This presentation premiered at WaterSmart Innovations

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INNOVATIONS

Global Water Transformation

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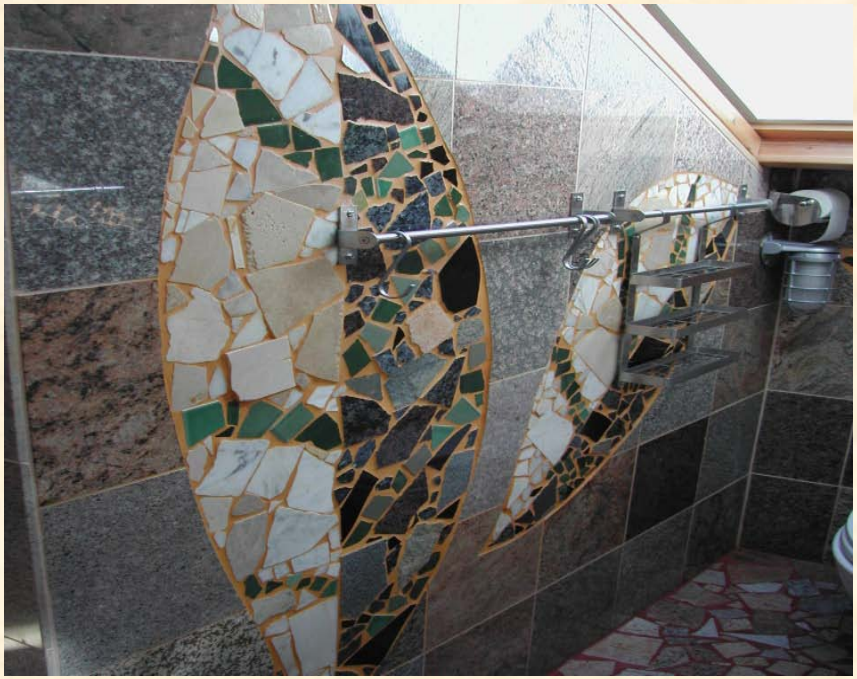
Marilyn's Bio

- Born, raised, educated, and housebroken, in California
- Love snow skiing, want to stop global warming so there's still snow.
- Emphasis on passive design for water drainage, temperature stability, ventilating, day lighting since 1970's



Marilyn's Credentials

- Lic. 4 states; CA ('90), CO, WA, AZ
- ARCSA AP, LEED AP, UC Berkeley
- Chaired Formation of Santa Cruz Green Building Program
- 6 yrs Planning Commission & Design Review
- 3 yrs AIA Dir. of Green Building

Passion For Water

I design projects with Integrated Water Management : rain harvesting, gray, waste & storm h20 reclamation for edible plant irrigation

The Ecology Movement has made these mainstream vocabulary:

- Passive Design,
- Renewable Energy,
- Non-Toxic Materials

Water technology is next on the list of core eco- skills & fluency of our society. This is where our awareness & attention must be now.

