

NWP Training course, Predictability & ensemble forecast systems

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European Centre for Medium-Range Weather Forecasts (ECMWF)

ECMWF is an international organisation with

- 23 Member States
- 12 Cooperating States

ECMWF's role is to address the critical and most difficult research problems in medium-range NWP that no one country could tackle on its own

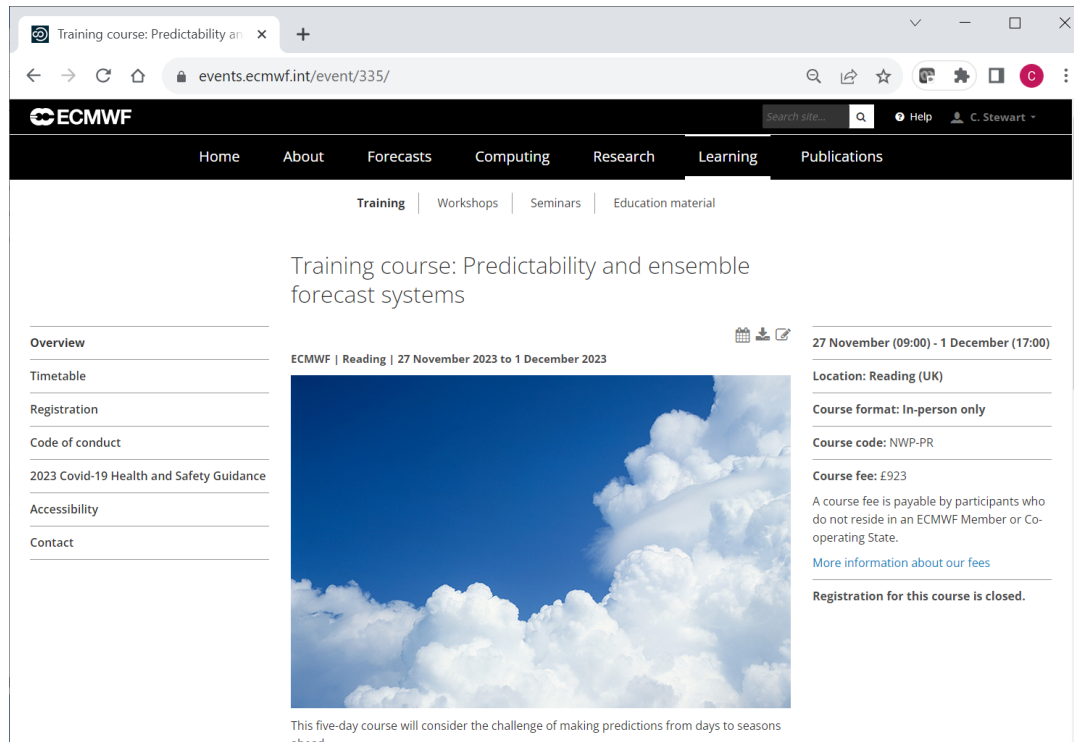
Three sites in UK, Italy and Germany

- Both research institute & 24/7 operational centre
- Established in 1975
- Advanced training = one of ECMWF strategic activities

