FOG Newsletter

May 2000 / Issue 4

A newsletter for those working on fog and dew related projects

With this issue we begin the second year of publication of the *Fog Newsletter*. It has been a busy and productive year as we build the mailing list. This issue will have a printing of 1200 copies and a direct mailing of 1000 copies to individuals and institutions. Our sincere thanks to all those who have submitted articles or photos as well as those who have passed along comments. The support of two world-renowned Canadian development agencies, CIDA and IDRC, and the Department of the Environment in Canada, makes this publication possible.

Andrew Smith (L) and Richard Corbett (R) at the enhanced vision test facility located at Torbay, Newfoundland.

One challenge that remains from the first year is to build a base of individual contributions for the *Fog Newsletter*, which would provide for its future sustainability. Only about 1% of recipients contributed $10 US towards the annual costs last year. We will look at this again in the late summer and, if necessary, explore some alternative approaches to meeting the costs.

The Second International Conference on Fog and Fog Collection is moving strongly forward with 109 pre-registrants from 39 countries. Arrangements are in place at the Hotel Newfoundland in St. John's and the conference promises to be productive and enjoyable. Remember, short abstracts are due by 1 September 2000.

We are very pleased to welcome back as Exhibitors for the St. John's Fog Conference in 2001, two companies that also supported the 1998 Vancouver Fog Conference.

Usui Kogyo Kenkyusho, Inc. of Japan is a manufacturer of both active and passive fog collectors. These collectors provide fog samples for subsequent chemical analysis and are in wide-spread use in Japan. usuifog@mxu.mesh.ne.jp

KRONEIS Ges.m.b.H. is a manufacturer and distributer of meteorological sensors and of specialized scientific instrumentation such as an active Fog/Cloud Water Collector. office@kroneis.co.at

We would also like to welcome a new Exhibitor from the United States.

Droplet Measurement Technologies (DMT), Boulder, Colorado,serves the international atmospheric sciences community with particle size and concentration spectrometers for airborne and ground based applications. DMT also provides instrumentation for measurement of liquid water content, aerosols, fogs, clouds, and precipitation measurement, as well as data analysis for projects. ceo@dropletmeasurement.com

FOG VISIBILITY TEST SITE

Submitted by
Andrew Smith

Newfoundland is a beautiful, rugged province with diverse weather conditions, which are known to change in the blink of an eye. Dense fog, rain, snow, hail, and extremely high winds combine to form a truly harsh environment offshore on the Grand Banks. Along with the inclement weather conditions, the Grand Banks are well known for the vast hydrocarbon reserves situated deep beneath the ocean floor. In December 1997, the Hibernia platform, a gravity-based structure, began production of the oil reserves off Newfoundland's east coast. The extremely foggy conditions hinder the helicopter transport of workers to and from the platform, significantly increasing operating costs.

Editor:
Dr. Robert Schemenauer

Production Editor:
Sherry Bennett Kornblum

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

robert.schemenauer@ec.gc.ca

or by mail to:

Fog Newsletter
P.O.Box 81541
1057 Steeles Avenue West,
Toronto, Ontario,
Canada M2R 2X1

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.

Thomas Wrzesinsky (L) and Otto Klemm (R) have a new publication listed. Otto is the leader of the Working Group on Fog Deposition.

Transport Canada has stated that if the helicopter pilot cannot detect the offshore installation, via visual or enhanced visual techniques outside of half a nautical mile, he cannot begin his approach. During peak fog months of July and August, the visibility is less than half a nautical mile greater than 50% of the time. Unexpected weather delays pose a great logistical challenge to offshore oil and gas operators. This typically results in losses of $30,000 - $40,000 per missed approach as well as an increased risk to the workers safety.

C-CORE, an independent R&D company located on the campus of Memorial University of Newfoundland, is investigating several enhanced vision (EV) techniques aimed at helping the pilots 'see' through the fog. The current research is focused on the evaluation of polarization difference and thermal imaging techniques. It is hoped that these systems will improve the pilot's ability to detect active targets on the Hibernia structure, reducing the minimum approach distance. This will increase the rate of successful helicopter landings in marginal weather conditions and reduce the risk to offshore workers.

