Climate & Water Resources in NJ:

Some DEP Research Interests

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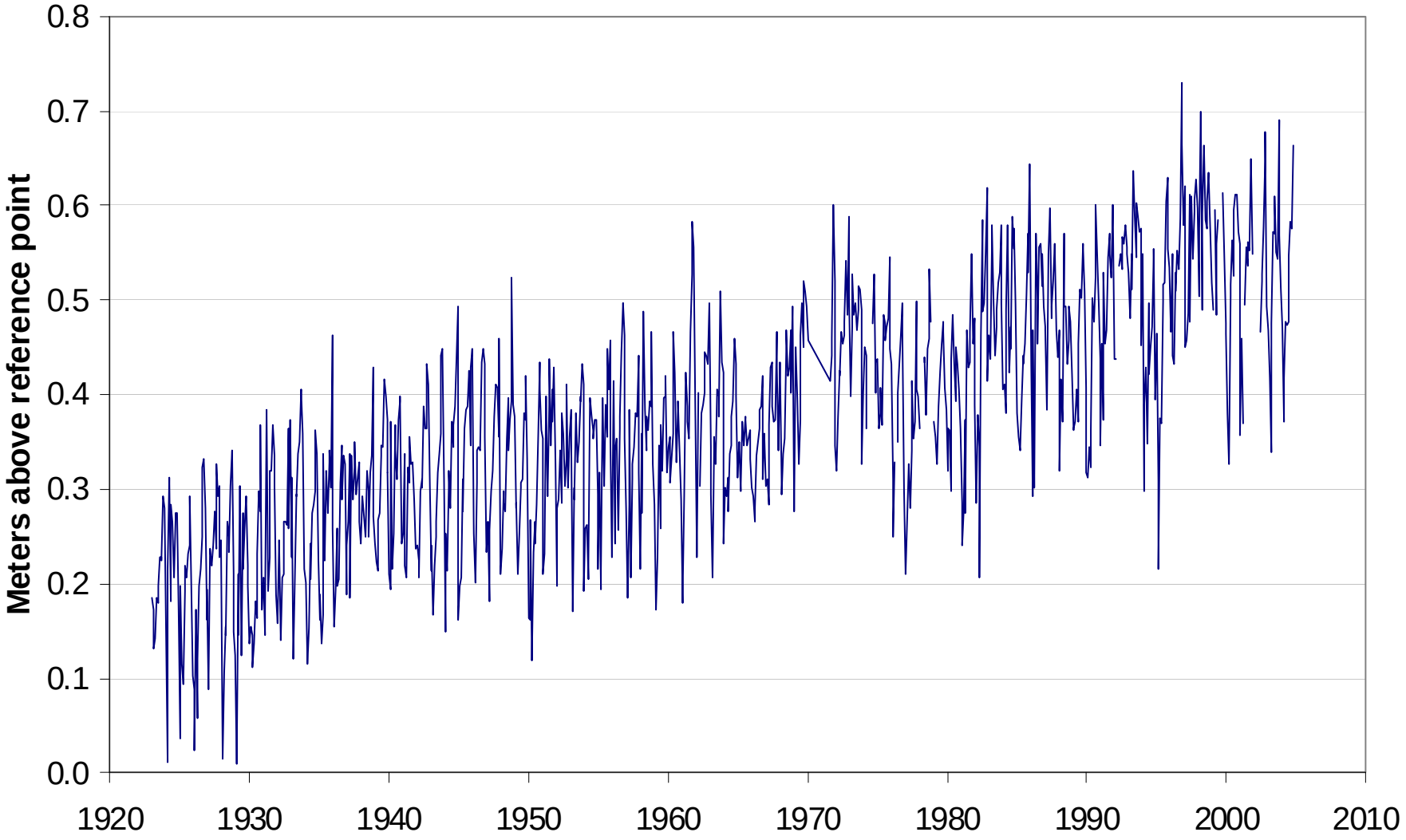
with thanks to Marjorie Kaplan, Steve Doughty, Jeff Hoffman, Joel Pecchioli, Tom Atherholt, Steve Domber, Jeanne Herb, and Michele Putnam