Water Availability

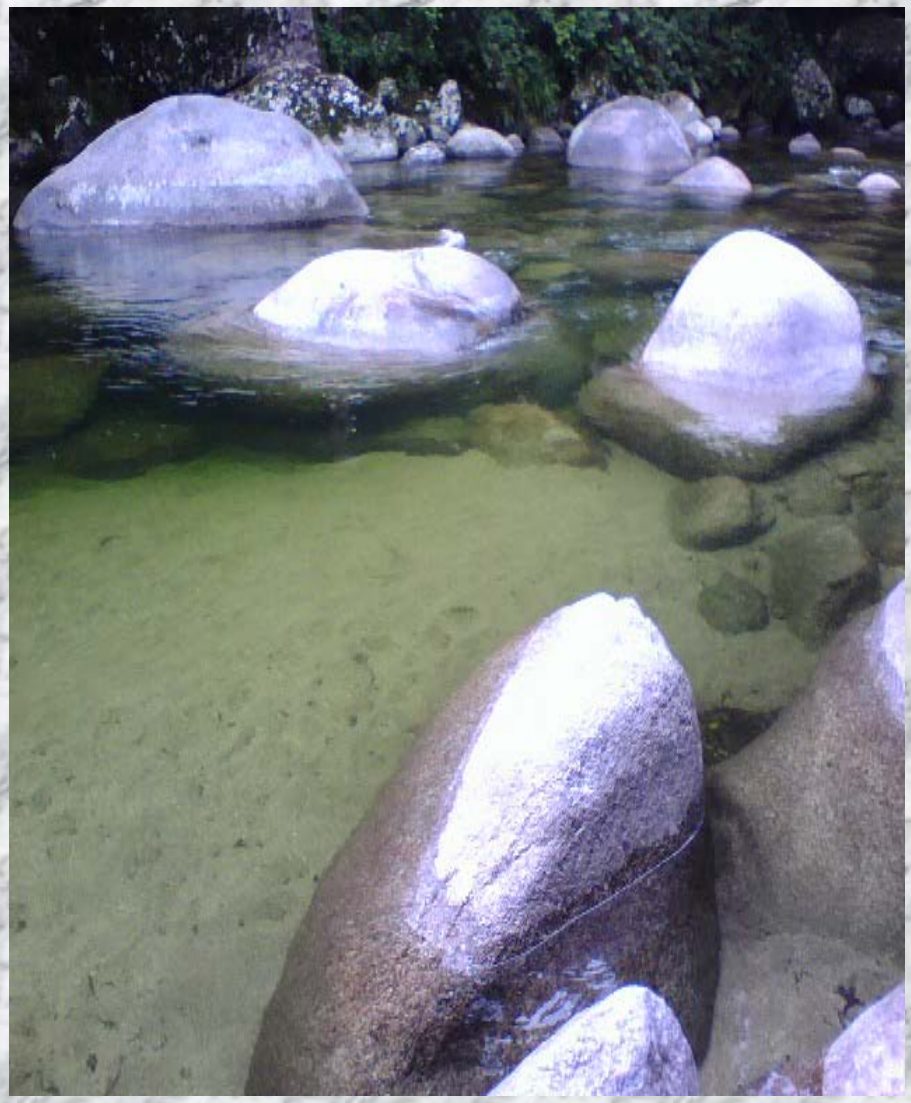
- 97% of all water is salty
- 3% is locked up in the icecaps of Greenland, Antarctica and deep in groundwater aquifers
- 2% is inaccessible or polluted
- 1% can be used for drinking and agriculture.

International Crisis

- 1/3 of earth's population does not have access to clean sanitary water
- BY 2015, that will increase to 40%
- The UN says that 2/3 of the worlds' population will have water scarcity by 2025

US Crisis

- Aquifers are being over used, going dry, and becoming polluted
- Water supply infrastructure hasn't kept up with increasing population needs
- 36 states expect to have h2o shortages within 10 years



Chronic Lack of Funding

- USA needs to repair & replace 2371 dams & watershed failing structures
- Current US gov't water budget is under-funded, will create an *annual* shortfall of $1 to 6 *billion* over the next 20 years
- In the past 5 years water cost has increased 27%

Evapo-transpiration

- All water is recycled through evapo-transpiration (the engine of earth's water cycles)

- The challenge of the urban environment is to maintain the evapo-transpiration

TYPICAL RAINFALL DESTINATION

- 45% evapo-transpires
- 40% infiltrates
- 15% goes to the water shed

The Future of Water

- Water will determine the wealth of nations
- Water promises to be to the 21st century as oil was to the 20th century
- Water supply for the future for all civilization to meet demands of basic human needs is directly related to Maintaining health of the watershed & health of the atmosphere

Watershed Security

- **Optimizing watershed health**
- **Aquifers - Optimize purity, volumes, & recharge**
- **Reducing global warming**

Watershed Solutions

- **Protecting wetlands' ability to cleanse & purify watershed drainage, preserve existing & build new**
- **Issue Watershed report cards like Australia does.**
- **Reverse desertification**