C-CORE has constructed an outdoor test facility that spans Torbay Bight, a small inlet 5 km from the city of St. John's. The test facility consists of a transmit and a receive enclosure separated by a distance of 1 km and elevated 60 m above sea-level. The site is frequented by dense fogs blown in from the cold Atlantic ocean. Visibility during fog events is estimated using an image processing algorithm developed by the author, while temperature and humidity are measured using an automated weather station. The test facility provides the necessary resources to characterize the different fog events and their impact on the EV system performance.

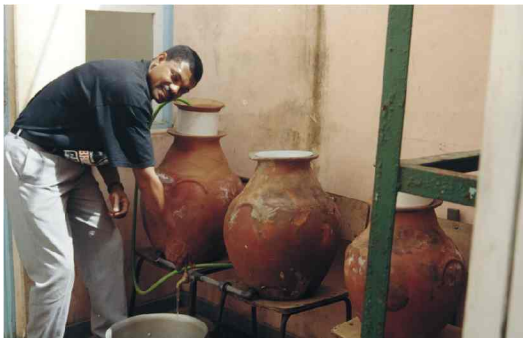
The research presented in this article is a result of the harsh environments initiative, a joint program between C-CORE and the European Space Agency, focusing on using space technologies to improve terrestrial applications. Interested readers can contact Andrew Smith at andrew@engr.mun.ca.

COMET® MODULES ON FOG FORECASTING

Submitted by
Douglas A. Wesley & Dwight Owens

The Cooperative Program on Operational Meteorology, Education and Training is in the midst of developing computer-based instructional components for forecasting fog. These modules are part of the Professional Development Series entitled: Forecasting Low-Altitude Clouds and Fog for Aviation Operations (see for details http://meted.ucar.edu/fogstrat/index.htm). Each draws upon the expertise of both research and operational scientists, with particular focus on operational applications.

One freely available Web-based module has been completed, entitled, "Radiation Fog." (accessible from http://meted.ucar.edu/fogstrat/ic31/ic311/index.htm). This instruction emphasizes the physical processes important during the various phases of radiation fog events: preconditions, formation, maintenance, and dissipation. The module includes extensive animations, conceptual models, and audio narrations. Each section contains several interactive questions, which reinforce learning of the concepts presented.



Carlos Monteiro by the sand filters for the fog water collection system on Santiago Island in the Cape Verde Islands.

Ongoing development is focusing on fog events that occur in various regions around the world, Overview of Sea and Coastal Fogs, and on those that frequent the west coasts of continents (West Coast Fogs). Cold upwelling, large-scale subsidence, and advection are important processes occurring before and during these events. We anticipate that the initial instruction on these topics will first emphasize physical processes, then present illustrations utilizing case study data.

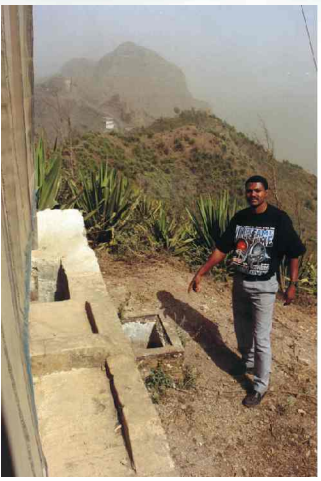
If you are interested in collaborative development of fog or stratus instructional case studies, please contact seafog@comet.ucar.edu.

FOG COLLECTION IN THE CAPE VERDE ISLANDS

Submitted by
Antonio Advino Sabino

Although, we can say that the situation concerning fog project activities is not well known in the country, as a matter of fact, some private individuals, especially some peasants living in mountain communities, are beginning to be aware of the importance of fog collection to supply water for domestic use, mainly in the highest elevation of the Santo Antão Island (1200 meters). Also, the official and international institutions are becoming interested in this kind of project. Recently, in February, a small project to supply water for an elementary school in Serra Malagueta (750 metres), Santiago Island, was carried out by Carlos Monteiro, meteorologist of the National Institute of Agrarian Research (INIDA). This very small project was funded by UNICEF. It is now supplying water for the children who attend the school. A photo of the collector is shown in the *Newsletter*. In Santo Antão four collectors were installed in the community of Corda, located at 1200 meters elevation, in order to supply water for animals.

Unfortunately, because of recent local elections, the municipal projects located in



The collection basins for the fog collector on Santiago Island in the Cape Verde Islands.

