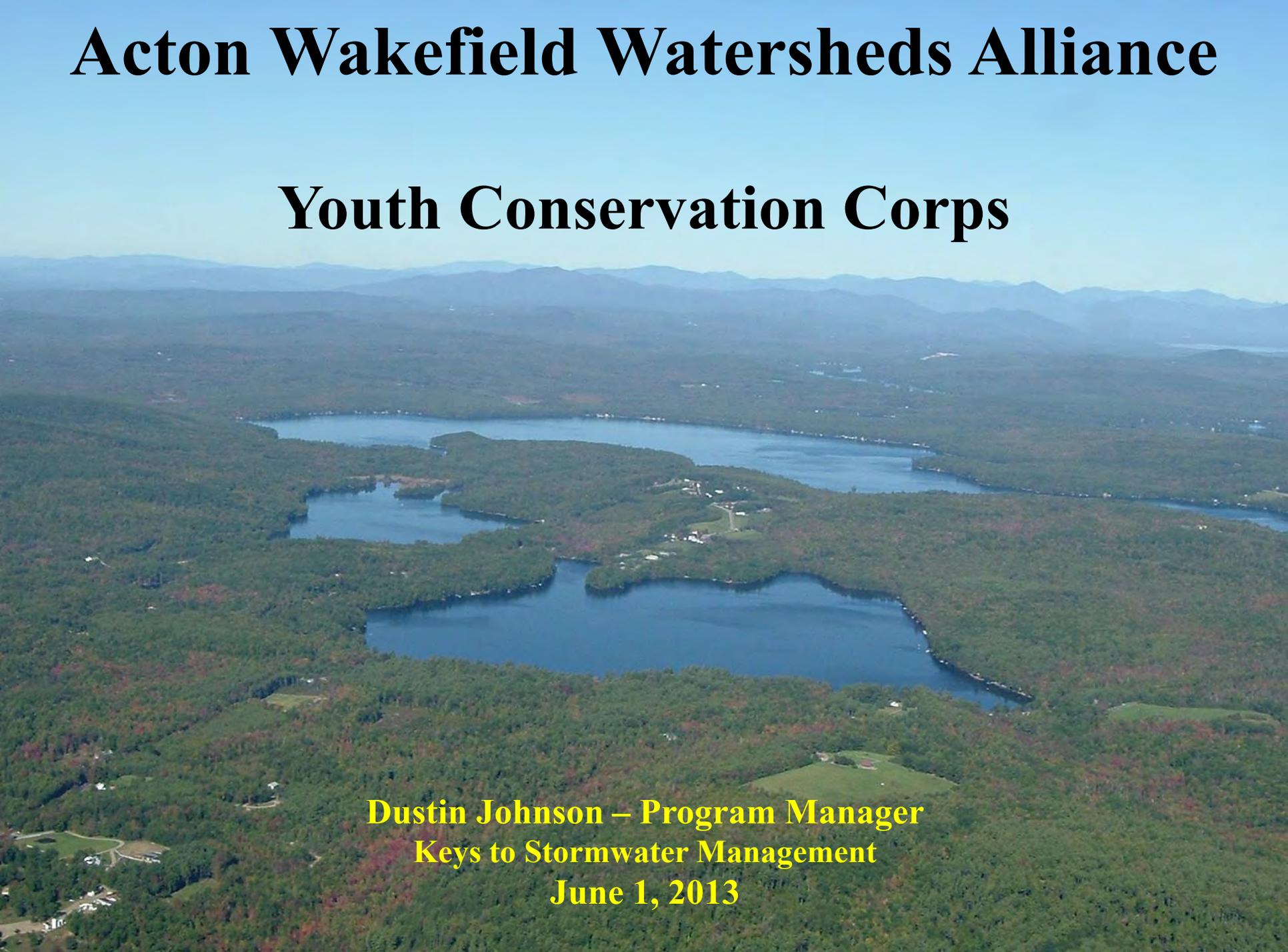


# **Acton Wakefield Watersheds Alliance**

## **Youth Conservation Corps**



**Dustin Johnson – Program Manager**  
**Keys to Stormwater Management**  
**June 1, 2013**

# Program Overview - History

AWWA founded in **2005** to protect water quality in the Wakefield, NH and Acton, ME regions

**2006** - Received 1<sup>st</sup> two-year Watershed Assistance grant from NH DES to initiate Youth Conservation Corps (YCC)

