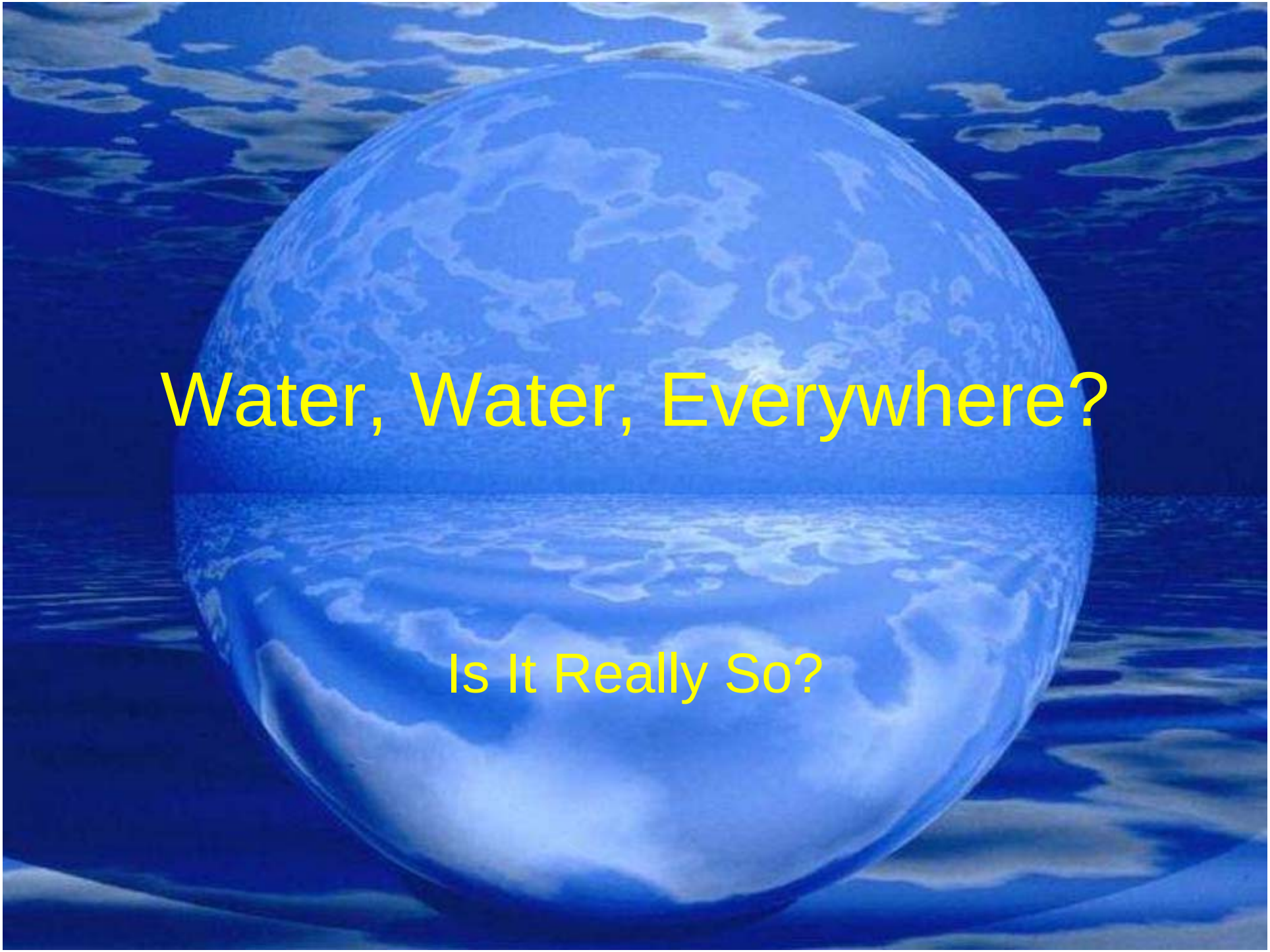
Water, Water, Everywhere?
Is It Really So?

Introduction

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Introduction

Urban Hydrology

- Hydrological Cycle
- Importance of near surface groundwater
- Influencing the hydrological cycle

Introduction

Urban Hydrology Around the Home

- Design ideas
- Landscaping ideas
- Plant and soil ideas
- Operation & Maintenance

Introduction

Future Considerations

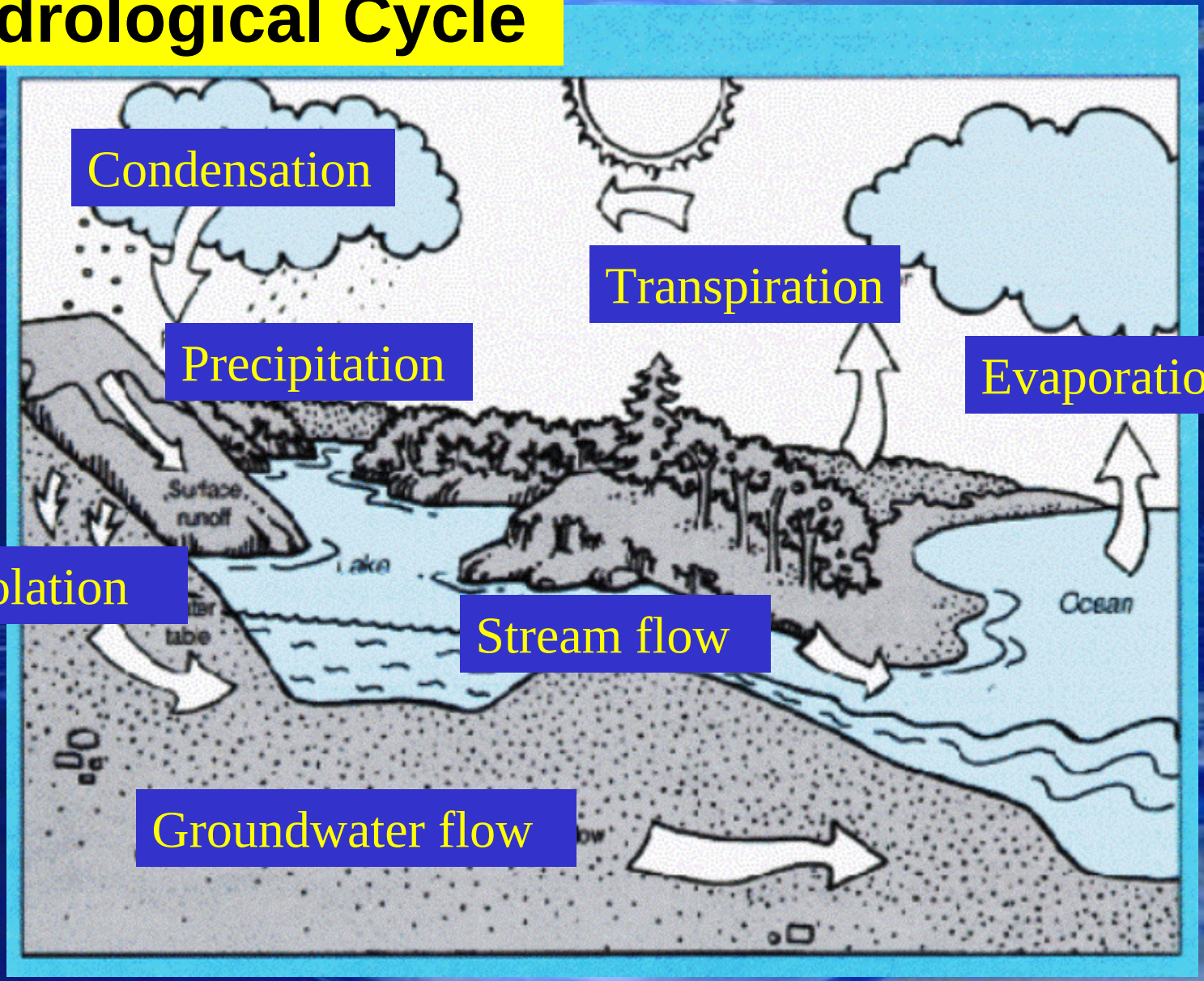
- Climate Change
- Policy & Bylaws
- Trends

