FOG Newsletter

February 2001 / Issue 6

A newsletter for those working on fog and dew related projects

Preparations for the 2001 Fog Conference are in high gear. Approximately 165 papers have been accepted for oral and poster presentation. This is a 32% growth in numbers from the 1998 Vancouver Conference. The authors were notified of the acceptance of their papers in early January and the four-page extended abstracts are due by 1 March. The papers will be published in the Proceedings, a copy of which will be given out to each delegate at the conference. If you will not be attending and would like to purchase a copy, please contact the conference office to place an order or use the order form on the web site. In January we also mailed out a registration package to each person who has completed a pre-registration form. Again, if you did not receive a package and would like one, please contact the conference office. We very much look forward to meeting you in St. John's.

We are pleased to welcome as an Exhibitor the **Central Aerological Observatory (CAO)** of Russia. The CAO is one of the largest atmospheric research institutes in Russia with a staff of about 700 scientists and engineers. The facility is very active in the development of instrumentation and also in techniques for fog dispersal. CAO carries out research in; aerology; remote sensing from the ground, aircraft, spacecraft and high altitude balloons; microwave radiometers; radar meteorology; stratospheric studies; and cloud physics. albert@orm.mipt.ru

Together with this issue of the Fog Newsletter is a card for you to complete and return. After six issues of the Newsletter we need to review the mailing list. It is important for you to return the enclosed card if you wish to continue receiving the Newsletter. It is also important for you to make any necessary corrections to your address.

FOG WATER COLLECTION PROJECTS IN SOUTH AFRICA

Submitted by
Jana Olivier

Two fog water collection systems have been implemented in South Africa with funding obtained from the (South African) Water Research Commission and SANPAD (South African-Netherlands Research Programme on Alternatives in Development). Both projects are located in areas which experience acute shortages of water but which are prone to frequent fog episodes.

Experiments conducted during a pilot project (1995 - 1998) indicated that the fog prone parts of the West Coast and mountainous regions of the country have a relatively high potential for fog water yield. Detailed studies were conducted in these areas to identify sites suitable for the implementation of a fog water collection system. The Tshanowa junior primary (JP) school was selected as the high elevation test site. The school is located on the crest of one of the easternmost promontories of the Soutpansberg (Northern Province) at an elevation of 1004 m above MSL. The school population comprises 128 children and four staff members. On the West Coast, a small missionary station called Lepelfontein was found to be most suitable for fog water collection. The village is located about 400 km from Cape Town, 35 km to the west of Bitterfontein and 5 km from the sea. The settlement with its 200 inhabitants is located at the base of a 100m high hill. Although ground water is abundant, it has such high concentrations of sodium bicarbonate and magnesium sulphate that it is considered to constitute a health risk. Most of the construction work was done by Prof van Heerden and a team of local inhabitants, with some assistance from prof van Rensburg and Dr Hannes Rautenbach. Both fog water collection systems have essentially the same design, which was based on that used at El Tofo, Chile, but modified for local conditions.

The first results from the Soutpansberg were extremely gratifying. The construction of the fog collector was completed on March 5 1999. Both rain and fog occurred immediately and four days later water was available for the tribal chief and the school children. By the end of March 1999, the tank was brimful and

Professor Jana Olivier of the University of South Africa in Pretoria. Professor Olivier is on the Scientific Committee of the Fog Conference.

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Copies of the Newsletter are available to individuals or groups working in fog studies (physics, chemistry, meteorology, instrumentation, forecasting, hazards, satellite observations, etc.), studies of fog deposition to tropical and temperate forests, studies of dew, and applications of fog collection for use in both developing countries and in commercial concerns. A voluntary contribution of $10 US per subscription would be appreciated to cover printing and mailing costs. The Newsletter will appear three times a year.

Johann van Heerden and two workers installing the fog collectors at Lepelfontein, South Africa.

overflowing. According to records kept by the teachers and pupils, it took only 10 fog days for half of the screen to fill the tank. Since March 9 1999, fog water has been consumed on a daily basis by school children and members of the local communities. Lepelfontein yields were recorded on the data logger for the period September 1999 to March 2000 and flow meter readings for June to September 2000. The average yield during September 99 to March 2000 was 1.13 l/m^2/day or 6.73 l/m^2/wet day.

Jana Olivier, Mr. Netshifhefhe and Professor Mashego at the fog collectors at Soutpansberg, South Africa.

The above results indicate that fog water collection could be used successfully to supplement water supplies in the fog prone areas of the West Coast and mountainous regions of the country. Since the Soutpansberg site is located at only 1004 m above MSL, it can be expected that higher-lying areas would produce higher water yields. Indeed, up to four times the volumes recorded at the school could be collected from many parts of the Drakensberg and Cape mountains.