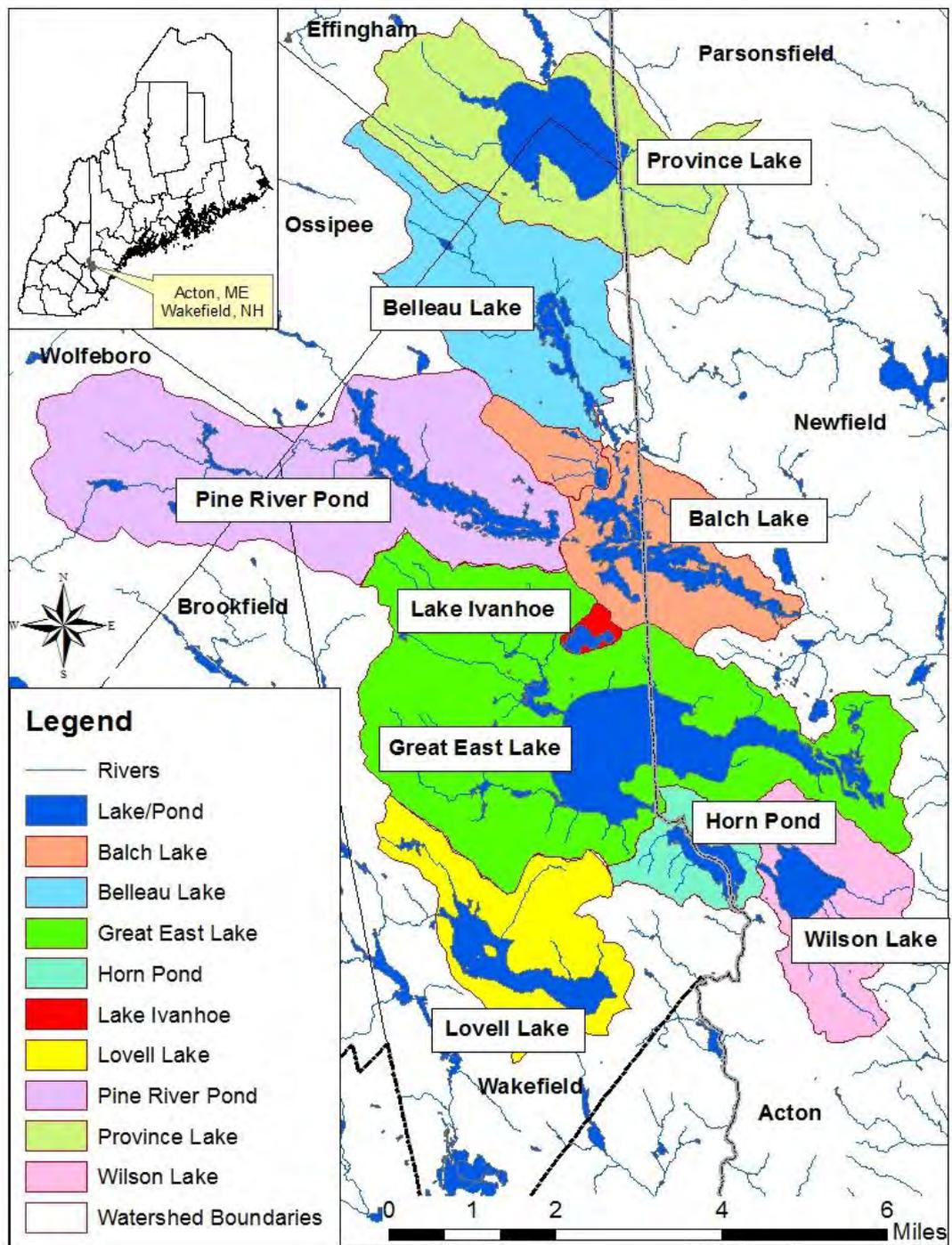
**2008** – Received Moose Plate grant from the NH Conservation Committee to continue YCC work

**2008** – NH DES Watershed Assistance grant was awarded to develop a broad-scale Watershed-Based Management Plan for the headwaters of the Salmon Falls River (Great East Lake, Lake Ivanhoe, Lovell Lake, Wilson Lake, and Horn Pond).

**2010** – Watershed-Based Management Plan published

**2010** – NH DES awarded grant for AWWA to begin implementation of action items from plan.

**2012** – Received NH DES and ME DEP grant to continue YCC work and begin work on lake roads with large pollution loads.



