GPI Atlantic

Genuine Progress Index for Atlantic Canada
Indice de progrès véritable - Atlantique

Measuring Community Wellbeing

Measuring What Matters
Dundee, Scotland
27 March, 2009

3 Themes Today

- Measurement as a powerful tool to engage communities
- Economic valuation as powerful means to engage policy makers
- Relevance and utility in current economic downturn

GPIAtlantic.org

Indicators are Powerful

What we measure:

- reflects what we value as a society;
- determines what makes it onto the policy agenda (e.g volunteers);
- influences behaviour (students): & What we don't count doesn't get attention

GPIAtlantic.org

A good set of indicators can help communities:

- foster common vision and purpose;
- identify strengths and weaknesses;
- hold leaders accountable at election time
- evaluate which programs are working or not
- initiate actions to promote wellbeing; + agreed targets can change public behaviour

GPIAtlantic.org

What kind of community are we leaving our children...?

- Community safety, trust – "Do you feel safe...?"
- Health vs sickness
- Decent living standards vs poverty; equity
- Educated vs ignorant
- Clean air, safe drinking water, healthy envt. vs pollution, health hazards
- Time balance (paid/voluntary/free) vs stress
- Strong communities, social supports

= Consensus values - Beyond politics & ideology

GPIAtlantic.org

Counting it Wrong

- Resource depletion as economic gain
- Negatives can make economy grow
- Unpaid work counts for nothing
- How much income/wealth but not how it's distributed

-> Misleading signals to policy makers and general public (e.g. GHGs)

GPIAtlantic.org

Therefore – In the GPI:

- Natural wealth, health, free time, unpaid work, and education have value
- Sickness, crime, disasters, pollution are costs
- Reductions in greenhouse gas, crime, poverty, ecological footprint are progress
- Growing equity signals progress

GPI Atlantic = Non-profit, fully independent, NS-based research and education organization founded April, 1997. Web site: www.gpiatlantic.org

GPIAtlantic.org

Provincial -> Community

- Where rubber hits road in QOL; BUT Statcan data not available at comm. level
- Kings County, Glace Bay – Contrasting communities - ***Consultations***, survey design
- 2+ hours; Sample size = 3,600 (2 cross-tabs – 95% +/- 3%); Statcan oversight
- Response rate = 70+% Kings; 82% GB

GPIAtlantic.org

Survey components include:

- Economic wellbeing – including income, employment and job characteristics
- Subjective wellbeing: life satisfaction, happiness
- Core values and guiding life principles
- Social supports and networks, formal and informal volunteering, and care-giving
- Health status, incl. self-reported health, chronic disease prevalence, activity limitations, and prevention (e.g. mammograms, blood pressure tests)

GPIAtlantic.org

- Lifestyle behaviours, incl. smoking, diet, physical activity
- Mental health, including cognitive ability, stress, and depression
- Children's health, including health status, mental health, cognition, and chronic conditions
- Environmental behaviours (e.g. transportation patterns) and ecological attitudes
- Safety and security, including victimization rates and subjective feelings of safety.

Full survey – see: GPIAtlantic.org

Each category has several indicators (results in charts)

E.g. employment section will have results on:

- Unemployment (short + long-term)
- part-time employment
- work schedules
- job characteristics
- multiple job holding
- discouraged workers
- proportion of jobs with employee benefits

GPIAtlantic.org

Sample results: Economic Security

	Glace Bay	Kings
Unemployed	26.4	12.7
Discouraged	40.9	16.3
Multiple Jobs	5.1	11.0
% Households <$20,000	28	14

GPIAtlantic.org

Life-Satisfaction (+ Happiness)

	Glace Bay	Kings
Very Satisfied	40.3	39.4
Somewhat Satisfied	50.3	53.4
Dissatisfied	9.3	8.2

GPIAtlantic.org

Health Status

- No significant difference in self-reported health
- GB had higher rates of disabling pain, chronic diseases, smoking
- Strong relationship to income and employment in both communities
- Low vs high incomes = 3x rates of severe pain, discomfort, daily smoking, health-related activity limitations; 2x HBP, arthritis, chronic diseases. U.e.: ½ as likely satisfied as w. jobs

GPIAtlantic.org

Very good to excellent health % cf across income + GB/Kings

	-20000	20000-34999	35000-49999	50000-69999	70000+
Glace Bay	33	46	55	58	73
Kings	30	41	52	60	67

