European Severe Storms Laboratory
Newsletter 2017-1

**No. 12**   **January 2017**

ESSL celebrates 10th Anniversary

On 1 July 2016, ESSL celebrated its 10th Anniversary in Wiener Neustadt, Austria. In a celebratory session, various persons presented their reviews of ESSL's accomplishments. Charles Doswell (left) discussed the successes of the ESSL Testbed, Harold Brooks (NOAA, center) talked about the importance of the European Severe Weather Database. Hans-Joachim Koppert (DWD, right) mentioned the value of ESSL's educational activities and presented a video recorded by DWD forecasters. Robert Sausen talked about ESSL's development throughout the years. Pieter Groenemeijer (ESSL Director) gave a review of the past and presented a vision for the future of ESSL. After the talks, there were snacks and drinks.

New institutional full members: ECMWF and KNMI

ESSL is delighted that it could welcome two new members in 2016, the European Centre for Medium-Range Weather Forecasts (ECMWF) and the Royal Netherlands Meteorological Institute KNMI. Full institutional members are weather services or non-profit research organizations. ESSL is looking forward to future collaborations with ECMWF and KNMI.
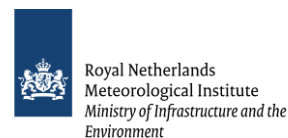
RAIN project: climate models predict more severe weather in the coming century

Since May 2014 the ESSL is engaged in the new FP7 EU-project RAIN. ESSL is leader of Work Package 2, dealing with Hazard Identification. The EU-project on Risk Analysis of Infrastructure Networks (RAIN)

evaluates the vulnerability of European transport, energy and telecommunication infrastructure, and develops strategies to minimise the impact of extreme weather events on these networks.

Within the RAIN project, ESSL coordinated interviews among critical infrastructure managers, and carried out a survey among weather service providers. On that basis, recommendations on how to improve early warning systems were formulated. They include increasing the availability of weather forecast and warning data and additional research in a number of areas.

ESSL also lead-authored the RAIN project report "Present and future probability of meteorological and hydrological hazards in Europe". Besides the coordination of the work, ESSL contributed by studying the probability of convective severe weather (large hail, severe wind gusts and tornadoes) using regional climate models.

A map of spatial distribution of large hail (left figure) shows that it occurs, on average, once in 50 to 25 years over Central Europe and once in 25 to 10 years along the Mediterranean Sea coastlines. By the end of the century, the annual frequency is projected to increase by 30 to 60% over Central and South-Central Europe for the RCP8.5 scenario (right figure). The reason for the change is an increase in atmospheric instability.
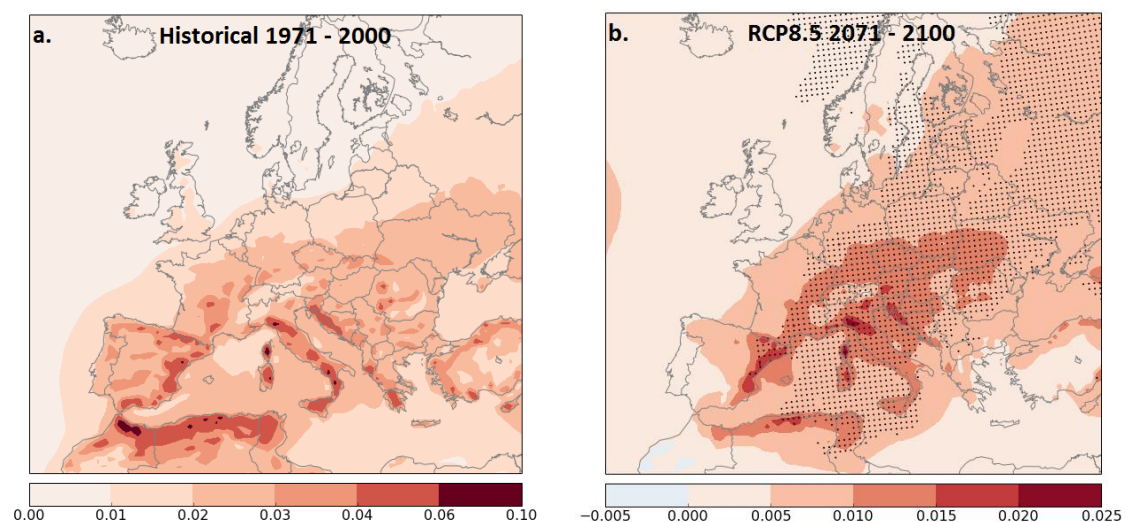
a) Annual frequency of large hail over Europe (1971-2000). b) Projected change of annual frequency until 2071-2100. Black dots denote robust changes in the ensemble.