# Program Overview - Structure

Board of Directors (representatives from local lakes and community)

Full Time Staff

- Executive Director
- Program Manager/Technical Director

Summer Staff

- Crew Leaders (2 college-aged, senior crew members)
- YCC Crew (16-18 year old local youth)



# Program Overview - Funding

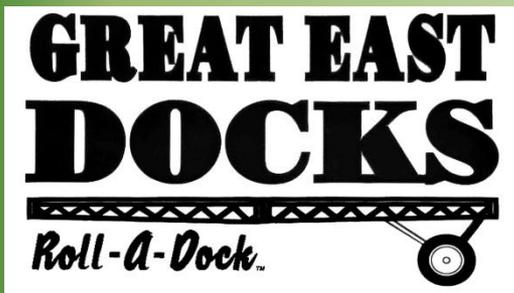
AWWA is a 501(c)(3), nonprofit organization

Funding for day to day activities, programs, and YCC include:

- NH Department of Environmental Services
- ME Department of Environmental Protection
- Town of Wakefield
- Town of Acton
- Charitable Foundations
- Local Businesses
- Individual Donations



\*Our local town support is strong due to our providing employment opportunities to local youths who have a residence in Wakefield or Acton



# Youth Conservation Corps (YCC)



## Program Manager

- Meets w/ homeowners
- Educates them on erosion issues and the connection to water quality
- Provides Technical Assistance
- Erosion control design
- Sets up Projects