Overarching issues

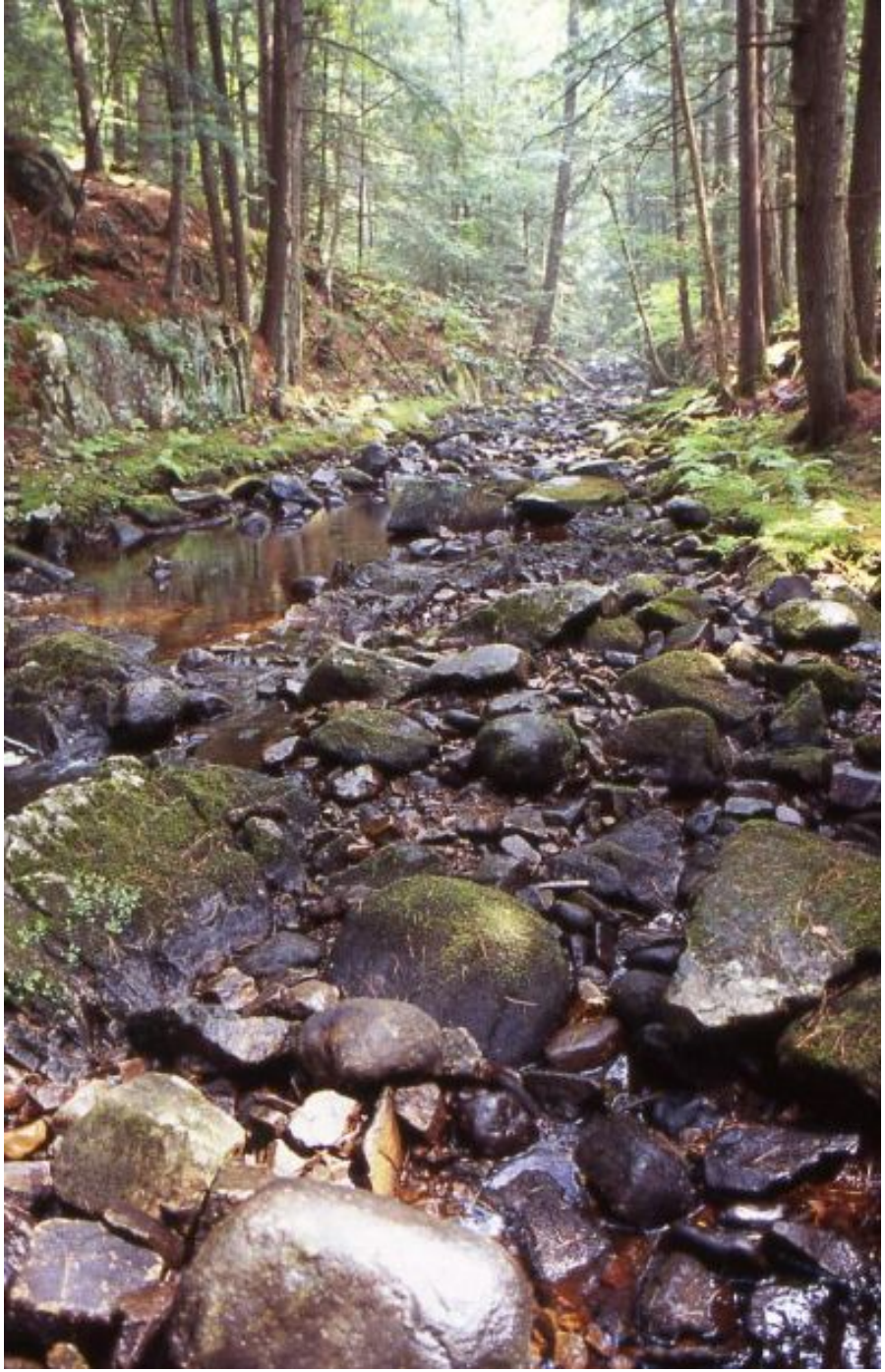
- What will happen to water supply?
  - How will the rate of recharge change?
  - What's the potential for more floods, droughts?
  - How will water demands change, e.g. for irrigation, recreation?
  - What will be the rate of sea level rise in the future?
  - What will be the effect of sea level rise and storm surges on vulnerable wells?
  - Will there be significant changes in cooling water needs?

