# Global public water education: the World Water Monitoring Day experience

Submitted for Publication in {*Journal of Applied Environmental Education and Communication* }. Prepared with the T&F Journal Template.

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*Public awareness of the impending world water crisis is an important pre-requisite to create a responsible citizenship capable of participating to improve world water management. In this context, the case of a unique global water education outreach exercise, World Water Monitoring Day of october 18th, is presented. Started in 2002 in the USA, currently World Water Monitoring Day is celebrated in 50 countries by more than 75,000 particpants per year. Review of this exercise in terms of public environmental education and possible transferrability to to other global issues of importance is discussed.*

water education • world water monitoring day • public participation • environmental education

## 1. Introduction

The world faces severe and growing challenges in maintaining water quality and meeting the rapidly growing demand for water resources (e.g. Gleick, 1998, UN-WWAP, 2003). This demand for freshwater is soaring as a result of increasing population, urbanization, industrial development, agriculture and rising life standards; yet the existing water supply is shrinking due to unsustainable ground water mining and pollution. Changes in the distribution, abundance, and quality of water resources and freshwater ecosystems represent a strategic threat to the quality of human life, the environmental sustainability of the biosphere, and the vitality of human cultures (Naiman *et al.*, 1998). One such example may be water borne diseases, which as a result of lack of basic sanitation, are responsible for 80% of illnesses and deaths in the developing world, killing a child every 8 seconds (WHO, 2005).

One of the major stumbling blocks to taking timely corrective actions, according to the World Water Assessment Program (WWAP) report, is a world population not fully aware of the scale of the problem, and in many cases not sufficiently empowered to do much about it. Unarguably the protection and sustainable use of freshwater resources cannot succeed, unless people have enough basic knowledge and a personal relationship to their water (Seacrest and Herpel, 1997; Mirvis and Clark, 1998). Hence creating this awareness and empowering users about their water is one the most important educational challenges of our age (Chitale and Cederwall, 2001). In particular educating the

youth, is a key step, as it is this youth who will be making future decisions (Mancl and La Barge, 1996; Peckumn, 2003). A number of approaches to such water education have been tried. These include from symposiums, like that of Children's Ground Water Festival (Seacrest and Herpel, 1997) to full-fledged five-day Conservation Camps (Mancl and La Barge, 1996) and from company based touring education service (Pekumn, 2003) to programmes integrated within formal education (Chitale and Cederwall, 2001).

In this paper, a case study of the global exercise, named as World Water Monitoring Day (WWMD) celebrations, conducted yearly from September 18 to October 18 is presented. Opinion is also given on whether the exercise and lessons learnt from WWMD could be transferred to other global social and environmental issues.

## 2. World Water Monitoring Day

World Water Monitoring Day (WWMD) is a global education and outreach event designed to promote personal stewardship and individual involvement in the protection of our world water resources. While water quality monitoring currently takes place throughout the year, WWMD (celebrated on October 18$^{th}$) is designed to expand and enhance these on-going efforts by creating a focal event to annually draw direct attention to water quality and to educate global citizens about the opportunities that exist for stewardship and personal involvement.

### *2.1 Brief history and aims*

World Water Monitoring Day (WWMD) was first initiated as a U.S. national event by America's Clean Water Foundation (ACWF) in October 2002, as part of the celebrations of the 30$^{th}$ Anniversary of the Federal Clean Water Act. The success of this National Water Monitoring Day (NWMD) led ACWF to expand the educational outreach effort throughout the world as the need for clean water is not limited to the United States alone. This initiative was further complemented at the World Watershed Summit in Washington D.C. (2002) and the Third World Water Forum in Kyoto (2003), where ACWF found support to broaden its focus. In its quest for global exercise of water monitoring, ACWF was joined by its current major international partner, the International Water Association (IWA). Through their joint WWMD efforts, ACWF and IWA expect to 1) build public understanding of clean water programs; 2) encourage innovation and technology exchange; 3) rekindle public interest in clean water; and 4) promote personal stewardship of sustainable water resources.

Presently, WWMD is already a major date in the global water calendar, conducted throughout 50 countries in 2004, with up to 75,000 people per year taking part.

***2.2 Monitoring the water quality***

The water quality indicators measured by the participants in their local neighbourhood include: temperature, pH, dissolved oxygen and turbidity. These are all basic indicators used to assess water health and can be performed safely with simple kits. Studies of aquatic benthic macro-invertebrates ("bug counts") may also be conducted.

The target group comprises of all sections of the community, although special focus is placed on involving school children. To get involved, participants first register at the WWMD website (www.worldwatermonitoringday.org). They then conduct the tests either using test kits obtained from their school or specially prepared kits available for purchase through the WWMD website. Occasionally, local and international sponsors are involved in providing subsidized kits. After monitoring the sites, the results are then fed into the WWMD website, which subsequently makes available the compiled report available online for the general public. The data then provides a useful educational exercise as well as a snapshot of the water quality issues and trends.

***2.3 Results***

WWMD success has come from the collaborative partnerships that have developed across the globe. Table 1 shows the participation statistics from 2002-2005 while Figure 1 shows the global spread of participating countries in 2004.