Urban Hydrology

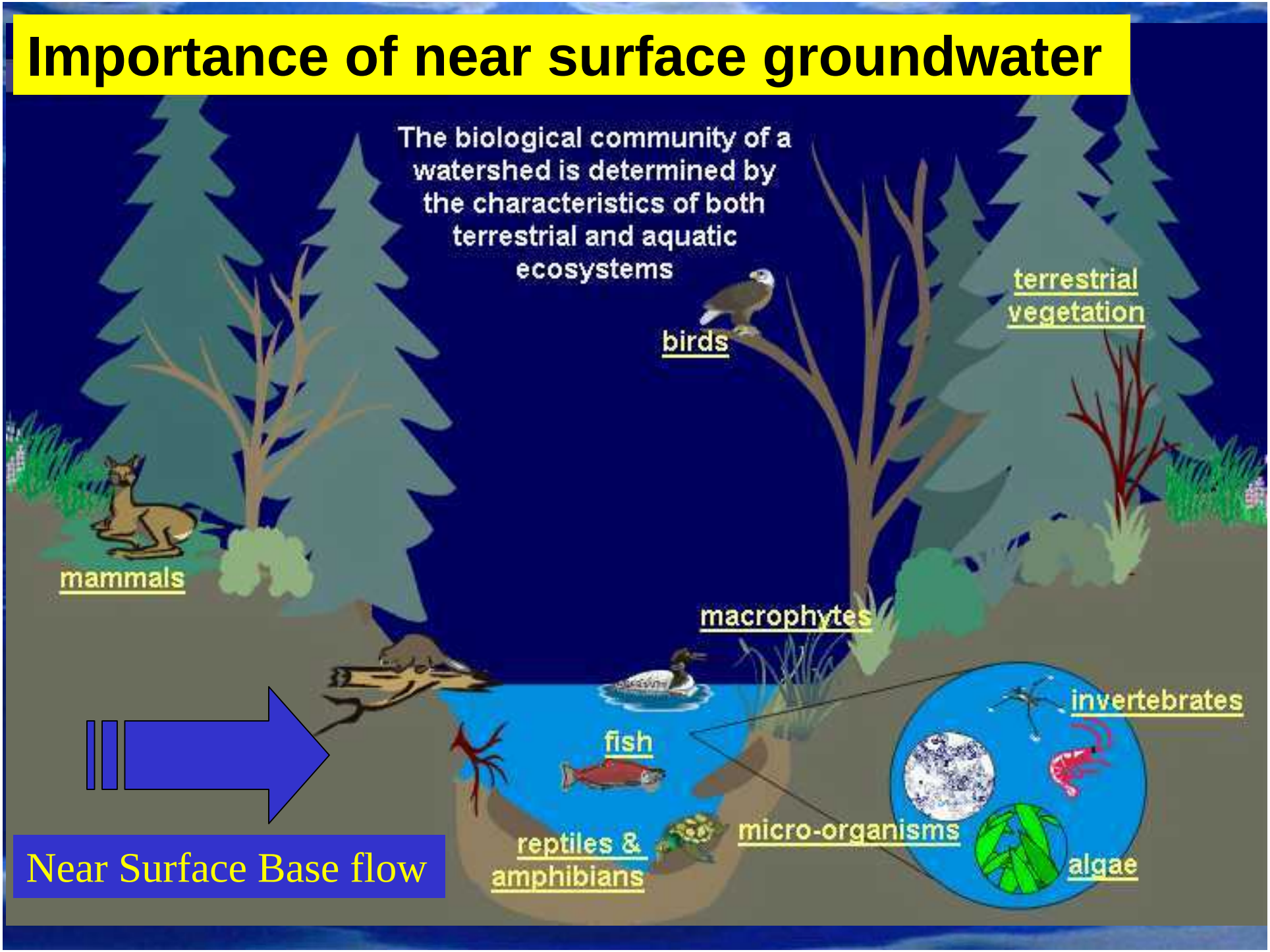
Hydrological Cycle

The process by which water, in liquid, solid and gaseous states, is cycled through the ecosystem within the hydrosphere

