For instance, it has been shown that migrating birds soaring over Israel identify the Sea-Breeze-Fronts (SBF) and actively search the upward motion associated with the converging lines of the SBF and actively search the upward motion in their migration through the country. The figure below (from Alpert et al. 2000) shows an example from the 10th September 1995 in which migrating birds of the species honey buzzard are seen by the radar of Ben-Gurion (Tel-Aviv) International Airport as biological target lines that are very closely aligned with the SBF convergence lines.

The predicted significant regional climate changes in many of the weather variables over the E. Mediterranean, including temperature, rainfall, humidity and winds and particularly increase in the extreme events have been recently computed employing ensemble of regional climate models and different scenarios for emission of greenhouse gases GHG (Alpert et al., 2008, Samuels et al., 2010, 2011). These climatic changes driven largely by the global warming due to GHG increases will undoubtedly affect the migrating birds. This including, the timing of migration and period of stay in Israel. I will review our most recent 21st century regional climate modelling predictions for this region. I will focus on a new methodology for weighting high resolution model simulations to project future rainfall in the Middle East and our new findings from DESERVE (Dead Sea Research Venue) project; the DESERVE Project website: <http://www.deserve-vi.net/>.



DERSERVE project Ein Gedi meteorological station  
(Photo: Timo Gamer)



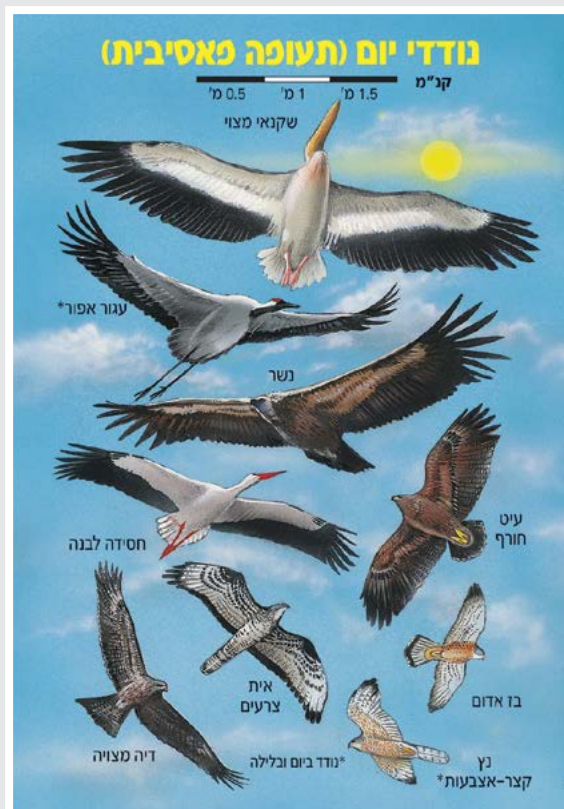
Steppe Buzzard (*Buteo vulpinus*), one of the prominent raptors in the autumn migration flying over the cliffs of the Judean Desert  
(Photo: Hadoram Shirihi)

# The effects of atmosphere dynamics on long-distance flight

Nir Sapir

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Diverse taxa use the airspace for movements of all kinds. Aerial movement is known to strongly depend on environmental conditions but due to methodological limitations we still lack good knowledge on the role of the environment, and specifically variation in the flow of air, on different biomechanical, physiological and behavioral properties of animal flight. Understanding the causes, mechanisms, patterns and consequences of animal flight requires knowledge of relevant forces that shape animal long-distance flights. In my talk I will present several case studies in which an integration of numeric atmospheric models substantially enhanced our understanding of animal movement. I will describe how migratory bee-eaters passing through Israel are affected by atmospheric conditions at different temporal scales, and how migrating raptors integrate information from the environment in their selection of gliding speeds. In addition, I will present our analysis of the response of commuting fruit bats in Africa to variation in the flow field they must negotiate while flying to feeding sites located tens of kilometers away from their roosting colony. I propose that the integration of environmental information into the study of flying animals' behavioral, physiological and biomechanical response is vital for understanding fitness consequences of long-distance flight. Specifically, combining atmospheric modelling in studies of climate change is crucial for correct prediction of animal response to environmental changes and its implications for populations, communities and ecosystems.



