

## Harnessing Internet Power to Serve Weather Warning Purposes

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The PC and the internet constitute a “breakthrough technology” which empowers meteorological services with limited resources, such as those of the least developed countries, to execute the weather warning process professionally and effectively.

The weather warning process comprises collection of meteorological data, analysis and prognostication of weather patterns, anticipation of local weather impact and communication of relevant warnings to the public as well as to emergency response organizations. The essential mission of meteorological services is to ensure that the people it serves get the information they need to prepare for approaching hazards, with relative ease and sufficiently well in advance. It also has to cater for a wide range of audiences, ranging from the under-privileged, who should be given simple and easily understood messages to minimize confusion, to the sophisticated, who would demand comprehensive, up-to-the-minute information to enable them to make decisions related to complex operations.

At the global level, the main obstacle to international cooperation in the exchange of warning information has been the complexity of the telecommunication set-up and the cost of conventional technology, making it virtually impossible for least developed countries to participate. Under the auspices of WMO, the Hong Kong Observatory (HKO) is running a pilot website “Severe Weather Information Centre” (SWIC) <http://severe.worldweather.org> (Fig. 1) to demonstrate the feasibility of applying internet technology to resolve this issue. It initially covers official warnings on tropical cyclones but should eventually incorporate other types of severe weather. In September 2003, 1.3 million page visits were handled (Fig. 4).

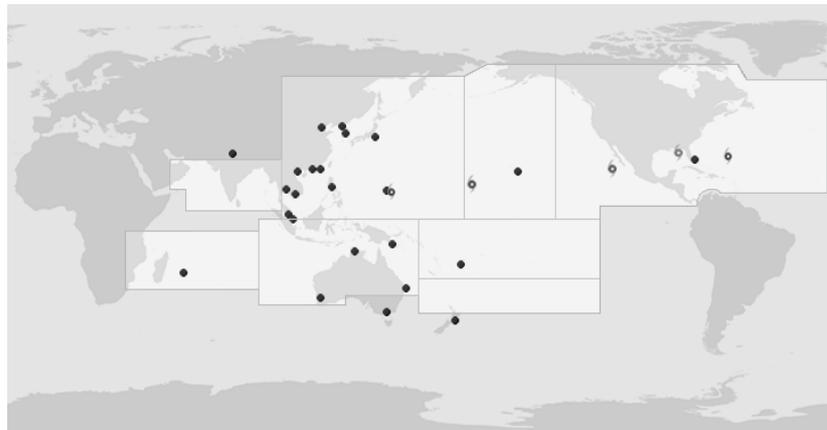


Fig. 1. Front page of the SWIC website, showing the presence of 5 tropical cyclones on 5 September 2003.

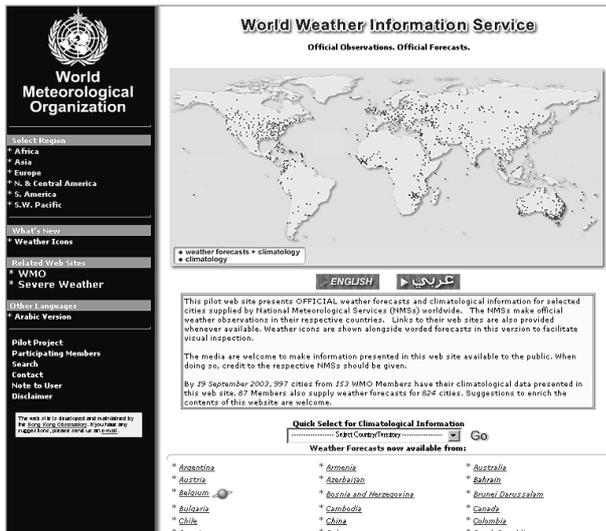


Fig. 2. Front page of the WWIS website

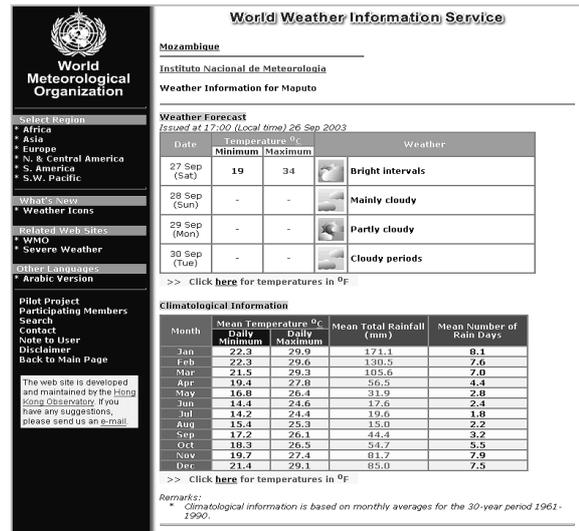


Fig. 3. Sample city forecast from a LDC

In a parallel development, another WMO pilot website known as World Weather Information Service (WWIS) on official city forecasts is also run by the HKO (Fig. 2 and Fig. 3). The site handled 16 million page visits in September 2003 (Fig. 5). 13 least developed countries (LDC) are now supplying forecasts to this website. It would not have been possible to achieve this figure in the absence of internet and e-mail.

