



# WAA TA

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## WATER USEAGE PATTERNS STUDY PROVIDING SURPRISING DATA

What is the daily per capita demand for water in the Virgin Islands? Amazingly low, if mid-study findings hold for the entire WRRC Water Useage Patterns Study. This study is currently being carried out to obtain a better fix on per capita daily demand for water in the Virgin Islands. Current planning figures run the range of 50 to 150 gallons per capita per day (gpcd) which is too wide a range for effective planning.

At approximately four months into the field work of this water useage study, initial reduction of the raw data involving over 1100 dwelling unit days and almost 4000 per capita days is providing some rather surprising findings. These findings are presented as unweighted averages by dwelling units. (See Table at end of newsletter)

For those readers who find the figures presented as being unbelievably low a few points should be noted. First, the findings of this study do not include water used away from home. However, it is felt that because of the timing of the test period and the techniques used, that the figures presented are probably

slightly higher than the true annual per capita useage. For example, the test period included a rainy December with Christmas and school vacation useage which is higher than normal. Because of two preceding years with high rainfall and high cistern levels it can be speculated that water conservation by water users was not at an all time high. As mentioned by one owner, "We can make the last quarter of our cistern supply last about as long as the first three quarters".

Because of the small size, 16 water pumps and 14 dwellings, it is not the contention of this study, at this time, that the figures presented truly represent the current residential demand for the entire population. However, it is felt that these water useage figures are consistent with reasonable water conservation practices and high standards of living in the Virgin Islands. These figures may be used when planning supply requirements that wholly or partially depend on fossil fueled seawater distillation plants. That is, if the true per capita demand for the entire population is greater than those presented by this study, then investment in water conservation is probably a better option than the investment in excessive desalting capacity.

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## CENTER DIRECTOR RESIGNS

Dr. Roger W. Peebles, Director of the Water Resources Research Center since June 1977, resigned at the end of March 1980. In the almost three years that he was here, Dr. Peebles engaged in several research projects that provided much needed information and data on water resources in the Virgin Islands. He served on several committees in the community and provided expert technical advice on various occasions. Dr. Peebles' presence will be missed and we wish him success in his new position at the Department of the Interior.

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## WATER CENTER SEEKS SOLAR DESALTING FUNDS

The WRRC has submitted a proposal for a matching funds grant to the Office of Water Research and Technology, U.S. Department of the Interior to test the feasibility of solar roof stills in the Virgin Islands. The title of the proposed project is, "An Evaluation of the Economic Feasibility of a Multi-Purpose Solar Roof Still in Water Scarce Areas". Don Bullock will be the Principal Investigator for the project.

The specific objective of this research is to measure and evaluate the feasibility of incorporating a solar still into the structural design of standard single family dwellings that rely on cistern water.

Bullock's project design call for a double roof construction with the roofing plywood fastened to the undersides of the beams and clear corrugated plastic covering the top of the beams. In this manner a trough of solar energy is created under the plastic top roof. Sea-water is run across the plywood which is covered with a waterproof

insulation and a wick which sucks up the water and distributes it evenly in the trough. The sun heats the wick through the clear plastic of the upper roof causing evaporation which condenses on the underside of the plastic and drains down into a catchment. The upper side of the roof continues its traditional function as a rain catchment. Current plans call for the construction of a 24 foot by 24 foot test roof at the the West Indies Laboratory on St. Croix. Several sections of the test roof will be evaluated with the clear plastic on both the upper and lower sides of the beams to test the concept's applicability for greenhouse or hydroponics use.

It is hoped that the production of hot water and the midday cooling of the single family dwelling can also be achieved by this double roof solar design. An additional advantage of this concept is that it produces most of its water during dry, hot periods of the year when cisterns have ample space to store the new distillate water. In fact, with good conservation practices and this type of roof design, cisterns for new houses might not need to be so large, yet would supply more water per year to the household.

Current calculations by Bullock of this design indicate that water production rates should be in the range of one gallon of water per day for every twenty square feet roof area without any special orientation of the dwelling or the use of special or expensive materials. Therefore, we might be able to expect an additional sixty gallons of water per day from the typical 1200 square foot home.

It is anticipated that general approval for the project will be received shortly with funding available by Fall of this year.

RESPONSE TO QUESTIONNAIRE ENCOURAGING

The response we got to the questionnaire mentioned in the last issue of WAA TA' was very good. We wish to thank those who cooperated with us and to encourage you who still have questionnaires to return them. On completion of the study we will have a report of our findings available to the public.