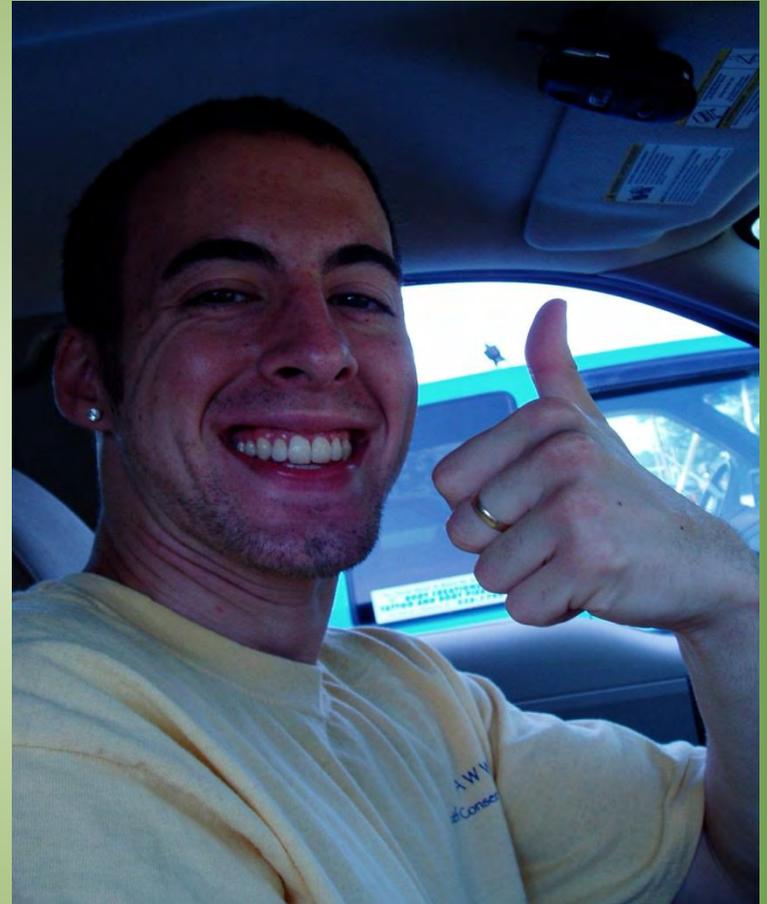
## Crew Leaders

- Direct crew on installation of Best Management Practices

## Crew

- Six members
- 16-18 year old Wakefield and Acton residents

# Goals of the YCC Program



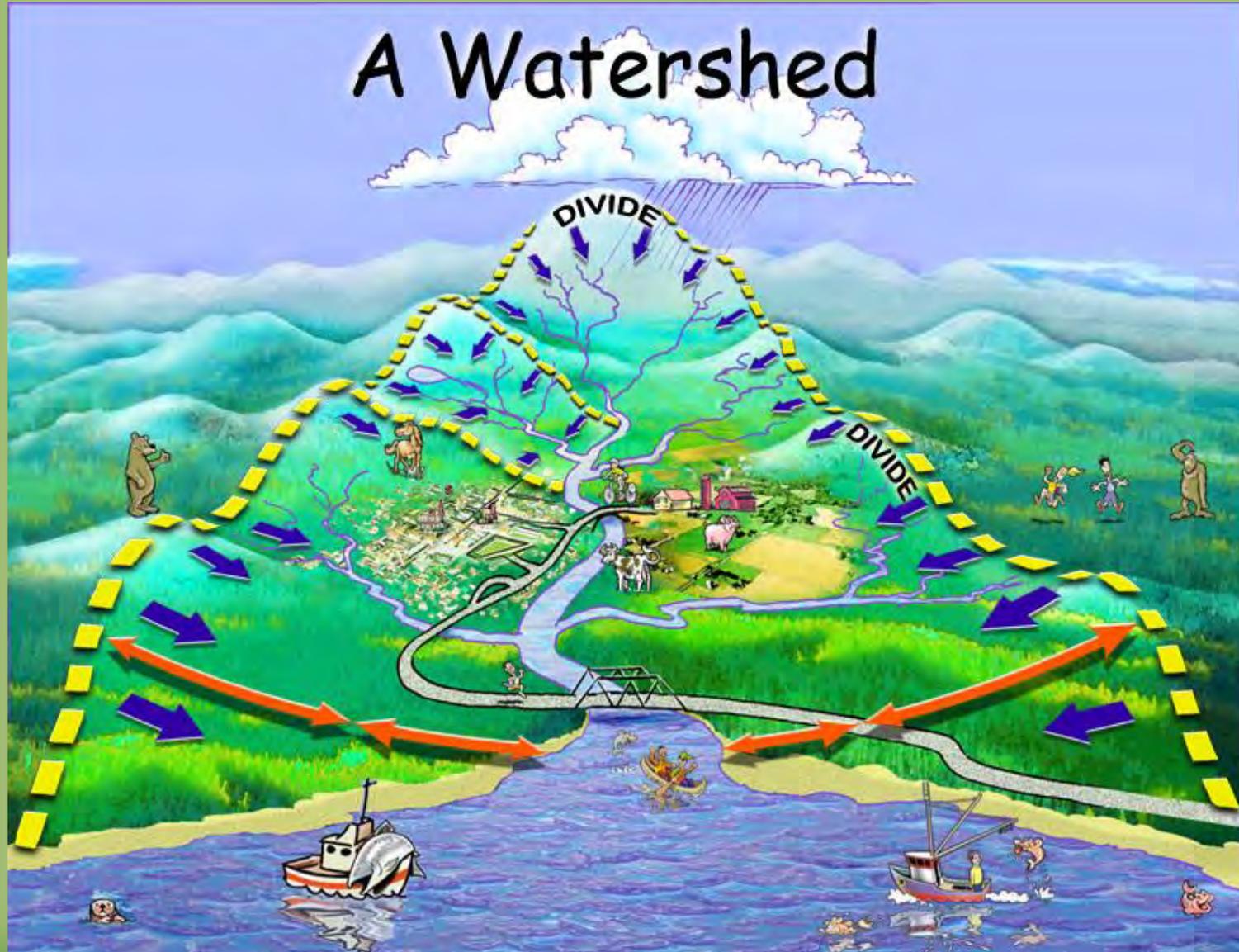
- Gain great work experience
- Learn to be part of the community
- Understand what it means to be good lake and environmental stewards
- Extend education to others from what they learn on the job