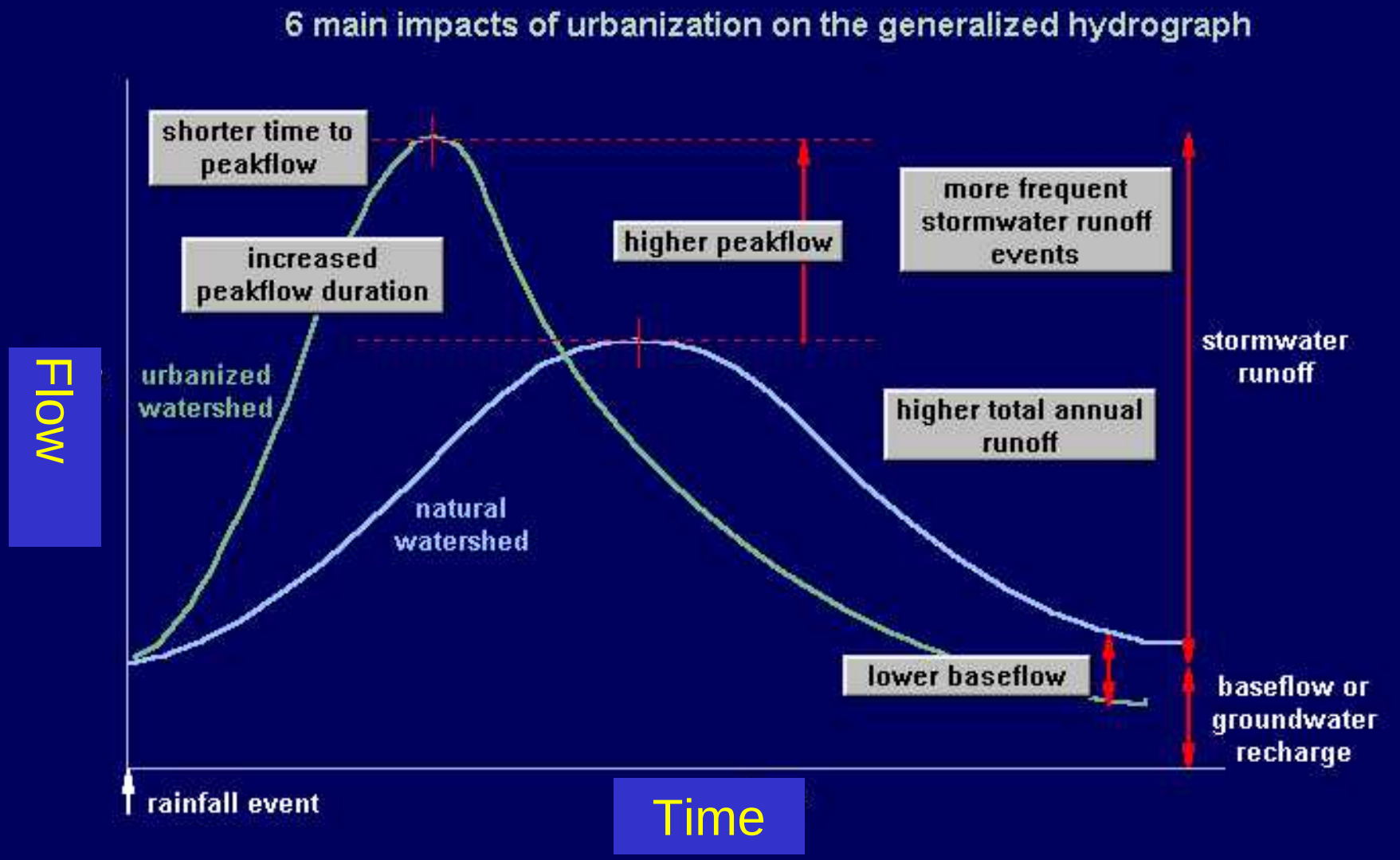
Hydrological Cycle



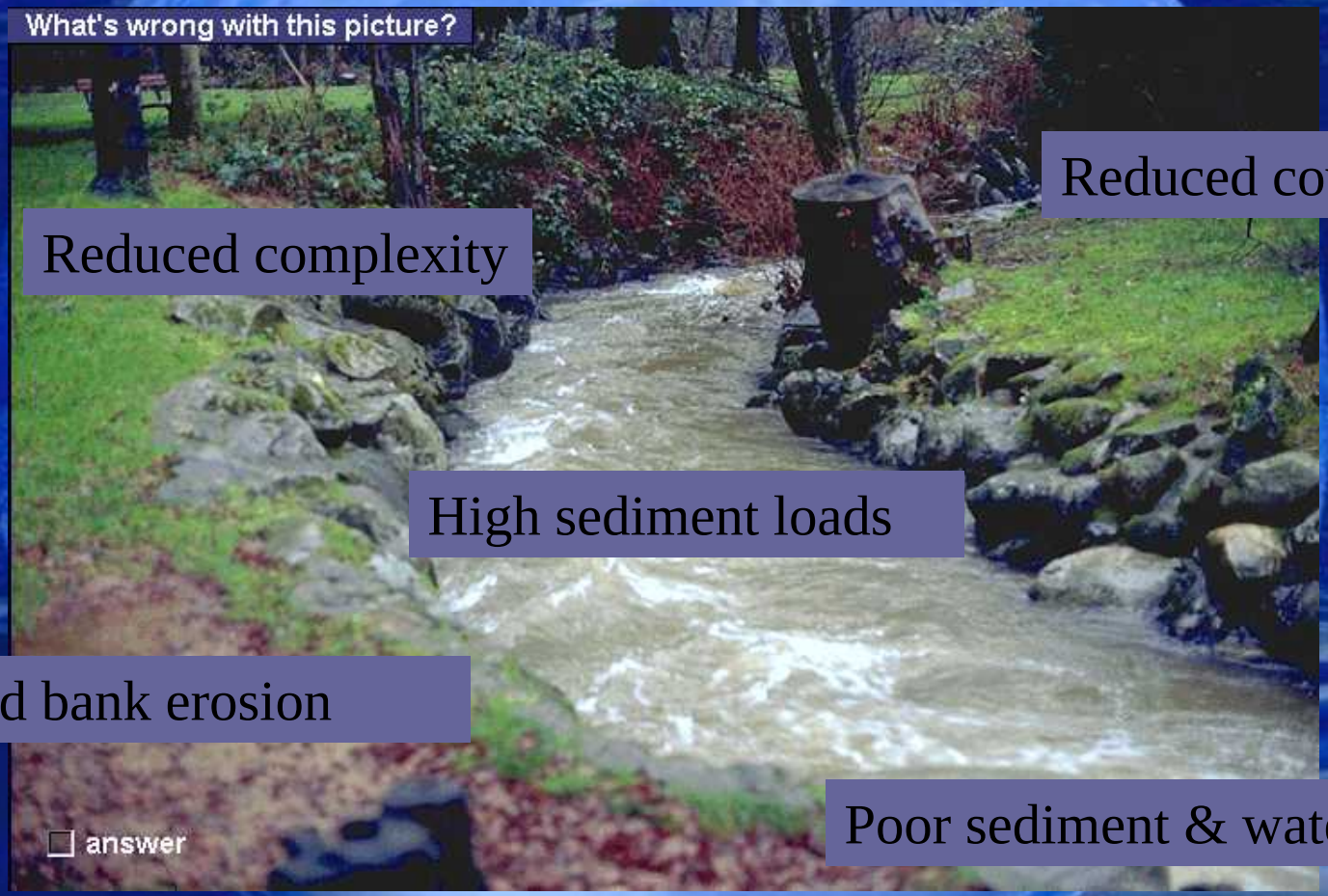
Importance of near surface groundwater



Influencing the hydrological cycle



Influencing the Hydrological Cycle



Reduced cover

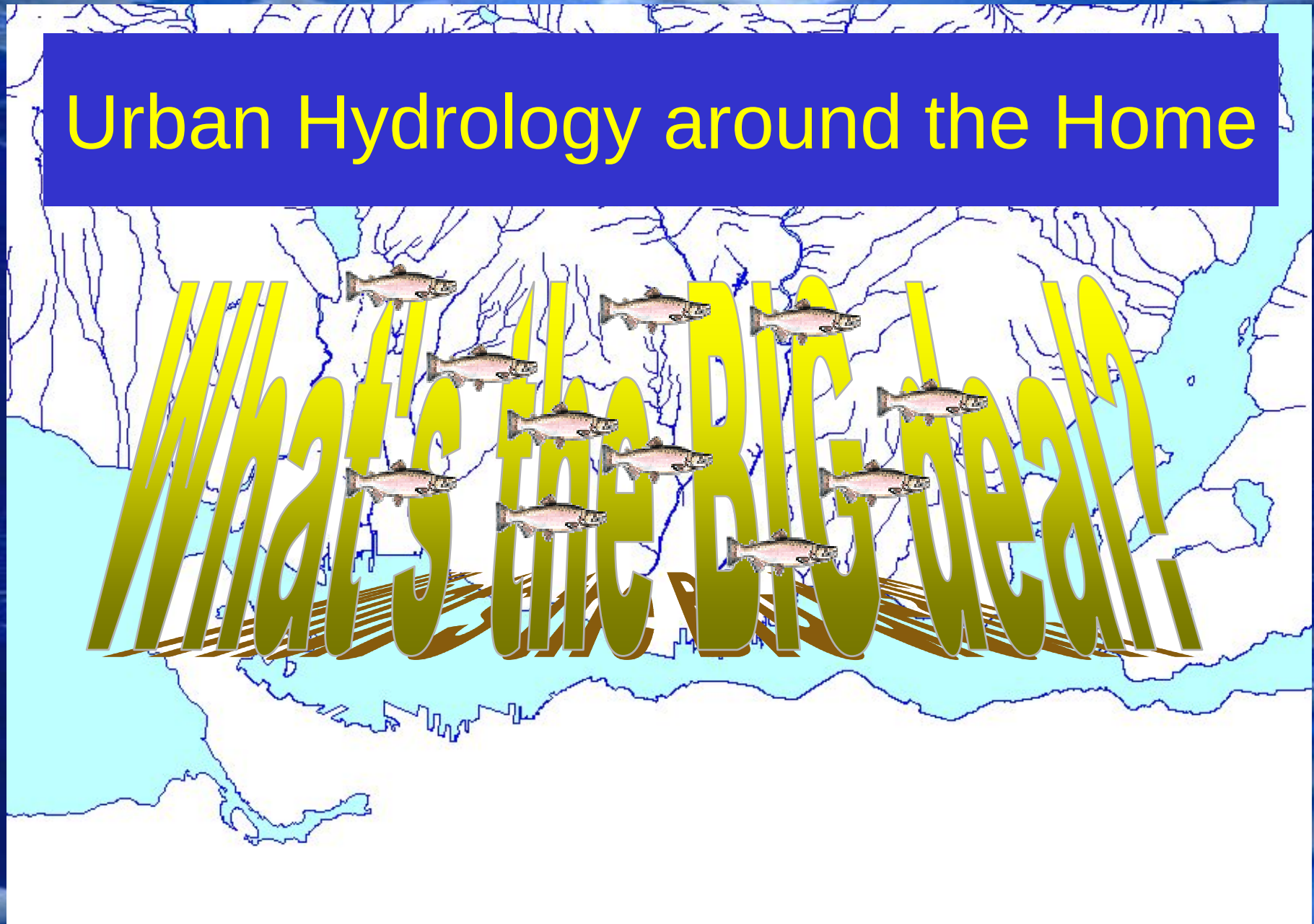
Reduced complexity

High sediment loads