Diurnal migrating species (passive migration)  
(Illustrations: Tuvia Kurtz)



Nocturnal migrating species (active migration)  
(Illustrations: Tuvia Kurtz)



# A Water Energy Nexus Across the Jordan for Stability and Climate Change Mitigation

**Gidon Bromberg**

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Regional trade agreements in Europe over coal and steel served as the foundation for both larger regional integration and regional stability. A water-energy nexus could provide a similar foundation for a more peaceful and more sustainable Levant region. The Levant is among the most water stressed regions in the world, but it is bountiful in solar energy potential. Technological innovation coupled with trans-boundary cooperation could provide the solution to the region's growing water and associated energy demand, as well as contribute to regional stabilization and mitigation of climate change impacts.

Mr. Gidon Bromberg will speak about the rationale for the creation of a proposed water-renewable energy community based on interdependence among Israel, Jordan, and Palestine, where much needed water is produced through desalination on the Israeli and Palestinian Mediterranean coasts and the additional electricity needs are met by extensive investment in solar renewable energy in Jordan's eastern deserts.

Advancing such regional cooperation whether on limited cross border solar-based desalination, or broader water - energy needs in general, requires a multi-disciplinary multi-country effort of further studies to identify strategies to help overcome political obstacles and generate political will, based on studies related to environmental, economic and technical feasibility. Mr. Bromberg will speak about EcoPeace's research and advocacy efforts in this direction.



Ein Gedi Nature Reserve, near the Dead Sea (Photo: Eyal Bartov)

# The Barn Owls, bird migration and bats as a model for extending regional cooperation

**Yossi Leshem<sup>1</sup>, Mansour Abu Rashid<sup>2</sup> and Adnan Budieri<sup>3</sup>**

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Israel and Jordan's unique location at the junction of three continents has created one of the most important "bottlenecks", with 500 million birds crossing twice a year during the autumn and spring migrations. In a joint research project of the Max Planck Institute in Radolfzell Germany and the Tel Aviv University in Israel, funded by the German Ministry of the Environment, we tracked 120 migrating White Storks to which satellite transmitters had been attached. Founded on this joint research, an educational curriculum was developed for 300 schools in Israel, based on an Internet site, [www.birds.org.il](http://www.birds.org.il), which enabled the online tracking of the migrating birds, as well as including field trips for direct observations. This scientific-educational project was extended from a local to regional level, funded by US-AID MERC, with the joining of Palestinian and Jordanian researchers and schools between the years 1998-2004. The aim of the project was to use migrating birds as the platform for the furthering of regional co-operation in the Middle East, an area strife with conflict. Later on, with funding by the European Union, the SPNI established three tracking stations in Israel, Jordan and the Palestinian Authority along the Great Rift Valley (GRV) in order to develop eco-tourism and bird-watching as well as to nurture the connection to the community.

Since 2001 we have advanced an additional regional project encompassing the use of Barn Owls and Common Kestrels as biological pest control agents in agriculture in the Beit Shean Valley in Israel (27 km south of the Sea of Galilee), on the eastern side of the Jordan River in Jordan and in Jericho and Tamoun in the Palestinian Authority. This project has led to excellent co-operation between all sides involved from the scientific and agricultural aspects. The GRV is one of the unique geological phenomena on earth, stretching from Turkey to Mozambique along 7,200 km. As a result it constitutes a migration route of global importance through which hundreds of millions of migrating birds migrate yearly from Europe-Asia to Africa and back. It was proposed to the UNESCO World Heritage Center to declare the entire GRV as one global World Heritage Site as a serial nomination of 22 countries which will together develop policies of research, conservation, education and eco-tourism in a new concept that will be able to apply the idea on a mega scale for the benefit of the migrating birds and their habitat and studying the impact of climate change.

The last year has seen the initiation of a joint Jordanian-Israeli project to conserve the 27 insectivorous bat species that are globally in danger of extinction along the border between Jordan and Israel in the GRV.

In our presentation we will show the unique power of birds to connect between countries, even in conflict-ridden regions, while creating an innovative multidisciplinary scientific concept based on education, conflicts in agriculture, eco-tourism, climate change and nature conservation of birds and their habitats.