Watershed Innovation

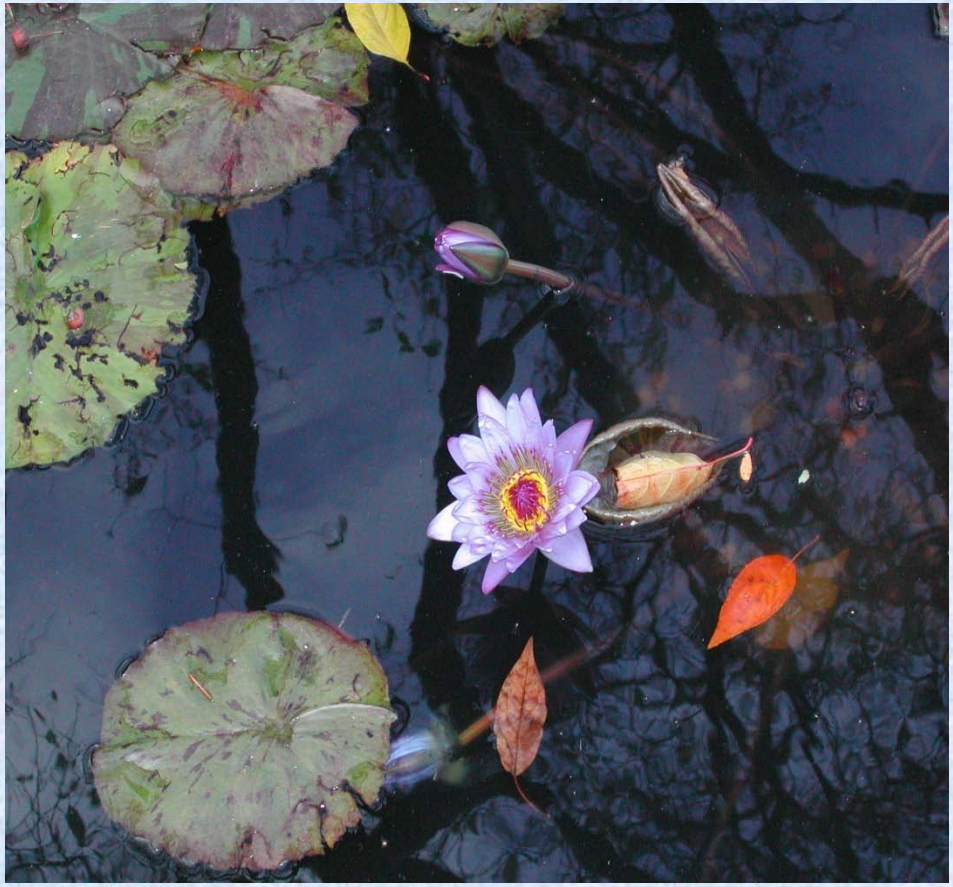
*Mycological Remediation- is a method to clean up toxic spills, m*ushrooms as solution to save the world, employ fungi as ninja warriors to get things done

Watershed Survival

- Implement bio retention pre-filtering
- River restoration
- Mimic natures' ecosystems no waste & renewable energy

Watershed Monitoring

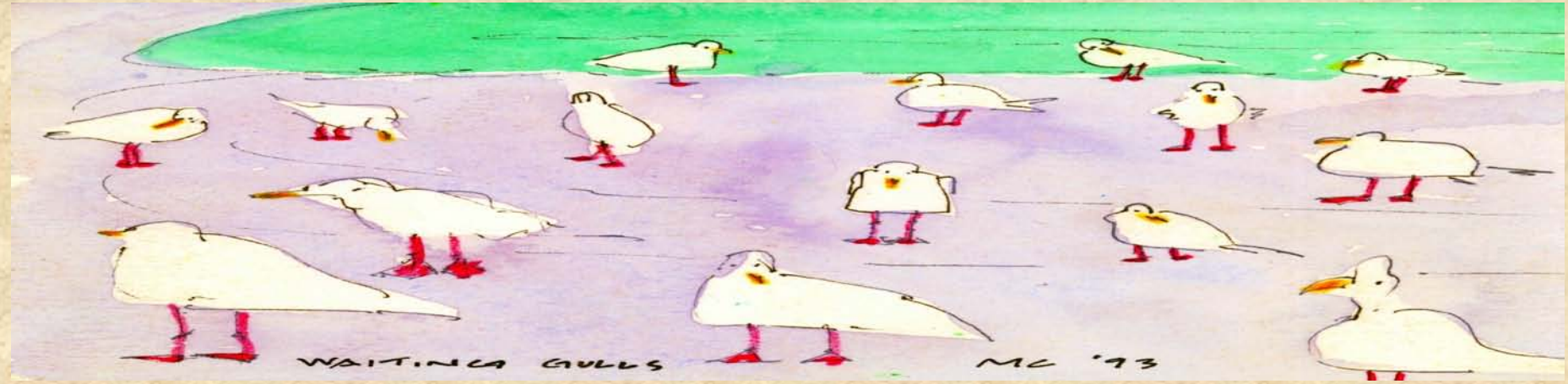
- Monitor macro invertebrate health
- Monitor aquatic plants health & biodiversity
- Monitor & maintain our rivers in excellent health



