

Assessing the **Water Quality Benefits of BMPs** -- at Watershed Scale Across Canada

-- the '*WEBs*' Project

(Watershed Evaluation of BMPs)

AAFC, Ducks Unlimited
& other partner agencies

www.agr.gc.ca/env/greencover-verdir/

May 2006



South Tobacco Ck, MB

How Well Does BMP Programming Pay?

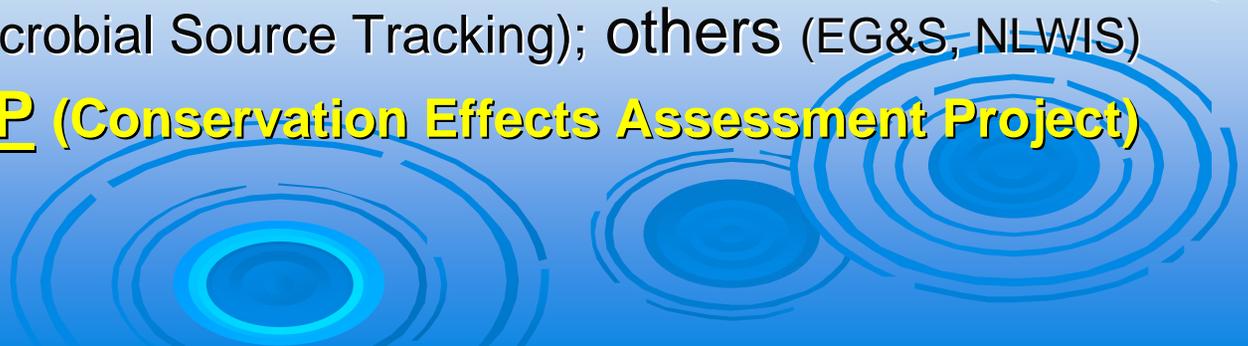
Past 20 yrs, 5 major programs (\$180 M)

Greencover Canada	2004-2008	~ 280 K ha (land conversion)	\$110 M
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- Very little watershed testing of BMP effect
- Estimates are largely based on model extrapolations
- *Ultimately, we need to identify those BMPs & lands that will give the greatest return on investment*

WEBs Objectives:

- Evaluate the environmental and economic performance of BMPs
 - *Begin* the process.
- Water quality as primary indicator
 - Predict, apply BMPs, validate
- Correlate with other agencies & studies
 - AAFC/NAHARP (indicators); EC/NAESI (standards);
 - HC-MST (Microbial Source Tracking); others (EG&S, NLWIS)
 - **USDA/CEAP (Conservation Effects Assessment Project)**

