



## **Monash Weather and Climate seminar series**

**Next seminar: Friday 18th September**

### **Aircraft encounters of turbulence over Greenland**

Todd Lane

(School of Earth Sciences, The University of Melbourne)

Turbulence is a hazard to aviation, being responsible for numerous serious incidents in the commercial and general aviation sectors in recent years. Turbulence can be caused by jet streams, deep moist convection, and a variety of terrain-induced flows. The dynamics underlying each of these turbulence sources are the subject of active research with the goal of improving turbulence forecasting and avoidance strategies. This study examines the dynamics and statistics of turbulence encounters above the complex terrain of Greenland, which underlies the normal commercial flight routes between North America and Europe and is a region of frequent turbulence occurrence.

Historical records of aviation turbulence encounters above Greenland are examined for the period from 2000 to 2006. These data identify an important flow regime that contributes to the occurrence of aircraft turbulence encounters, associated with the passage of surface cyclones that direct easterly or southeasterly flow over Greenland's imposing terrain. The result of this incident flow is the generation of mountain waves that may become unstable through interactions with the background directional wind shear. It is shown that this regime accounted for approximately 40% of the significant turbulent events identified in the 7-yr database. In addition, two specific cases from the database are examined in more detail using a high-resolution mesoscale model. The model simulations demonstrate the utility of high-resolution forecasts in the prediction of such events.

**Seminars held in Room 345, Building 28, Fridays 1-2pm**

**All Welcome!**

For more information, contact Laura Davies  
(room 215, 9902 0110)