Micro Water Security

- Food growing
- Providing healthy drinking water
- Maintaining sanitation
- Decentralize h2o supplies to minimize security fears.
- Reuse h2o multiple times like Earthships biocells
- Stimulating the economy by creating blue jobs

Supply Solutions



- Conservation to develop alternative sources: recycle, reuse, reclaim, remediate all water sources
- Harvest air to water condensate in greenhouse agricultural biocells irrigated by waste water
- Desalinate & waste water distilation by renewable power
- Overflow retention basins : deep trench with rocks below landscaping
- Food irrigation w/ dilluted sea water

Poop Phobia Solutions

- Legalize black water reclamation
- Define - safety basic rules to guide innovation
- Nationalize New Mexico's Sustainable Testing Site Bill
- LA reclaims 54 million gal sewage per day to drinking quality but doesn’t use it due to cootie phobia
- AU is recycling effluent for drinking water
- Create attitude PR campaign to accept recycled effluent

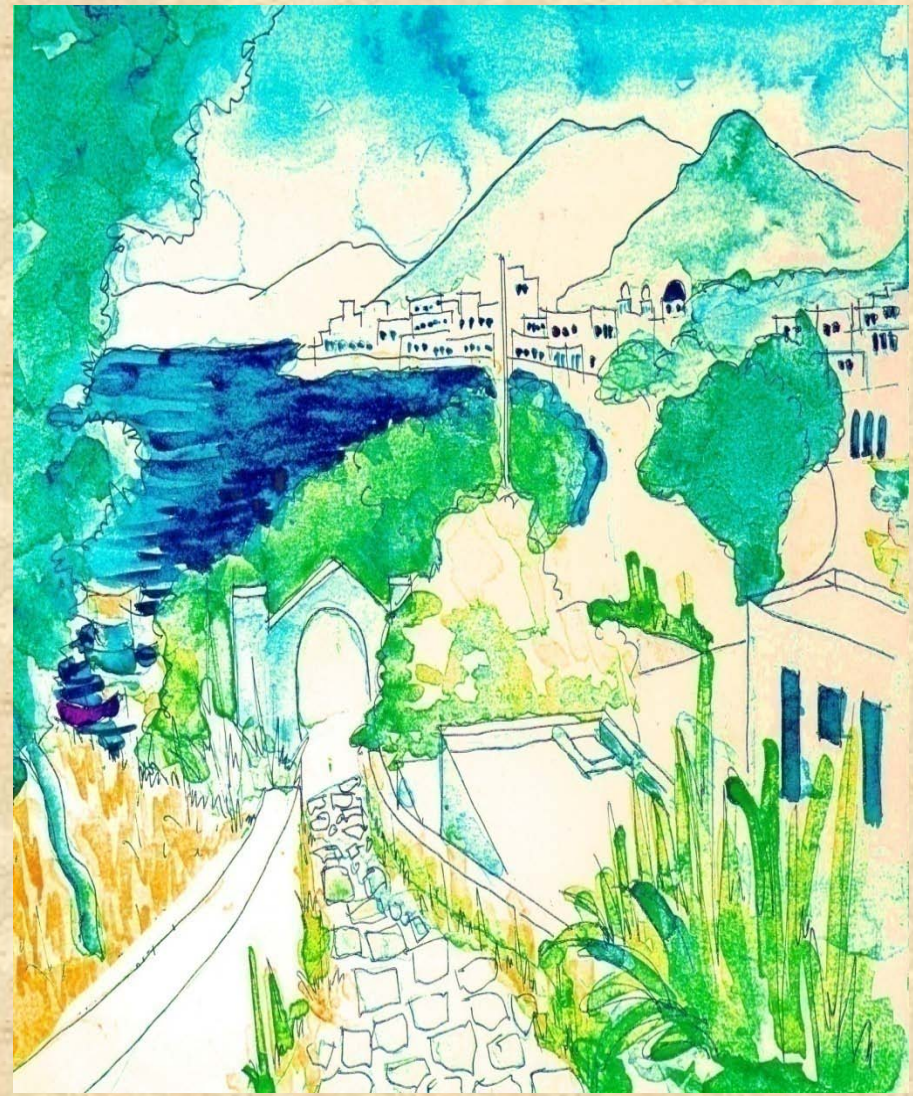
INVENTORY H20 VOLUMES

- Inputs : Rain, Fog, snow, Gray Water
- Existing : Lakes, aquifers, watersheds, dams, ocean
- Outputs : Evapo-transpiration, run off, percolation
- Demands : Agriculture, Industry (by sector) , Residential