June 13, 2010: A Jordanian farmer holding a Barn Owl (Tyto alba) next to a nest box in Kibbutz Sde Eliyahu, Beit Shean Valley (Great Rift Valley) (Photo: Hagai Aharon)

# Bats in bunkers along the Jordan River

## Shmulik Yedvab

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In October 1994 the historic peace treaty between Israel and Jordan was signed. The IDF changed its deployment along the border and abandoned many of its bunkers. These bunkers were gradually adopted by new tenants: bats. The bats found here an alternative to their natural roosts – caves that have been taken over by people. The phenomenon was first noticed by Aviam Atar from the Israel Nature and Parks Authority (INPA), who, together with Dr. Eran Levin from the Mammal Center in the Society for the Protection of Nature in Israel (SPNI) started investigating it. 12 bat species, some rare and endangered, were found to use the bunkers, in some cases one of the only meeting places for African, Asian and European species. It was also realized that the bats found it difficult to hang onto the smooth concrete and metal ceilings. Bat researchers Eran Levin and Eran Amichai from The Mammal Centre of SPNI, in collaboration with INPA and IDF's Jordan Valley Brigade, with the support of Bat Conservation International (BCI), The Hoopoe Foundation and Tel Aviv University, have been working since the discovery to conserve the bats by adding gripping areas to the ceilings, protecting the bunkers at critical periods, research, monitoring, and public awareness projects. Since this discovery more than 15 old bunkers were converted into homes for bats.

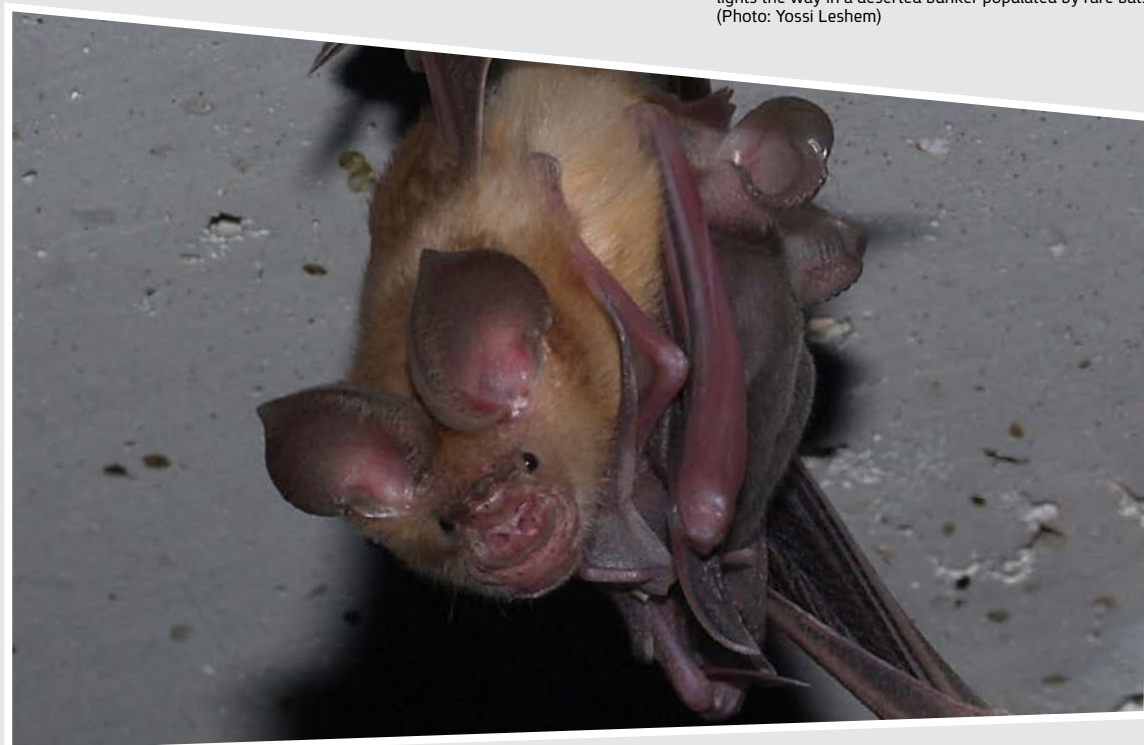


The Greater Mouse-tailed Bat (*Rhinopoma microphyllum*) is one of the species that has populated the deserted IDF bunkers. The ACPD, Jordan, has initiated a joint project with Israel for their conservation (Photo: Eran Levin)





General Mansour Abu Rashid, Chairman of the Amman Center for Peace and Development, lights the way in a deserted bunker populated by rare bats (Photo: Yossi Leshem)



