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ESSL Newsletter 2025-3

June 2025

Our Team Is Growing!

Meet the Newest Members of ESSL

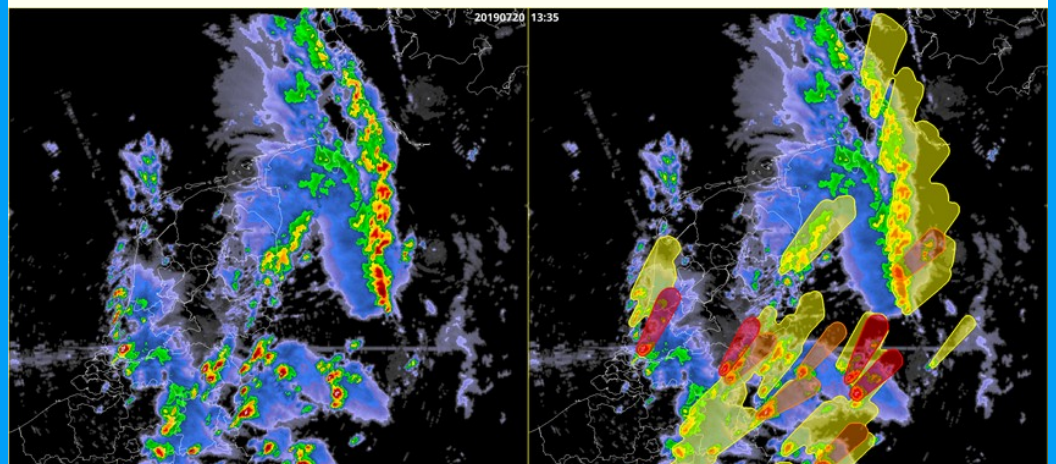
We're thrilled to welcome two new colleagues to the ESSL team! **Bram van 't Veen**, a programmer and developer for the ESSL Weather Data Displayer, joined us at the beginning of the year.

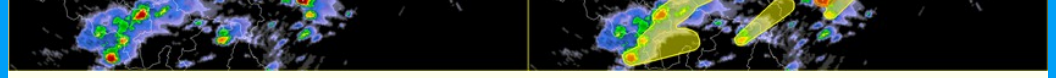
He shares a personal introduction and insights into his work below. Most recently, on June 1st, we welcomed **Brice Coffer**, a Senior Research Associate. We had a chance to sit down with him for a short interview to learn more about his background, interests, and what led him to join ESSL.

Read on to get to know both of them.

Bram van ‘t Veen

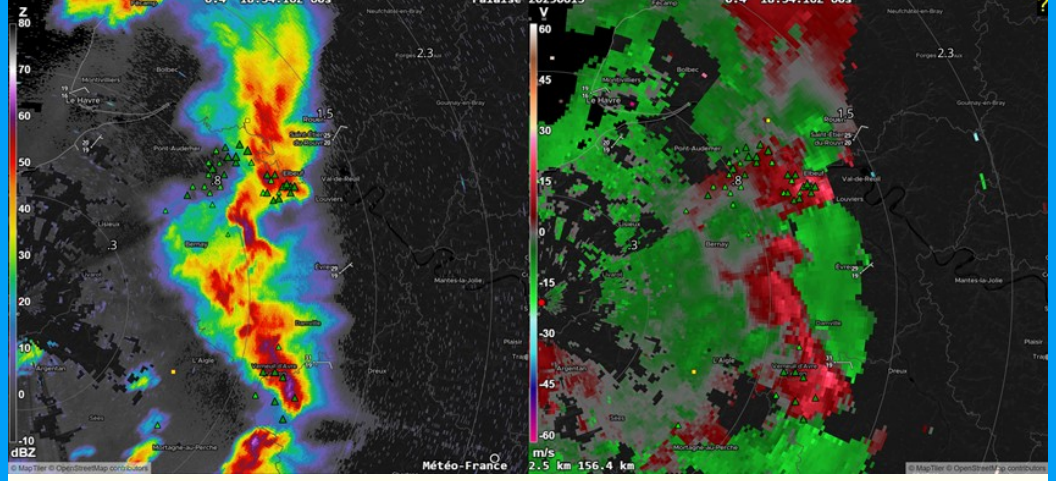
“I’ve been passionate about thunderstorms since my early teenage years, which led to pursuing a bachelor in Physics and master in Climate Physics at Utrecht University (NL). A desire to study storms in detail led to an interest in radar data, in the period just before I started my bachelor. This interest and passion quickly grew in subsequent years after I bought the GR2Analyst software to view US radar data. A friend then inspired me to learn Python during a summer between two bachelor years, and this gave me the ability to start making my own radar visualisations. A project that ultimately formed the start of the development of my radar viewer NLradar. Important in the motivation for this project was that KNMI was one of the earliest weather services that made volumetric radar data publicly available."