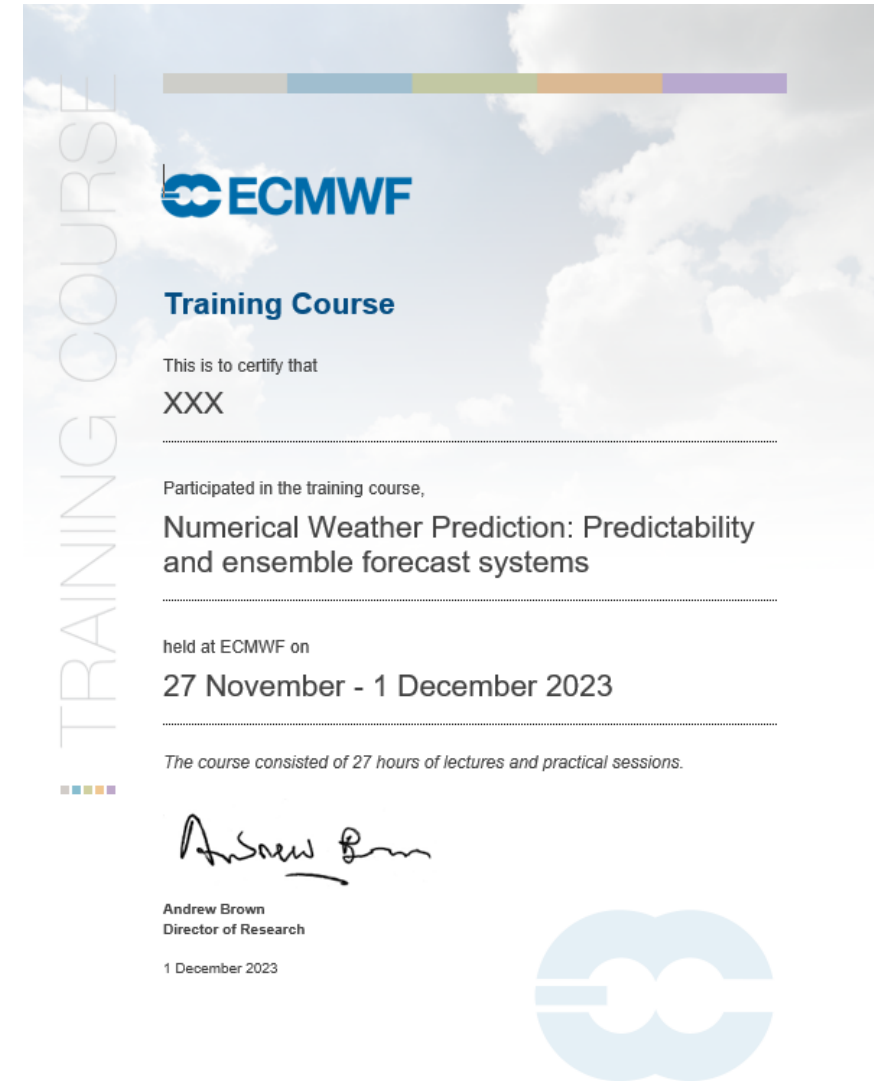


NWP training course: Predictability & ensemble forecast systems

- Course webpage: <https://events.ecmwf.int/event/335/>
- ECMWF training: <https://www.ecmwf.int/en/learning>
- eLearning resources <https://learning.ecmwf.int/>