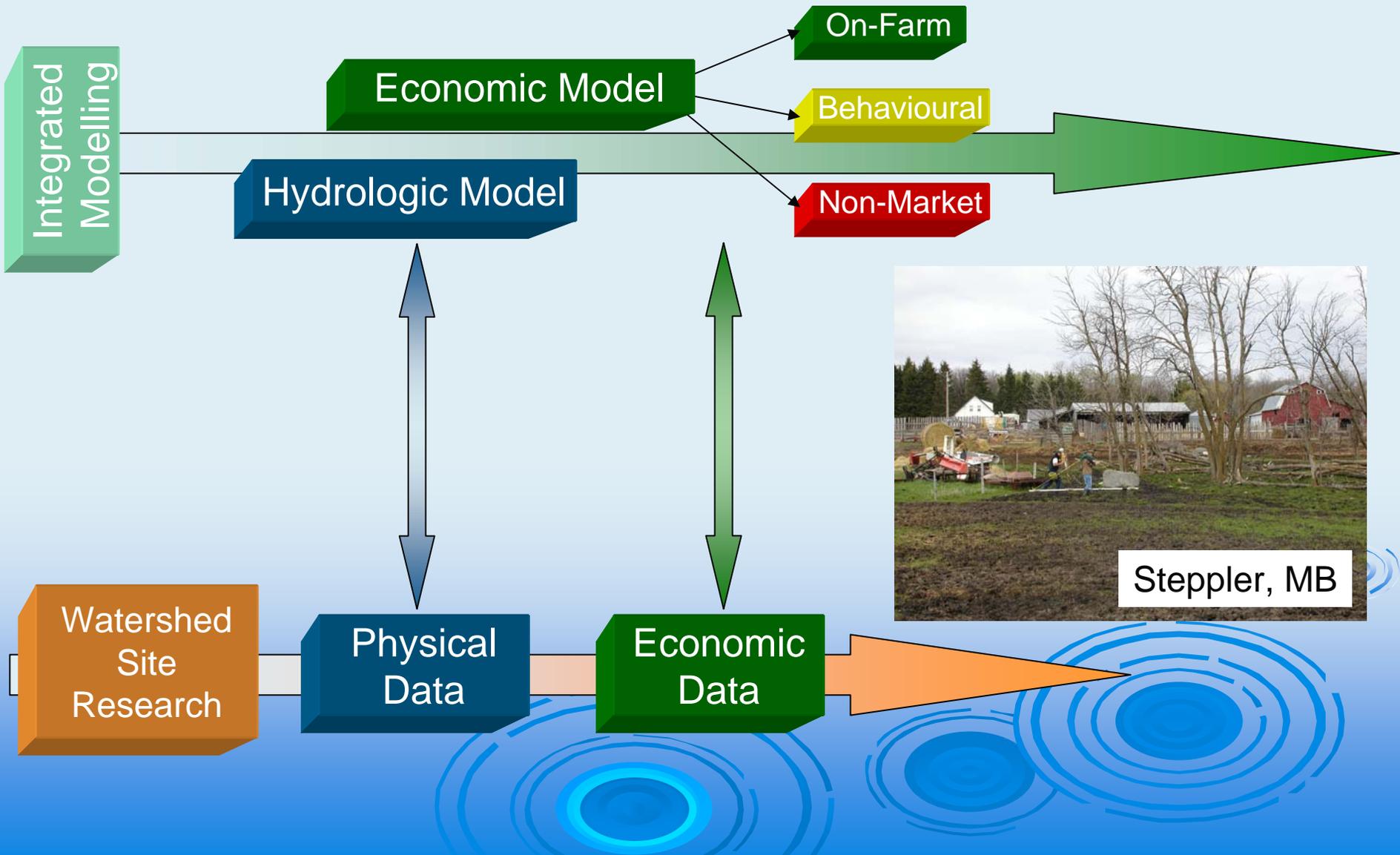


Our Watershed Approach

- **Carefully selected watersheds**
 - AAFC-led team, key regional partners
 - existing long-term sites
 - known runoff data sets
- **In-field Methodology**
 - environmental (BMP) effect
 - economic (farm/public) analysis
 - hydrologic (SWAT-style) model
 - integrate through modelling
 - **pilot studies, scaling-up**



WEBs - *Integrated Economic & Environmental Impact*



WEBs – 7 Regional Project Sites

→ factsheets



WEBs - BMPs Applied, by Watershed

BMPs Under Evaluation (Grouped by management focus)	SR BC	LLB AB	STC MB	SN ON	Bd'H QC	BB NB	TB NS
1. Riparian – exclusion fencing	✓	✓		✓			✓
2. Riparian – rotan'l grazing / mech. harvest			✓				
3. Riparian – off-stream watering	✓	✓		✓			
4. In-field – manure mgt (distrib / applica)	✓	✓		✓	✓		✓
5. In-field – tillage (zero vs. conventional)			✓				
6. In-field – crop rotation / permanent cover		✓	✓		✓		
7. In-field – reduced herbicide use	<u>Not</u> a test of BMP effect across watersheds				✓		
8. Runoff – grassed waterways						✓	
9. Runoff – diversions (in-field / farmstead)						✓	✓
10. Runoff – effluent holding pond			✓				
11. Runoff – buffer strip / shelterbelt		✓			✓	✓	
12. Runoff – small reservoir retention			✓				
13. Drainage – controlled tile outlet				✓			

Current Project Status

- **Environmental (BMP) effects**
 - all sites are up and operational (historic vs. newer sites)
 - monitoring & evaluation is ongoing
- **Economics assessment**
 - on-farm studies are underway (workshop Dec '05)
 - protocols & procedures being finalized
 - (farm behavioural and public good aspects yet to come)
- **Hydrologic (SWAT-style) Modelling**
 - current emphasis is on the pilot projects
 - application to other sites is proceeding
- **Integrated Modelling**
 - agreements with 3 universities (pilot sites)
- **Ongoing multi-agency cooperation**
 - multi-disciplinary work.