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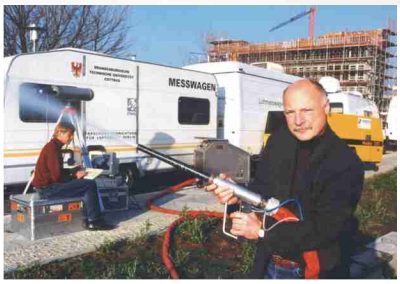
MEETING INFORMATION: FOG DISPERSAL

Submitted by
Detlev Möller

The 20th Session of the Executive Council Panel of Experts/CAS Working Group on Physics of Clouds and Weather Modification Research was held in Geneva, 20-24 November 2000. Detlev Möller, who is a member of the Panel in liaison with the Experts Group on Atmospheric Chemistry, attended this important meeting. Together with many issues on rain making, hail prevention, and general aspects of cloud seeding, fog dispersal was an important subject. The Panel did make the following statements in the final document:

Different techniques are being used to disperse warm (i.e. at temperatures greater than 0°C) and cold fogs. The relative occurrence of warm and cold fogs is geographically and seasonally dependent.



Detlev Möller with the dry ice, fog dispersal gun. Wolfgang Wieprecht is in the background.

The thermal technique, which employs intense heat sources (such as jet engines) to warm the air directly and evaporate the fog has been shown to be effective for short periods for dispersal of some types of warm fogs. These systems are expensive to install and to use. *Another technique* that has been used is to promote entrainment of dry air into the fog by the use of hovering helicopters or ground based engines. These techniques are also expensive for routine use.

To clear warm fogs, seeding with hygroscopic materials has also been attempted. An increase in visibility is sometimes observed in such experiments, but the manner and location of the seeding and the size distribution of seeding material are critical and difficult to specify. In practice the technique is seldom as effective as models suggest. The corrosive and/or toxic properties of some hygroscopic agents may pose problems. *Cold (supercooled) fog* can be dissipated by growth and sedimentation of ice crystals. This may be induced with high reliability by seeding the fog with artificial ice nuclei from ground-based or airborne systems. This technique is in operational use at several airports at highways where there is a relatively high incidence of supercooled fog. Suitable techniques are dependent upon wind, temperature and other factors. Dry ice has commonly been used in airborne systems. Other systems employ rapid expansion of compressed gas to cool the air enough to form ice crystals. For example, at a few airports and highway locations, liquid nitrogen or carbon dioxide is being used in ground-based systems. A new technique, which has been demonstrated in limited trials, makes use of dry ice blasting to create ice crystals and promote rapid mixing within the fog. Because the effects of this type of seeding are easily measured and results highly predictable, randomized statistical verification generally has been considered unnecessary.

Jürgen Hofmeister with the dry ice, fog dispersal gun during a fog event. Wolfgang Wieprecht is on the right.

The Panel explicitly mentioned the *new technique* based on dry ice blasting, proposed by Detlev Möller in co-operation with people from the Technical University Berlin. At the 2nd Fog Conference the new, very effective, method will be presented. Experiments have shown that fog will be removed within 3 minutes after blasting around 1.5 kg of dry ice pellets in a circle of 100 m. The invention will be commercialized by a company in Germany. For further information contact: Detlev Möller at *moe@byu-lc.fta-berlin.de*

DEW STUDIES AT NIZZANA, ISRAEL

Submitted by
Simon Berkowicz and Adrie Jacobs

An intensive dew measurement field campaign was carried out in Fall 2000 by Adrie Jacobs, Bert Heusinkveld (Wageningen University) and Simon Berkowicz (Hebrew University of Jerusalem) in the linear sand dunes near Nizzana, NW Negev Desert, Israel (30°56'N 34°23'E, 190 m elevation). The aim of the work was to carry out measurements on dew formation and evaporation over a short transect that included a north-facing sand dune slope. These slopes are covered, in part, by thin biological crusts that can stabilize the dune. Dew is an important and regular source of moisture for such crusts. In addition to relying on traditional measurement methods, newly developed

Part of the meteorological setup for dew measurements along a linear sand dune slope, Nizzana, Israel (34° 23' E; 30° 56' N; 190 m elevation).

non-destructive optical sensors were tested and calibrated. Sensitive thermal imagery cameras were also used to measure surface temperatures. Preliminary results show that dewfall started 1 hour before sunset and only completely evaporated from the soil surface at about 13:00, despite the high temperatures. This suggests that, in winter, dewfall in these dunes may remain throughout the day. For information contact Simon Berkowicz at *berkowi@vms.ac.il*

NEW PUBLICATIONS

Aboal, J.R., M.S. Jimenez, D. Morales and P. Gil: Effects of thinning on throughfall in Canary Islands pine forest - the role of fog. J. Hydrology (2000) 238, Iss. 3-4, 218-230.