Increased bank erosion

Poor sediment & water quality

Urban Hydrology around the Home

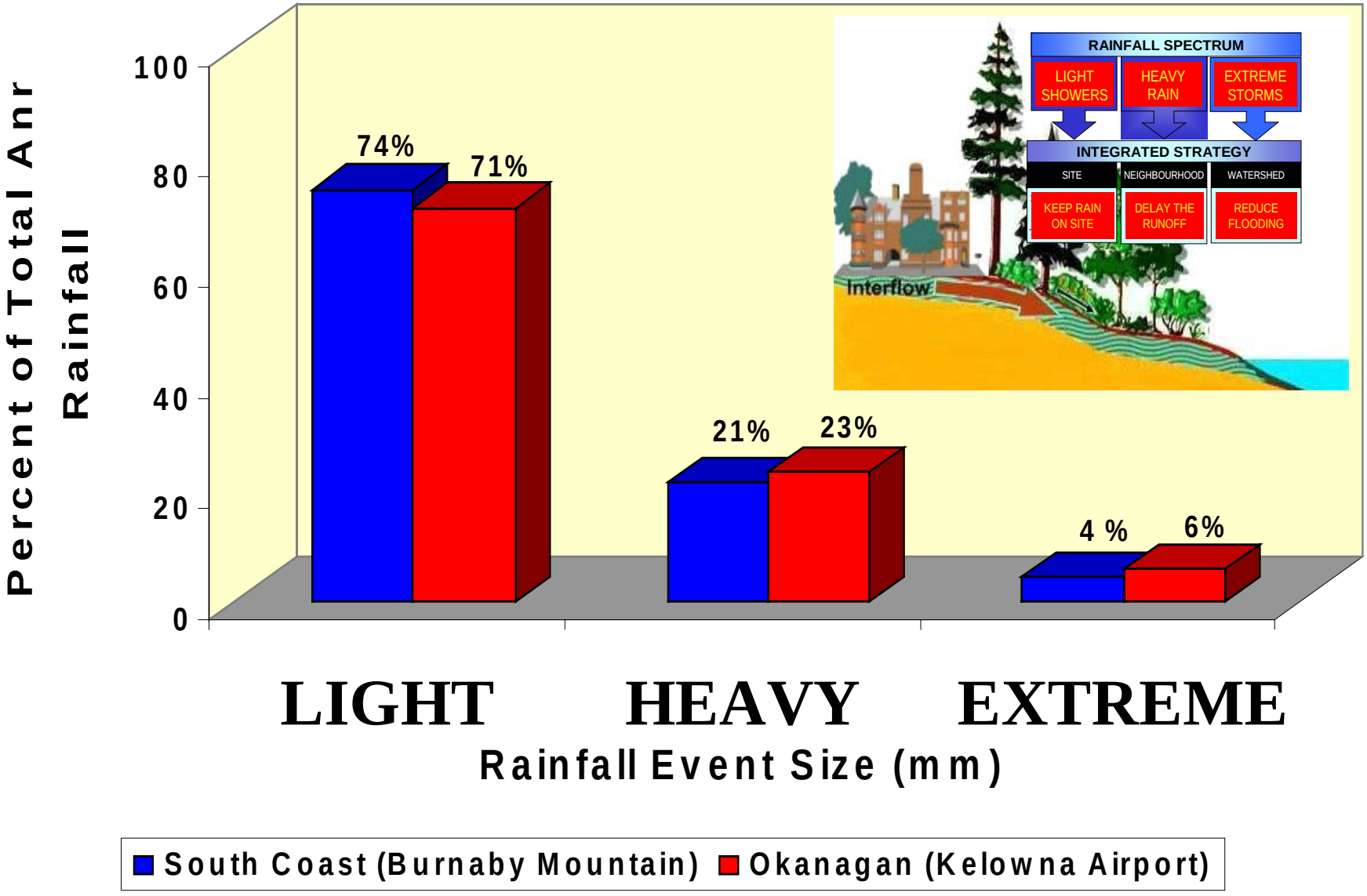


Urban Hydrology around the Home

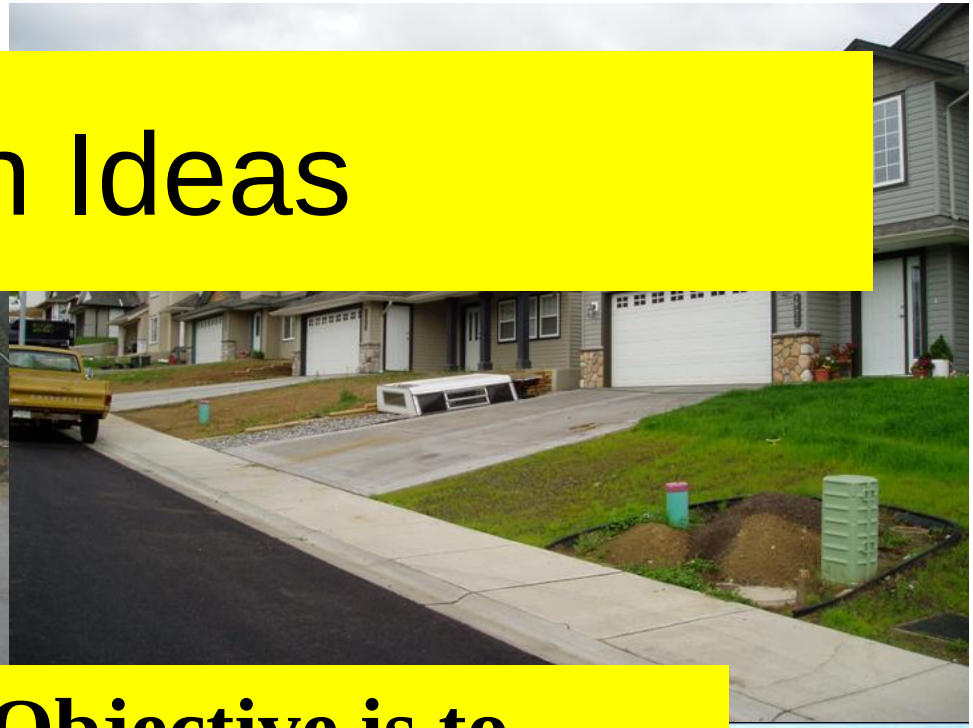
The single largest factor we can control, and make a difference with, is the landscaping in our yards.

