


BRITISH COLUMBIA
The Best Place on Earth

Ministry of Environment




Perspectives on Flow Augmentation: A BC Provincial Perspective

Osoyoos Lake Water Science Forum
September 16 – 18, 2007

Brian Symonds, P. Eng.
Director of Regional Operations
Water Stewardship Division
BC Ministry of Environment

BRITISH COLUMBIA
The Best Place on Earth

Ministry of Environment



Methods of Augmenting Flows

- Modification of natural hydrographs within a basin through:
 - the storage and release of water from reservoirs
 - the diversion of between adjacent streams within a watershed
- Interbasin Diversions or Transfers

BRITISH COLUMBIA
The Best Place on Earth

Ministry of Environment




Using Storage to Modify of Natural Hydrographs

- Water diverted into storage during periods of surplus (i.e., spring freshet)
- Water released from storage when natural and human demands (i.e., irrigation, waterworks, fish, recreation, instream values, etc.) exceed water which is available naturally

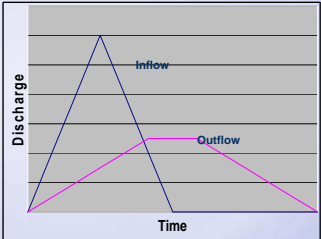


BRITISH COLUMBIA
The Best Place on Earth

Ministry of Environment



Use of Storage to Modify Natural Hydrograph



BRITISH COLUMBIA
The Best Place on Earth

Ministry of Environment



Storage in the Okanagan in Canada

- Number of dams - 357 (~ 180 reservoirs)
- Majority of dams in upland areas
- Mainstem Storage Reservoirs
 - Kalamalka/Wood Lake
 - Okanagan Lake
 - Skaha Lake
 - Vaseux Lake
 - Osoyoos Lake
- The largest reservoir is Okanagan Lake at 341 km² (131 mi²)



BRITISH COLUMBIA
The Best Place on Earth

Ministry of Environment



Okanagan Lake



Drainage area = 6,090 sq km
Surface area = 341 sq km
Average outflow = ~ 15 m³/s

BRITISH COLUMBIA
The Best Place on Earth

Ministry of Environment

Diversion of Water Between Adjacent Streams within a Watershed

- Typically diversions are located near the headwaters of a watershed to improve local management, treatment and distribution of water to users
- Maybe done to take advantage of desirable storage sites on adjacent streams

BRITISH COLUMBIA
The Best Place on Earth

Ministry of Environment

Modification of a natural hydrograph by providing storage or by diverting water between adjacent streams allows for more effective use of the water available but does not augment the total amount of water within a basin.

BRITISH COLUMBIA
The Best Place on Earth

Ministry of Environment

Interbasin Diversions or Transfers

- Increase the water available within the receiving basin but decrease water in source basin
- Some of the factors to consider include:
 - Impact of reduced flows in source basin
 - Engineering feasibility
 - Economic considerations
 - Water quality impacts
 - Fisheries and other environmental considerations
 - Legal constraints or requirements
 - Political & social considerations

BRITISH COLUMBIA
The Best Place on Earth

Ministry of Environment

BC Water Protection Act (1996)

- Prohibits any new large scale transfers of water between major watersheds in BC
- Large scale transfers defined as "a project to divert or extract a peak instantaneous flow of 10 m³ or more a second of water"
- Prevents the issuance of licences for the bulk removal or export of water from BC


BRITISH COLUMBIA
The Best Place on Earth

Ministry of Environment

Local Interbasin Transfers

- ~ 130 l/s Fortune Ck (Shuswap) Armstrong/Spallamacheen
- ~ 1000 l/s Duteau Ck (Shuswap) NORD
- ~ 18 l/s Alocin Ck (Nicola) Westbank ID
- ~ 100 l/s Kettle River tribs. SEKID

(Note: Average net outflow from Okanagan Lake ~ 15,000 l/s)



BRITISH COLUMBIA
The Best Place on Earth

Ministry of Environment

Shuswap River – Okanagan Lake Water Supply Canal

- In the 1960's the province researched a number of options to augment water supplies in the Okanagan during dry years by diverting water from Shuswap River upstream of Enderby into the north end of Okanagan Lake
- Due to economic, social and environmental considerations the project has never proceeded beyond this stage



Questions ?

Brian Symonds
Ministry of Environment
102 Industrial Place
Penticton, BC V2A 7C8
Brian.Symonds@gov.bc.ca