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WAA TA' STATISTICS

Rainfall(Inches)	Feb.	March
St. Croix		
Cotton Valley	3.15	1.09
Sugar Mill	1.00	1.45
Sprat Hall	1.48	2.86
St. Thomas		
Fort Mylner	1.64	2.94
Dorethea	2.66	2.16
Estate Wintberg	3.50	3.17
St. John		
Cruz Bay	2.03	2.28
Catheringberg	2.06	2.33
WAPA Water Production (Gallons)		
St. Thomas	21,974,360	25,410,538
St. Croix	35,986,108	22,425,850

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NOTICE OF VACANCY

The College of the Virgin Islands is now accepting applications for the position of Director of the Water Resources Research Center. A person with a doctorate in Hydrology, Water Resources Administration or other related field is sought. In lieu of a Doctorate, substantial research and administrative experience in water

research and research administration, preferably gained at one of the State Water Resources Research Institutions, is required.

The Director will be expected to develop research priorities, carry on technical assistance and information dissemination activities in the Territory and administer the program at the Water Center.

Resumes or information concerning qualified applications should be addressed to Dr. Orville Kean, Acting Director, Caribbean Research Institute, College of the VI St. Thomas, US Virgin Islands, 00801.

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FIGURE YOUR WATER USEAGE

WANT TO BECOME PART OF THE WRRRC USEAGE PATTERNS STUDY? YOU CAN. If you live in the Virgin Islands and have a method of measuring your water consumption, just fill in the WATER USE LOG sheet we've included in this months issue of WAA TA' and send it along to Don Bullock at the WRRRC. In fact, just fill out the first three columns in Section I and all of Section II and we'll do all the calculations for you. Then we'll return it to you with data on how your consumption compares with other unnamed but similar water consumers.

To get the best measure regarding your usage take five or six readings over a period of one to two months without trying to change your habits of water consumption. In this manner you can establish a base level of consumption such that you can evaluate the effectiveness of any water saving ideas or devices which you wish to try. One comment concerning column 3; it is sometimes easier to add up the number of occupants for each day of the reading period than to

come up with an accurate average; if so, you'll have arrived at a total people days figure which is fine for column 3. Just let us know which way you did it if you want us to do the calculations.

Finally, if you don't have a water meter, but do have a water pump give us a call and we'll tell you how to meter your water with any cheap electrical clock.

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TABLE OF WATER USE AVERAGES

TYPE OF OCCUPANT	<u>WATER USE AVERAGE</u> (US gallons per capita per day)
Tourist	64.42
All owner-residents	24.25
Owner-residents of island origin	17.14
Owner-residents of continental origin	40.84
Total sample	34.87

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WATER USE LOG

SITE NAME \_\_\_\_\_

SITE # \_\_\_\_\_

LOCATION \_\_\_\_\_

PHONE \_\_\_\_\_

SECTION I

COL. 1 DATE & TIME OF READING	COL. 2 METER READING	COL. 3 AVE. NUMBER OF OCCUPANTS *	COL. 4 TOTAL GALLONS	COL. 5 & 6 GALLONS PER DAY TOTAL   PER CAPITA		COL. 7 NOTES (days vacant, etc.)

\* OR TOTAL PEOPLE DAYS

SUMMARY: TOTAL DAYS \_\_\_\_\_, TOTAL PEOPLE DAYS \_\_\_\_\_, TOTAL GALLONS \_\_\_\_\_  
 PER CAPITA DAILY USEAGE: AVE. \_\_\_\_\_, RANGE \_\_\_\_\_ TO \_\_\_\_\_, STANDARD DEV. \_\_\_\_\_, VAR. \_\_\_\_\_

SECTION II SITE CHARACTERISTICS:

- A. NUMBER OF BATHROOMS \_\_\_\_\_, OF BEDROOMS \_\_\_\_\_, OF LAUNDRY WASHING MACHINES \_\_\_\_\_,  
 OF DISH WASHING MACHINES \_\_\_\_\_, OF GARBAGE DISPOSAL MACHINES \_\_\_\_\_.
- B. UNIT IS OCCUPIED BY OWNER \_\_\_\_\_, SHORT TERM RENTER(TOURIST) \_\_\_\_\_, LONG TERM RENTOR \_\_\_\_\_,  
 OTHER \_\_\_\_\_, WHO ARE OF ISLAND \_\_\_\_\_, OR CONTINENTAL \_\_\_\_\_, ORIGIN.
- C. SOURCES OF POTABLE WATER: CISTERN(RAIN) \_\_\_\_\_, TRUCKED \_\_\_\_\_, WELL \_\_\_\_\_,  
 UTILITY PIPELINE \_\_\_\_\_, ON SITE DESALINATION \_\_\_\_\_, OTHER \_\_\_\_\_.
- D. IS THERE A NON-POTABLE WATER FLUSHING SYSTEM ? YES \_\_\_\_\_, NO \_\_\_\_\_.  
 IS THERE SUBSTANTIAL USE OF POTABLE WATER FOR IRRIGATION ? YES \_\_\_\_\_, NO \_\_\_\_\_.  
 IS BOTTLED WATER FREQUENTLY USED? YES \_\_\_\_\_, NO \_\_\_\_\_.