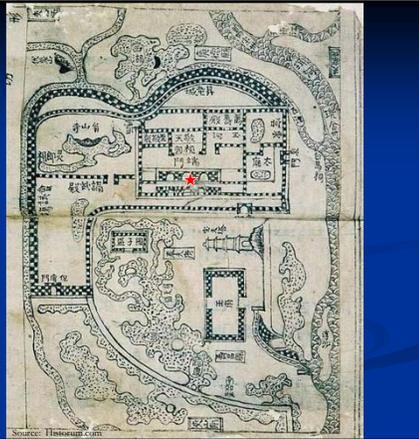


# Ha Noi's Lakes and Ponds

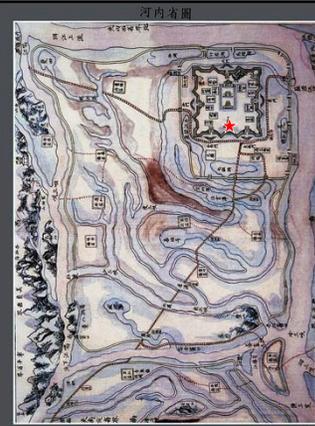
Loss, Degradation, and Hope

77%

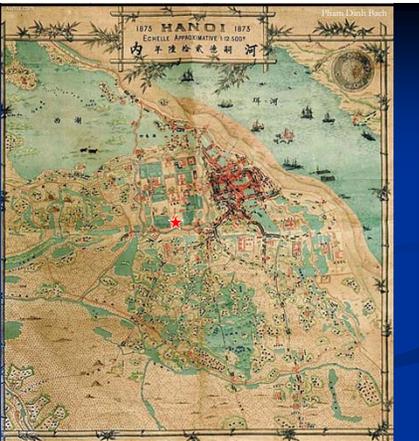
Ha Noi 1490



Ha Noi 1500+



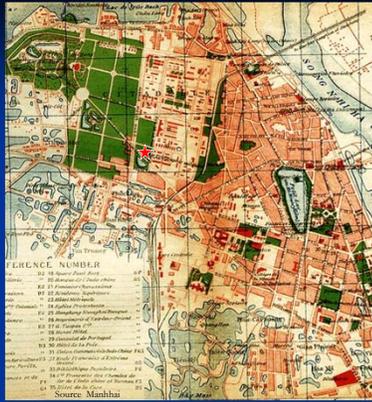
Ha Noi 1873



Ha Noi 1898



Ha Noi 1920



Ha Noi 1968



Ha Noi 2012



77%

1885-2005

Why Should You Care?

The lakes, ponds, marshes, streams, and rivers that are left in Hanoi are inadequate



The lakes and ponds in Hanoi are also very polluted



Hanoi's Sewer and Drain System:

- ❑ Sewers/Drains: only ~40% of inhabitants
- ❑ Human Wastewater: >500,000,000 L/day
- ❑ Industrial Wastewater: >300,000,000 L/day
- ❑ < 10% of industrial discharge is treated

It ALL goes into your lakes, ponds, and rivers

Source: Assoc. Prof. Thi Thanh Van NGO, Tu International, January 2009

Biochemical Oxygen Demand (BOD)

The amount of oxygen required by aerobic microorganisms to decompose organic matter.

Category	Percentage
Không ô nhiễm	14%
Có dấu hiệu ô nhiễm	29%
Ô nhiễm nặng	25%
Ô nhiễm rất nặng	32%

Source: CFCR, Hanoi Lakes Report, 2010

□ 2<sup>nd</sup> largest lake in Hanoi (Thong Nhat Park)  
 □ 21ha surface area, 500,000,000 L max capacity  
 □ 12,000,000 L/day of human and industrial discharge