Urban Hydrology around the Home

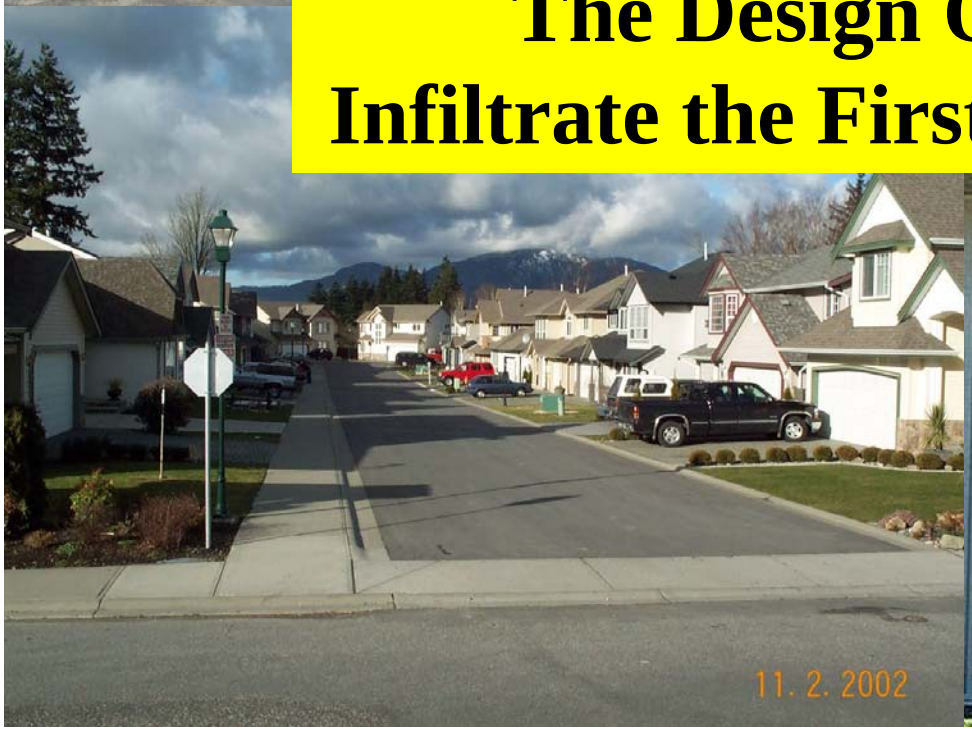
Typical Volume Distribution of Annual Rainfall



Design Ideas



The Design Objective is to Infiltrate the First 30mm of Rainfall



Home | About this Site

WATER Balance MODEL

CANADA | WATER BALANCE MODEL | RESOURCES | NETWORKING

Poll

From the list below, which item would you like to see added first to make the Water Balance Model more useful?

- More Climate Stations
- More Training
- Cascading Source Controls
- Tree Interception Losses
- Snowmelt
- Sediment Washoff

Cast vote

Partners

City of Chilliwack

Visit
City of Chilliwack

Events

WATER Balance MODEL
TRY THE MODEL

1. Enter the area of your site, add existing soil conditions, and land use information.
2. Create a graph of rainwater volume summaries and see how well your site performs.
3. Add a Green Roof or a Rain Garden or similar rainwater source control and compare before and after results.

DFO Embraces Water Balance Model

The **Department of Fisheries & Oceans (DFO)** has joined the British Columbia Inter-Governmental Partnership (IGP) that has been responsible for development of the Water Balance Model: "On behalf of the Water Balance Model Partners, we are pleased to welcome DFO to the IGP", announced Ted van der Gulik, the IGP Chair. "We now have representation plus financial contributions from three federal agencies – .....More

The Water Balance Model can be applied at Three Scales to achieve Watershed Protection and Community Liveability Objectives

Web Links

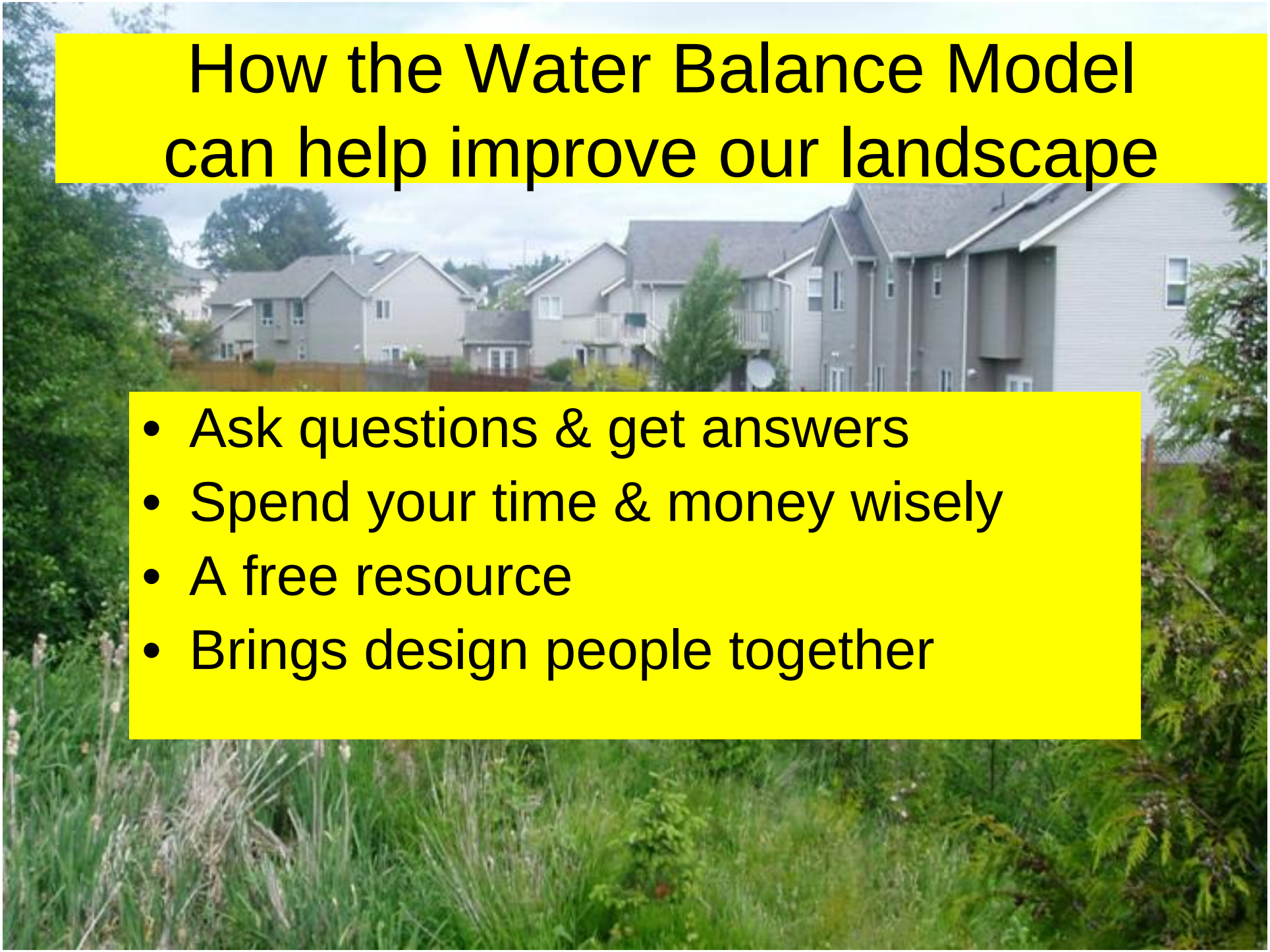
Random Selections...