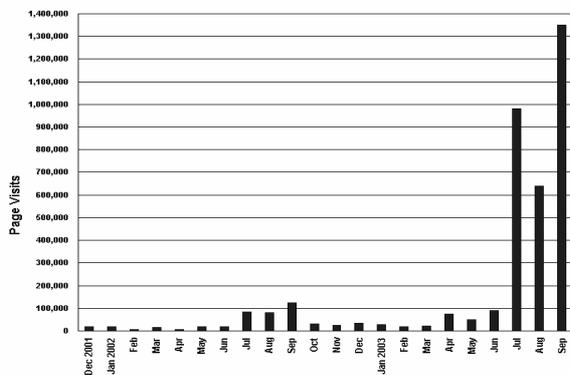


Fig. 4. Monthly page visits of SWIC

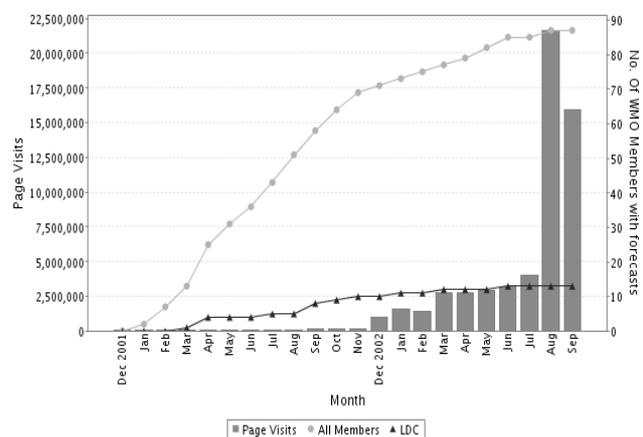


Fig. 5. Monthly page visits of WWIS

In operating both websites, PC and internet technology enables HKO to exchange warnings and forecasts with participating WMO Members flexibly in multiple ways. The experience so far has illustrated beyond doubt that the PC and the internet together have lowered the “entrance fee” for developing countries to join the “club” of effective warnings for the public, on the basis of international goodwill as well as the good use of appropriate technology.

In terms of the operation of individual meteorological services, the HKO has experimented with a back-up weather service system based on the PC-internet combination. In that system, meteorological data and products would be obtained via the internet while forecasts and warnings would be disseminated via a PC-controlled operation, partly also making use of the internet. The same mode of operation could be applied to practically any location in the world at a lower cost than that of a conventional set-up. The HKO will organize a training workshop at the end of 2003 to promote the application of this approach among the developing countries.

Internet technology enables the HKO and indeed any weather service to deliver tailored-made meteorological information to different emergency response organizations, through the creation of purpose-built websites as well as advance alerting by e-mail messages which also generate alarms on client PCs. In addition to supplying data, these special websites allow key government departments to know about the anticipated timing of changes in warning status, so that they can take preparatory actions in advance of the public responding to “public warnings”. This is particularly relevant to the city environment where commuter traffic, port and airport operations are all heavily weather dependent. The introduction of the internet-based service has greatly reduced the amount of telephone consultation among government departments, which is tedious and inefficient.

Internet technology also empowers the individual citizen to make informed decisions. Conventional communication means such as radio and television convey only limited information which often appears as a flash in the mind and leaves little impact on the audience. To overcome this problem, the HKO keeps a close tab on the information needs of the community and provides a wide range of text and graphic information on its website. In tropical cyclone situations, the forecast track as well as local observations reported by automatic weather stations are extremely popular. For example, the HKO website handled a total of 10 million page hits in a single day recently during the passage of Typhoon Dujan in September 2003. In rainstorms, the HKO website offers real-time rainfall information from radar and rain-gauges, on top of a simple colour-coded warning system. Thus the sophisticated could have as much information as he likes while the under-privileged could continue to be served by an easy-to-understand signal system. The key point is that internet technology is agile and flexible, enabling weather services to serve the diverse niches in the audience by supplying a range of matching information at affordable costs.