Fenn, M.E., M.A. Poth, S.L. Schilling and D.B. Grainger: Throughfall and fog deposition of nitrogen and sulfur at an N-limited and N-saturated site in the San Bernardino Mountains, Southern California. Canadian J. of Forest Research (2000) 30, Iss. 9, 1476-1488.

Hachfeld, B. and N. Jurgens: Climate patterns and their impact on the vegetation in a fog driven desert: The Central Namib Desert in Namibia. Phytocoenologia (2000) 30, Iss. 3-4, 567-589.

Kidron, G.J.: Analysis of dew precipitation in three habitats within a small arid drainage basin, Negev Highlands, Israel. Atmospheric Research (2000) 55, 257-270.

Luo, W. and J. Goudriaan: Dew formation on rice under varying durations of nocturnal radiative loss. Agricultural and Forest Meteorology (2000) 104, 303-313.

Plessow, K., K. Acker, H. Heinrichs and D. Moller: Time study of trace elements and major ions during two cloud events at the Mt. Brocken. Atmospheric Environment (2000) 35, Iss. 2, 367-378.

Rush, K., M.K.R. van Huyssteen and J. Olivier: Patterns of domestic water inadequacy on the South African West Coast. Water SA (2000) 26, Iss. 4, 537-554.

Streicher, J., I. Leike and C. Werner: Visibility measurements and fog warning with lidar. Gefahrstoffe Reinhaltung der Luft (2000) 60, Iss. 7-8, 289-294.

Wahlgren, R.V.: Atmospheric water vapour processor designs for potable water production: a review. Water Research (2001) 35, Iss. 1, 1-22.

Zhao, Z.W. and Z.S. Wu: Millimeter-wave attenuation due to fog and clouds. Intl. J. of Infrared and Millimeter Waves (2000) 21, Iss. 10, 1607-1615.

FOG COLLECTION PROJECTS

The conference this summer will be an excellent place to talk to people about past, present and future fog collection projects. We anticipate that delegates will be present from **Chile**, **Ecuador**, **Peru**, **South Africa**, **Namibia**, the **Canary Islands**, **Cape Verde**, **Mexico**, **Nepal** and **Israel**. The conference is the place to find out what is happening in these and other countries. News has come that Mohammed Abul Kalam is involved in fog collection projects in northern **Bangladesh**. Joh Henschel has just installed a new more robust large fog collector in **Namibia** to test whether it will withstand the high winds during sand storms.

NEWS

A recent newspaper article highlighted one of the main worries of the organizers of the 2002 Winter Olympics in Salt Lake City, USA. It is fog. The Salt Lake Valley frequently experiences winter fog. Those of you who were at the Vancouver Conference will remember two students from Namibia, **Martin Coetzee** and **Karl-Heinz Mulder**. They won an award for the most original research for young researchers at EXPO 2000 in Hannover. **Jana Olivier** is now with the University of South Africa in Pretoria. **Daniel Beysens** will report on the "dew condenser" field trials in Corsica at the Fog Conference. **Henry Jiménez** from Colombia is presently a UNEP visiting scholar at Brown University in Rhode Island.

3rd FOG CONFERENCE 2004

It is anticipated that following the St. John's conference this year that there will be a third conference in 2004. Individuals or groups wishing to organize the 2004 conference should contact the Scientific Committee and also plan to make a brief presentation at the Plenary Session of the St. John's conference this July.

VISAS FOR CANADA

It is the responsibility of each delegate to determine if he or she requires a visa to enter Canada. The nearest Canadian Embassy or your travel agent should be able to help you with this information. We are pleased to announce that as a result of discussions with the Department of Foreign Affairs that we have arranged that the processing fee for visas will be waived for delegates attending the Second Fog Conference. Please be sure to reference the conference when applying for your visitor's visa. Note that this waiver will only apply to delegates to the conference. It does not apply to other family members or to journalists attending the conference.

FOG CONFERENCE ADDRESSES

The Second Fog Conference web site address is: ***http://www.msc-smc.ec.gc.ca/armp/fog/icffc2.html***

mailing address:

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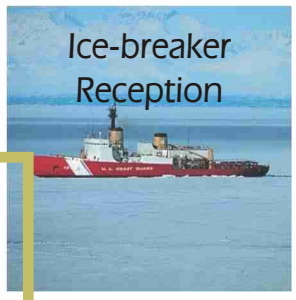

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Extended Abstracts Due 1 March 2001

Registration Fees Rise After 1 April 2001

Second
INTERNATIONAL CONFERENCE ON FOG AND FOG COLLECTION

15 - 20 July 2001
St. John's, Newfoundland, Canada

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