Warning polygons from the software I created at KNMI. Polygon colors are only based on column-maximum reflectivity however in this image.

"Professionally, I've worked at KNMI for two years as a software engineer, but with main focus on the development of an automatic warning system for thunderstorms. This started with a bachelor thesis project where I developed a cell-tracking algorithm, and after finishing my master I got the opportunity to work on expanding this further into a nowcasting system. A big problem had arrived by then however, which were the Repetitive Strain Injuries that I had developed in my wrists. This caused me to start voice coding, but after a while it became clear that I had to fully stop working to be able to recover. So, I stopped at KNMI after my temporary contract finished, and started fully focusing on recovery. Initially that went slow because of a wrong approach, but in March 2023 I started making serious progress with the right approach. And more than a year later I considered myself sufficiently recovered to start looking for a job again, and came in touch with Pieter. "



A screenshot from the radar viewer, with strong supercells in northwestern France. I was storm chasing this day, and my team was positioned just northeast of Rouen at this moment.

“Here I got the great opportunity to develop a web viewer for radar data. Initially as a freelancer, but since this year fortunately as a part-time employee, where I combine work on the radar viewer with work for the main ESSL displayer. I very much enjoy expanding the radar viewer’s capabilities, and creating and archive of interesting radar data. And in the future I hope to also get back to R&D work on radar data beyond visualization, such as work on radar-based hail detection.”

Interview with Brice Coffer

Welcome to ESSL, Brice! Could you share what inspired your move from the United States to Austria and what this transition has been like for you, both professionally and personally?

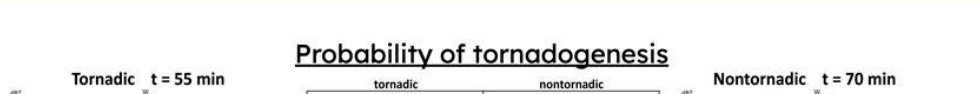
Thanks! It's great to be here. Honestly, the decision to move across the Atlantic was driven by my natural curiosity and overall sense of adventure. Both professionally and personally, I have been given an opportunity that not many people get, to take a big step out of our comfort zone and

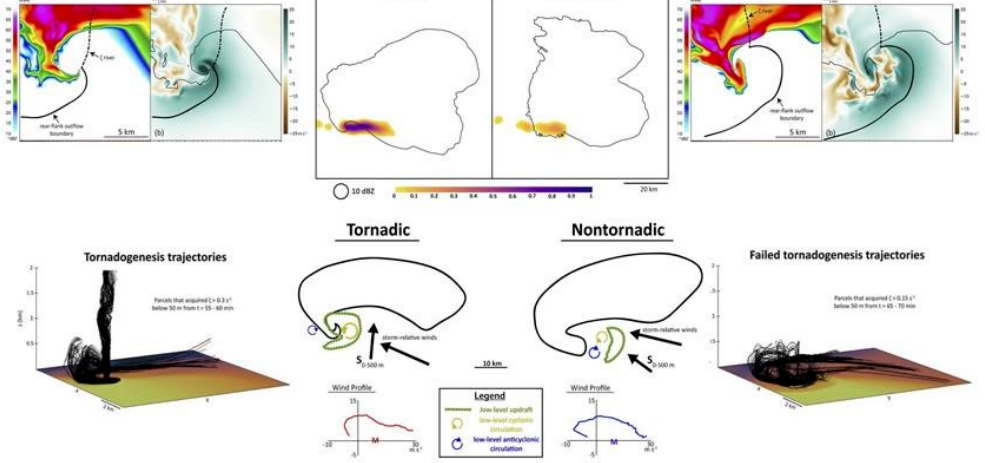
confront new challenges. Professionally, ESSL offers a unique chance to tackle a fresh and exciting research project, and personally, I get to experience new places, people, and cultures. Transition-wise, it's been somewhat chaotic, both good and less good. I arrived a day late (and without my luggage!) and in the middle of a testbed week, with the ESSL facility buzzing with people. My German is very much work in progress, and I'm still spending entirely too long at the grocery store trying to decipher labels. But overall, I couldn't ask for a more understanding group of colleagues to help with the move!