The reports of the RAIN project can be downloaded here: http://www.essl.org/cms/research-projects/new-eu-project-rain/

More information can be found on the RAIN website: http://rain-project.eu/

ESSL student reseachers receive awards

Ph. D. students Tomas Pucik and Anja Rädler, who work at ESSL, have both received an award at the American Meteorological Society's Severe Local Storms Conference. Pucik presented his work on future changes in severe thunderstorm environments across Europe according to the EuroCordex models. He won the second prize for student presentation. Rädler presented a poster on Additive Logistic Regression Models for Convective Hazards and their

Application to Reanalyses and Climate Scenarios. She won the third prize for best student poster.

Tomas Pucik's presentation can be listened to here:

https://ams.confex.com/ams/28SLS/webprogram/Paper300871.html

Anja Rädlers conference abstract can be found here:

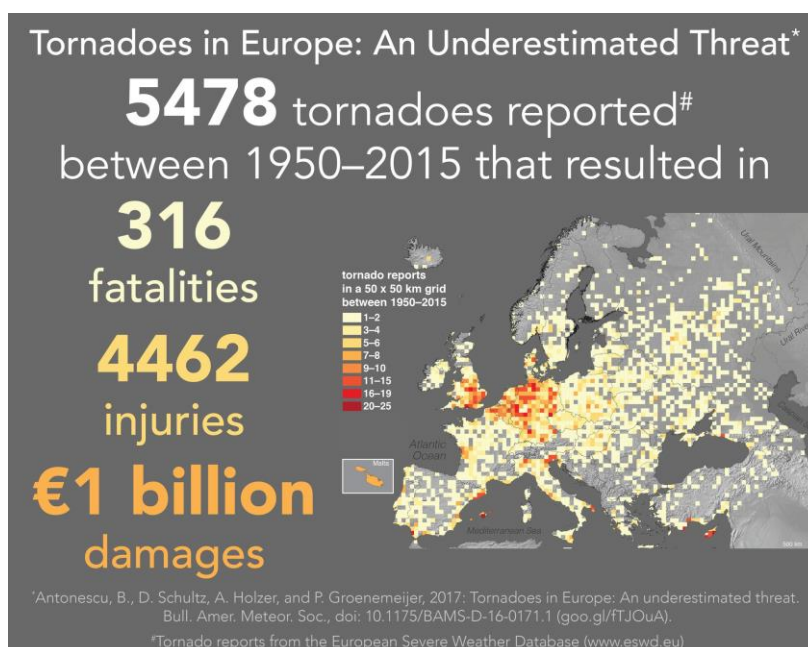https://ams.confex.com/ams/28SLS/webprogram/Paper301712.html

New study on tornadoes in Europe: An underestimated threat

The social and economic impact of tornadoes in Europe was analysed in a new paper that resulted from collaboration between the European Severe Storms Laboratory and the University of Manchester (United Kingdom).

Based on tornado reports from the European Severe Weather Database between 1950 and 2015, the paper summarises our current understanding of the tornado threat to Europe by showing the changes in tornado injuries and fatalities since the 1950s and by estimating for the first time the damages associated with European tornadoes.

Tornadoes in Europe: An Underestimated Threat*
5478 tornadoes reported[#] between 1950–2015 that resulted in
316 fatalities
4462 injuries
€1 billion damages

tornado reports in a 50 x 50 km grid between 1950–2015
1–2
3–4
5–6
7–8
9–10
11–15
16–19
20–25

'Antonescu, B., D. Schultz, A. Holzer, and P. Groenemeijer, 2017: Tornadoes in Europe: An underestimated threat. Bull. Amer. Meteor. Soc., doi: 10.1175/BAMS-D-16-0171.1 (goo.gl/fTJOuA).
[#]Tornado reports from the European Severe Weather Database (www.eswd.eu)

The paper also proposes a strategy to increase awareness of tornadoes and their threat to Europe that includes 1) collaboration between meteorological services, researchers and the general public toward a pan-European database, 2) development of national forecasting and warning systems and of pan-European convective outlooks, and 3) development by decision-makers and emergency managers of policies and strategies that include tornadoes.

Antonescu, B., D. Schultz, A. Holzer, and P. Groenemeijer, 2017: Tornadoes in Europe: An underestimated threat. Bull. Amer. Meteor. Soc., doi: 10.1175/BAMS-D-16-0171.1.

ESSL Summer School on Severe Convection

The first Summer School on Severe Convection organized by ESSL will be held between 28 August and 1 September 2017 at the ESSL Research and Training Centre in Wiener Neustadt (Austria). The aim of the ESSL Summer School is to provide PhD students, forecasters, emergency and risk managers, and insurers and re-insurers with the most updated advances on severe convection both from a theoretical and practical perspective. The lectures will be given by international recognized scientists in the field of severe convection.