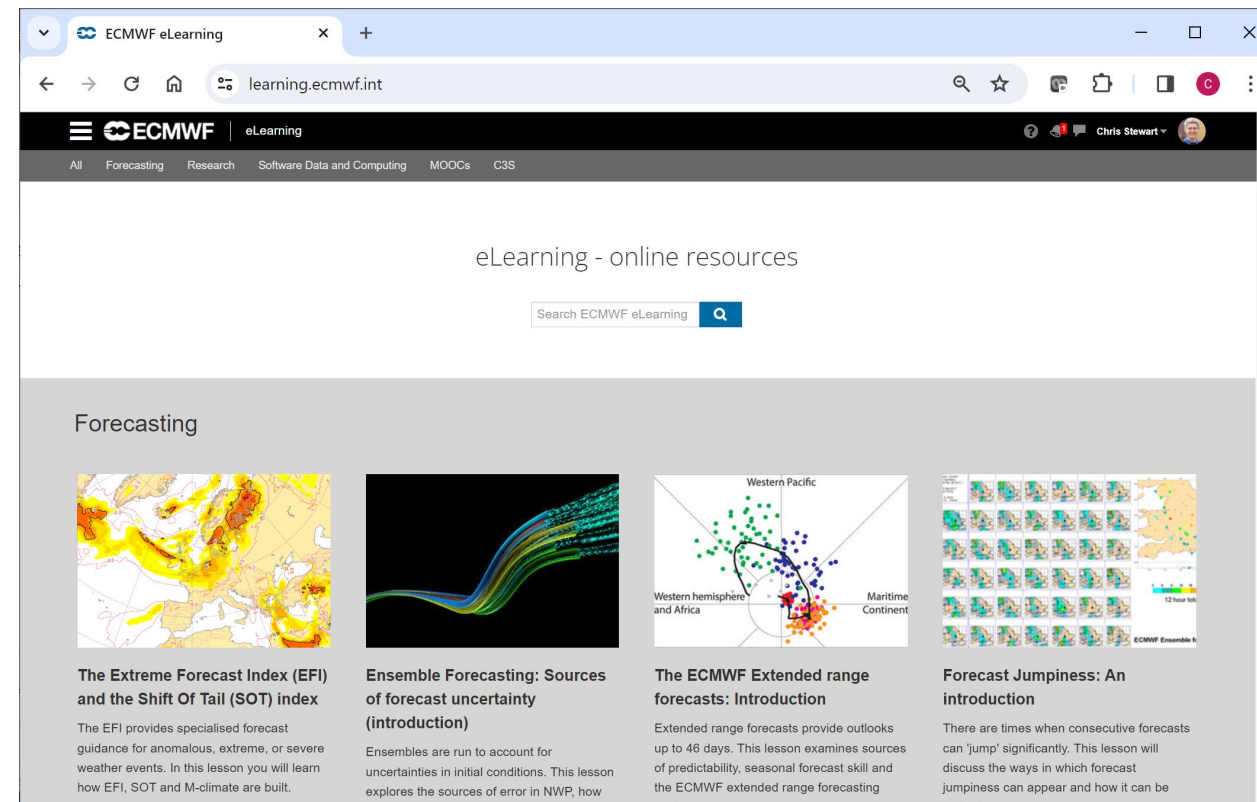
The screenshot shows a web browser window displaying the ECMWF training course page. The URL is events.ecmwf.int/event/335/. The page features the ECMWF logo and navigation menus for Home, About, Forecasts, Computing, Research, Learning, and Publications. The main content area is titled "Training course: Predictability and ensemble forecast systems" and includes a sidebar with sections like Overview, Timetable, Registration, and Code of conduct. The main text describes the course as a five-day program held at ECMWF in Reading, UK, from 27 November 2023 to 1 December 2023. It specifies the location as Reading (UK), the course format as in-person only, and the course code as NWP-PR. The course fee is listed as £923, with a note that it is payable by participants who do not reside in an ECMWF Member or Co-operating State. A registration status message indicates that registration for this course is closed. A large image of a blue sky with white clouds is featured in the center of the page.



The certificate is titled "TRAINING COURSE" and features the ECMWF logo. It certifies that "XXX" participated in the training course, "Numerical Weather Prediction: Predictability and ensemble forecast systems", held at ECMWF on 27 November - 1 December 2023. The certificate notes that the course consisted of 27 hours of lectures and practical sessions. It is signed by Andrew Brown, Director of Research, and dated 1 December 2023. The certificate includes a vertical "TRAINING COURSE" label on the left and a large ECMWF logo on the right.

Learning Management System

- Visit <https://learning.ecmwf.int/> (can login with ECMWF account, then we add you to course)
- Select your name (top right), then “My courses”, then “Predictability and ensemble forecast systems”.
- Forum:
 - Introduce yourself
 - Ask questions
 - Start discussion
- Course info, posters, choose your dinner menu.
- E-learning modules (optional, pre-course):
 - Seasonal Forecasting
 - Ensemble Forecasting: Sources of forecast uncertainty (introduction)
 - Extended Range Forecasts
 - Ensemble Forecasting



The screenshot shows the ECMWF eLearning website interface. At the top, there is a navigation bar with the ECMWF logo and 'eLearning' text. Below this is a search bar labeled 'Search ECMWF eLearning'. The main content area is titled 'eLearning - online resources' and features a 'Forecasting' section. This section displays four course modules, each with a representative image and a brief description:

- The Extreme Forecast Index (EFI) and the Shift Of Tail (SOT) index**: The EFI provides specialised forecast guidance for anomalous, extreme, or severe weather events. In this lesson you will learn how EFI, SOT and M-climate are built.
- Ensemble Forecasting: Sources of forecast uncertainty (introduction)**: Ensembles are run to account for uncertainties in initial conditions. This lesson explores the sources of error in NWP, how
- The ECMWF Extended range forecasts: Introduction**: Extended range forecasts provide outlooks up to 46 days. This lesson examines sources of predictability, seasonal forecast skill and the ECMWF extended range forecasting
- Forecast Jumpiness: An introduction**: There are times when consecutive forecasts can 'jump' significantly. This lesson will discuss the ways in which forecast jumpiness can appear and how it can be

General Housekeeping

Access to Centre

- Please sign in/out each day at reception

Personal belongings

- Do not leave any personal belongings at ECMWF outside office hours.
- We recommend that you do not leave valuables unattended in the classroom or any other part of the building.
- ECMWF will not take any responsibility for items lost at the premises.

Smoking

- Smoking is not allowed inside the building. Please ask at Reception Desk and you will be directed to the outside smoking area.

Enquiries

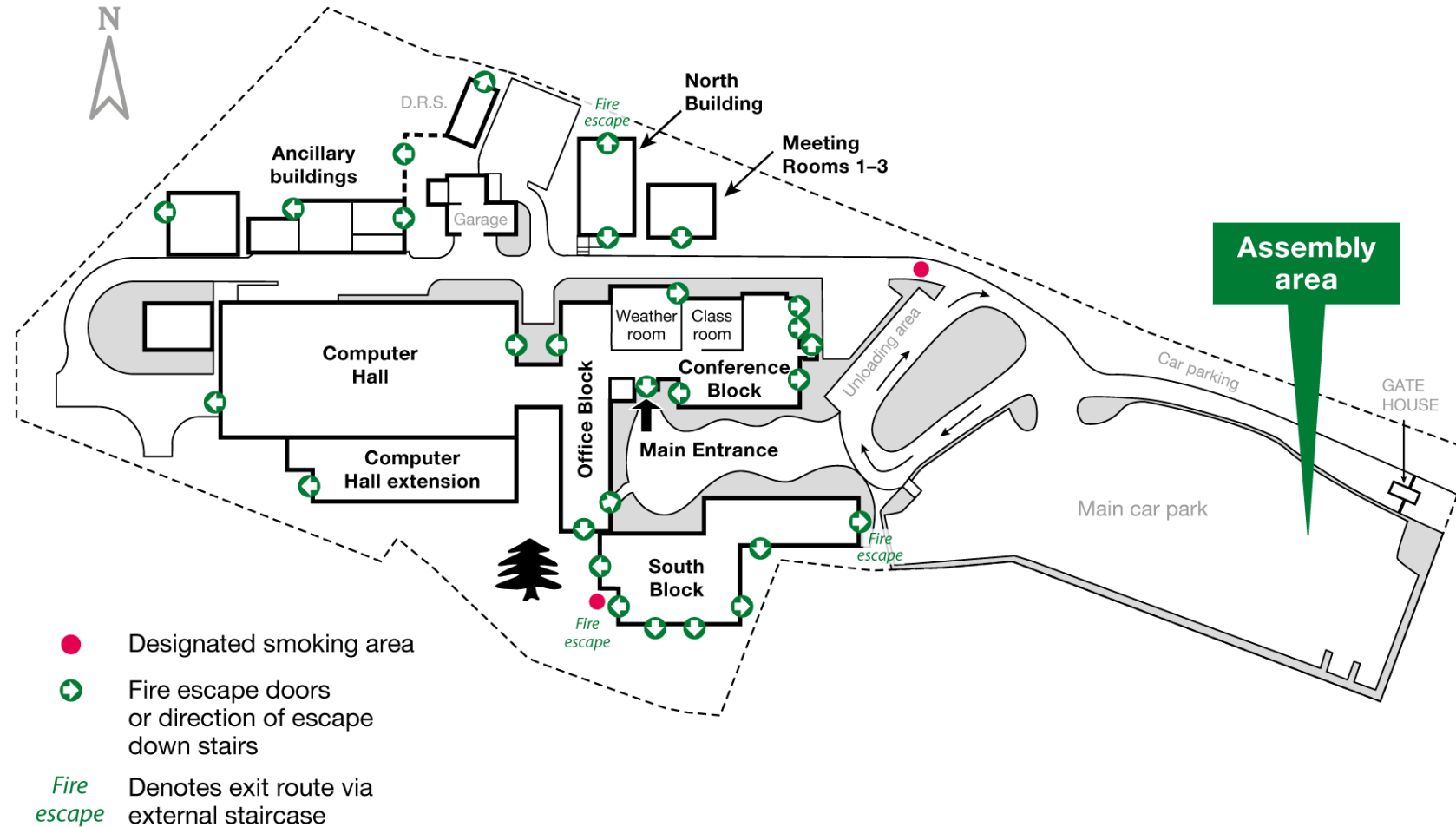
- If you have any questions, please contact the Reception Desk who will liaise with the course organisers.