**Before we go any further...**

**What are we trying to protect?**

**And what are we trying to protect them  
from?**

# What happens on land, affects the water!

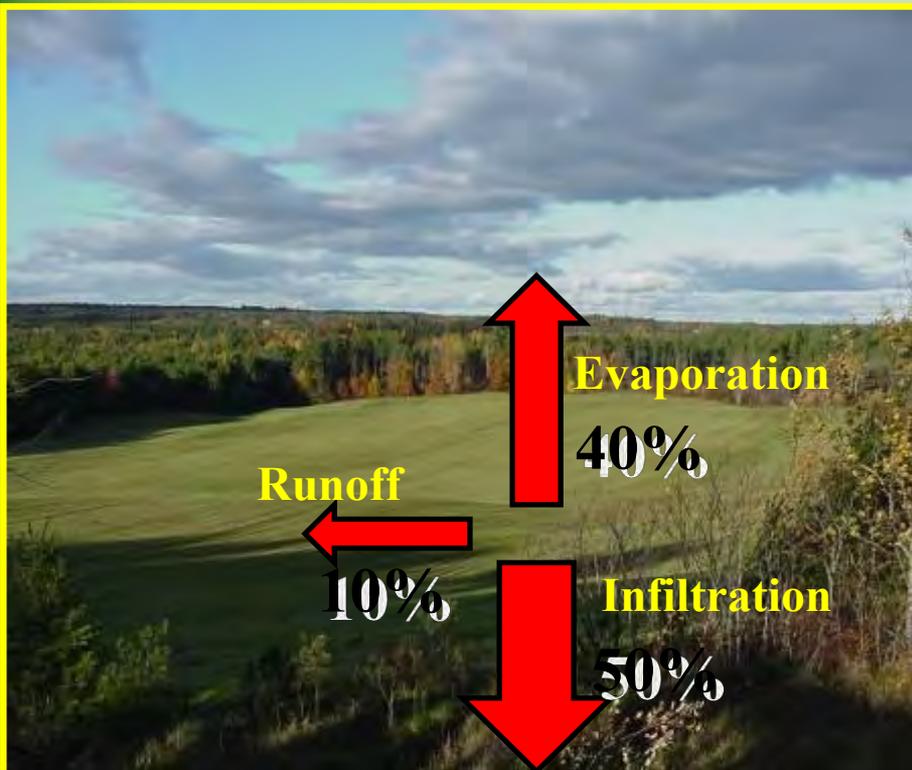


# What happens on land, affects the water!

When it rains, pollution happens...

**Natural Cover**

**75-100% Impervious Surface**



**What is in runoff that WE are concerned about?**

**What is in runoff that WE are concerned about?**

**PHOSPHORUS**

# PHOSPHORUS

Naturally Occurring Element

15	30.974
277	2.1
44.30	
<b>P</b>	
[Ne]3s <sup>2</sup> 3p <sup>3</sup>	
1.82	±3,4,5

Periodic Table of Elements

1	2											3	4	5	6	7	8	9	10
1	2											3	4	5	6	7	8	9	10
3	4											5	6	7	8	9	10		
11	12	13	14	15	16	17	18												
19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36		
37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54		
55	56	57	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86		
87	88	89	104	105	106	107	108	109	110										

\* Lanthanide Series

58	59	60	61	62	63	64	65	66	67	68	69	70	71
Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu

+ Actinide Series

90	91	92	93	94	95	96	97	98	99	100	101	102	103
Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr

Legend - click to find out more...