The ESSL Summer School will offer lectures on:
- Methods of forecasting severe convective storms
- Flash-flood climatology, formation and forecasting
- Convective windstorms (downbursts and gust fronts) climatology, formation and forecasting
- Hail climatology, formation and forecasting
- Lightning climatology and formation
- Tornado climatology, dynamics and forecasting
- Subtropical and tropical cyclones in the Mediterranean climatology and formation
- Climate change and severe storms

The registration for the ESSL Summer School is open:
http://www.essl.org/cms/upcoming-events event-registration/

For the latest updates about the ESSL Summer School please visit:
http://www.essl.org/cms/upcoming-events/essl-summer-school-on-severe-convection/

Project ARCS has started

In April 2016, ESSL has officially started to work in a new project "Assessment of Risk of Convective Storms in Europe" (ARCS) together with Munich RE. The project is funded by the German Ministry of Education and Research (BMBF). Its goals are to establish a regional climatology of convective hazards for Germany and Europe and to detect changes of frequency and variability during the last decades and create projections for the future. In addition, risk maps are created by combining the modelled present, past and future hazard climate with socio-economic data. The project will last three years.
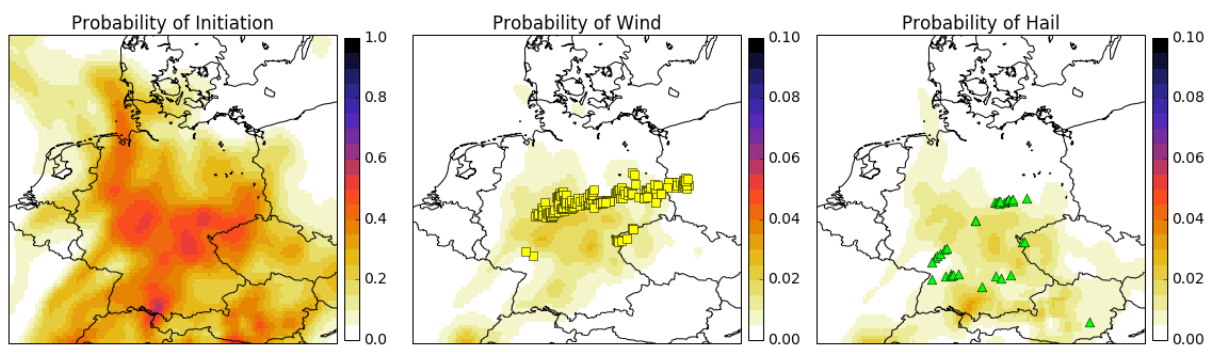
# Estimation of convective hazards in NWP models

Probability of hail on 7 July 2015 at 18 UTC (colours) and hail reports (green triangles), wind reports (yellow) from the ESWD (+30 h ECMWF forecast).

In spring 2016, the German Weather Service (DWD) expressed interest in a tool to predict severe weather events such as lightning, hail, severe winds and tornadoes using NWP data 12 to 36 hours ahead. ESSL was able to offer to develop such a tool based on statistical models that had been developed by Anja Rädler in the project ARCS (see above). These statistical models give the probability of lightning, hail, severe wind and tornadoes using reanalysis data and observations.

The probabilities are calculated using a set of severe weather predictors from NWP or climate models. Lars Tijssen has developed a program that uses ECMWF and ICON forecast data to yield probabilities of various severe weather events over Germany. As an example, see the figure above. The tool will be evaluated at the ESSL Testbed 2017.

EWOB App

In December, the European Weather OBserver app (EWOB) was relaunched. It now has improved translations into **35 languages** spoken in Europe. A number of skilled voluntary translators across the continent offered their free time to support this community effort over the past year. ESSL is very thankful to all translators for this valuable contribution to the project. The new app release also includes bug fixes. Now it is also possible to save the taken photos on the user's device, while in earlier versions the images taken were only sent to the EWOB database.
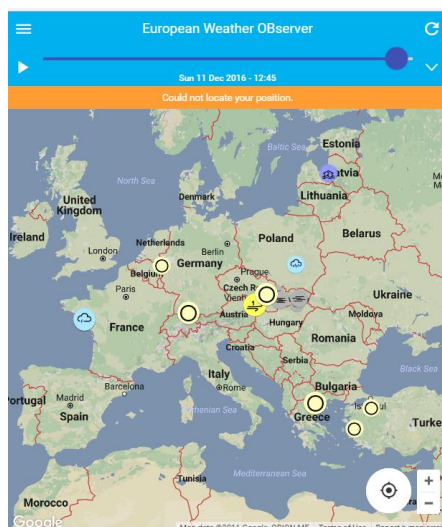
The success of EWOB strongly depends on spreading the word by our partners and members.