Your research has extensively focused on supercell thunderstorms and tornado formation. Could you elaborate on your key findings regarding the role of near-ground wind profiles in tornadogenesis?

Absolutely. One of the big takeaways from my work over the last decade is just how influential a quite shallow layer of the overall wind profile, say just the lowest few hundred meters above the ground, is on properties of a thunderstorm that sometimes reach up to 20,000 meters! Something

we've discovered lately is how prevalent broad, weak rotation is at the surface in basically all thunderstorms. Some amount of sub tornadic-scale rotation is nearly ubiquitous in thunderstorms. However, most storms, (>99%) fail to convert this weak rotation into a tornado. One of the distinct features of supercells is their ability to converge and stretch this broad rotation into a tornado. Their ability to do this relies on having a strong updraft as close to the ground as possible. This is where the near-ground wind profile comes in. Strong wind shear near the ground feeds into the updraft at low altitudes, roughly near the cloud base. Through a daisy-chain of processes, this drives very intense low-level updrafts within the supercell's low-level mesocyclone and makes it much more likely to produce a tornado. Of course, many other things have to go right (or wrong, depending on your perspective!) to get a tornado, but the underlying probability of supercell tornadoes is much, much higher when the wind shear in the lowest few hundred meters is very strong.





Using high-resolutions supercell simulations, Brice's previous work has shown the probability of tornadogenesis can be specifically linked to differences in the low-level wind profile near the ground, primarily related to the organization of a supercell's low-level updraft and its ability to stretch tornado parcels.

At ESSL, you're joining the Climate Research & Hazard Modelling Team. What specific projects or goals are you excited to pursue in this new role?

What I think I'm most excited about is the new challenge and the opportunity to research severe weather topics as part of a driven, internationally diverse group of people at ESSL. I see a lot of professional growth opportunities working with ESSL, and their many partners, and I'm eager to apply my expertise, while also expanding my skill set. Specifically, I want to be able to blend my

knowledge of thunderstorm environments with fresh, creative ways to represent the probability of different hazards in a changing climate. There are a lot of important, outstanding questions regarding the frequency and intensity of severe storms in not just Europe, but also globally. For example, there has been a significant rise in the societal cost of severe weather in recent years, and there is a dire need to understand the risk associated with these events. How can we use emerging observational platforms and our improved understanding of the dynamics within thunderstorms to be able to blend high-level climate modeling with practical, real-world solutions? That is an overarching question I hope to contribute while at ESSL.

You've participated in major field projects like VORTEX2 and PERiLS. How have these experiences shaped your approach to severe weather research?

Field work is ultimately what kept me in this discipline as an impressionable 19 year old working on VORTEX2, who wasn't sure if all the math and physics that goes into meteorology was

really worth it! Not only did the challenge of finding the right storms on a chase day appeal to my somewhat competitive nature, but the ability to observe the processes that you were studying in school made the classroom environment much more enjoyable as well. I've been fortunate to be in many field projects since then, and much of my research has been driven by data and ideas formulated in the field. On a personal level, the experiences in field projects also helped me grow as a researcher, teaching important skills on being both meticulous, yet flexible at the same time! And they've also shown me how important collaboration is: everyone brings something different to the table and that collective effort is essential for breakthroughs.

