

FOG Newsletter

October 1999 / Issue 2

A newsletter for those working on fog and dew related projects

The well known Canadian author Farley Mowat writes in his book *The Farfarers* (Key Porter Books 1998, Toronto):

"This was fine so long as her people could see where they were going. However, for much of the time the ship was entombed in fog so thick her masthead and even her steeply up-tilted bowsprit could not be seen from deck level. The Foggy Strait, as mariners called it, was, and remains, one of the world's great fog machines." (Used by permission.)

Farley Mowat was writing about Hudson Strait (north of Labrador) and the exploration of the Canadian Arctic. Sailing vessels may not be normal methods of transportation today but fog still presents serious obstacles to safe travel. On 13 August 1999 a Regionair aircraft crashed at Sept-Iles, Quebec while trying to land at night in fog. On 3 September 1999, one of the worst traffic accidents in Canadian history resulted from dense fog on Highway 401 east of Windsor, Ontario. The accident involved 62 vehicles and took eight lives. The fog appeared about 0800 after a clear early morning and no warnings were issued for this section of Canada's busiest highway.

In reporting on the 3 September accident, the survivors used terms such as "It was like a sheet came down" or "a freak occurrence." The media talked about "industrial fog" or "instant fog" that "quickly moved" east from the city of Windsor. What is clear is that there was a localized thin layer of dense fog that formed rapidly and covered a stretch of highway. There are great challenges in

forecasting such events and in issuing timely warnings. Later reports (Toronto Sun, 7 September 1999, p. 10) brought up the analogy to a terrible accident on the U.S. Interstate I-75 in Tennessee in 1990 that killed 12 people. Victims of this accident received an \$11 million settlement from a pulp-and-paper mill that was emitting two million tons of water vapor per day near I-75. It was argued that pollution can turn "mild fog" into "super fog" or "zero visibility fog." The State of Tennessee subsequently "built a \$4.4 million fog and speed detection system that automatically shuts down I-75 in dense fog." Does anyone have details of



The Roundtop Mountain site at Sutton, Quebec, Canada operated by Environment Canada.

this system? I recall that last year not long before the Vancouver Fog Conference there were two very serious highway accidents in Italy that were due at least in part to fog. We can review fog warning systems in a future issue of the *Fog Newsletter*. I would be pleased to have a contribution from someone on this.

Perhaps nowhere is fog such a problem for transportation as off the coast of Newfoundland. Extensive petrochemical exploration and production are taking place in the ocean and fog seriously hampers movements of both aircraft and ships. For this reason, we are presently discussing having at the St. John's Conference one or more sessions devoted to the impact of fog on offshore operations. If your work or interests are related to fog and industry, in any of the oceans of the world, please contact me or any member of the Working Groups or Scientific Committee.



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Contributions of short articles, news items and photographs for upcoming issues of the Newsletter are welcome. They should be sent to:

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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.

THE ROUNDTOP MOUNTAIN SITE

Submitted by
Mohammed Wasey

The site was established at Sutton, Quebec, Canada in 1985 by Robert Schemenauer and Peter Schuepp to provide continuous fog chemistry measurements. These continued to 1990 after which the ridge site at 845 m was used primarily for ozone and meteorological measurements. Lately the site has been equipped with instruments to study background and episodic occurrences of ozone, nitrogen oxide and PAN. For the period June to September 1999, continuous PMS FSSP measurements of fog droplet sizes and concentrations are being made to look at fog-gas interactions and correlations. The project leader for the site is Dr. Kurt Anlauf. Other Environment Canada staff involved in the current projects are: Dr. Jan Bottenheim, Dr. Richard Leaitch, Dave MacTavish, Katherine Hayden and Mohammed Wasey.



The shrine of Padre Hurtado, 270 km north of Santiago, Chile. The fog collectors are on the hill above the shrine.

agreement to form a joint Israeli-European consortium to study the role of dew and soil moisture on the formation, growth, and regeneration of biological crusts in the AERC's Nizzana sand dune experimental station situated in the NW Negev desert, Israel.