GPIAtlantic.org

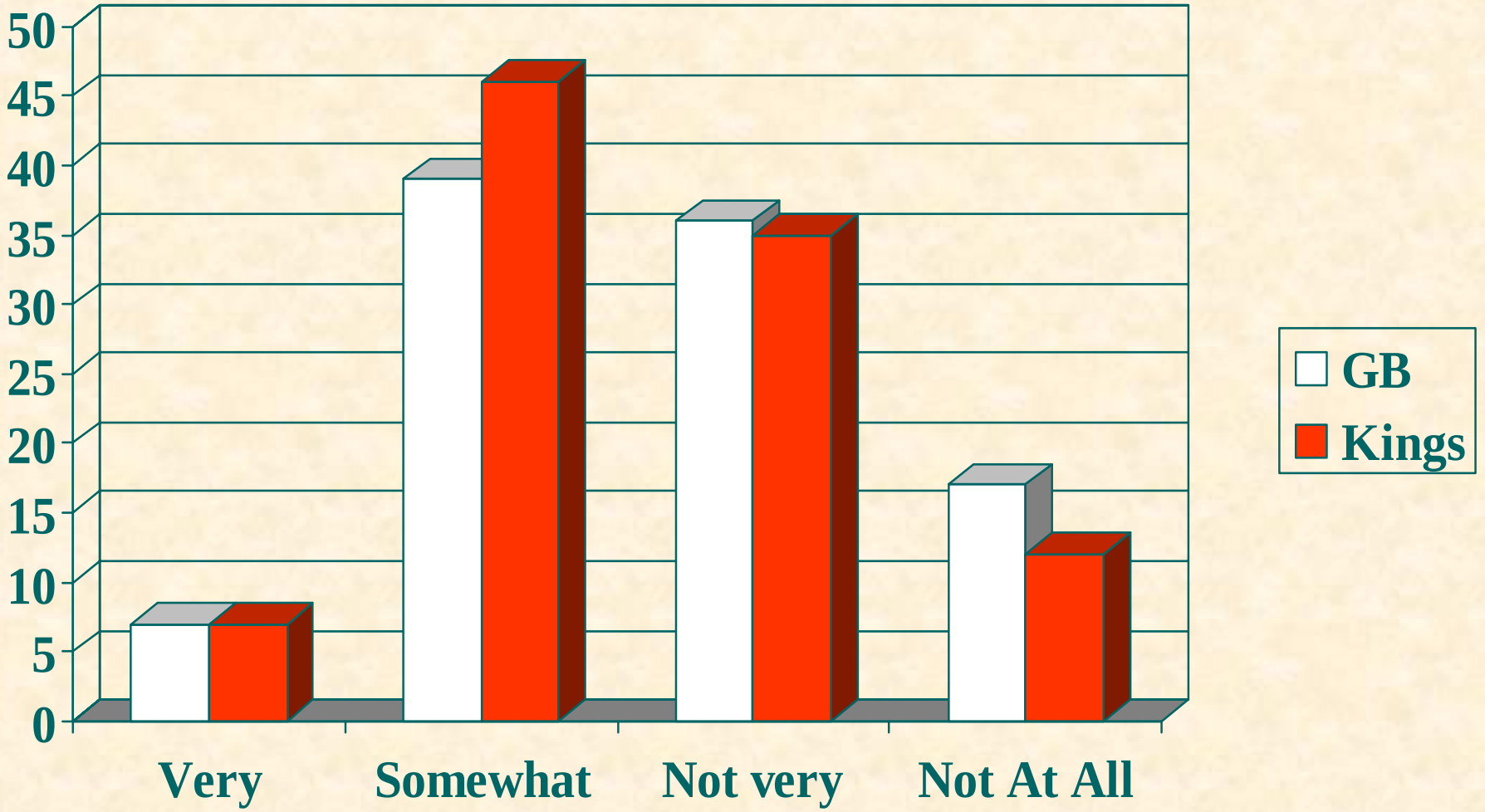
Health Status and Income

Query: If health status is income related and Glace Bay has a much higher proportion of low income respondents, why isn't GB self-rated health status lower than Kings?

- Higher rates VG/excellent health across most income groups in Glace Bay
- As a result, overall rates are equivalent despite the higher rates of low income in Glace Bay and relationship between health and income. ***But why.....?***

GPIAtlantic.org

Self-Reported Stress



GPIAtlantic.org

Sources of Stress

Kings

- Too many demands
- Too many hours
- Insufficient autonomy
- Interpersonal conflict

Glace Bay

- Too few hours
- Risk
- Fear of layoffs

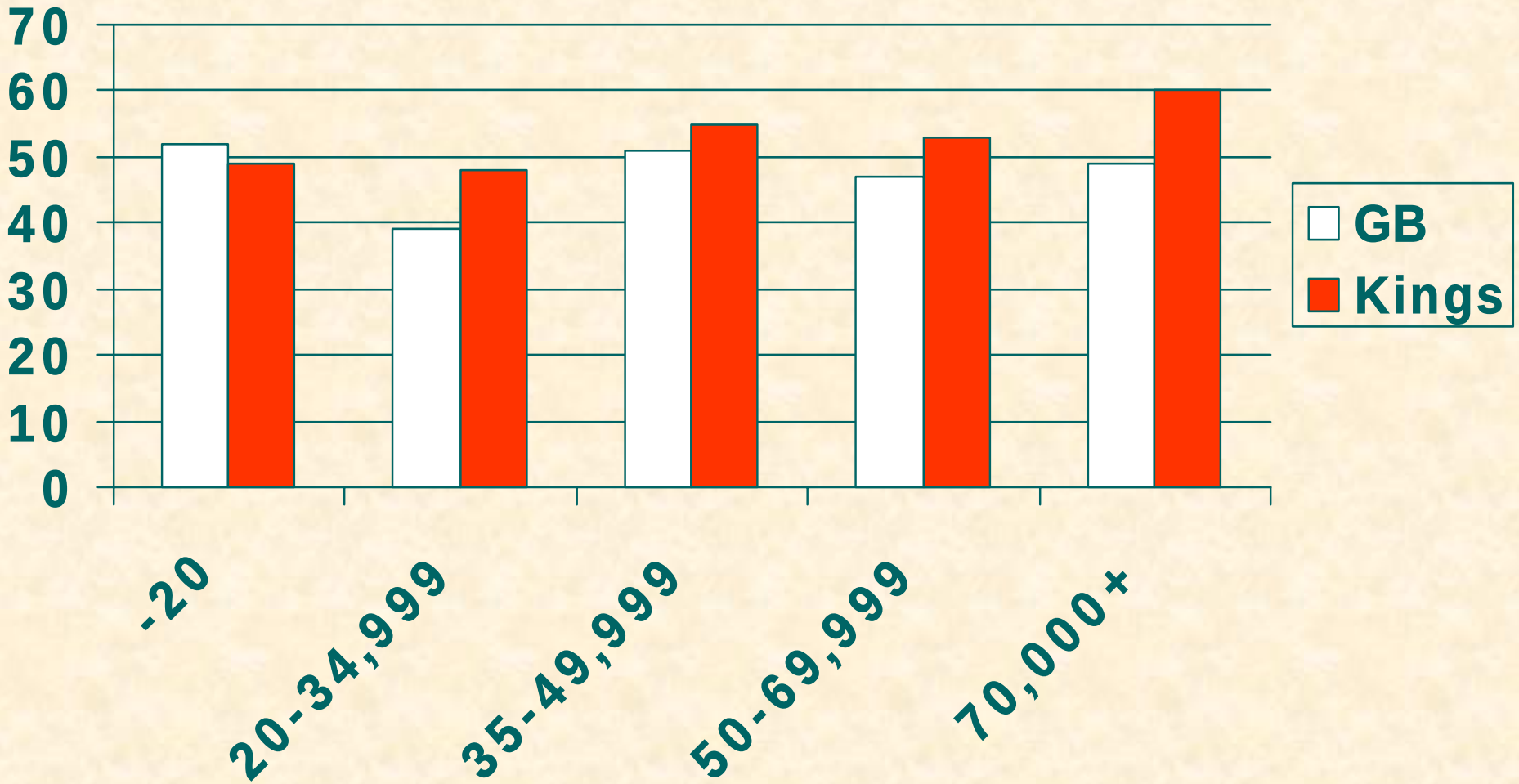
GPIAtlantic.org

Stress and Employment

- Two-income families much more highly stressed than one-income families
- More two-income families in Kings
- Two-income families in Kings more highly stressed than in Glace Bay
- Kings – highest incomes = most stressed
- (AJHP: Stress = costliest of all risk factors)

GPIAtlantic.org

Stress and Household Income



GPIAtlantic.org

Social Support

	Glace Bay	Kings
Count on in crisis	95.5	94.4
Advice	94.6	91.6
Loved	96.8	94.7
Close relative 1/week	**80.1**	**72.9**
Neighbour 1/week	**77.9**	**63.1**

GPIAtlantic.org

Faith, spirituality, safety…

- Glace Bay had higher rates of self-reported faith, spirituality, church attendance, decision control + half as likely to have been victimized or to know someone who has been victimized