Environment Agency: Water Resources
The Environment Agency has a duty to secure the proper use of water resources in England and Wales. We monitor water in the environment, and issue 'abstraction licences' to regulate who can take water from the environment. These specify the amount of water someone can take from a location over a period of time. We also have a long term strategy for Water Resources that looks 25 years ahead and considers the needs of both the environment and society.

Discussions

Newest Topic
»Welcome
Most active forums
»General Discussions
Most active topics
»Welcome

How the Water Balance Model can help improve our landscape

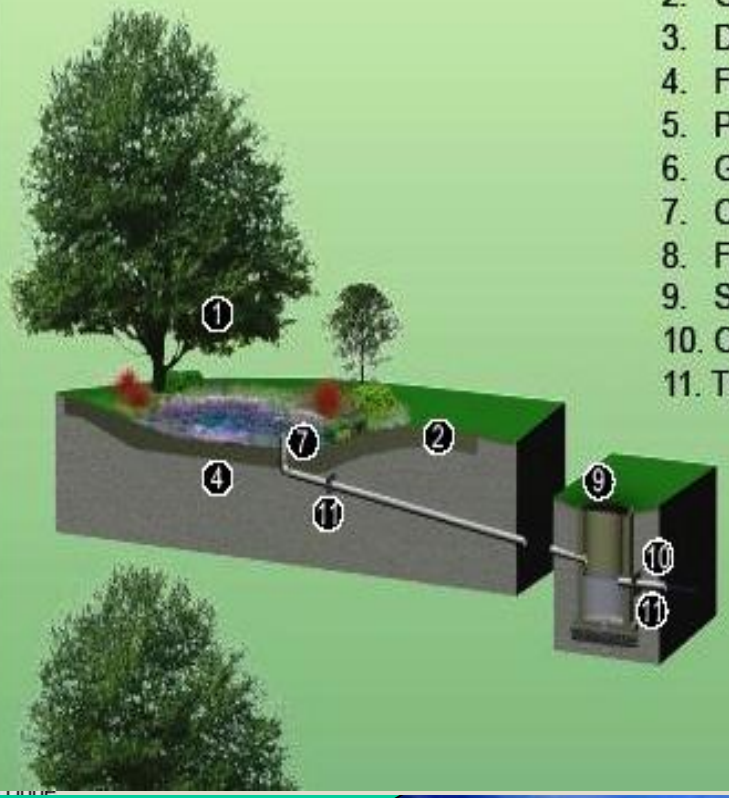


- Ask questions & get answers
- Spend your time & money wisely
- A free resource
- Brings design people together

WATER Balance

FAQ • Home

An **Infiltration Rain Garden** is a form of bioretention facility designed to have aesthetic appeal as well as a stormwater function. Rain gardens are commonly a concave landscaped area where runoff from roofs or paving infiltrates into deep constructed soils and subsoils below. On subsoils with low infiltration rates, Rain Gardens often have a drain rock reservoir and perforated drain system to convey away excess water.



1. Tree, Shrub and Groundcover Plantings
2. Growing Medium Minimum 450mm Depth
3. Drain Rock Reservoir
4. Flat Subsoil - scarified
5. Perforated Drain Pipe 150mm Dia. Min.
6. Geotextile Along All Sides of Drain Rock Reservoir
7. Overflow (standpipe or swale)
8. Flow Restrictor Assembly
9. Secondary Overflow Inlet at Catch Basin
10. Outflow Pipe to Storm Drain or Swale System
11. Trench Dams at All Utility Crossings

Full Infiltration

Where all inflow is intended to infiltrate into the underlying subsoil. Candidate in sites with subsoil permeability > 30 mm/hr. A overflow for large events is provided by pipe or swale to the storm drain system.

Design Ideas

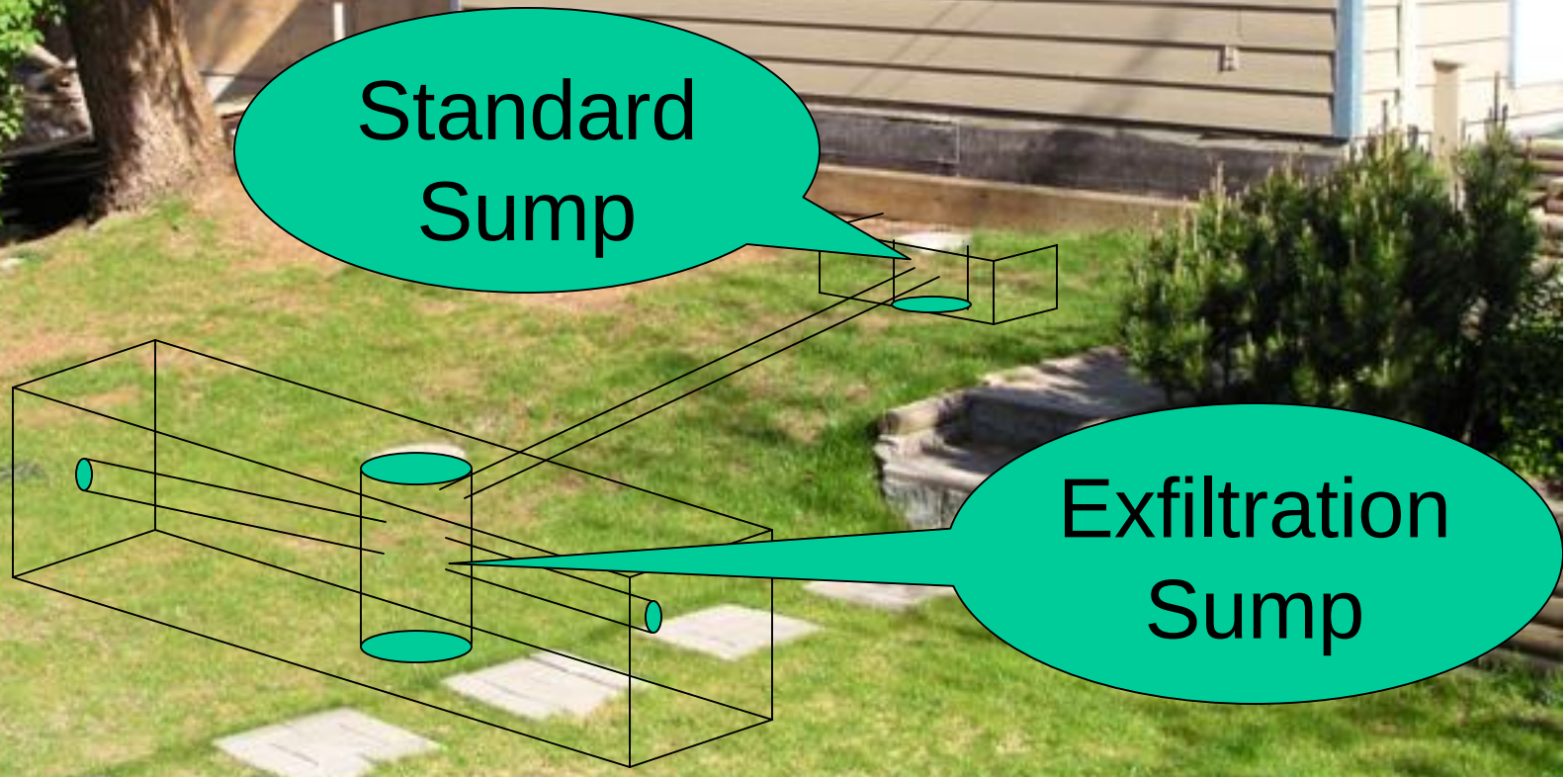
- Think NATURAL (Hydrological Cycle)

