Weather news

By Stephen Davenport

DOI: 10.1002/wea.345

Short contributions to this page are welcome. Please send items to weather@wiley.com or as shown on Contents page.

Drought in Cyprus

Despite periods of heavy rainfall during September and the first two weeks of October, Cyprus is suffering one of its driest years on record, according to the National Water Department. Unfortunately, the downpours and hailstorms during this six-week period were showery and transient, and did little to replenish the reservoirs, instead serving only to damage some crops, particularly fruit, that had not yet withered from the drought.

By the middle of October, reservoirs were standing at a mere 3% of capacity, starkly illustrated by the photograph (Figure 2) of a reservoir near Paphos during August this year. Figure 1 shows the same reservoir in August 2007. This has prompted the European Union to look more closely at implementing a grant of about €57 million to the island, €53 million of which would go towards immediate purchase and transportation of water.

Rainfall across Cyprus has been 50% below average this year. Scant rainfall during the relatively wet months, climatologically, of February and March has badly affected crop production, particularly viticulture. The harvest was small in 2007, and vintners are predicting another reduction this year, of 15 to 25%.

The Levant as a whole is lacking rain. Syria is in thrall to its worst drought in 40 years, and crop yields are so poor that the Government has had to import wheat for the first time in 15 years.

Towards a less turbulent journey

The sudden mid-air jolting and plummeting caused by clear-air turbulence (CAT) results in dozens of injuries to passengers and millions of pounds worth of damage to aircraft every year, yet is notoriously difficult to forecast. That could change, however, thanks to new research by Dr Paul Williams from the Walker Institute at the University of Reading.

In collaboration with John Knox (University of Georgia) and Don McCann (a retired National Oceanic and Atmospheric Administration (NOAA) meteorologist), Dr Williams has developed an entirely new technique that predicts energy associated with gravity waves, based on a mathematical model of the physical processes involved in waves generated around jet streams.

'Our new method for predicting clear-air turbulence significantly outperforms the approach used currently, which dates back to the 1960s', says Dr Williams. 'I hope it can be used operationally as soon as possible.'

Application of the Lighthill-Ford Theory of Spontaneous Imbalance to Clear-Air Turbulence Forecasting:http://ams.allenpress.com/perlserv/?request=get-abstract&doi=10.1175%2F2008JAS2477.1

Figure 1. Reservoir near Pahpos, Cyprus, August 2007. (© George Anderson.)

Figure 2. The same reservoir in 2008. (© George Anderson.)

Cloud radar

Another tool that is likely to prove beneficial to pilots, and to the forecasters who inform them, is one developed over ten years by the Science and Technology Facilities Council.

Their cloud radar is a portable system that can analyse layers of cloud up to 8 km overhead, slice by vertical slice, measuring cloud base, thickness, density and internal structure. It emits a frequency-modulated signal that is returned by back-scattering from water droplets and ice crystals.

The equipment has been purchased by the University of Marburg in Germany, and by the UK Met Office, which is conducting trials around the UK.

http://www.scitech.ac.uk/

A stormier Arctic

Research by NASA, published in the journal *Geophysical Research Letters*, has shown that the Arctic has become a stormier place since 1950. This has, in turn, increased the pace of movement of sea-ice along the Transpolar Drift Stream from Siberia to the Atlantic Ocean.

The observations seem to confirm decades-old predictions that warming oceans would make Arctic storms both stronger and more frequent. 'Gradually warming waters have driven storm tracks northward', says Sirpa Hakkinen of NASA's Goddard Space Flight Center.

Maximum summer sea-ice speeds have increased from about 20 cm s^{-1} to more than 60 cm s^{-1}; in the winter, speeds are up to about 50 cm s^{-1} from 15 cm s^{-1} in 1950.

This has provoked greater mixing in the top layers of the ocean, and consequent increase in ocean convection. Although predictions are uncertain, it is perhaps ironic that this could help to increase the capability of the ocean to absorb atmospheric carbon dioxide.

http://www.agu.org/journals/gl/

Rain and snow on Mars

Evidence of past rainfall on Mars continues to mount after soil experiments conducted by NASA's Phoenix Mars Lander in the Martian Arctic suggested the presence of calcium carbonates and clay, minerals that on Earth mostly require a source of water.

The last rain is estimated to have fallen more than 3.5 billion years ago; but the Lander has also spotted 'snow' falling from Martian clouds. During September its LiDAR (Light Detection and Ranging) instrument detected fall-streaks of ice crystals at an altitude of about 4000 metres, although these were vaporizing long before reaching the surface.

http://phoenix.lpl.arizona.edu/