H - gas

Non-Metals

Li - solid

Transition Metals

Br - liquid

Rare Earth Metals

Tc - synthetic

Halogens

Alkali Metals

Alkali Earth Metals

Other Metals

Inert Elements

# PHOSPHORUS

Naturally Occurring Element

**Sources: ???**

# PHOSPHORUS

Naturally Occurring Element

**Sources:**

**Atmosphere**

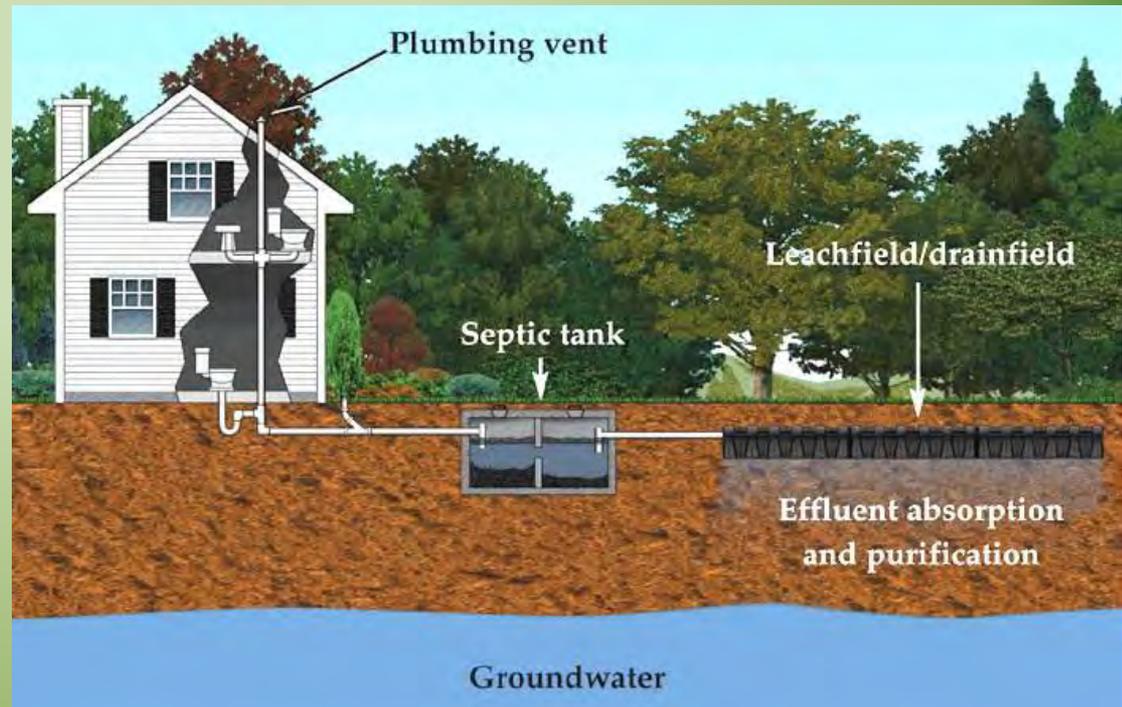
# PHOSPHORUS

Naturally Occurring Element

**Sources:**

Atmosphere

**Septic Systems**



# PHOSPHORUS

Naturally Occurring Element

**Sources:**

Atmosphere

Septic Systems

**Manure & Pet Wastes**



# PHOSPHORUS

Naturally Occurring Element

## Sources:

Atmosphere

Septic Systems

Manure & Pet Wastes

**Fertilizers**



# PHOSPHORUS

Naturally Occurring Element

## Sources:

Atmosphere

Septic Systems

Manure & Pet Wastes

Fertilizers

**Soil Erosion**



# Which source is the largest contributor of phosphorus???

Sources:

Atmosphere

Septic Systems

Manure & Pet Wastes

Fertilizers

Soil Erosion

# Soil Erosion!!!

Soil particles are extremely “sticky”. Phosphorus in soils sticks to the sediment and is easily transported by runoff to a waterbody.