In Sum: GB low stress, high faith, safety, social supports = non-material ***assets*** that partially compensate for poorer material conditions = key sources of life satisfaction & wellbeing + important information for community development planners (vs conventional tools)

GPIAtlantic.org

Core Values - Guiding Life Principles

% rating 8 to 10	Glace Bay	Kings
Family	95.2	94.4
Responsibility	93.2	93.2
Freedom	87.5	89.1
Friendship	88.4	86.4
Financial Security	**80.6**	72.4
Generosity	**78.4**	73.4
Pleasure	70.8	68.6
Spiritual	**67.2**	52.5
Career Success	**68.0**	58.3
Material Wealth	**32.4**	22.8

GPIAtlantic.org

Importance of Core Values

% Rating 8-10	Self	Others
Family	**94.9**	55.9
Responsibility	**93.3**	50.8
Freedom	88.4	80.6
Friendship	**87.3**	54.2
Financial Security	76.3	76.9
Generosity	**75.8**	36.6
Pleasure	69.6	**76.1**
Spiritual	**59.5**	29.4
Career Success	62.8	**92.4**
Material Wealth	27.4	**67.8**

GPIAtlantic.org

Value Alienation?

- Large majority of respondents in both communities believe they are socially motivated individuals living in a materialistic society
- Is dominant commercial culture, materialism out of touch with what matters most to people?
- Factor analysis: Positive social values intrinsically related to positive wellbeing while materialistic values were not - Consistent with growing research literature

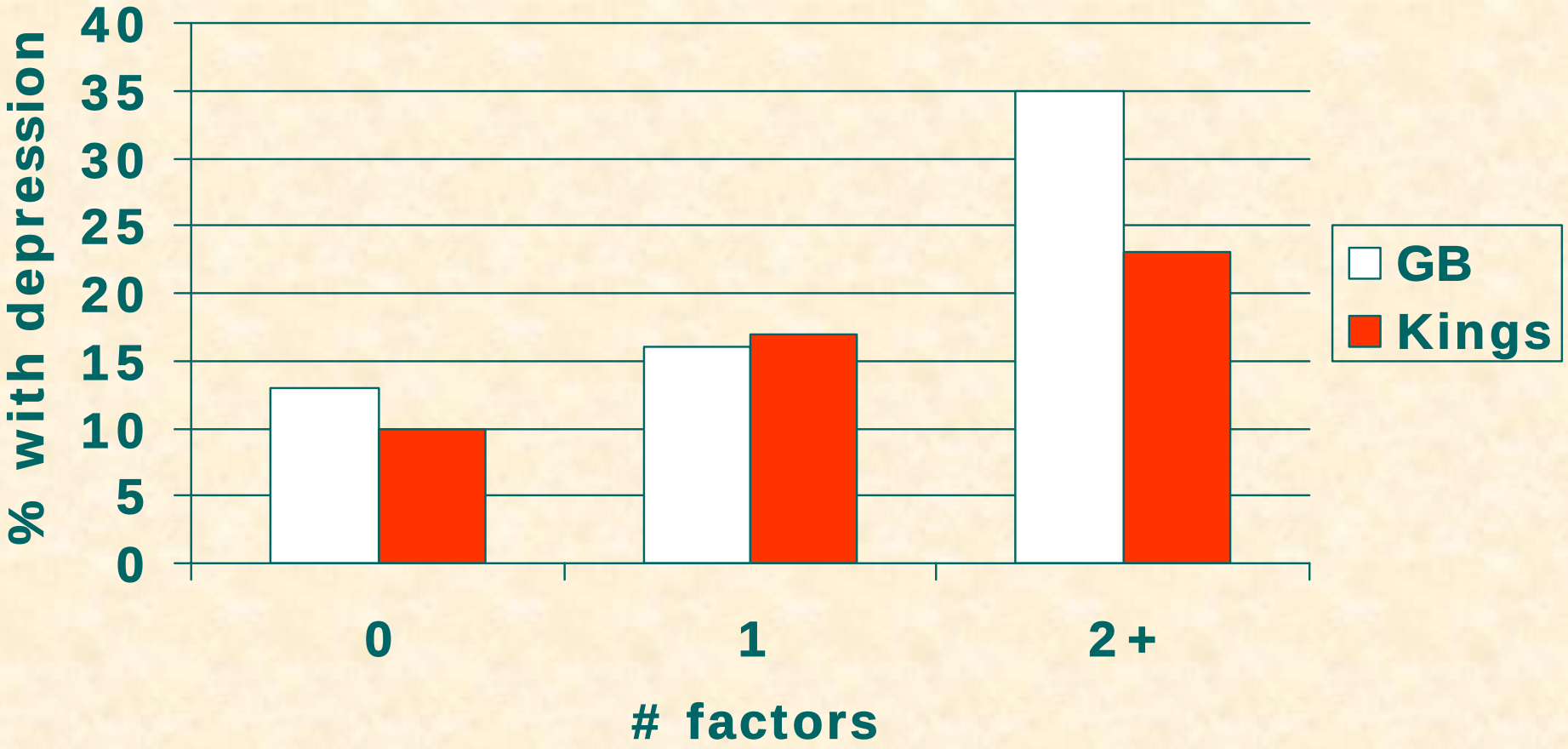
GPIAtlantic.org

Practical utility for policy. E.g:

- Glace Bay has significantly higher current smoke rate but lower ever-smoked rate = Quit rate much higher in Kings County -> Schools initiative
- Identify health needs, prevention/screening: E.g. Kings significantly higher rates than GB for mammogram (64% vs 40%), CBE (45% vs 35%). Both low on Pap smear (47% vs 45%)

