Sub-Action E.1.3

Deliverable E1.3.1 Newsletter on MEDEA aims/progress /results (June 2018+ Periodic updating every 6 months)

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LIFE MEDEA NEWSLETTER

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ANNUAL MEDEA MEETING AND COLLOQUIUM IN HERAKLION, CRETE, GREECE

Recent trends of DDS events in Eastern Mediterranean

29 - 30 th November 2018
University of Crete
Heraklion, Greece

The LIFE16 CCA/CY/000041 MEDEA project is co-financed by EU within the framework of LIFE program

Kick-off Event

The Kick- off event and the " Colloquium on Desert Dust Storm Phenomenon" of LIFE MEDEA was held on December 11th-12th 2017 at Medical School of University of Cyprus. This event aimed to disseminate to the scientific community and the public the current evidence on DDS phenomenon and associated adverse health effects and introduce the aims and objectives of the MEDEA project. During the colloquium, reputable scientists and collaborators of the MEDEA program, reported on the various parameters of the DDS phenomenon. Dr. Panayiotis Yiallouros presented the MEDEA objectives which include the establishment of early warning systems for the public and vulnerable groups through the development of meteorological models and the development of directives and exposure reduction guidelines for cardiac patients and children with asthma within the MEDEA framework. Dr. Stavros Solomos from the National Observatory of Athens, presented the existing knowledge and practices implemented for the prediction of desert dust storms and referred to the capabilities of regulatory authorities for early warning of the public, while extensive attention was also paid to the effects of DDS on human health. Dr. Stephania Papatheodorou, assistant professor at the Cyprus University of Technology, presented a review of the scientific data on the correlation of dust storms with cardiorespiratory disease while Dr. Victor Novack (Soroka University Medical Center, Beer-Sheva), talked about the acquired experience in Israel regarding the health effects of DDS events on cardiovascular patients.

Message from the Project Coordinator

Welcome to the first edition of the LIFE MEDEA e-newsletter. This newsletter will be published every six months and will include information on the progress and activities of LIFE MEDEA. This edition includes an overview of the project's kick-off meeting, a short article on the relationship between Climate Change and Desert Dust storms in Eastern Mediterranean and brief updates on our activities during the first months of the project.
The newsletter is the result of the combined work of enthusiastic young MEDEA researchers from Cyprus, Greece and Israel and I hope that you will enjoy reading it.

Yours sincerely,

Professor Panayiotis Yiallouros,
Coordinator LIFE MEDEA

Initation of Recruitment Phase in Primary Schools

Within the framework of the MEDEA project and our collaboration with the First Lakatamia Primary School and the Second Primary School of Voutes in Cyprus and Crete respectively, members of the MEDEA research team carried out informative school visits in mid-March.
In Cyprus, more than 250 students, parents and teachers attended interactive presentations on children's health issues. During the first presentation, children and parents were informed about healthy eating and exercise habits, and afterwards, everybody enjoyed a healthy breakfast that was prepared and offered by the Schools parent association. The second presentation focused on respiratory health and the different strategies on how to protect ourselves from various environmental factors that may affect us, such as desert dust storms.
The implementation of this initiative is part of the actions of the European research project MEDEA aiming to reduce the adverse effects of desert dust storms on human health and especially in vulnerable groups such as asthmatic children. The First Lakatamia Primary School and the Second Primary School of Voutes will participate in the pilot phase of the project, which includes the completion of a respiratory health questionnaire and the feasibility and effectiveness of MEDEA protocols and tools.

Climate Change and Desert Dust Storms in Southeastern Mediterranean

Recent reports from scientific organisations and multidisciplinary research consortiums such as the 2015 Lancet Commission on Health and Climate Change and the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, describe the continuing global warming phenomenon as one of the major global health threats of this century. For the Eastern Mediterranean region these reports highlight the alarming impact of climate change on rising average temperatures, reduced rainfall, desertification and increasing frequency and severity of desert dust storms. During the last decade (1998-2008), the frequency of dust storms in Cyprus, Israel and Greece has risen. In Israel, intense DDS were reported between 2009-2012 with daily PM levels reaching 2,643μg/m^3(Krasnov J Air Waste Manag Assoc 2014). In Cyprus the number of DDS increased with an average pace of approximately 2 extra dust days per year and according to climate models projections this trend will continue (Achilleos J Air Waste Manag Assoc 2014).In Crete, in winter and spring background PM10 level were greater than the daily EU limit in 1 out of 5 days, with 80-100% of the cases due to DDS events. (Gerasopoulos, Atmos Environ 2006)