Potentially interested groups to use the data and submit reports are firefighters, emergency services, weather enthusiasts, and simply your colleagues, friends and family from all around Europe.

To help attract and invite new user more easily, ESSL offers a number of simple messages that can be sent to your contacts or used in social media. An example:

"*The weather does not behave like it was forecast? Report it to EWOB, so that meteorologists can see it. You will help scientists in research to better understand such weather situations, but your report can also improve warnings in the short-term.*"

More information about EWOB, the recent map of reports and download links can be found here: http://www.essl.org/ewob

New Advisory Councillors

At the General Assembly the Executive Board proposed Prof. Dr. Yvette Richardson (USA), Prof. Dr. Sorin Cheval (Romania), and Dr. Marina Baldi (Italy) to be elected as Advisory Councillor. The ESSL General Assembly on 1 July 2016 in Wiener Neustadt elected the candidates.

Detailed information on all terms of office within ESSL can be found in the download section of this webpage: https://www.essl.org/cms/about-us/

The European Severe Storms Laboratory has the pleasure to invite you to the

ECSS 2017
9th European Conference on Severe Storms
in Pula, Croatia
18–22 September 2017

The scope of the conference covers all aspects of severe convective storms. Researchers, operational forecasters, and risk and emergency managers are invited to submit contributions. ESSL wholeheartedly invites participants from all over the world to attend.

The ECSS 2017 will deal with the following topics:
- Convective storm and tornado dynamics
- Numerical modelling of storms, storm-scale data assimilation
- Impact of storms on society, impact mitigation and early warning systems
- Convective storms within extratropical, Mediterranean and tropical cyclones
- Floods and flash floods
- Forecasting and nowcasting of severe weather
- Severe weather forecast training
- Satellite studies of storms and their environment
- Radar studies of storms
- Storm electrification, lightning, microphysics and hail
- Storm climatologies, risk assessments and climate change
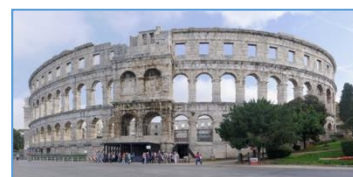- Collection of storm data, historical events and damage assessments

Abstract submission has already opened. Registration will open on the **31st January 2017**.
The deadline for abstract submission is the **20th March 2017**.

For more information please visit www.ecss.eu
Please feel free to forward this information to any interested persons!

ECSS 2017 is made possible by:

Upcoming Activity Calendar

Date	Event	Additional information	Registration deadline
5 – 9 Jun 19 – 23 Jun 26 – 30 Jun 3 – 7 Jul 2017	**ESSL Testbed 2017**		Until fully booked. Early bird rate until 1 Feb 2017
12 – 16 Jun 2017	**Seminar** Forecasting Severe Convection II Dynamics and Prediction of Severe Thunderstorms	by Prof. Matthew D. Brown Parker, USA	Until fully booked. Early bird rate until 1 Feb 2017
28 Aug – 1 Sep 2017	**ESSL Summer School** on Severe Convection Every day another convective hazard, lectures and exercises by different expert lecturers. Climatology, theory, risk and forecasting/warning.		Until fully booked. Early bird rate until 1 Feb 2017
4 - 8 Sep 2017	**EMS Annual Meeting** European Conference for Applied Meteorology and Climatology	co-sponsored by ESSL, in Dublin, Ireland	Registration: www.ems2017.eu
18 – 22 Sep 2017	9th European Conference on Severe Storms **ECSS 2017**	in Pula, Croatia	Early bird rate until 15 June 2017.
23 Sep 2017	**Introduction Seminar** Forecasting of Severe Convective Storms	by Dr. Charles A. Doswell III, in Pula, Croatia	Until fully booked. Early rate until 15 June 2017.
2 – 6 Oct 2017	**Seminar** Forecasting Severe Convection I	by Tomas Pucik (ESSL/ESTOFEX)	Until fully booked. Early bird rate until 15 June 2017.
28 – 31 Aug 2018	International Tornado Standard Working Group Meeting and **Workshop** on Tornado and Windstorm Damage Assessment	by ESSL staff and expert guests.	
3 – 7 Sep 2018	EMS Annual Meeting: European Conference for Applied Meteorology and Climatology	co-sponsored by ESSL, in Budapest, Hungary	
11 – 15 November 2019	10th European Conference on Severe Storms **ECSS 2017**	In Krakow, Poland	

The current calendar can always be found on the website: www.essl.org

For more information, feel free to contact us at events@essl.org