GPIAtlantic.org

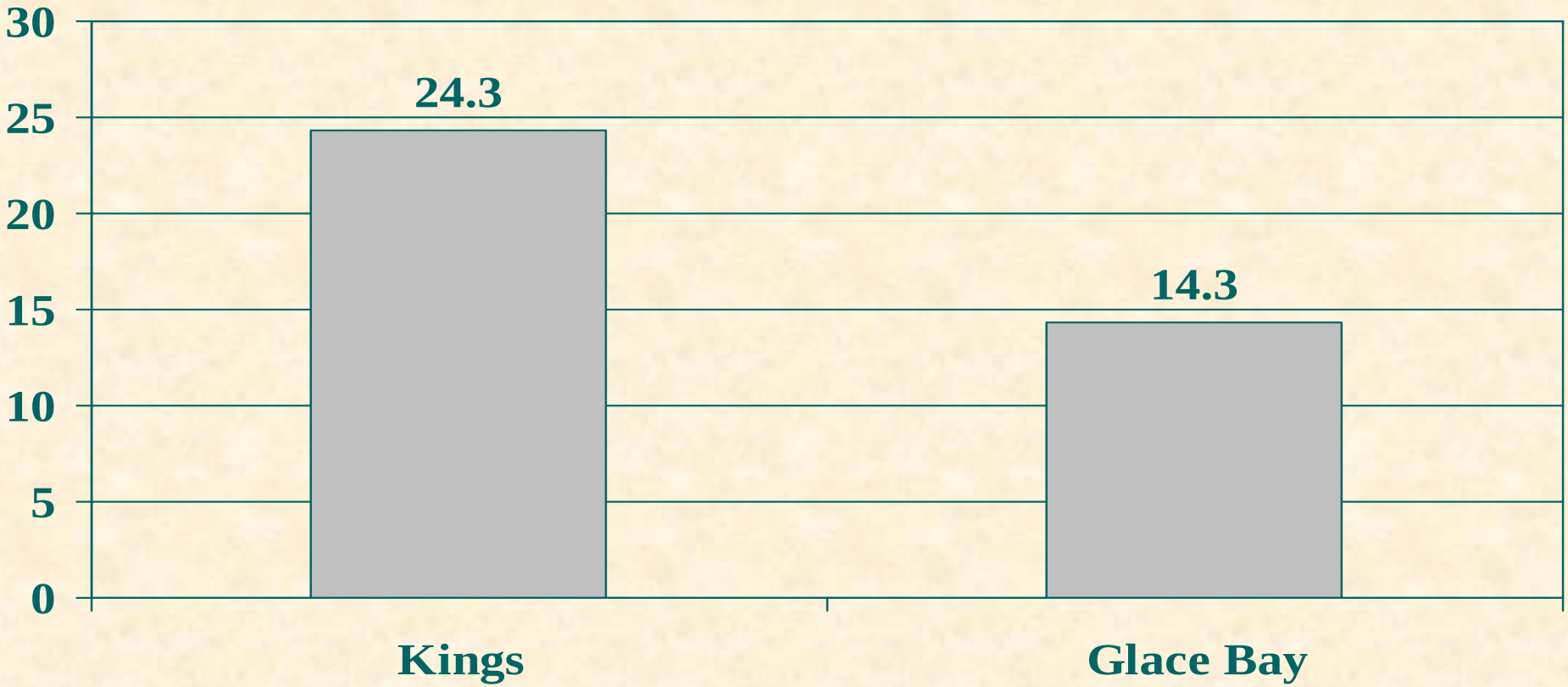
Mental health: Depressed feelings associated with child risk factors



GPIAtlantic.org

Results suggest new policy options

% workers willing to trade all or part of a future pay increase for shorter work hours



GPIAtlantic.org

What would increase life-satisfaction? Kings County

Spend more time with family/friends	72 %
Less stress	71%
More money	53%
More possessions	16%

GPIAtlantic.org

Greater focus on economic security vs consumption

- E.g. Core values: 3x high importance to financial security vs material wealth
- So policies that enhance job security, ensure living wage, social safety net appear closer to values than growth policies alone
- E.g. Benefits: Part-time workers less than half as likely to have most benefits + very strong relationship with income. E.g. GB: less than 5% lowest income have benefits. Cf Netherlands

GPIAtlantic.org

Ecological Attitudes and Behaviours

- 83% said their way of life produces too much waste, & focuses too much on current consumption, not enough on conserving resources for future generations
- 85% said “most of us” buy and consume more than we need; 2/3 said they could consume less if they chose
- Stronger in Kings and among high-income (81% could consume less)

GPIAtlantic.org

Understanding the ecological footprint

Nova Scotia	Income Quintile				
	Q1	Q2	Q3	Q4	Q5
Footprint	6.2	6.6	7.0	8.1	10.7

GPIAtlantic.org

Household income $/year	Average #f Vehicles/ Household	Average Kms./ Vehicle/ Year	Household Kms Per Year	Av. Commuting Distance to Work for H'hold commuters
-20,000	1.0	17,777	13,772	14.4
20,000 to 34,999	1.4	19,268	22,629	12.9
35,000 to 49,999	1.5	20,861	27,530	16.4
50,000 to 69,999	1.8	20,966	34,665	14.4
70,000+ *+ more SUVs*	2.0	22,600	40,384	15.9
Total	1.6	20,853	28,916	15.1

GPIAtlantic.org

Income and wellbeing – to a certain point...

"Despite the weak relation between income and global life satisfaction or experienced happiness, many people are highly motivated to increase their income." (Daniel Kahneman- Economist, Princeton University)

"Economies thrive when individuals strive, but because individuals will only strive for their own happiness... they mistakenly believe that producing and consuming are routes to personal wellbeing" (Daniel Gilbert: Stumbling on Happiness. 2006)

GPIAtlantic.org

And at most practical level:

- E.g: Kings: Volunteerism: 49% would give more time if asked: Esp: males - 55%; low income – 58% ; young (15 to 24) 76%
- E.g: Glace Bay: Identified problem areas - police chief immediate action

At the community level, fewer barriers to action. Power of evidence - can really inform practical decisions

GPIAtlantic.org

+ Process = Result. E.g.:

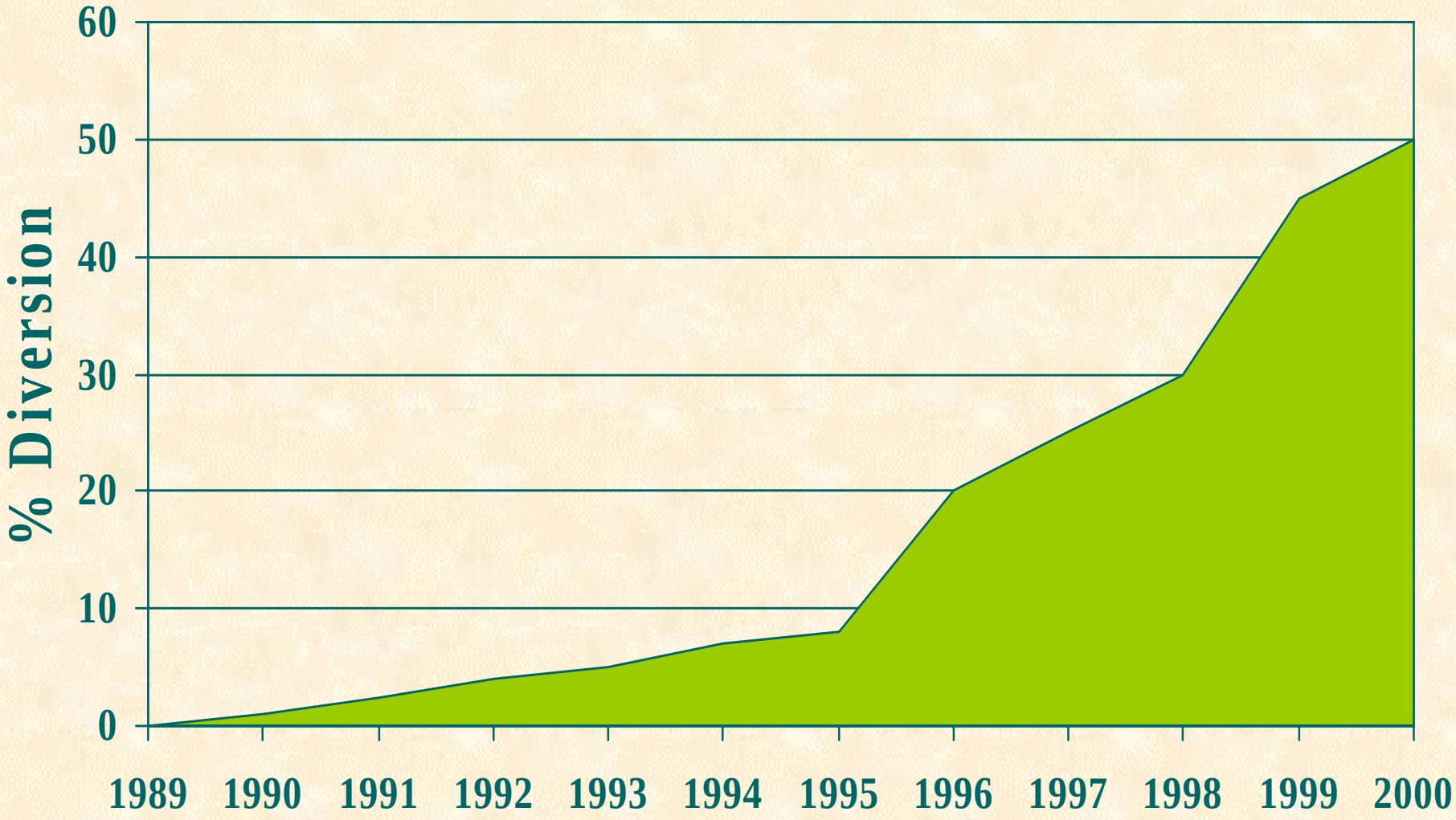
- Indicator selection, creating survey = community building
- Farmers exchanging information
- Report releases in Sheffield Mills, Jeddore - farmers, fishermen present
- New ideas: e.g. restorative justice
- Results bring disparate groups together

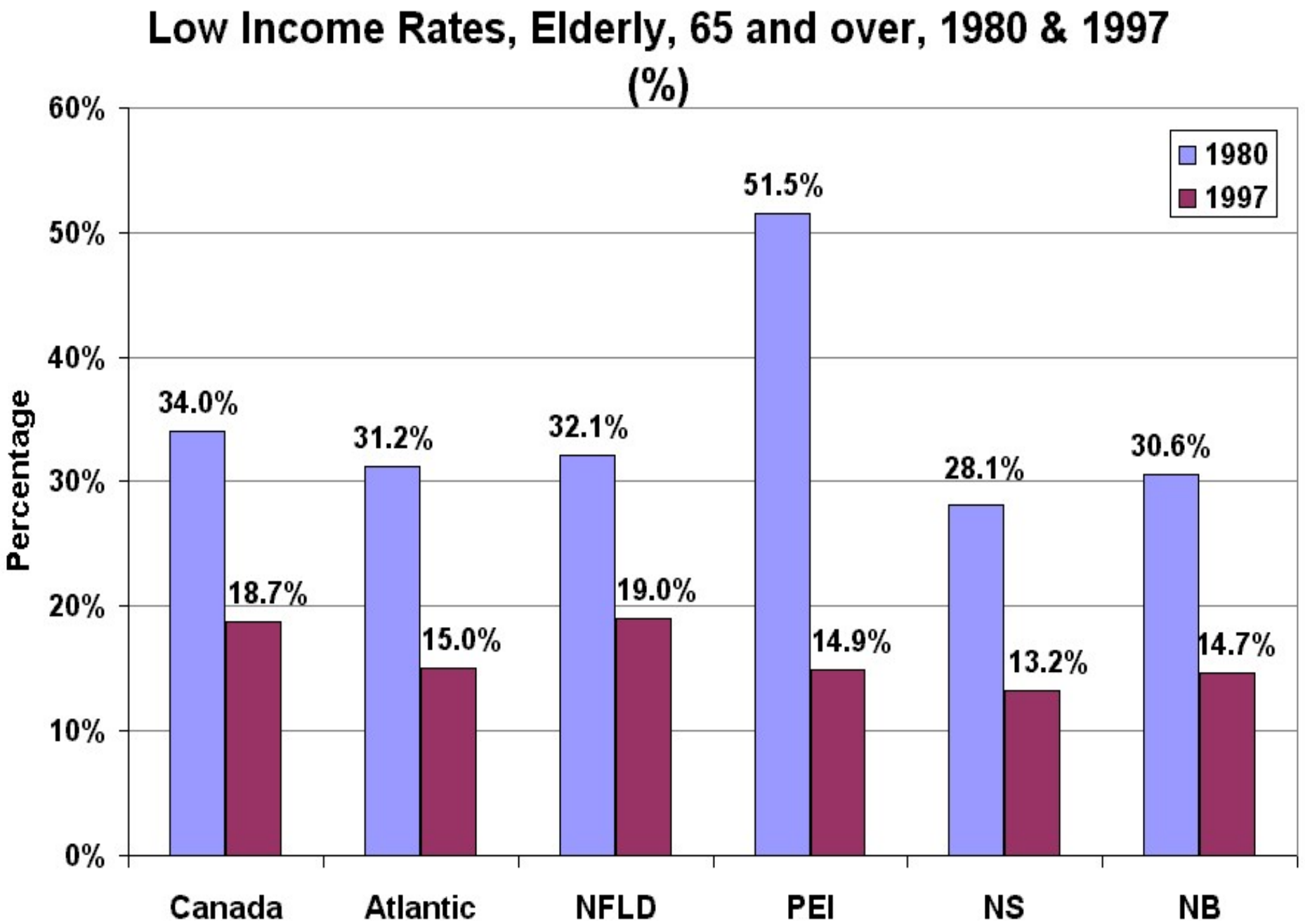
Next Steps.... Update for which baseline data now available

KC, GB results at: GPIAtlantic.org

Can we do it?