Desert Dust Storms are caused by the elevation from the grounds of arid and semi-arid areas of considerable amounts of small particles by strong turbulent winds. These particles are evenly distributed in the atmosphere and depending on the prevailing winds are transported over long distances. The formation of dust storms is thus enhanced by three conditions: the presence of a dust source, strong winds, and low surface coverage of the ground. Dust storms can travel thousands of kilometres across countries and continents carrying along other pollutants which they encounter on their way and finally deposit particles far away from their origin. As expected, inhabited areas neighboring deserts or other semi-arid areas are extremely susceptible to Desert Dust Storms.Examples of such regions include the mega-cities in the Far-East (e.g. Beijing, Shanghai, Seoul) that are in close proximity to the great Mongolian and Asian deserts, the south-western US states (California, New Mexico, Texas, Arizona) that are located across the great North America plains and of course the Mediterranean region with countries

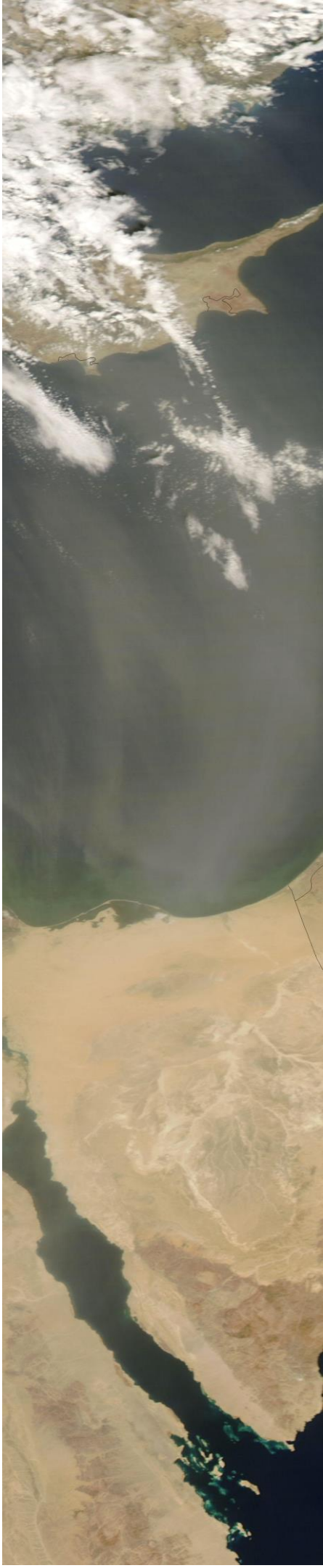
Overview of Heraklion Crete and photos from the recent dust storm (March,2018)

such as Cyprus, Israel and South Greece being highly exposed as they are affected by southerly and easterly winds that transfer dust from the Sahara and the Arabic Peninsula respectively.

The Mediterranean region is expected to be further highly impacted by climate change as climatic models predict that within the next 100 years mean annual temperature will rise by 2.2 to 5.1 degrees Celsius. Similarly, for the same period, the decrease in mean annual precipitation is expected to be as low as between -4% and -27% (International Panel on Climate Change 2013). Long droughts in the region, together with pasture overgrazing, deforestation and frequent large-scale wildfires will lead to the development of favourable conditions for higher frequency and intensity of dust storms. Precipitation decreases in the Mediterranean region are expected to negatively affect soil moisture thus resulting in consolidated soil particles that are easily transported by the wind whereas decreasing plant growth will lead to eventually diminished vegetation coverage (Yang Atmospheric Environment 2007).

To date, numerous adverse health effects have been linked to desert dust storms such as the worsening clinical status of allergic, asthmatic, COPD and cardiovascular patients. Particularly vulnerable to dust storms are also the elderly as a result of the natural decline and deterioration of their immune system and small children due to the immaturity of their immune system and lung function. Although the precise biological mechanisms of desert dust toxicity remain unclear and requiring further investigation, the health effects of dust storms are attributed to the inorganic and organic components of dust that can enter the human body through the respiratory tract. Particles with aerodynamic diameter of less than 10 micrometres (PM10) and more so less than 2.5 micrometres (PM2.5) can reach deep into the respiratory system and trigger inflammation and oxidative stress responses, while a wide array of bacterial and fungal organisms that are transported with the dust may result in respiratory infections (Schweitzer M, Environmental Research, 2018). Research data from Cyprus, Greece and Israel suggest that increased PM10 concentrations during desert dust storms are associated with increased rates of mortality (Neophytou, Journal of Exposure Science and Environmental Epidemiology 2013) and increased rates of hospital admissions especially due to cardiovascular causes (Middleton, Environmental Health 2008), asthma (Samoli, Environ Res 2011) and chronic obstructive pulmonary disease (Vodonos, Air Qual Atmos Health 2014).