I hope to be able to continue working in the field at some point, who knows...maybe even in the mountains throughout Europe! ESSL's ambitions to organize the Thunderstorm Intensification from Mountains to Plains was a huge selling point in my decision to move here.

Beyond your professional life, we hear you're an avid traveler and have a goal to visit every U.S.

National Park. How do your personal interests intersect with your work in meteorology?

Yes and actually I achieved my goal not long after accepting the position at ESSL! In April, I traveled to the islands of American Samoa in the south Pacific and spent a week hiking, snorkeling, and lounging on the beach at my 63rd, and final, U.S. National Park. I started this journey during the first year of my PhD at NC State, and it's been as much a part of the last decade of my life as my research has. It is sort of fitting that this chapter of my life, both in visiting the parks and my time at NC State, is coming to a close together. Now I get to explore all that Europe has to offer!

Looking ahead, what do you see as the most pressing challenges in severe weather forecasting, and how do you hope your work at ESSL will contribute to addressing them?

Right now, one of the most pressing challenges for forecasting severe weather in my opinion is simply the communication of our already quite good forecasts. The social science side of severe weather forecasting is something that most of us,

who come from a physical science background, really struggle with. I imagine some of the easiest wins in forecasting in the coming decade will revolve around improved communication. I say ‘easy’ not to denigrate the hard work of the people working on this, but because it is so obviously the best way to make a huge leap forward. We just have to invest in the process. And communication challenges go not only for real-time forecasts of severe weather, but also when presenting long-term risk to public and private partners. At ESSL, I want to help bridge the gap between cutting-edge research and the practical aspect of communicating the probability of severe weather hazards in a changing climate. Hopefully in the end, allowing everyone to make better actionable decisions.

The novel damage assessment course - highly relevant for impact-oriented warnings

We spoke with **Alois Holzer** about the motivation behind organizing this new training and the

importance of educating professionals on how to assess damage caused by severe wind events.

Alois Holzer, this September we will be organizing the first course on damage assessment of extreme wind events. What is the motivation for that?

Over the past years, we have been asked several times by our members and other interested parties to offer such a course. At the ESSL, we agree that this is something important. Without skillful

damage assessment carried out after an extreme wind event, weather services typically are not able to determine the strength and nature (straight-line wind or tornado) of a damaging event. This means that a weather service is not only unable to answer media requests in a meaningful way, also there is no way to establish climatologies of those events for a given region or country. Climatological data is the basis to answer the question about the frequency of such events and any trends as well as to allow for further research on the topic.

In the past we organized a series of wind damage assessment expert workshops, why now a course?

We first had to establish the knowledge base for such a course. Knowledge how to perform site surveys, how to assess the damage and how to translate it into meteorological categories and quantitative data has been very limited in Europe. For that reason, we invited people interested and active in the field to a series of expert workshops. We teamed up with construction engineers and forest experts, visited construction sites but also fresh damage sites and compared our findings

with pre-established procedures from the United States and with their ongoing EF-Scale revision process. We soon found out that there is no way to simply use or copy the EF-Scale for European purposes. The EF Scale widely isn't applicable in Europe due to very different building practices including our vast heritage of historical buildings from different centuries, different building codes and a very specific approach of the EF Scale, namely to often rate buildings based on their purpose rather than on their structural properties. It soon became clear that we need a more generic approach for Europe, an approach that should even be applicable worldwide and should allow us to, for example, rate tornadoes in Luxemburg, China, Australia, Uruguay, Canada, or South Africa with a consistent methodology and theoretical framework. Building codes and building practices differ, but physics are the same on the globe, so this should be possible. And I think we were able to make a big step forward with the idea, setup and first published version of the International Fujita Scale (IF-Scale). With the IF-Scale, we aimed not only for cross-country consistency of ratings but also for consistency with the historical F-Scale and with present-age science including very close

to ground radar measurements of tornadic winds. That said, we now believe that we are ready to spread the theoretical and practical knowledge that we gained over the past 10 to 20 years, to make it available to the European weather services and to other interested parties.