Serra Malagueta (Santiago island, 750 meters) and Pero Dias (Santo Antão island, 110 meters) were stopped. I am not sure of how aware the new mayors are of the importance of the fog collection projects. In any case, I will keep working in this field, although without any kind of official support. Recently I designed a project for a private individual to be implemented in Monte Verde (São Vicent Island, 600 meters), one of the sites with the best potential for fog water collection in the Cape Verde Islands. Previous collectors have used window screen as a collection material. In the future this will be replaced by the polypropylene Raschel mesh to provide better efficiency and drainage. Contact: António Advino Sabino procave@cvtelecom.cv

The large fog collector on Santiago Island in the Cape Verde Islands. Please see the article in this issue.

NEW PUBLICATIONS

Acker, K., W. Wieprecht, D. Moeller, R. Auel, D. Kalass, J. Zwozdziak, A. Zwozdziak and G. Kmiec: Results of cloud water and air chemistry measurements at three different sites in Europe. Izvestiya Akademii Nauk Seriya Biologicheskaya (1999) Iss. 6, 736-747.

Blando, J.D. and B.J. Turpin: Secondary organic formation in cloud and fog droplets: a literature evaluation of plausibility. Atmospheric Environment (2000) 34, Iss. 10, 1623-1632.

Borys, R.D., D.H. Lowenthal and D.L. Mitchell: The relationships among cloud microphysics, chemistry, and precipitation rate in cold mountain clouds. Atmospheric Environment (2000) 34, Iss. 16, 2593-2602.

Elbert, W., M.R. Hoffmann, M. Kramer, G. Schmitt and M.O. Andreae: Control of solute concentrations in cloud and fog water by liquid water content. Atmospheric Environment (2000) 34, Iss. 7, 1109-1122.

Facchini, M.C. , S. Fuzzi, S. Zappoli, A. Andracchio, A. Gelencser, plus six authors: Partitioning of the organic aerosol component between fog droplets and interstitial air. J. Geophysical Research - Atmospheres (1999) 104, Iss. D21, 26821-26832.

Kasper-Giebl, A., A. Koch, R. Hitzenberger and H. Puxbaum: Scavenging efficiency of "aerosol carbon" and sulfate in supercooled clouds at Mt. Sonnblick (3106 m.a.s.l., Austria). J. Atmos. Chem. (2000) 35, 33-46.

Kidron, G.J., A. Yair and A. Danin: Dew variability within a small arid drainage basin in the Negev Highlands. Q.J.R. Meteorol. Soc. (2000) 126, 63-80.

Kutasi, H., Z. Sarvari and Z. Krivacsy: Study of water-soluble macromolecules in atmospheric aerosol and fog by capillary electrophoresis. Magyar Kemiai Folyoirat (1999) 105, Iss. 10, 391-402.

Lovett, G.M., A.W. Thompson, J.B. Anderson and J.J. Bowser: Elevational patterns of sulfur deposition at a site in the Catskill Mountains, New York. Atmospheric Environment (1999) 33, 617-624.

Matveev, Y.L. and L.T. Matveev: The anthropogenic influence of the big town on the formation of fogs and mists. Doklady Akademii Nauk (2000) 370, Iss. 3, 387-389.

Nakanishi, M.: Large-eddy simulation of radiation fog. Boundary Layer Meteorology (2000) 94, Iss. 3, 461-493.

Ortiz, V., M.A. Rubio and E.A. Lissi: Hydrogen peroxide deposition and decomposition in rain and dew waters. Atmospheric Environment (2000) 34, Iss. 7, 1139-1146.

Pounds, J.A., M.P.L. Fogden and J.H. Campbell: Biological response to climate change on a tropical mountain. Nature (1999) 398, 611-615.

Schatzmann, M.: Wind tunnel modelling of fog droplet deposition on cylindrical obstacles. J. Wind Engineering and Industrial Aerodynamics (1999) 83, 371-380.

Still, C.J., P.N. Foster and S. H. Schneider: Simulating the effects of climate change on tropical montane cloud forests. Nature (1999) 398, 608-610.

Watanabe, K., Y. Ishizaka, and C. Takenaka: Chemical composition of fog water near the summit of Mt. Norikura in Japan. J. Meteorol. Soc. Japan (1999) 77, Iss. 5, 997-1006.