In response to the pressing need to protect the public and susceptible subgroups in the affected regions, the European Union has funded the LIFE project MEDEA ("Mitigating the Health Effects of Desert Dust Storms Using Exposure-Reduction Approaches") in an effort to support the development and implementation of a climate change adaptation strategy to dust storm events that could be applied to all Mediterranean and south European countries.



2018 Climate Change Conference

Within the framework of the International Conference “Climate Change in the Mediterranean and the Middle East: Challenges and Solutions” organised by the Cyprus Institute on the 18th and 19th of May 2018, Dr. Souzana Achilleos from the LIFE MEDEA research team presented the work "Climate change adaptation in the Eastern Mediterranean: Desert Dust Storms and the EU LIFE project MEDEA".
On behalf of MEDEA project, other members of the research team from the University of Cyprus, CUT, the Cyprus Meteorology Department, the University of Crete and the Department of Labour Inspection of Cyprus also took part in the conference.

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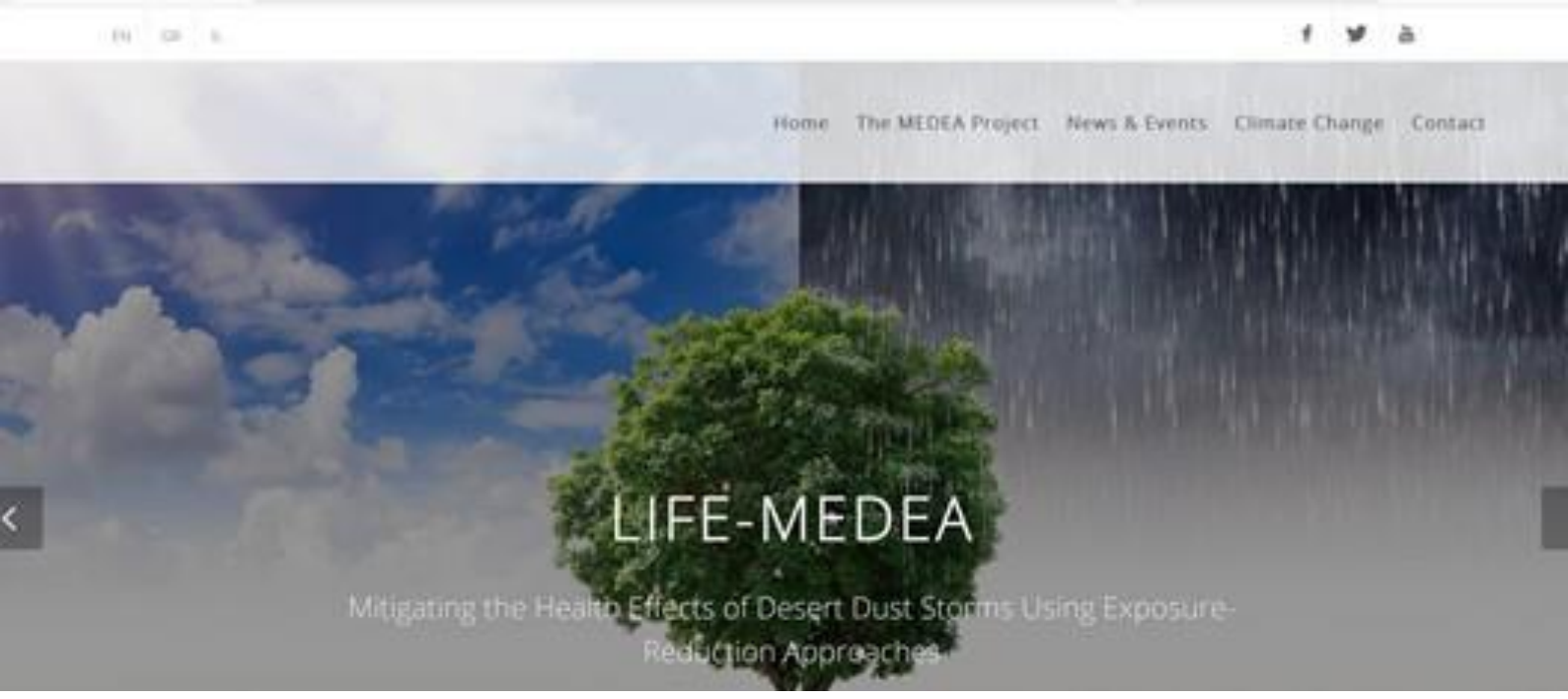
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