Alois, you spoke about the importance of damage assessment for the link between observed damages and underlying wind types and strengths. This reminds me on the international aim to forecast impacts and not only meteorological quantities, where we deal with the same relationship.

Right, this is a tightly linked topic. Not much is needed to see the point that without knowing the relationship between damage and wind speed, you have hardly any basis to forecast the outcome in the other direction, i.e. forecast impacts based on gust speeds. For impact oriented forecasting, we urgently need better knowledge of this relationship, especially for the high-end events. Or in practical words: If you as a forecaster expect gusts of 50 m/s based on radar or high-resolution modelling, what does that mean in terms of typical

damage patterns? And what about 60 m/s? We know that such events occurred in Europe in the past several years.

So, what is your wish for this first damage assessment course?

My wish is that as many weather services as possible will make use of this offer to strengthen their know-how in this important field. If you think about the direct link to the quality of your impact oriented warnings, the relevance is obvious. The level of demand for this first course will obviously determine if we can offer further such courses in the future. For this September, we have a few remaining places. Registration is still possible. I am really looking forward to this course, as we will build on a structured theoretical background, we will teach the many practical aspects of damage assessment, and we will also cover the important topic of behavior, safety and health aspects in areas that were hit by catastrophic events. Such damage assessment missions are highly demanding and require sound preparation on logistics, physical, technical and mental levels. We put all of this together for the participants. Do not

miss it out.

You can register for the course here.

ESSL training calendar for 2025 and 2026

You can find details about all events and registration at

https://www.events.essl.org/

Date	Activity
23 – 27 June 2025	ESSL Testbed 2025 – expert week
30 June – 4 July 2025	ESSL Testbed 2025 – regular week
1 – 5 September 2025	ESSL-EUMETSAT Forecaster Testbed week
8 - 11 September 2025	NEW Course: Damage assessment of extreme wind events
8 – 12 September 2025	EMS Annual Meeting (co-sponsored by ESSL) Ljubljana, Slovenia
6 – 10 October 2025	Course: Aviation forecasting of severe convective storms (autumn ed.)
13 – 17 October 2025	ESSL-EUMETSAT Forecaster Testbed week
17 – 21 November 2025	12th European Conference on Severe Storms (ECSS2025) Utrecht, The Netherlands
21 November 2025 (afternoon)	ESSL-EUMETSAT Forecaster Workshop on MTG FCI and LI Utrecht, The Netherlands (ECSS venue)
2 – 6 February 2026	Course with closed audience: Aviation nowcasting of severe convection – focus on new satellite products (MTG)
9 – 13 March 2026	NEW Course: Optimal use of radar data in severe storm nowcasting
23 – 27 March 2026	Course: Forecasting Severe Convection (FSC1)
13 – 17 April 2026	Course: Aviation Forecasting of Severe Convection

4 – 8 May and 18 – 22 May 2026	ESSL-EUMETSAT Forecaster Testbed weeks (t.b.c.) – tentative dates
11 – 12 May and 1 – 2 June 2026	2-day ONLINE refresher on forecasting severe convection (qualification: at least one prior ESSL course or testbed week)
15 – 19 June 2026	ESSL Testbed 2025 – regular week (focus on radar and NWP)
22 – 26 June 2026	ESSL Testbed 2025 – expert week
7 – 11 September 2026	EMS Annual Meeting (co-sponsored by ESSL)
14 – 18 September and 28 Sep – 2 October 2026	ESSL-EUMETSAT Forecaster Testbed weeks (t.b.c.) – tentative dates
13 – 15 October 2026	IF Scale and wind damage assessment workshop (tentative)
9 – 13 October 2026	Second ESSL Workshop on Weather Warnings (tentative)

Unsure which course to attend? Try our online quiz!

For further information about the registration for these events, please contact us at: events@essl.org .

Or approach us for tailored trainings or forecaster training on-the-job.

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European Severe Storms Laboratory