Percentage Waste Diversion in Nova Scotia




Low Income Rates, Elderly, 65 and over, 1980 & 1997
(%)
60%
50%
40%
30%
20%
10%
0%
Percentage
1980
1997
34.0%
18.7%
31.2%
15.0%
32.1%
19.0%
51.5%
14.9%
28.1%
13.2%
30.6%
14.7%
Canada
Atlantic
NFLD
PEI
NS
NB

Measuring what we value to leave prosperous and healthy communities for our children

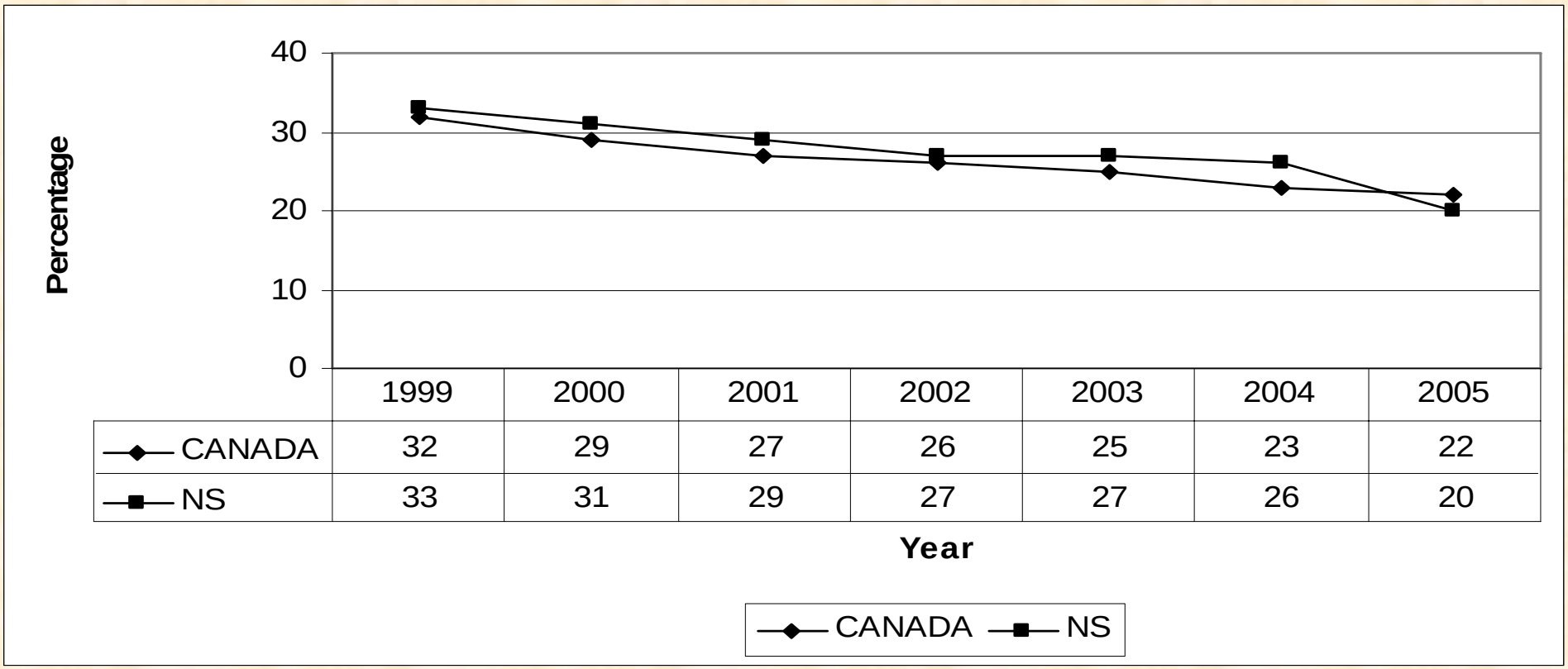
2. Why go beyond indicators?

- Continuing dominance of GDP makes it essential that new measures are ***critique*** of GDP-based measures vs "add-on's"
- The side streets and the highway
- GDP is not an indicator, but an accounting system. To challenge its power and dominance, we must enter the world of economic valuation
- + Economic valuation reaches policy audience: Need for ***net*** vs ***gross*** accounting

GPIAtlantic.org

+ Nothing changes behaviour like price signals. E.g.:

- SUVs and oil prices (vs envtal movement)
- Smoking and taxes (vs health messages) – youth smokers 15-24, 1999-2005



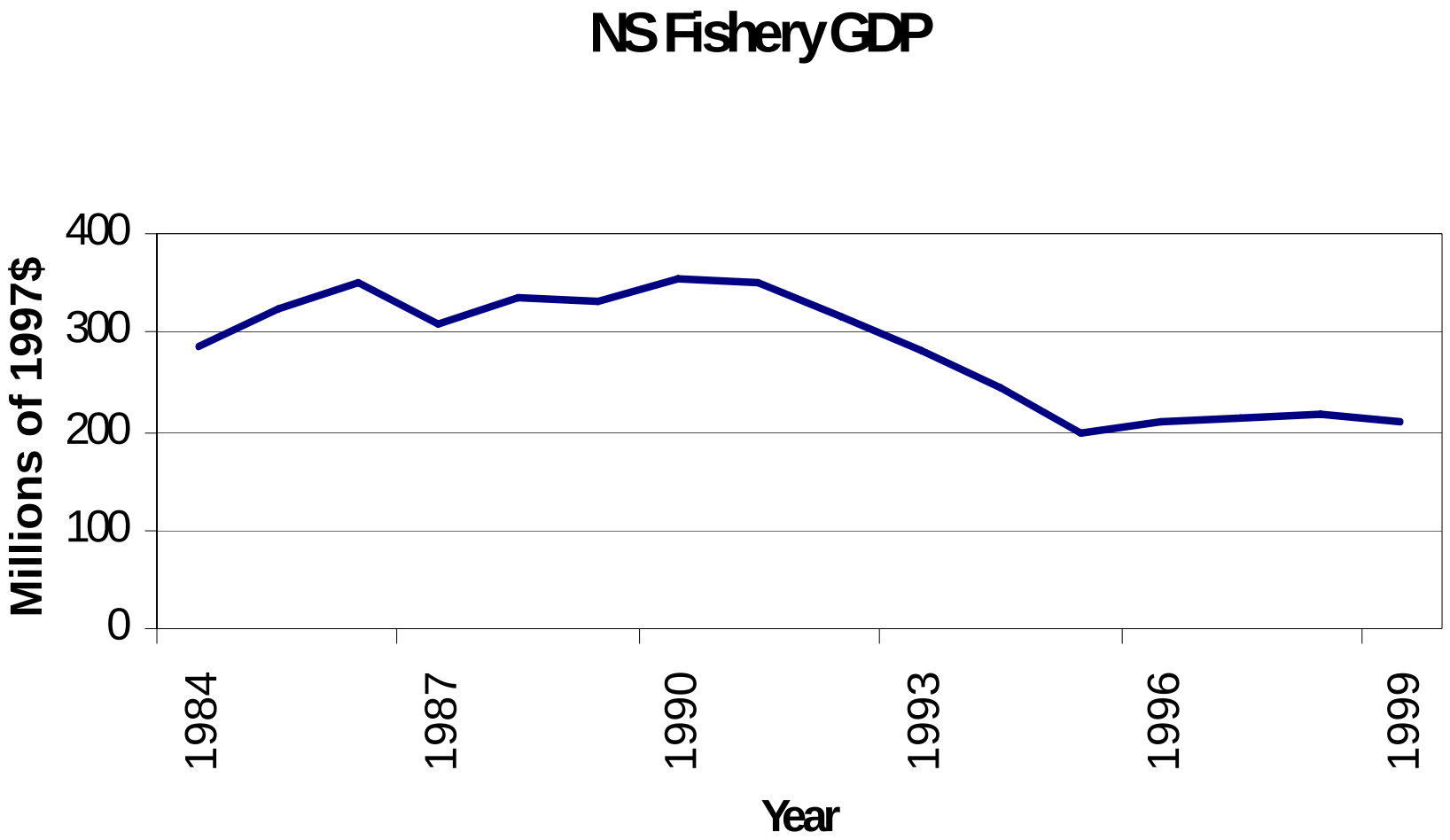
	1999	2000	2001	2002	2003	2004	2005
CANADA	32	29	27	26	25	23	22
NS	33	31	29	27	27	26	20