Water Sensors

- Smart building sensors for water resource monitoring
- Off grid internet weather feed to anticipate precipitation & aid occupant usage
- Cistern volume levels and leak detection
- On grid monitoring for usage & cost to encourage conservation
- Smart low flow valves with timers & irrigation moisture sensor
- Water quality pollution PPM monitoring

Collection Innovation



- Rainwater Harvesting
- Reclamation of Storm, Grey, Black & Industrial Water
- Permeable Pavement Catchment

Water Innovation

- Solar distillers, Carbon filters & UV lights- for potable
- Living roofs, Sponge landscaping & Permaculture
- Air to Water dehumidification harvesting & distilling
- Integrated fire protection h20 cisterns

Water & Electricity
Hydro-Power

- Harness: Tidal, Wave, and River movement power, & Micro hydro

- Energy storage hydro battery- renewable or solar voltaic pumped hydro electric system

Measure & Monitor h20 distribution power

- Inventory all water pumping energy
- Inventory all electrical generation from utilities & private renewable installations
- 7% of USA energy/GHG tons from pumping clean & dirty h20
- Localized collection & reclamation avoids pumping

Water Distribution GHG Footprinting

- Establish criteria , standards, & training for Water GHG foot print boundaries
- States- shall report on their h20 related GHG footprint for water distribution
- Change Building Codes to implement a building GHG foot print cap, with h20 GHG itemization

Edible Irrigation GHG

- Provide local food supply for local population, irrigated with local reclaimed h2o.
- Inventory all embodied CO2 miles in our food supply
- Inventory water volume needed for growing food
- Double CO2 reduction with reduced h20 distribution & reduced food distribution miles

Pollution Solutions

- H2o pollution cap & trade program paralleling CO2 reduction proposals
- Adopt an h2o pollution mitigation program
- Implementation Phase Ins
- Establish waste data base of all unwanted water, to match with entity who wants to re-use or purify it

Smart Grid

- New Smart Water Grid to monitor volumes, weather, pollution
- Ties the electric grid to the water grid for more efficient (cheaper) distribution
- Planetary Smart Water Grid with localized Integrated Water Management

Building Solutions

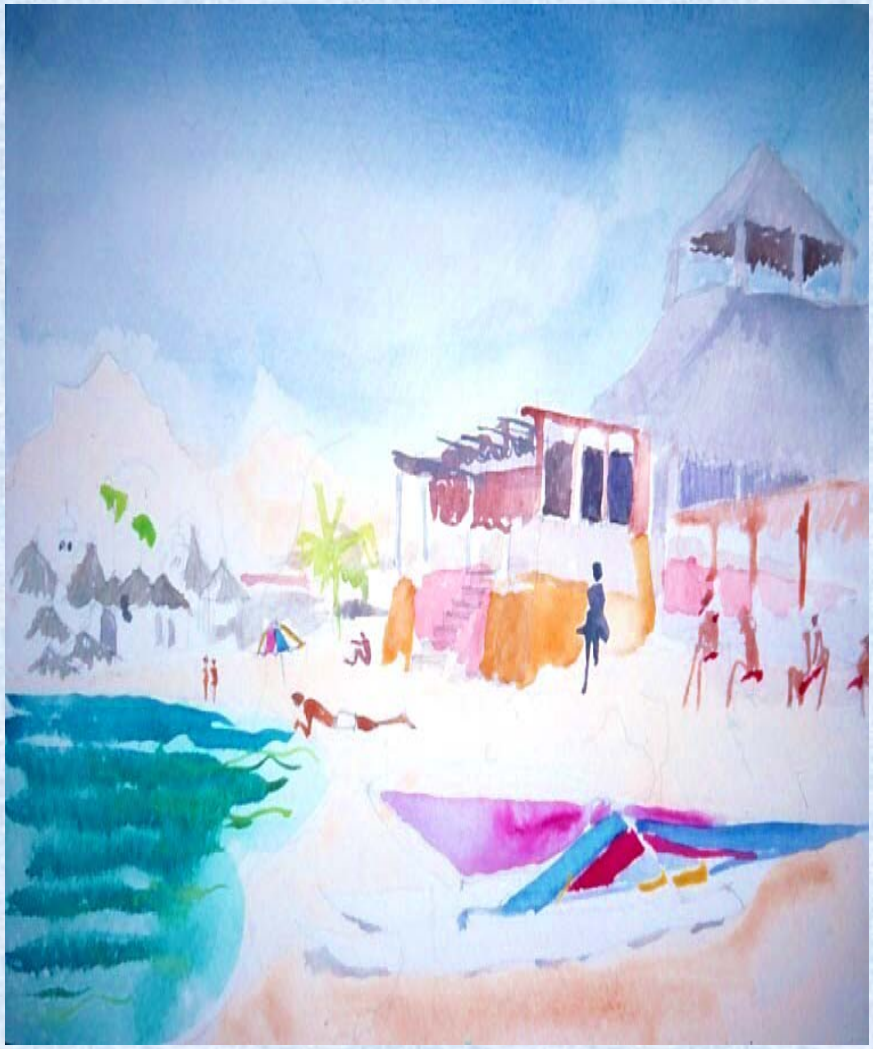
- USA constructs 6 billion square feet of buildings annually
- Require Water catchment & reclamation on individual buildings
- Require edible landscaping at campuses, institutions, homes
- Require passive strategies for drainage