Sea Level; Atlantic City, NJ

Tide gauge data, from National Oceanic and Atmospheric Administration




DELAWARE
RIVER

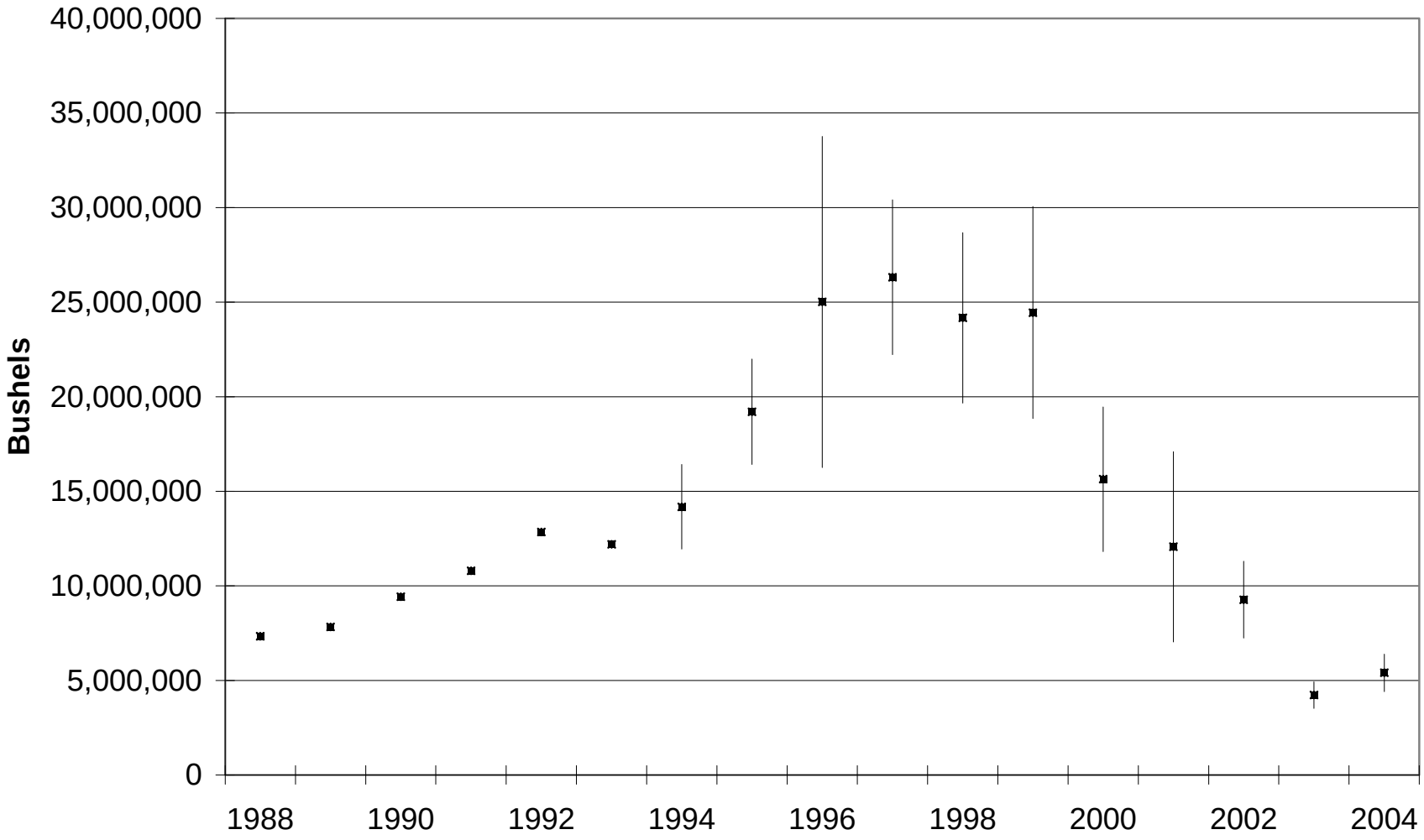


Overarching Issues, cont'd.

- What will happen to water quality?
  - Will there be significant temperature & pH changes in coastal zones?
  - Will greater warmth significantly reduce dissolved oxygen levels anywhere?
  - Will there be effects on wildlife and habitat?
  - Will there be greater threats from water-borne pathogens?
  - Will sedimentation from floods affect pumping & treatment capacities?