Black Brook, NB

Parameter List - Water Chemistry

List of Water Chemistry	Detection Limit mg/l
Carbon	
Carbon Dissolved Organic	0.1
Carbon Particulate Organic	0.01
Nitrogen & Phosphorus	
Ammonia Dissolved	0.005
Nitrogen Dissolved NO3 & NO2	0.01
Nitrogen Particulate	0.01
Nitrogen Total Dissolved	0.01
Phosphorus Total	0.002
Phosphorus Total Dissolved	0.002
Other	
Non-Filterable Residue	1.0
Conductivity	0.1 uS/cm
E-Coli	



WEBs Project Management

➤ Overview Management Committee

- Various AAFC departments, Environment Canada, Ducks Unlimited, Fed/Prov Working Group

➤ Technical Committee (day-to-day)

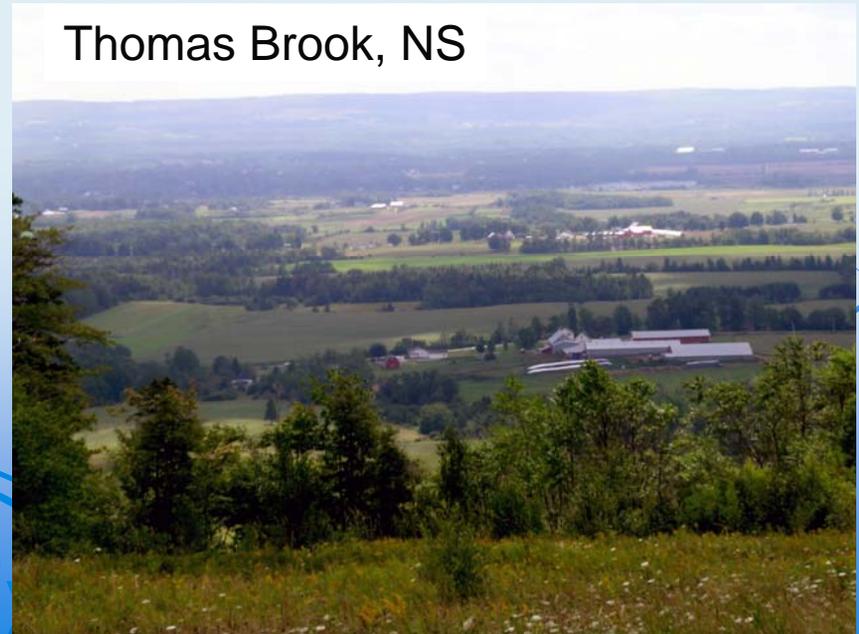
- 7 Watershed Leads, Ducks Unlimited, AAFC Ag-Indicators, 3 Subcommittee Chairs
 - **Communications**
 - **Economics**
 - **Integrated Modeling**



Site Approvals Process

- **Spring 2003** – ‘Terms of Reference’
 - federal, provincial & NGO input
 - began to identify potential watersheds
- **December '03**
 - AAFC-wide call for proposals
 - Full internal & peer review
- **March 2004**
 - regional projects approved
 - **site work initiated**

Thomas Brook, NS



WEBs Budget

➤ Site establish. (BMPs, monitoring)	15 %	
➤ Operate expenses (access, data)	30 %	
➤ Sci. staffing (<u><i>non-permanent</i></u>)	30 %	<hr/>
		\$5,56 M
➤ Communications	} 25%	
➤ Economics		
➤ Integrated Modeling		
➤ Project mgt, annual review		
	<03%	<hr/>
➤ Total		\$7,40 M
➤ <i>Other cash and in-kind contributions</i>		\$1,41 M
➤ Grand Total		\$8,87 M

AAFC 70% (\$6.21 M); DUC 14% (\$1.25 M); Others 16% (\$1.41 M)

Relationship to Other Programs

- Environmental Outcomes & Targets
 - NAHARP indicators, EC/NAESI standards
 - Integrated modelling (econ. & environmental)
- BMP Applications & Data Collection
 - HC-MST (Microbial Source Tracking)
 - APF scans, EFP, FEMS
- Strategies and Information Systems
 - **EG&S; NALS; NLWIS**