NGO -Transparent H2O Reporting

- USE NGO STAKEHOLDERS FOR POLITICALLY NUETRAL WATER USE DATABASE REPORTING
- ESTABLISH MANDATORY WATER USE, QUALITY AND QUANTITY REPORTING
- DECLARE CARBON NEUTRAL WATER USE IN THE US

How the environment can survive increasing water demands

- We need fully integrated Water policies that legislate basic rights
- Catchments management
- Demand management



Create US Dept. of Water

- ☞ Establish A US Dept. of Water Resource Optimization, that parallels DOE
- ☞ Raise public awareness & fluency through innovative outreach & educational programs
- ☞ The US has the opportunity to become a world leader, demonstrating how to conserve, reclaim to increase water supplies

USA H2O Leadership

- Prepare for significant contribution at 2009 United Nations Climate Change Conference scheduled to be held in December 2009,

Copenhagen , Denmark

- Submit an aggressive global leadership commitment
- Declare Water Goals & Benchmarks

Let’s invent Global Blue-Tech Activation now

- Global blue-tech start-ups
- Host International Water Tech Conferences
- Sponsor blue-tech competitions

Opportunities to Get Active

- Use “World Mayors Council on Climate Change” (WMCCC) 5 miles stones) for water
- WorldWaterCouncil.org
- Australia: http://www.environment.gov.au/water/
- WaterWebster.com
- UN-Water.org/statistics

BE INSPIRED

entertain your wet dreams

- To manifest developments w/ significant water works
- To Improve distribution systems
- To retrofit existing buildings

My Open Source Website Featuring

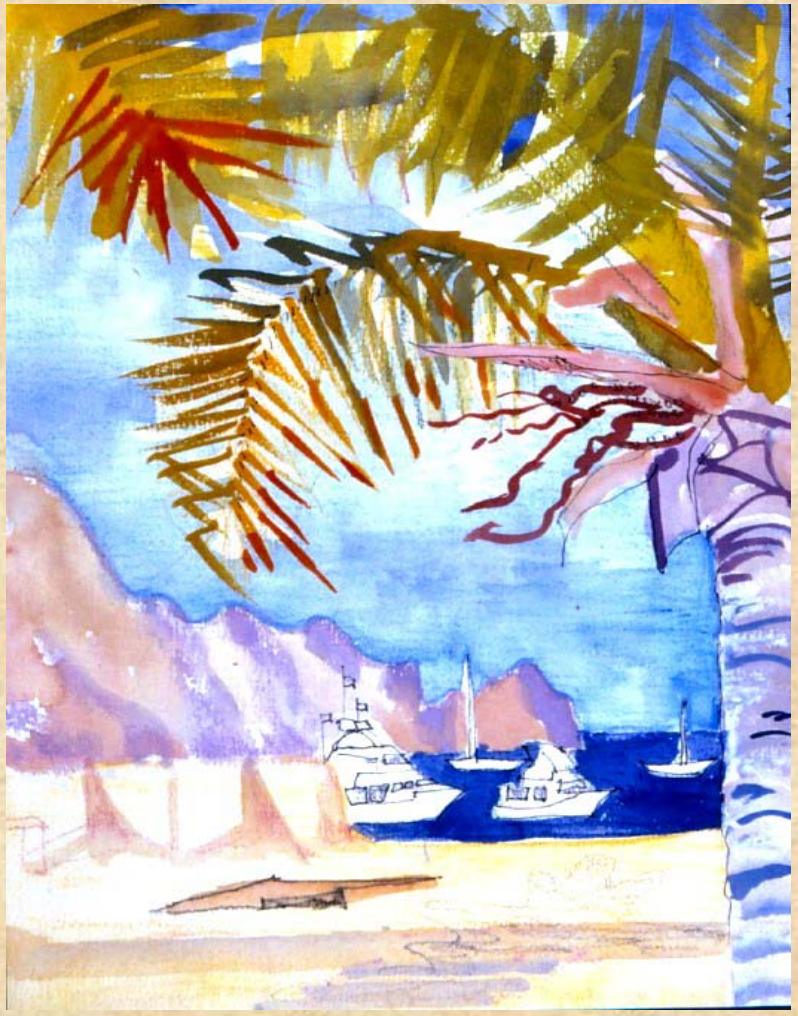
- **150 Water Links**
- **More than 3000 general green building links**
- **Numerous Water & Green Building articles (by me)**
- **Gratitude to all of the teachers, mentors & stewards who have inspired & handed their baton to me.**