# Phosphorus Impacts

**Excess algae growth**



# Phosphorus Impacts

**Excess algae growth**



**Less clear water**



# Phosphorus Impacts

**Excess algae growth**



**Less clear water**



**Oxygen depletion**



# Phosphorus Impacts

**Excess algae growth**



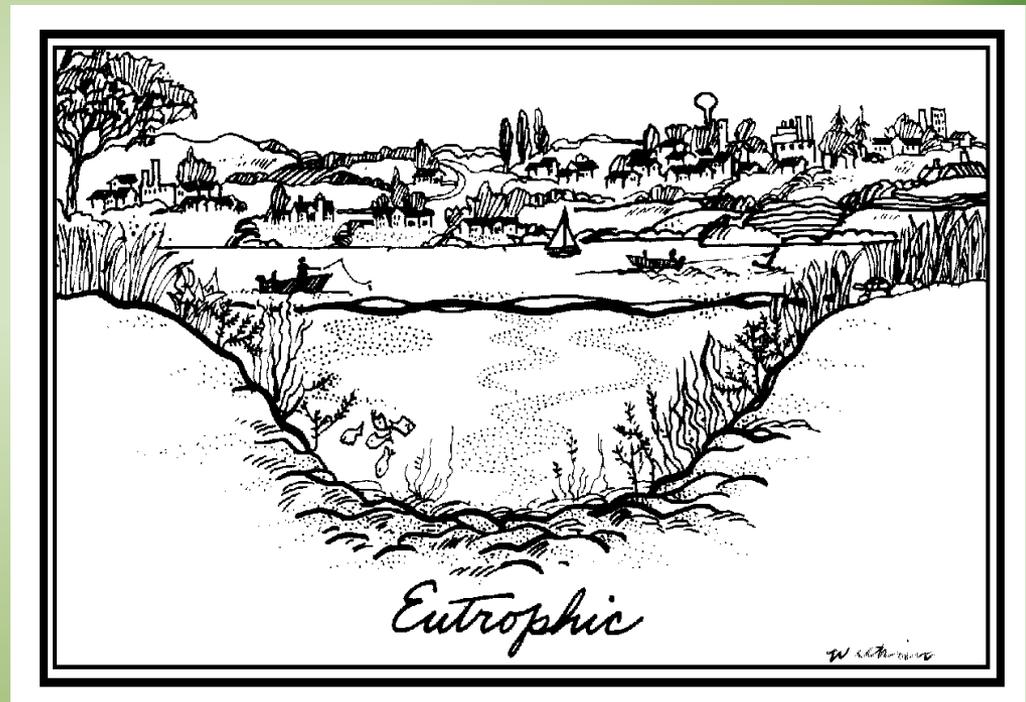
**Less clear water**



**Oxygen depletion**



**Internal loading**



# Phosphorus Impacts

Excess algae growth



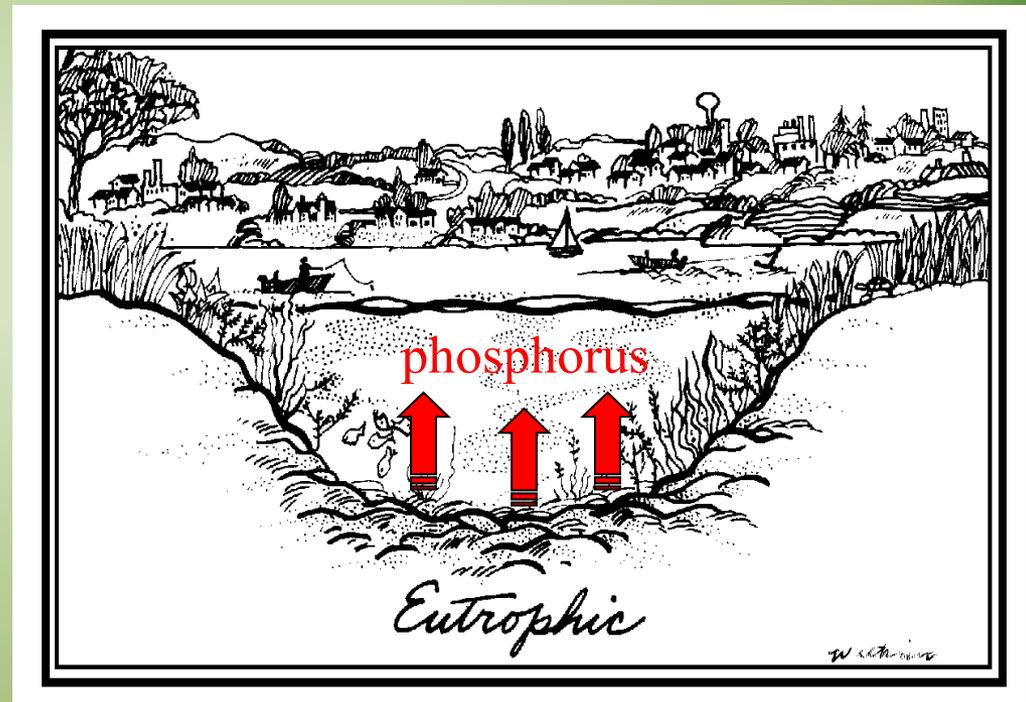
Less clear water



Oxygen depletion



Internal loading



# Phosphorus Impacts

**Excess algae growth**



**Less clear water**



**Oxygen depletion**



**Internal loading**



**Algae blooms**





## Experimental Lake Area Study Canada

- Top-to-bottom curtain divides lake in two
- Carbon and nitrogen added to one side; Carbon, nitrogen and phosphorus added to other side

# Experimental Lake Area Study Canada

**Less than 10 ppb  
Phosphorus**

**Greater than 20 ppb  
Phosphorus**

- Top-to-bottom curtain divides lake in two

- Carbon and nitrogen added to one side;  
Carbon, nitrogen and phosphorus added to other side

**Now we know what we are trying to  
protect and what we want to protect it  
from, but**

**HOW!!**

# Best Management Practices (BMPs)

- Best Management Practices, or BMPs, are landscaped features that help control runoff and stop/slow erosion on land.
- The goal is have runoff infiltrate into the ground where it can be “cleansed” or “filtered” by sediment before entering the waterbody.

# YCC – “Landscaping with a Purpose”

We install all sorts of erosion control features, including:

- Detention Basins
- Dripline Trench
- Dry Wells
- Erosion Control Mulch
- Infiltration Steps
- Open Top Culvert
- Paths and Walkways
- Rain Garden**
- Rubber Razors
- Turnouts
- Vegetated Buffers
- Waterbars