At the Workshop, Dr. Beysens formed a non-profit organization called "OPUR" ("pure water"). The focus of OPUR will be on dew and its potential use and application in environmental and ecological issues. A Board of Trustees was

appointed with Dr. Beysens as President. An annual registration fee of 300 FF/year is required for membership. People who are interested can contact OPUR at the following address:

OPUR
1, Bvd de Jomardière
38120 Grenoble (France)
email: dbeysens@cea.fr;
milimouk@spectro.ujf-grenoble.fr



New prototype of a large fog collector erected in downtown Santiago.

robert.schemenauer@ec.gc.ca or to the mailing address on this Newsletter. The site name, country, latitude and longitude, elevation, types of measurements, and contact person with email address should be given. It is anticipated that most of the sites will be in urban areas, valley bottoms, or along coastlines. We would also like to prepare a list of all sites where dew measurements are being made. Information as noted above should be sent directly to Simon Berkowicz at berkowi@vms.huji.ac.il.

NEW PUBLICATIONS

Bower, K.N., T.W. Choularton, M.W. Gallagher and 29 others.: The Great Dun Fell Experiment 1995: an overview. *Atmospheric Research* (1999) **50**, Iss. 3-4, 151-184.

Bradbury, C., K.N. Bower, T.W. Choularton and 8 others.: Modelling of aerosol modification resulting from passage through a hill cap cloud. *Atmospheric Research* (1999), **50**, Iss. 3-4, 185-204.

Cape, J.N., G.G. McFadyen, R.L. Storeton West, and 6 others: Field observations of S-IV in cloud. *Atmospheric Research* (1999) **50**, Iss. 3-4, 345-358.

Collett Jr., J.L., K.J. Hoag, D.E. Sherman, A. Bator and L.W. Richards: Spatial and temporal variations in San Joaquin Valley fog chemistry. *Atmospheric Environment* (1999) **33**, 129-140.

Ganor, E.: A method for identifying sulfuric acid in single cloud and fog droplets. *Atmospheric Environment* (1999) **33**, Iss. 26, 4235 - 4242.

Nomoto, S: A preliminary study on recent changes in the number of foggy days in Thailand. *Sci. Rep. Fac. Educ. Gifu Univ., Nat. Sci.* (1999), **23**, Iss. 2, 1-13.

DEW

Submitted by
Simon Berkowicz

A one-day dew Workshop (Dew Days #1) was held at the Commissariat à l'Énergie Atomique (CEA), Grenoble, on June 11, 1999. The workshop was organized by Dr. Daniel Beysens, Director of the Dept. de Recherche sur la Matière Condensée (CEA), Grenoble and Simon Berkowicz of the Hebrew University of Jerusalem Arid Ecosystems Research Center (AERC). The primary purpose of the workshop was to bring together a select group of individuals working on dew and soil moisture measurement research. One outcome of the Workshop was an

In order to prepare a list of all sites where low elevation fog measurements have been made in 1999, it would be appreciated if you would send the information to

NEW LISTS

Ogawa, N., R. Kikuchi, T. Okamura, T. Adzuhata, M. Kajikawa, and T. Ozeki: Cloud droplet size dependence of the concentrations of various ions in cloud water at a mountain ridge in northern Japan. *Atmospheric Research* (1999), 51, Iss. 1, 77-80.

Saxena, V.K. and S. Menon: Sulfate-induced cooling in the southeastern U.S.: An observational assessment. *Geophysical Research Letters* (1999), 26, No. 16, 2489-2492.

Takenaka, N., T. Suzue, K. Ohira, T. Morikawa, H. Bandow and Y. Maeda: Natural Denitrification in Drying Process of Dew. *Environmental Science & Technology* (1999) 33, 1444-1447.