Make the most of the training!

- Please don't check emails on the computers, or on other devices 😊
- There are no stupid questions!

General Housekeeping

Fire Escapes and Assembly Area



Restaurant

- The restaurant provides the following daily services:
 - Light breakfast from 08:00
 - Lunch: hot counter choices, salads, sandwiches, soup and desserts.
- Please speak to the restaurant staff if you have any special dietary requirements.
- Coffee/tea will be supplied during the breaks as specified on the programme.

Predictability and ensemble forecast systems. Training course programme

Monday, 27 November

09:15 → 09:30	Arrivals and registration Speaker: Christopher Stewart (ECMWF)	📍	🕒 15m
09:30 → 10:15	Introduction and practicalities Speakers: Andy Brown (ECMWF), Magdalena Alonso Balmaseda (ECMWF)	📍	🕒 45m
10:15 → 10:45	Coffee break	📍	🕒 30m
10:45 → 11:40	Introduction to probabilistic seamless forecasting Speaker: Magdalena Alonso Balmaseda (ECMWF)	📍	🕒 55m
11:40 → 11:45	Comfort break	📍	🕒 5m
11:45 → 12:45	Chaos and predictability limits Speaker: Antje Weisheimer (ECMWF)	📍	🕒 1h
12:45 → 13:45	Lunch break	📍	🕒 1h
13:45 → 14:40	Initial condition uncertainty Speaker: Simon Lang (ECMWF)	📍	🕒 55m
14:40 → 14:45	Comfort break	📍	🕒 5m
14:45 → 15:40	Diagnostics (1) Speaker: Mark Rodwell (ECMWF)	📍	🕒 55m
15:40 → 16:00	Coffee break	📍	🕒 20m
16:00 → 16:30	Introduction to practical sessions - Making sure your computer works! Speakers: Martin Leutbecher (ECMWF), Sarah Keeley (ECMWF)	📍 Gather	🕒 30m
16:30 → 17:00	Express poster presentations Speaker: Magdalena Alonso Balmaseda (ECMWF)	📍	🕒 30m
17:00 → 18:00	Evening reception Icebreaker	📍	🕒 1h

