Text on ECMWF for the public web derived from the video voice over and interview texts:

In the late 1960s, a number of European scientists had the vision that forecasting the weather up to 10 days ahead would be possible. Such medium-range weather forecasts would be of enormous benefit for the protection, safety and economic development of society.

As a result, European governments agreed to combine their individual resources and establish an international organisation with the goal of developing, improving and operationally producing medium-range weather forecasts.

The European Centre for Medium-Range Weather Forecasts, ECMWF, was born.

ECMWF was established by a Convention which came into force on 1 November 1975. The governing body is the Council, which normally meets twice per year and where all Member States are represented.

ECMWF's objectives are to operationally forecast the weather up to 15 days ahead as well as to continuously improve the forecasting models through research and development activities.

Today, more than 30 States support ECMWF.

Three major components are needed for the numerical weather prediction process:

- First, a set of observations describing the current atmospheric conditions. These observations are collected, for example, directly from weather stations and weather balloons, as well as remotely from satellites.

- Second, a mathematical model, which divides the atmosphere into a grid of small boxes and calculates how the temperature, pressure, humidity and wind change over time.

- Finally, a powerful supercomputer to run the numerical weather prediction system, and to perform the calculations on each grid point of the model.

ECMWF's numerical model system is acknowledged for producing the best numerical weather predictions worldwide.

Around 100 scientists in the Research Department constantly work on improving the model system.

The art of numerical weather modelling is to find the best way of representing the highly complex processes in our Earth system in a simplified and computationally efficient way. The more computer power you have, the better the atmosphere can be represented.

ECMWF has also developed a sophisticated method of incorporating all available meteorological observations into its model system.

Every day ECMWF receives a total of about 300 million observations. The largest and most important part of this data comes from polar-orbiting and geo-stationary satellites. Observations are also collected from meteorological stations on land and at sea, as well as measurements from aircraft, buoys, radiosondes, and radar systems.

This vast amount of data is used to determine the state of the atmosphere as accurately as possible in each grid box of the numerical model, to give what is called an analysis. This is used as the initial condition for the numerical model and is the prerequisite for high quality forecasts. The preparation of these initial conditions is an intricate and demanding task.

Despite great advances in producing the best possible analysis, and scientists making better use of all the available observations, there will always be remaining uncertainties in the initial conditions and the model itself, for two main reasons:

- Insufficient knowledge of the initial state
- Necessary simplifications of the representation of nature in the numerical model system

These uncertainties inevitably lead to inaccuracies in the model predictions, especially for longer forecast ranges. This is where the method of ensemble forecasting comes in.

An ensemble forecast works by running not just one weather forecast every day, but a large number. In fact the Centre runs 51 forecasts every 12 hours. This allows weather forecasters to get some indication of whether they can be confident of the forecast or whether a forecast is uncertain.

ECMWF's numerical weather predictions are one of the most important sources of information for meteorologists in weather services. These meteorologists then produce weather forecasts tailored for different customers, such as emergency services, transport, the media, and the general public.

ECMWF is one of the few centres worldwide to produce forecasts on a time scale even further ahead than 15 days.

These monthly and seasonal predictions cannot be used to answer questions like "Will it rain in Paris on the last day of next month?", but they can indicate how likely it is that next month or season will be warmer or wetter than it usually is. Such information can be of vital importance in the area of health protection, for example malaria early warning systems in Africa.

ECMWF's model system also features ocean wave forecasting. These predictions can be used to determine an optimal ship route to complete a trip in the shortest time, with a maximum saving of fuel, while avoiding strong head winds and heavy seas.

Time is of the essence in weather forecasting.

It is crucially important that all ECMWF forecast products arrive on time at the place where they are to be used. The highest priority is given to a fast and reliable dissemination of products.

The output of all ECMWF's operational models is stored in its huge archive, which, over the years, has grown to be the most comprehensive for meteorological data worldwide. It now contains more than 10 petabytes of data from observations, analyses, operational forecasts and research experiments.

The archive is used by ECMWF's researchers as well as by the wider meteorological research community. It is used for meteorological and environmental studies, but also for educational and commercial purposes.

Satellite data provided, for instance, by EUMETSAT, the European Organisation for the Exploitation of Meteorological Satellites, is a major component for improving the model systems. With the vast increase in satellite measurements, ECMWF has been able to incorporate information on global temperature and humidity levels in areas where few on-site measurements are being taken. ECMWF and EUMETSAT have been co-operating for many years, with both organisations benefiting from the sharing of data and expertise. ECMWF delivers feedback to EUMETSAT on the accuracy and usefulness of the EUMETSAT satellite data.

Education and training is very important. Sophisticated models and techniques require targeted information, and ECMWF offers a broad range of educational activities and training courses. Topics range from numerical weather prediction to making the best use of ECMWF's products. The Centre also fosters scientific exchange with the wider research community. Many ideas for improving the model systems have been conceived during scientific workshops organised by ECMWF.

ECMWF has proven to be a unique and successful European organisation. Over the years, it has provided both its Member and Co-operating States with numerical weather forecasts of the highest quality. Those who benefit most are the European citizens since they have access to the best forecasting system worldwide.