Teixeira, J.: Simulation of fog with the ECMWF prognostic cloud scheme. *Quarterly Journal of the Royal Meteorological Society* (1999) 125, Iss. 554, Part B, 529-552.

Weathers, K.C: The importance of cloud and fog in the maintenance of ecosystems. *Trends in Ecology & Evolution* (1999) 14, No. 6, 214-215.

Xu, G., D.E. Sherman, E. Andrews, K. Moore, D. Straub, K. Hoag and J.L. Collett Jr.: The influence of chemical heterogeneity among cloud drop populations on processing of chemical species in winter clouds. *Atmospheric Research* (1999) 51, 119-140.

Yuskiewicz, B.A., F. Stratmann, W. Birmili and 4 others.: The effects of in-cloud mass production on atmospheric light scatter. *Atmospheric Research* (1999) 50, Iss. 3-4, 265-288.

FOG COLLECTION PROJECTS

In September, Keith MacQuarrie, working with the Canadian NGO CECI, constructed the first 48 m² fog collector in Nepal. It was erected near Ilam in the eastern part of the country. The collector produced more



Constructing the fog collectors on Talinay Mountain, Chile.

than 1000 L of water in the first 12 hours after installation. This high collection rate is not sustainable but shows the potential of the resource. This is the first of an array of collectors that will be used for village water supplies. The project to provide water to the shrine of Padre Hurtado in Chile is complete. The site is 270 km north of Santiago. Ten 48 m² fog collectors are in place on Talinay Mountain and a pipeline and reservoir have been constructed. The projected yield from the system is about 2000 L per day. This is sufficient for the priest, caretaker, gardens, tree plantation and visitors. A proposal to expand the site to provide water to the local community of Canela has been prepared. Antonio Advino Sabino has written to say that there are now three fog collection projects in the Cape Verde Islands. They are at Serra Malagueta and Pedra Comprida on Santiago Island and Pero Dias on Santo Antão Island.

NEWS

Howard Bridgman, Chair of the Scientific Committee for the 1st International Conference on Fog and Fog Collection, is visiting the University of East Anglia in Norwich, UK for seven months on sabbatical leave. He has joined a team researching the climatology and chemistry of fog events in the Krusne Hory area of NW Czech Republic. Significant sources of pollution from coal-fired power stations, open pit mining, and urban/residential activities contribute to very low pHs and very high sulfates and nitrates in the fog along the Krusne Hory ridge and mountains. In the past, this has

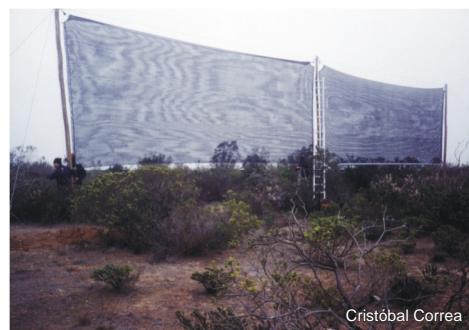
created major damage to coniferous forests and the pollution emissions have also created important health problems within the local population. Waldo Canto and Alejandro Cruzat of the National Forestry Corporation (Region IV) in Chile have initiated a project to save the fog forest at Fray Jorge on the north-central coast of Chile. Fog collectors will be used to provide the irrigation water for the plants. Maurice Millet returned to

the CNRS group in Strasbourg in September of 1999 and will continue his fog related research. Roger Cox of the Canadian Forest Service has installed two fog collectors at two elevations on Mount Megantic, Quebec, in association with forest health monitoring plots, to look at the possible role of fog in Birch browning. Lothar Zimmermann is now with the Bayerische

Landesanstalt für Wald und Forstwirtschaft (LWF) in Germany and is working with hydrological and element budget modelling. Robert Schemenauer will be the touring speaker for the Canadian Meteorological and Oceanographic Society in 1999/2000. He will speak at thirteen CMOS Centres on fog and fog collection. Elena Bresci received her Ph.D. from the Università Degli Studi Di Firenze. Her thesis is entitled "Field Measurements and Wind Tunnel Trials on Fog Collectors."