Wrzesinsky, T. and O. Klemm: Summertime fog chemistry at a mountainous site in central Europe. Atmospheric Environment (2000) 34, Iss. 9, 1487-1496.

FOG COLLECTION PROJECTS

Initial reports from a fog collection evaluation project in the **Dominican Republic** show promising results for the dry period in late 1999 and early 2000. The coordinates of the first large fog collector built in the far east of **Nepal** by Keith MacQuarrie are 27 4.7' N; 88 1.0' E. The final site selection process for a new set of collectors is presently underway. This project has the involvement of a number of Nepalese and Canadian NGOs. A new project was recently inaugurated at Atiquipa, **Peru**. It was supported by the British Embassy in Peru. More details will follow in the next *Fog Newsletter*.

NEWS

Joerg Bendix now has the Chair of Climatology and Remote Sensing in the Faculty of Geography at the University of Marburg in Germany. **Ray Hafkenscheid** has completed his Ph.D. at the Free University Amsterdam. His thesis was entitled, Hydrology and Biogeochemistry of Tropical Montane Rain Forests of Contrasting Stature in the Blue Mountains, Jamaica. Anyone interested in working on a fog climatology for the world should

contact **Howard Bridgman** at gghab@cc.newcastle.edu.au **Sarah Hottenroth**, a student of **Otto Klemm** at the University of Bayreuth, is analyzing fog samples for nitrophenols and chlorophenols. **Shih-Chieh Chang,** of the Institute of Botany of the Chinese Academy of Sciences in Taiwan, is working on the problem of fog deposition to mosses in a mountain forest.

SECOND FOG CONFERENCE
July 15 - 20, 2001

Pre-Registration

As well as providing us with relevant contact information, the pre-registration forms provide important information on the session topics of most interest to the delegates. We urge you to pre-register using the form on the web site or by mail.

Please note that you must be a pre-registrant in order to have your abstract reviewed by the Scientific Committee.

Call for Papers

Authors are invited to submit short abstracts on scientific topics related to fog and on the use of fog as a water supply for arid regions. A complete list of session topics can be found on the web site and in the first conference brochure. The conference will also include special sessions on the negative impacts of fog on offshore activities (aviation, shipping, remote sensing, etc.) in the oceans of the world.

Short abstracts of papers must be received by Professor Hans Puxbaum by 1 September 2000 at the address given below. They should be a maximum of 300 words, on 8 ½" x 11" paper, double spaced, with 1" margins. The short abstracts will be peer reviewed and the authors notified of acceptance by 15 November 2000. The abstracts should have a title in bold, followed by the author's name and affiliation. Extended abstracts (four pages) for publication in the Conference Proceedings are due 1 March 2001. Professor Hans Puxbaum, Technical University of Vienna, Institute of Analytical Chemistry, Getreidemarkt 9-151, Vienna A-1060, Austria. hpuxbaum@mail.zserv.tuwien.ac.at Please see the web site for answers to most queries and for electronic copies of the *Fog Newsletter*.

The Conference Hotel

Excellent meeting room facilities as well as guest rooms have been set aside in the Hotel Newfoundland.

For further information on the Conference Hotel, see issues 1 and 2 of the *Fog Newsletter*.

Tours

Other than the conference's one-day whale-watching, iceberg-viewing, seabird-island excursion, tours will not be arranged for the delegates. However, watch the web site for a link to Newfoundland's best tour operators for all your holiday options.

Scientific Committee and Working Groups

A list of the members of the Scientific Committee and the names of the Working Groups can be found on the conference web site.

Joerg Bendix, leader of the Working Group of the Remote Sensing of Fog, can now be reached at bendix@Mailer.Uni-Marburg.DE

Otto Klemm has now established a web site for the Working Group on Fog Deposition. It can be found at http://www.bitoek.uni-bayreuth.de/KLI/WGFogDeposition.html

FOG CONFERENCE ADDRESSES

The Second Fog Conference web site address is:
http://www.tor.ec.gc.ca/fog-conference/

mailing address:

Conference on Fog and Fog Collection
P.O. Box 81541
1057 Steeles Avenue West
Toronto, Ontario M2R 2X1, Canada
fax (1-416) 739-4211
e-mail: robert.schemenauer@ec.gc.ca

HOW TO RECEIVE THE NEWSLETTER

The Newsletter is available to anyone working in the areas noted on page 1. 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.

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