Till we take aim at perverse messages of existing accounting system, nothing will change

- A/c GDP-based accounting: The more fossil fuels we burn, more trees we cut, the better off we are
- Losses out of sight, out of mind: Local farms, cod, forests, voluntary work, free time (unmeasured)
- Current consensus on “injection” of “fiscal stimulus” to spur spending and growth. By contrast, recession, reduced consumption = R & R for natural world – dare we say it?!

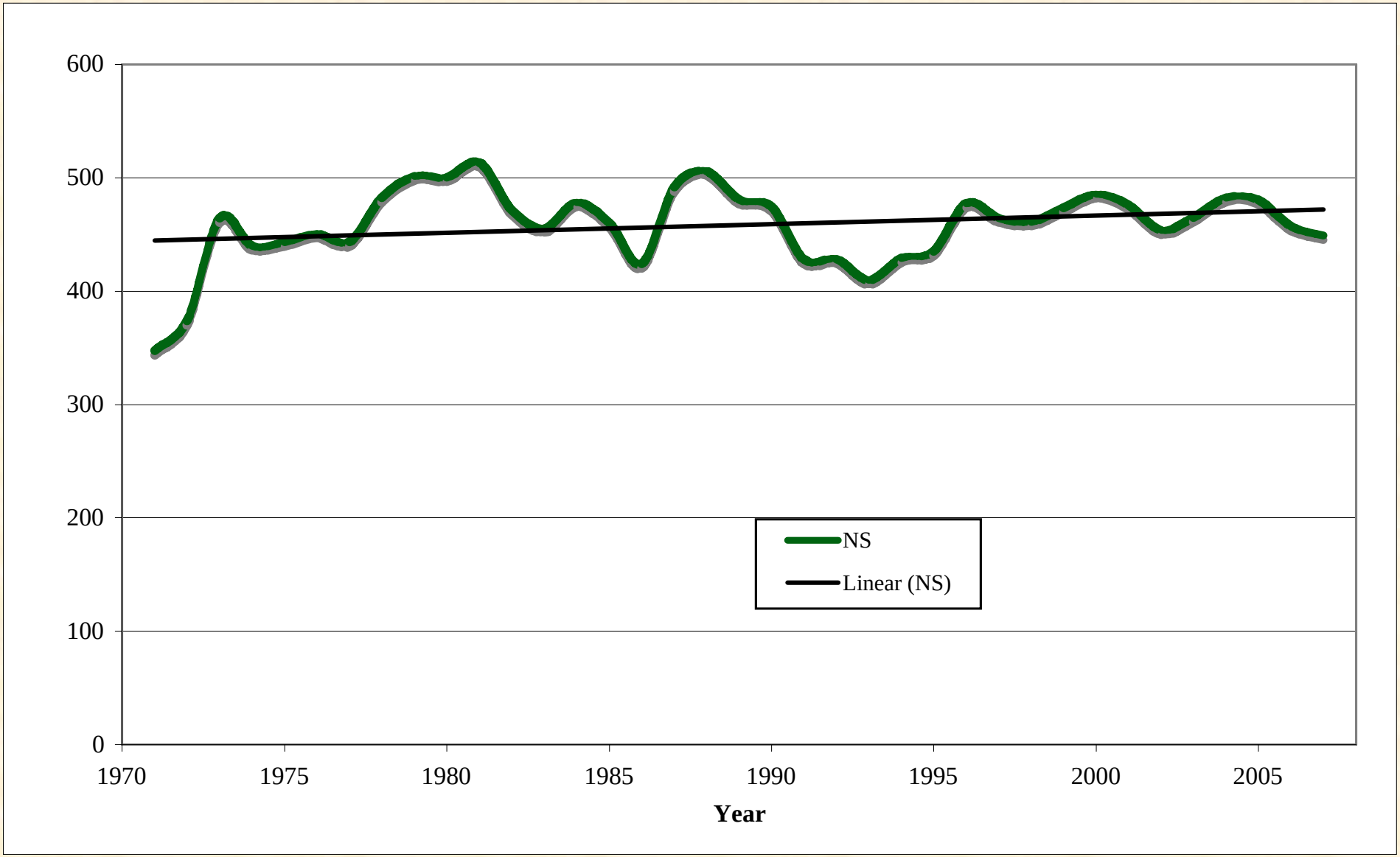
GPIAtlantic.org

Fishery GDP for Nova Scotia, 1984-1999 (1997$ millions): Depletion of Natural Wealth as Economic Gain