<Insert Table 1 here >

Overall, the trend shows a fast increasing number of participation. This is due to the numerous local, governmental and international agencies that support WWMD, as do businesses, schools, civic groups and volunteer monitoring organizations. On international level, this was possible due to ACWF's collaborative partnerships with global organizations, notably of IWA and the Young Water Action Team (YWAT). On the other hand, within the United States, where the greatest participation has occurred, ACWF's is joined by the U.S. Environmental Protection

Agency (USEPA) and the Association of State and Interstate Water Pollution Control Administrators (ASIWPCA) as primary domestic partners. In addition several other federal and state agencies, non-government organizations and corporate sponsors provide key support. A complete list of partners appears on the WWMD website. Without a strong network of support, the outreach could not have been possible.

<Insert Figure 1 here>

Monitorings frequently involve a large amount of preparation and commendable efforts were made by participants. In Sri Lanka, for example, a two-day "water symphony" was conducted to sample waters and teach local citizens about clean water issues. In Pakistan, water testing was carried in rugged areas where little, if any, water quality sampling has been done before. The Sunnyday Foundation in Sofia, Bulgaria undertook a monumental effort in a short time period to engage citizens in Bulgaria and the Balkan Peninsula in WWMD. Similar success stories occurred in India and Germany and Hong Kong. Taiwan also had an extremely well-organized effort in 2004, with over 2500 participants reporting from 407 sites, while in the United States many individual states also increased their participation. These are but a few examples of participation in WWMD in the past few years. [A complete overview, is available under "Results and Summaries" at www.worldwatermonitoringday.org ]

In expanding the exercise of WWMD two main limitations are often noted. The first is the cost of monitoring kits. In less affluent parts of the world, the cost of one WWMD test kit ($13.00 per kit plus shipping) could be out of reach for many. Although the kit is simple and allows for up to 50 tests each, it is of critical importance to engage more sponsors who believe in the mission of WWMD.

The second is that the tests are not conducted in tightly controlled circumstances based on quality assurances. Anyone can participate and often the "citizen scientists" are not trained in proper quality assurance techniques. In this context, WWMD should be viewed as an opportunity to introduce inexperienced persons to water quality monitoring methods with the hope of educating them so that they will begin to play a more active role in protecting their local environment.

**3. Discussion and Conclusion**

Outdoor educational settings have the potential to teach young people to consider environmental impacts when developing activities either in their life or community (Mancl and La Barge, 1996). Moreover, special 'environmental days' celebrating the environment have often been an underutilized opportunity to promote awareness (Ndaruga, 2003). In this context, the increasing participation in WWMD provides an opportunity to unify citizens, schools, governments and business as stewards of the water resources that impact everyone in an exciting and fun way. The impacts of practical learning exposures like WWMD can be quite striking. For example using pre and post-test on selected topics with regard to water quality of 14-18 year old youths in Ohio, Mancl and La Barge (1996) found test scores increased on average 3 times for groups that attended a water camp.

However, in order to maintain the behavioral change inspired by the festival experience, participants need repetition and continued hands-on experience. Even more significantly, especially children, require role models, such as parents, teachers, and others in the community to share in and support their behavior (Seacrest and Herpel, 1997). In this respect, one successful outcome of WWMD relates to the number of participants coming back in subsequent years – bringing others. This is an observation echoed by other studies on the impact of environmental days (e.g. Bennett and Heafner, 2004).

On the issue of WWMD itself, future focus on follow-up activities to extend the awareness created towards tangible attitude change and action is recommended. In this respect, ACWF and IWA continue to explore ways of resourcing community-based activities over the coming years. To date, WWMD partners play a key role in promoting the event, sponsoring and distributing test kits, providing web platform and encouraging community involvement. However, local participants in each region of the globe are best-positioned to promote social changes that will result in improved water quality. In this respect, local organizations, in particular water businesses, should be encouraged to take up this issue both as an opportunity to foster good relationships with the community they serve.

It is understood environmental education has a major contribution to make to sustainable development by integrating understanding of environmental issues that will ultimately affect development. In this context the excellent precedent set by WWMD day should be encouraged and when possible applied to other socially important issues. For example, public awareness to HIV/AIDS, energy use, fair-trade could benefit from this.

Overall, educating and empowering people to become active agents of sustainable and equitable development would be an important step towards a better global future.

**Acknowledgements**

The authors would like to thank America's Clean Water Foundation, International Water Association, the Young Water Action Team and numerous partners for helping World Water Monitoring Day activities. We also would like to extend our thanks to all participants of the event.

**Postscript**

From July 2006, World Water Monitoring Day has been adopted by the Water Environment Federation (www.wef.org) and is jointly coordinated with International Water Association.

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**Table 1.** WWMD participation by sites, country and number of participants for years 2002 - 2005

| **Description** | **Year** | | | |
|---|---|---|---|---|
| | **2002** | **2003** | **2004*** | **2005*** |
| Number of Sites | | | | |
| - US | 5,150 | 4,842 | 5,176 | 3,867 |
| - International | - | 433 | 1,351 | 1,050 |
| Number of Countries | 1 | 24 | 50 | 47 |
| Recorded Participants | | | | |
| - US | 75, 234 | 75,618 | 34,325 | 34,773 |
| - International | N/A | 4,912 | 11,712 | 9,578 |

* Note: The data for 2004 and 2005 include only registered participants.

**Figure 1.** Global spread of countries involved in WWMD 2004.