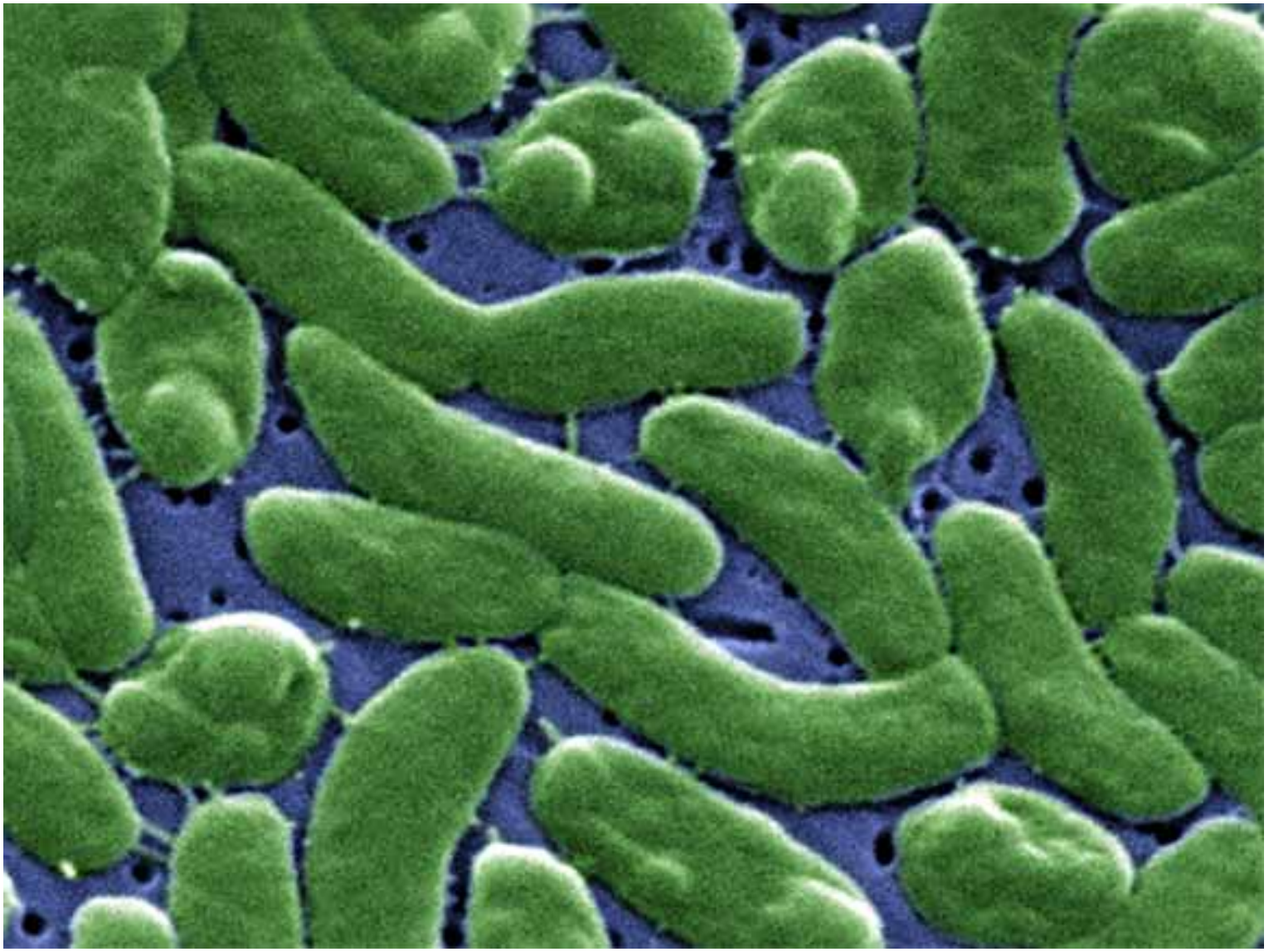
There may be new threats to wildlife….

Estimated Standing Stock of Surf Clams



and possibly new threats to humans as well….

Legionella species bacterium



Vibrio species bacterium

What should NJ do to increase its ability to adapt?

How should water supply systems adapt?

How best to minimize water waste and maximize water efficiency – in all sectors?

How best to increase water supply storage capacity?

- More reservoirs?
- Aquifer storage and recovery?
- Skimming of stream high flows?


Trap rock quarry
near Kingston, NJ

How best to maximize water system inter-connections & water transfer flexibility?

How best to protect the coast from sea level rise and storms?