Design Ideas

700 square foot garage

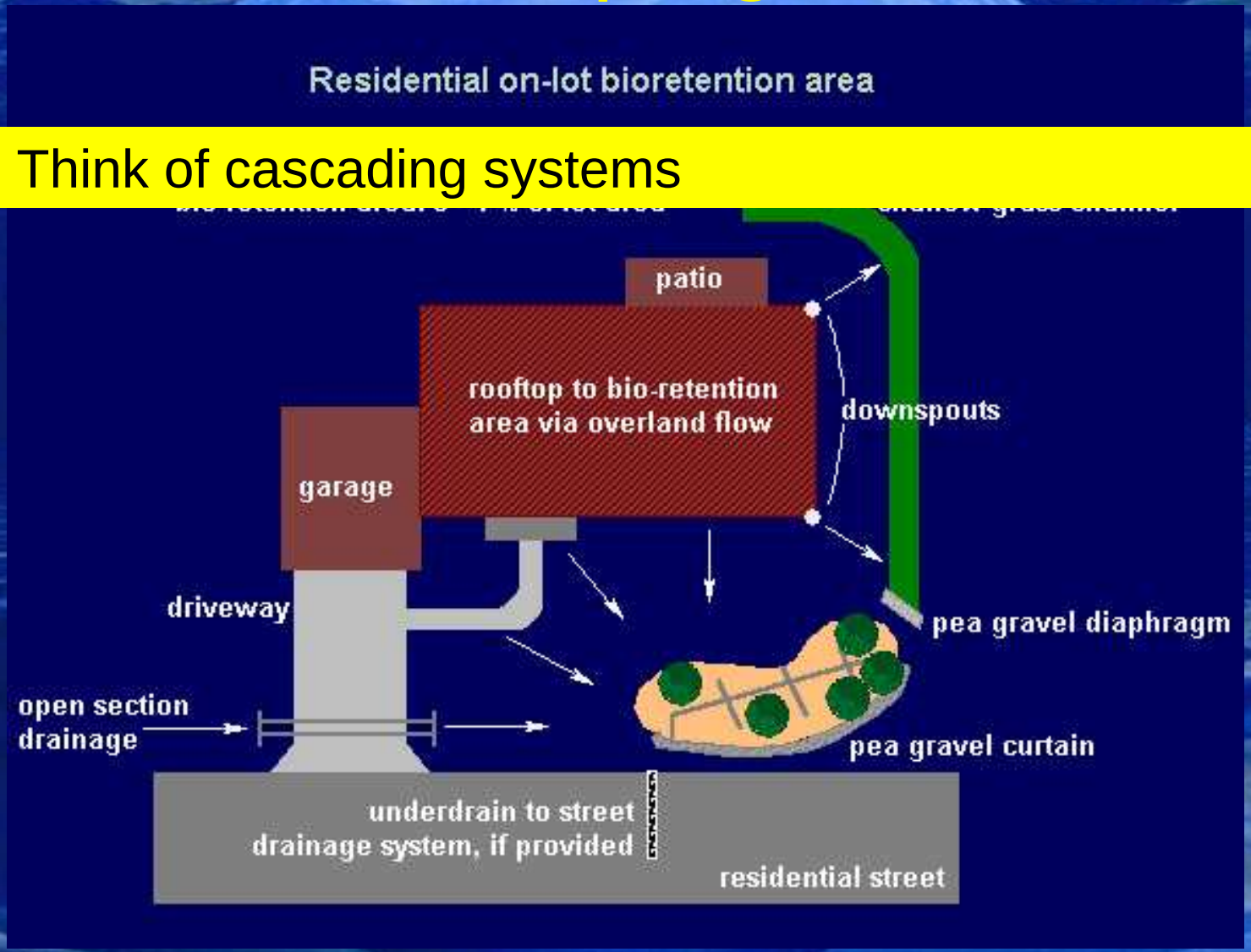
No storm connection at rear of property

Condition of permit



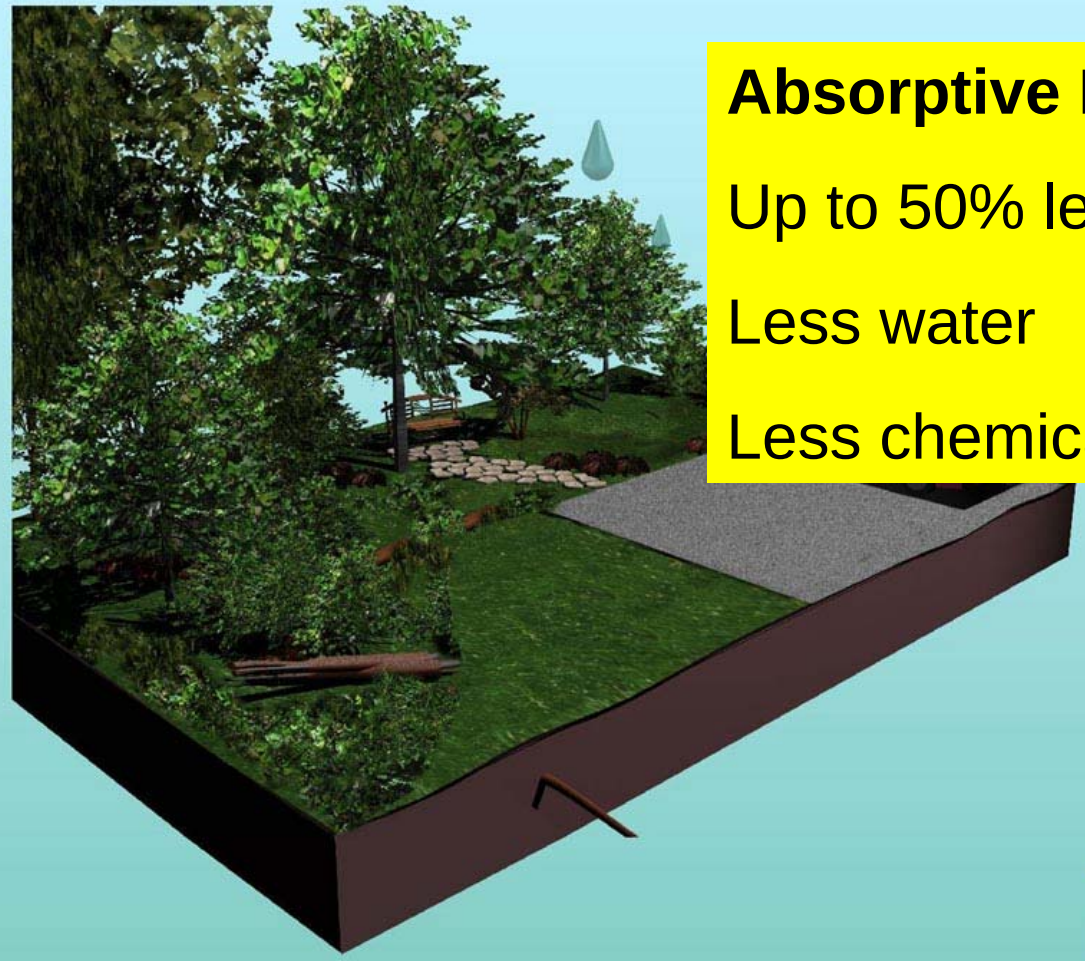
Landscaping Ideas

- Think of cascading systems




Practical Site Level Solutions
are Typically Landscape-based

Plant & Soil Ideas



Absorptive Landscapes

Up to 50% less runoff

Less water

Less chemicals

Plant & Soil Ideas

Plant & Soil Ideas

Compost and amended soils

- Adsorb more water, less run off
- Less weeds, less fertilizer, less competition for water
- Deeper root systems, healthier lawns