Tuesday, 28 November

09:15 → 10:15	Coupled sea ice-atmosphere variability Speaker: Steffen Tietsche (ECMWF)	📍	🕒 1h
10:15 → 10:45	Coffee break Group photo	📍	🕒 30m
10:45 → 11:40	Coupled ocean-atmosphere variability Speaker: Chris Roberts (ECMWF)	📍	🕒 55m
11:40 → 11:45	Comfort break	📍	🕒 5m
11:45 → 12:45	Coupled ocean-atmosphere variability - MJO Speaker: Frederic Vitart (ECMWF)	📍	🕒 1h
12:45 → 13:45	Lunch break	📍	🕒 1h
13:45 → 14:40	Poster Session	📍	🕒 55m
14:40 → 14:45	Comfort break	📍	🕒 5m
14:45 → 15:40	Coupled land-atmosphere variability Speaker: Jonathan Day (ECMWF)	📍	🕒 55m
15:40 → 16:00	Coffee break	📍	🕒 20m
16:00 → 17:00	Coupled ocean-atmosphere variability - ENSO Speaker: Magdalena Alonso Balmaseda (ECMWF)	📍	🕒 1h

Predictability and ensemble forecast systems. Training course programme

Wednesday, 29 November

09:15 → 10:15	Initialisation techniques in coupled forecasting Speaker: Magdalena Alonso Balmaseda (ECMWF)	📍	🕒 1h
10:15 → 10:45	Coffee break	📍	🕒 30m
10:45 → 11:40	Model uncertainty Speaker: Sarah-Jane Lock (ECMWF)	📍	🕒 55m
11:40 → 11:45	Comfort break	📍	🕒 5m
11:45 → 12:45	Ensemble verification (1) Speaker: Martin Leutbecher (ECMWF)	📍	🕒 1h
12:45 → 13:45	Lunch break	📍	🕒 1h
13:45 → 14:40	Poster session Speaker: Magdalena Alonso Balmaseda (ECMWF)	📍	🕒 55m
14:40 → 14:45	Comfort break	📍	🕒 5m
14:45 → 15:40	Diagnostics (2) Speaker: Mark Rodwell (ECMWF)	📍	🕒 55m
15:40 → 16:00	Coffee break	📍	🕒 20m
16:00 → 17:00	Overview of forecast systems in extended and long range Speakers: Frederic Vitart (ECMWF), Tim Stockdale (ECMWF)	📍	🕒 1h

18:00 dinner (non-hosted) at Shinfield Arms

Thursday, 30 November

09:15 → 10:15	Ensemble verification (2) Speaker: Martin Leutbecher (ECMWF)	📍	🕒 1h
10:15 → 10:45	Coffee break	📍	🕒 30m
10:45 → 11:40	Weather regimes and teleconnections Speaker: Linus Magnusson (ECMWF)	📍	🕒 55m
11:40 → 11:45	Comfort break	📍	🕒 5m
11:45 → 12:45	Post-processing and calibration Reforecasts - reliability diagrams Speaker: Tim Stockdale (ECMWF)	📍	🕒 1h
12:45 → 13:45	Lunch break	📍	🕒 1h
13:45 → 14:40	Practical session using SciLab (TBC) Speakers: Antje Weisheimer (ECMWF), Martin Leutbecher (ECMWF), Sarah-Jane Lock (ECMWF), Zied Ben Bouallegue (ECMWF)	📍 Gather	🕒 55m
14:40 → 14:45	Comfort break	📍	🕒 5m
14:45 → 15:40	Practical session continued Speakers: Antje Weisheimer (ECMWF), Martin Leutbecher (ECMWF), Sarah-Jane Lock (ECMWF), Zied Ben Bouallegue (ECMWF)	📍 Gather	🕒 55m
15:40 → 16:00	Coffee break	📍	🕒 20m
16:00 → 17:00	Practical session continued Speakers: Antje Weisheimer, Sarah-Jane Lock (ECMWF), Zied Ben Bouallegue (ECMWF)	📍	🕒 1h

Friday, 1 December

09:15 → 10:15	Assessing the skill of long-range forecast & the predictability paradox Speaker: Antje Weisheimer	📍	🕒 1h
10:15 → 10:45	Coffee break	📍	🕒 30m
10:45 → 11:40	Post-processing with ML Speaker: Mariana Clare (ECMWF)	📍	🕒 55m
11:40 → 11:45	Comfort break	📍	🕒 5m
11:45 → 12:45	Question and Answer Session		🕒 1h