Please send me
Your Water & Green Links

- **New strategies**
- **Consultants**
- **Service providers**
- **Innovative combinations**
- **Products**
- **Project case studies**

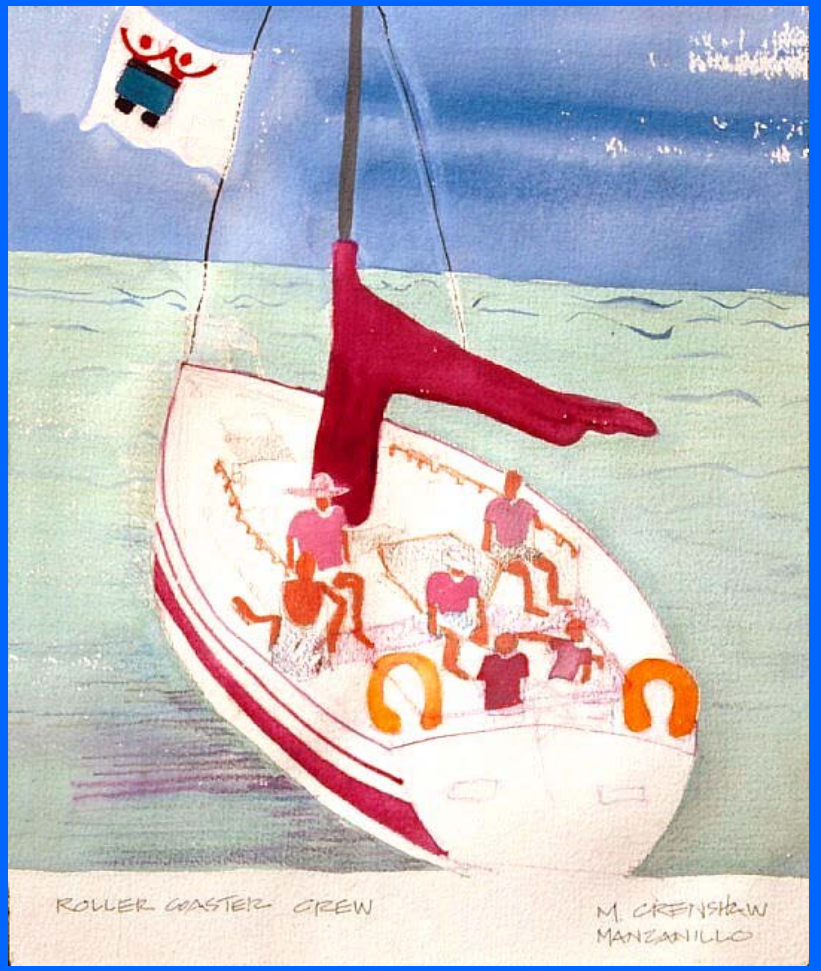
Got Pilot Demonstrations?

“It is important that we water professionals get pilot projects built to demonstrate passive water solutions with technology controls”



LET'S COLLABORATE on projects with integrated water management

- I would be delighted to be your architect
- Assemble your design team, or
- Consult with your architect



Credits

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- All paintings & most photos by Marilyn Crenshaw

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