Plant & Soil Ideas

Plant & Soil Ideas

- Native species have adapted to our climate making them a (personal) first choice
- Asses your yard for wet areas, sandy areas, light areas then chose plants

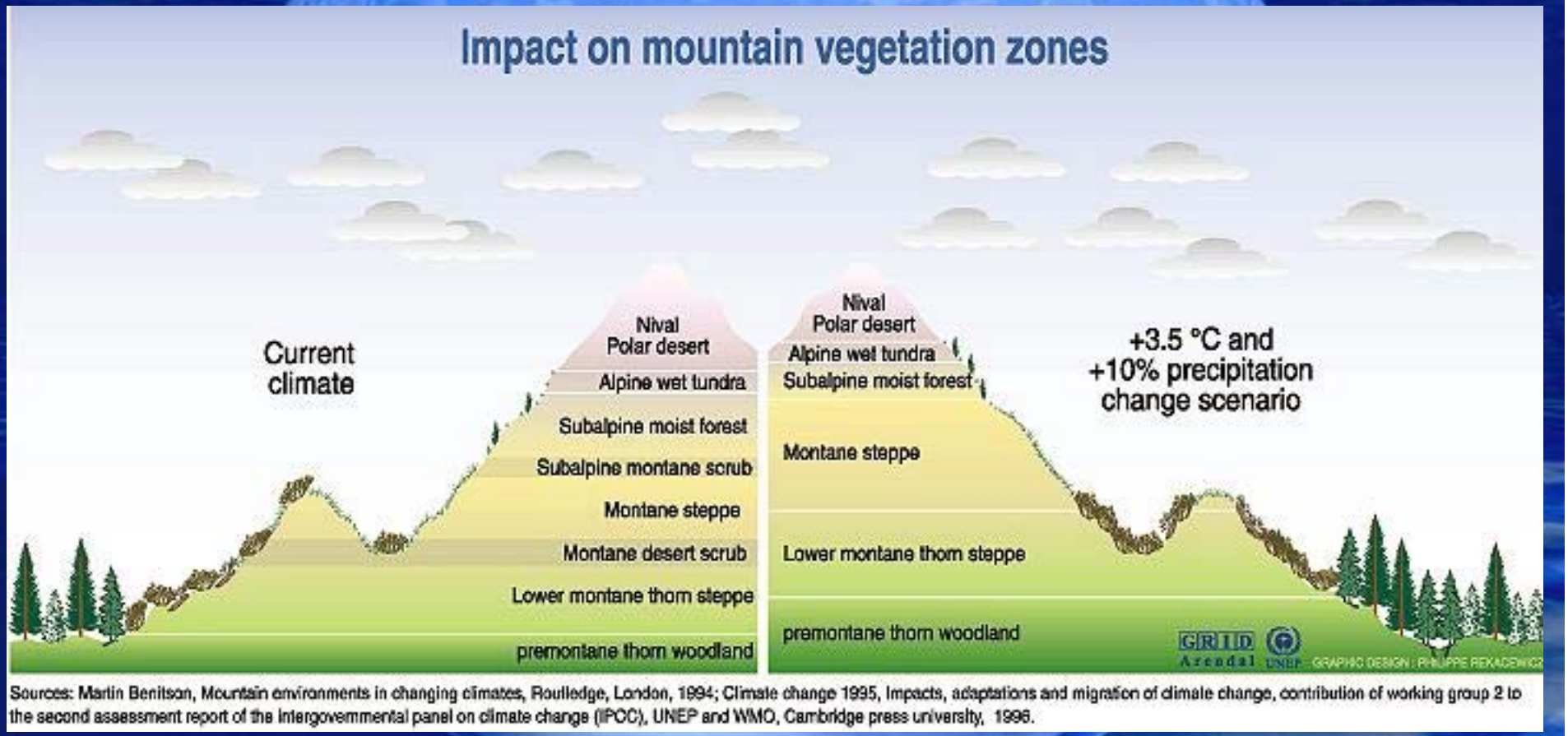
Future Considerations

Climate change

Policy & Bylaws

Trends

Future Considerations

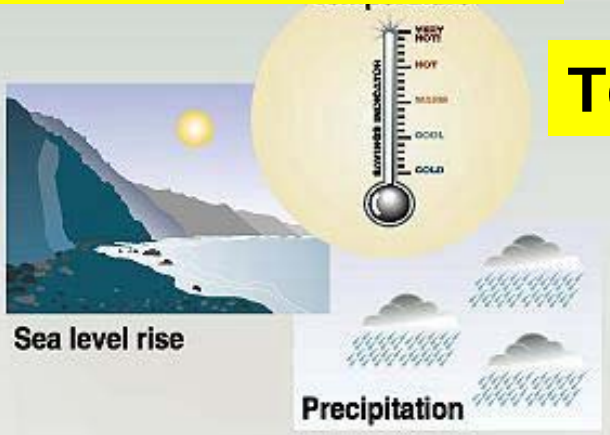


Sources: Martin Benitson, Mountain environments in changing climates, Routledge, London, 1994; Climate change 1995, Impacts, adaptations and migration of climate change, contribution of working group 2 to the second assessment report of the intergovernmental panel on climate change (IPCC), UNEP and WMO, Cambridge press university, 1996.

Future Considerations

Temperature rise

Sea level rise



More rain

Forest impact

Composition

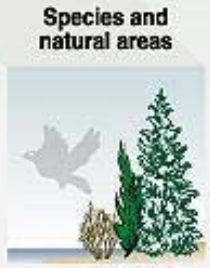
Range

Health & Productivity

Loss of species

Lower biodiversity

Less habitat



Water supply
Water quality
competition for water

Erosion of beaches
Inundation of coastal lands
additional costs to protect coastal communities

Loss of habitat and species
Cryosphere: diminishing glaciers

GRAPHIC DESIGN : PHILIPPE REKACEWICZ

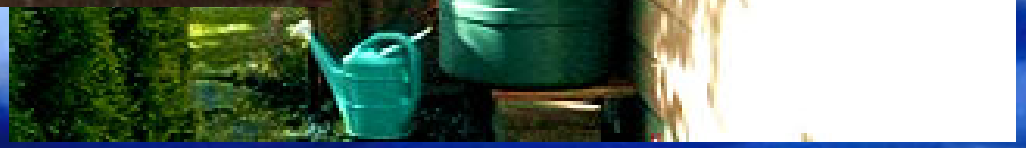
Source: United States environmental protection agency (EPA).

The City of Courtenay was the first municipality to adopt a Minimum Soil Depth Policy

Trends

More Local

Burnaby, Coquitlam, Delta, Langley City, Langley Township, Vancouver all have some form of rain barrel program



Trends

Natural Lawn Care

Composting & Mulching

Organic Gardening

Water wise gardening

Biological pest control

In Closing

70% of our water reserve falls in autumn & winter

Highest demand falls in July, typically we'll use 35% more water in July than December

Average consumption is $1x10^7$ L/day this can double on a hot summer day

Even a poor lawn only requires 2.5cm water once a week

Water early in the am, use sprinklers that produce drops rather than spray, water ONLY your lawn

Plants need more water than grass use a watering can

Aerate and add compost to your lawn

In Closing

Thanks to Liz Haan and the BC Master Gardener's Assoc.