Source: Nguyen Thi Thu Trang, 2005

# Eutrophication

Excess nutrients = Excess plant growth



# Eutrophication:

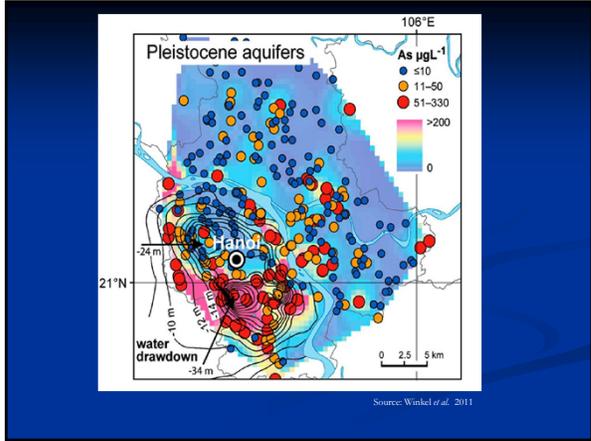
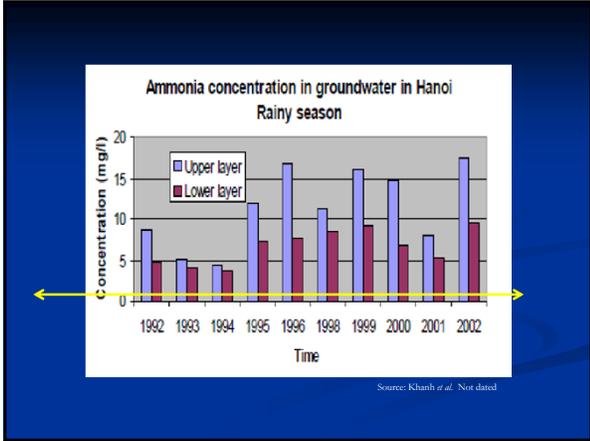
Too much sewage (e.g., fertilizer) →  
 Ammonia nitrogen ( $\text{NH}_3$ ) →  
 Algae (plants like  $\text{NH}_3$ ) →  
 Organic matter (↑ BOD) →  
 ↓ dissolved oxygen →



# Gross Pollutants



The pollution in the lakes is also in YOUR drinking water

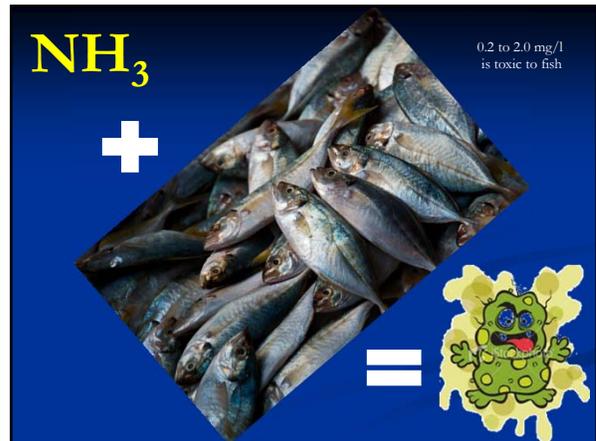


Water Break

The pollution in the lakes is also in YOUR food

Each hectare of pond in Hanoi produces over 5 tons of fish per month.

Source: Assoc. Prof. Thi Thanh Van NGO, Tu International, January 2009



Now do you understand why you should care?

Now that you know, what will YOU do about it?

Be part of the solution!

1. Volunteer Workdays
2. Outreach and Education
3. Laws, Regulations, Policy
4. Urban Planning



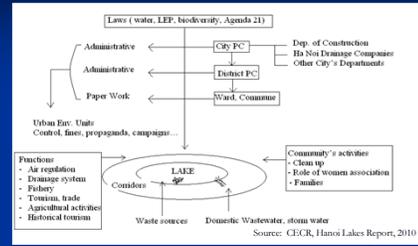
# Educate



Photo: Lehtonen

40+80+160+320+640+1,280...

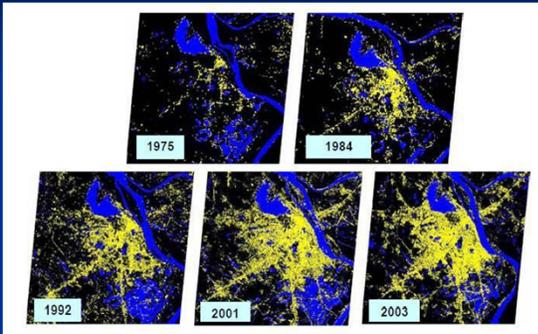
# Laws and Regulations



Source: CIGR, Hanoi Lakes Report, 2010

500 bad laws do not equal 1 good law!

# Urban Planning



Source: Hai and Yamaguchi 2006