27 species of insectivorous bats, 9 of them in danger of extinction globally, live in the Jordan Valley, Arava, Hula Valley and Beit Shean Valley. Deserted IDF bunkers constitute a shelter for them. The Jordanians have joined the conservation project on the eastern side of the Great Rift Valley (Photo: Eran Levin)



Sinkholes adjacent to the Dead Sea filled with water  
(Photo: Eli Raz)



The Hoopoe (*Upupa epops*), Israel's National Bird, after whom the SPNI's Hoopoe Foundation is named  
(Photo: Thomas Krumenacker)



לילית מדבר, מקננת  
ייחודית במצוקי מדבר  
יהודה לחוף ים המלח  
(צילום: חני לבנה)



# יום עיון שני בנושא ה"חם" בשמירת הטבע בעולם:

## שינוי האקלים בים המלח, הבקע הגדול - נדידת ציפורים ופרויקט DESERVE בנוכחות מיטב המומחים מישראל ומהעולם

יום העיון יתקיים ביום רביעי, י"ח באלול תשע"ה, 2 בספטמבר, 2015, באודיטוריום בניין הקפסולה, ב"ס ללימודי הסביבה ע"ש פורטר, אוניברסיטת תל אביב  
ההרצאות בשפה האנגלית, עם תרגום סימולטני מלא

### התכנית

07:30-08:30

08:30-08:35

08:35-08:50

08:50-09:15

מושב ראשון

09:20-09:50

09:50-10:20

10:20-10:45

10:45-11:15

מושב שני

11:20-11:45

11:45-12:10

12:10-12:35

12:35-13:00

התכנסות וכיבוד קל

סרטון "השפעת שינוי אקלים על ציפורים

ונדידת ציפורים", אייל וטל ברטוב

נגינה של קטע מהיצירה "FLYWAYS"

ע"י המלחין והנגן פול ווינטר, זוכה פרס גראמי שבע פעמים

### ברכות

ח"כ איוב קרא, סגן השר לשיתוף פעולה אזורי

H.E. Dr. Clemens von Goetze, שגריר גרמניה בישראל

פרופ' נגה קרונפלד-שור, ראש המחלקה לזואולוגיה, אוניברסיטת תל אביב

Gen. (Ret.) Mansour Abu Rashid, יו"ר מרכז עמאן לשלום ופיתוח (ACPD), ירדן

מנחים: פרופ' יוסי לשם, גבריאל הרמני

יו"ר - יוסי שריד, לשעבר, השר להגנת הסביבה ושר החינוך.....

Prof. Franz Bairlein, מנהל מכון המחקר הלוגנד, גרמניה:

נדידת ציפורים באגן הים התיכון - הכנסת אורחים בסכנה

פרופ' אמנון גינתי, סוכנות החלל האירופית, גרמניה: מעקב אחר

תכניות אקולוגיות מהחלל, ותכניות חלל לאגן הים התיכון

אלי רז, מרכז מדע ים המלח והערבה: ים המלח - משברים ופתרונות

הפסקת קפה

יו"ר - פרופ' דן רבינוביץ, יו"ר ב"ס ללימודי הסביבה ע"ש פורטר.....

Prof. Christoph Kottmeier, ד"ר גרמניה: תכנית לחקר

ים המלח, DESERVE, התועלת במחקר רב-תחומי במערכת טבעית מורכבת

פרופ' פנחס אלפרט, אוניברסיטת תל אביב: שינויים אקלימיים אזוריים והשלכותיהם

על נדידת ציפורים, בהתבסס על תחזיות מסמולציות TAU/RCM

ד"ר ניר ספיר, אוניברסיטת חיפה: השפעות דינמיקות אטמוספירות

על תעופה למרחקים

גדעון ברומברג, מנכ"ל EcoPeace: חילופי מים / אנרגיה מתחדשת: שיתוף

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# סדנה שנייה משותפת גרמניה-ישראל

שינוי האקלים בים המלח, הבקע הגדול -  
נדידת ציפורים ופרויקט DESERVE

י"ז-י"ט באלול תשע"ה,  
1-3 בספטמבר, 2015

אודיטוריום בניין הקפסולה, בי"ס ללימודי הסביבה ע"ש פורטר,  
אוניברסיטת תל אביב, עין גדי ואזור ים המלח



Hundreds of thousands of Honey Buzzards (*Pernis apivorus*) are migrating above the cliffs of the Great Rift Valley during the Ein Gedi workshop  
(Photo: Hadoram Shiriha)