Transforming a road runoff issue  
into a lovely rain garden

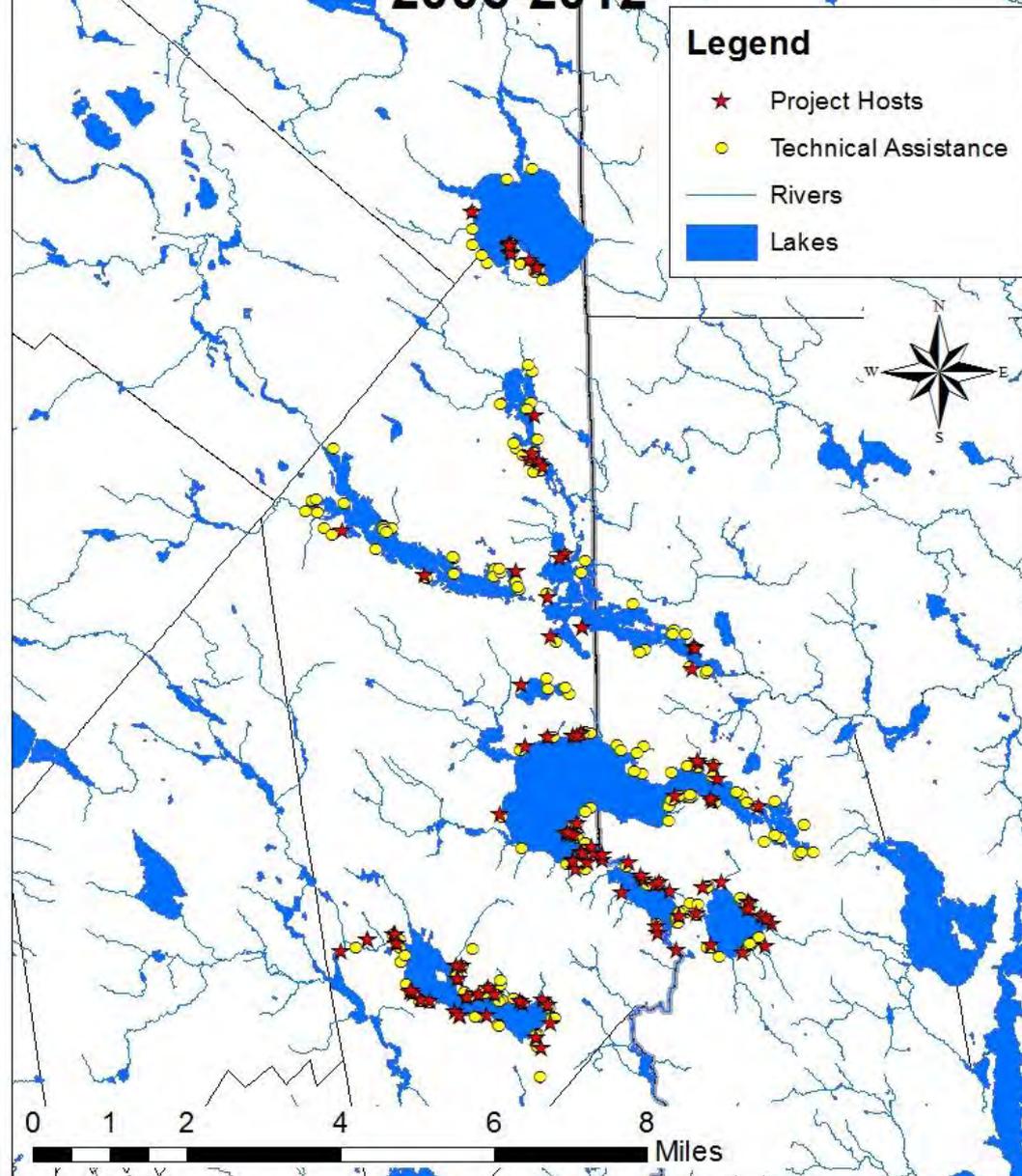
# YCC – By the Numbers

- Completed **123** projects on **10** lakes
- Completed another **230** technical assistance designs
- Installed **476** BMPs
- Stopped **244.4** tons of sediment and **207.3** lbs of phosphorus per year from entering the lakes



Transforming this.....to this!

# Acton Wakefield Watersheds Alliance Technical Assistance and Project Hosts 2006-2012



# Examples of BMPs



**Dripline Trench**

# Examples of BMPs



**Dry Well**

# Examples of BMPs



**Erosion Control Mix**

# Examples of BMPs



**New Infiltration Steps**

# Examples of BMPs



**Retrofit Infiltration Steps**

# Examples of BMPs



**Infiltration Trench**

# Examples of BMPs



**Open Top Culvert**

# Examples of BMPs



**Retaining Wall**

# Examples of BMPs



**Paths & Walkways**

# Examples of BMPs



**Buffer Strip**

# Examples of BMPs



**Native Vegetation**

# Examples of BMPs



**Rain Garden**

# Examples of BMPs



**Rubber Razors**

# Examples of BMPs



**Turnouts**

# Examples of BMPs



**Waterbars**

**A lot has been accomplished, but there is still a lot to do to keep our lakes clean!**

**Questions?**

Dustin Johnson – Program Manager

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