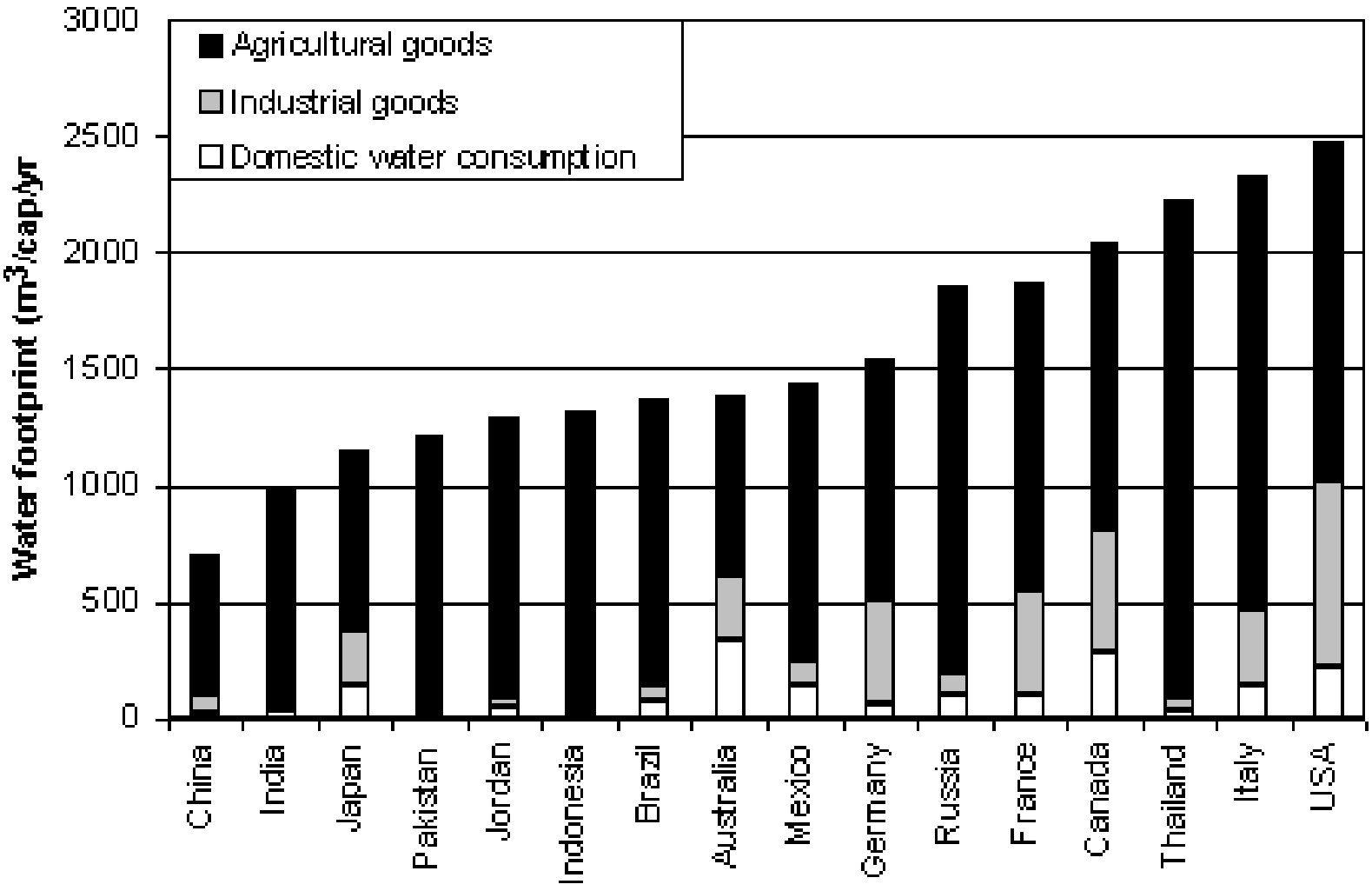
picture from Norb Psuty, Rugers U.

Are there significant energy savings and GHG emissions reductions available from water management systems?

What should be the role of desalinization?

What can people do at a personal level?

We all have a water footprint….



from Hoekstra and Chapagain, 2007, www.connectedwaters.unsw.edu.au

that can be looked at more closely…

Product	Virtual water content (litres)
1 glass of beer (250 ml)	75
1 glass of milk (200 ml)	200
1 cup of coffee (125 ml)	140
1 cup of tea (250 ml)	35
1 slice of bread (30g)	40
1 slice of bread (30g) with cheese (10 g)	90
1 potato (100 g)	25
1 apple (100 g)	70
1 cotton T-shirt (250 g)	2000
1 sheet of A4 paper (80 gsm)	10
1 glass of wine (125 ml)	120
1 glass of apple juice (200 ml)	190
1 glass of orange juice (200 ml)	170
1 bag of potato crisps (200 g)	185
1 egg (40 g)	135
1 hamburger (150 g)	2400
1 tomato (70 g)	13
1 orange (100 g)	50
1 pair of shoes (bovine leather)	8000
1 microchip (2 g)	32

from Hoekstra and Chapagain, 2007, www.connectedwaters.unsw.edu.au