Pablo Osses working on the fog collectors on Talinay Mountain.



Two of the ten large fog collectors on Talinay Mountain.

SECOND FOG CONFERENCE



Preparations for the Second International Conference on Fog and Fog Collection, 15-20 July 2001, are proceeding well. At a press conference in St.

John's, Newfoundland in late September, the Minister of Tourism was presented with a model fog collector. Media attention associated with the conference is considerable and will help heighten awareness of the conference in the province and the region.

One of our main tasks at the moment is securing funding from sponsors to ensure the success of the conference. We have every confidence that this will be achieved over the next year and one half. The sponsors are listed on the Second Fog Conference web site and will be listed in brochures being prepared to publicize the meeting.

Pre-Registration

It is important that those people who have an interest in attending the Second Fog Conference in St. John's provide us with all of their relevant contact information. The best way to do this is through the electronic form on the conference web site. You can also send by mail your name, title, complete address, telephone and fax numbers with all codes, your email address, and the session or topic you are most interested in. Please do not assume that because you have received this Newsletter that we have all the necessary information. You may also send changes to your contact information through the web site.

The Conference Hotel

The conference will take place in the Hotel Newfoundland in downtown St. John's. This comfortable modern hotel provides views from its rooms over the city and harbor. The shops and entertainment district of the city are

within walking distance as is Signal Hill Park. It is from this hill that the Italian scientist Guglielmo Marconi succeeded in receiving the first wireless signal across the Atlantic in December 1901. A special conference room rate of \$141 CAN (about \$95 US) has been guaranteed for July 2001. More details will be provided in the first conference brochure to be mailed later this year.

Scientific Committee

We are very pleased to announce the formation of the Scientific Committee for the Conference. There are fourteen members including the Chairman, Hans Puxbaum. A list of the members is included as an insert in this issue of the *Fog Newsletter*.

Working Groups

Two new Working Groups have been added to the original five announced in the first *Fog Newsletter*. They are:

6. Fog Deposition: Otto Klemm, BITÖK Klimatologie, University of Bayreuth, Germany
klemm@bitiek.uni-bayreuth.de

7. Fog Sampling Technology: Jeffrey Collett, Dept. of Atmospheric Science, Colorado State University, USA.
Collett@lamar.colostate.edu

We would like to thank Dr. Klemm and Dr. Collett for agreeing to lead these groups. You are encouraged to contact the Working Group Leaders and to participate in the discussions.

FOG CONFERENCE WEB SITE

The Second Fog Conference web site address is:
<http://www.tor.ec.gc.ca/armf/fog/icffc2.html>

1998 PROCEEDINGS

Presently, about 15 copies of the 1998 Conference Proceedings remain. If you or your institutional library

would like to purchase a copy, please contact the Conference at the address on this *Newsletter*. An order form is also available on the web site.

HOW TO RECEIVE THE NEWSLETTER

The Newsletter is available to anyone working in the areas noted above. Your name, title, and complete mailing address should be sent to us along with a brief statement about the area you are working in or interested in. There is no charge for the Newsletter. We realize that some people do not have the resources to pay for a publication nor the means to transfer funds; therefore, after considerable thought, we decided to make the Newsletter free and seek sponsors to assist with the costs.

We have also decided to ask for a voluntary contribution of \$10 US per year from those individuals who have the means and desire to support the Newsletter. Those in Canada or the US can send a cheque payable to the Fog Conference. People in other countries should not send cheques or bank transfers as the fees to cash them are too high. We can accept payment by MasterCard, if you provide us with your card number and the expiry date. Do not send credit card information by email. We will use these funds to help cover the costs and to increase the circulation. We would like to emphasize that any funds you contribute are on a voluntary basis and that your receipt of the Newsletter is not dependent on a contribution.

The production and mailing of this Newsletter is supported by the



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