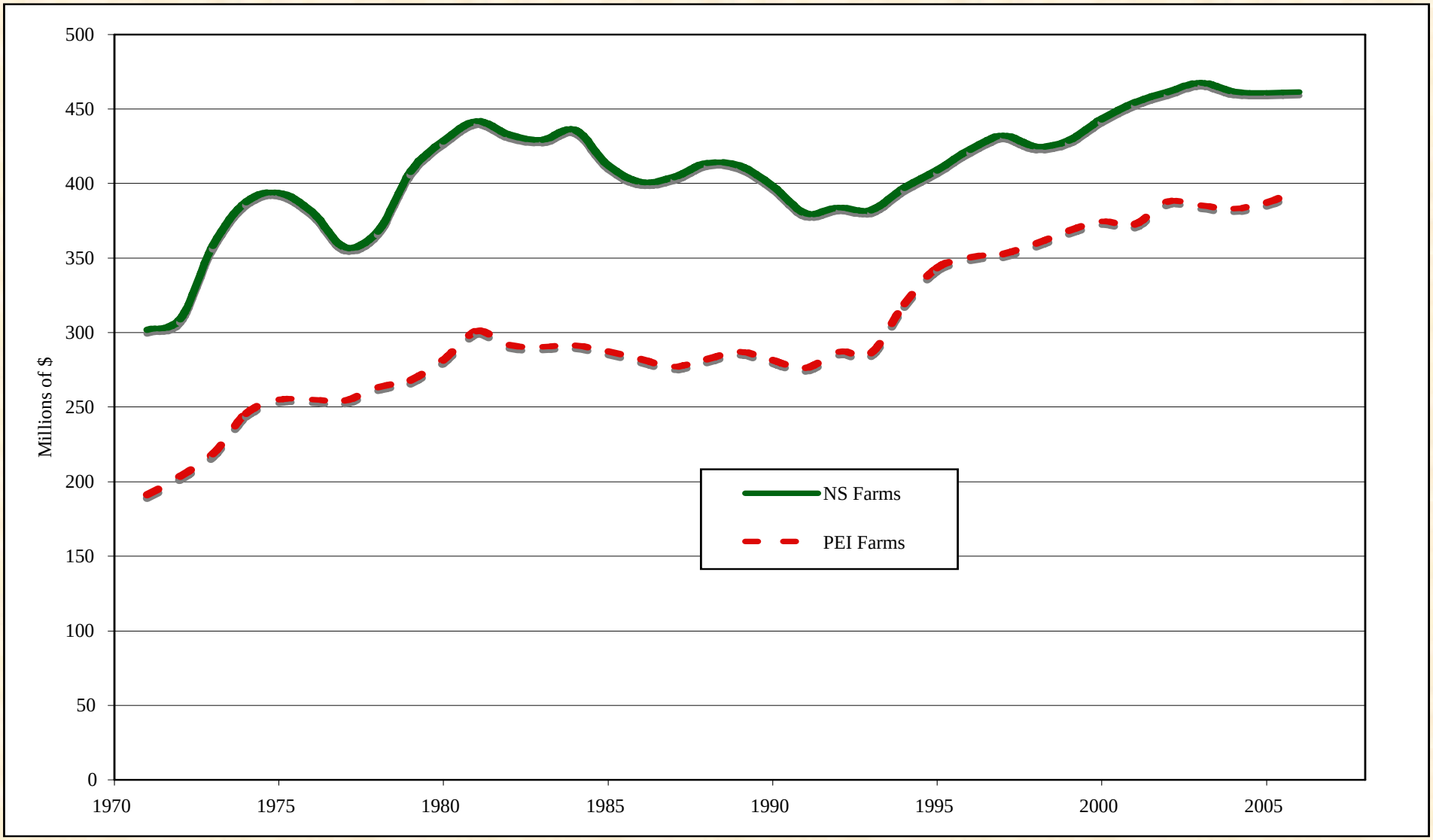


Total Farm Cash Receipts, NS, 1971–2007

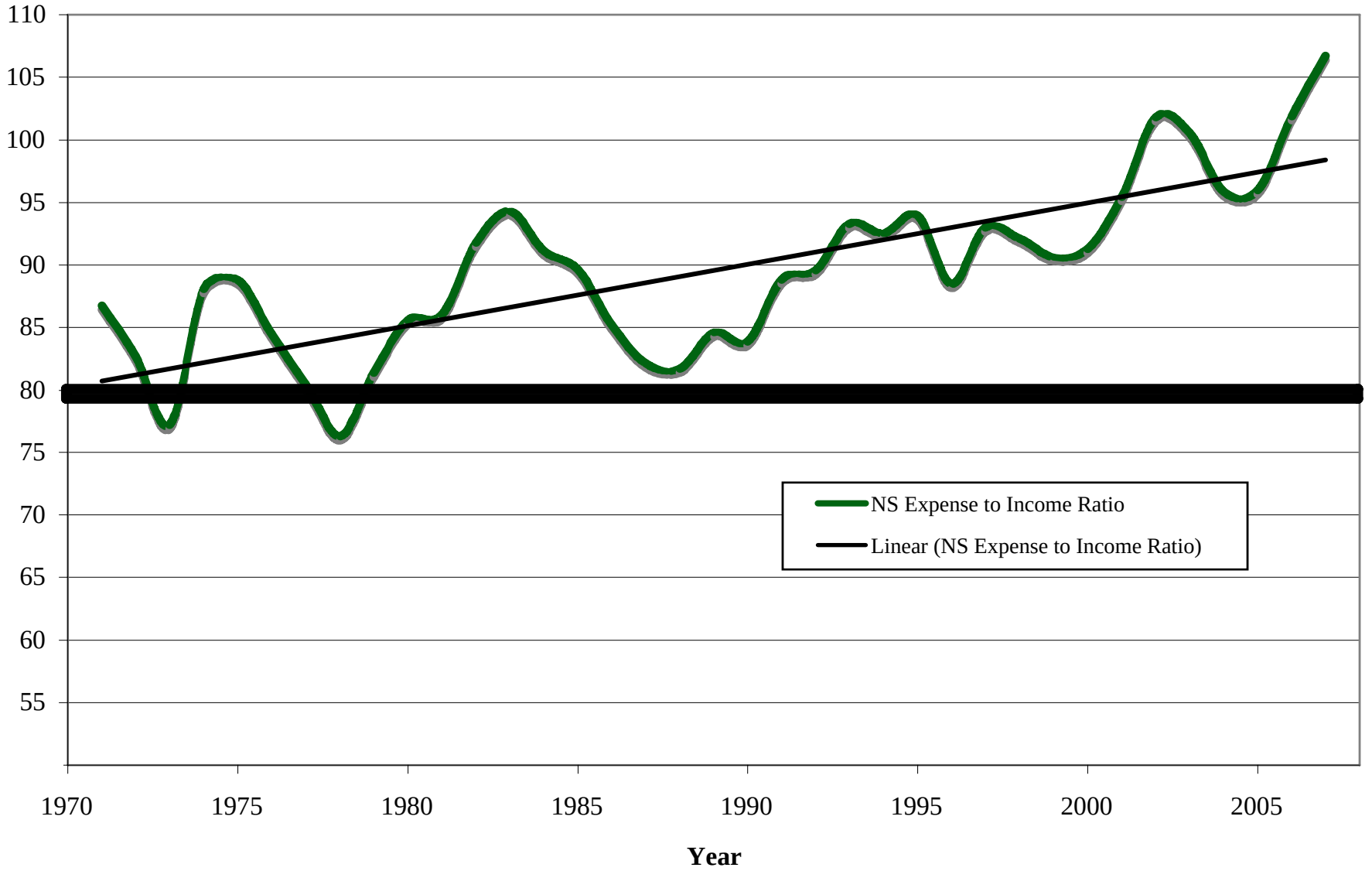
(Millions of $2007) = no early warning



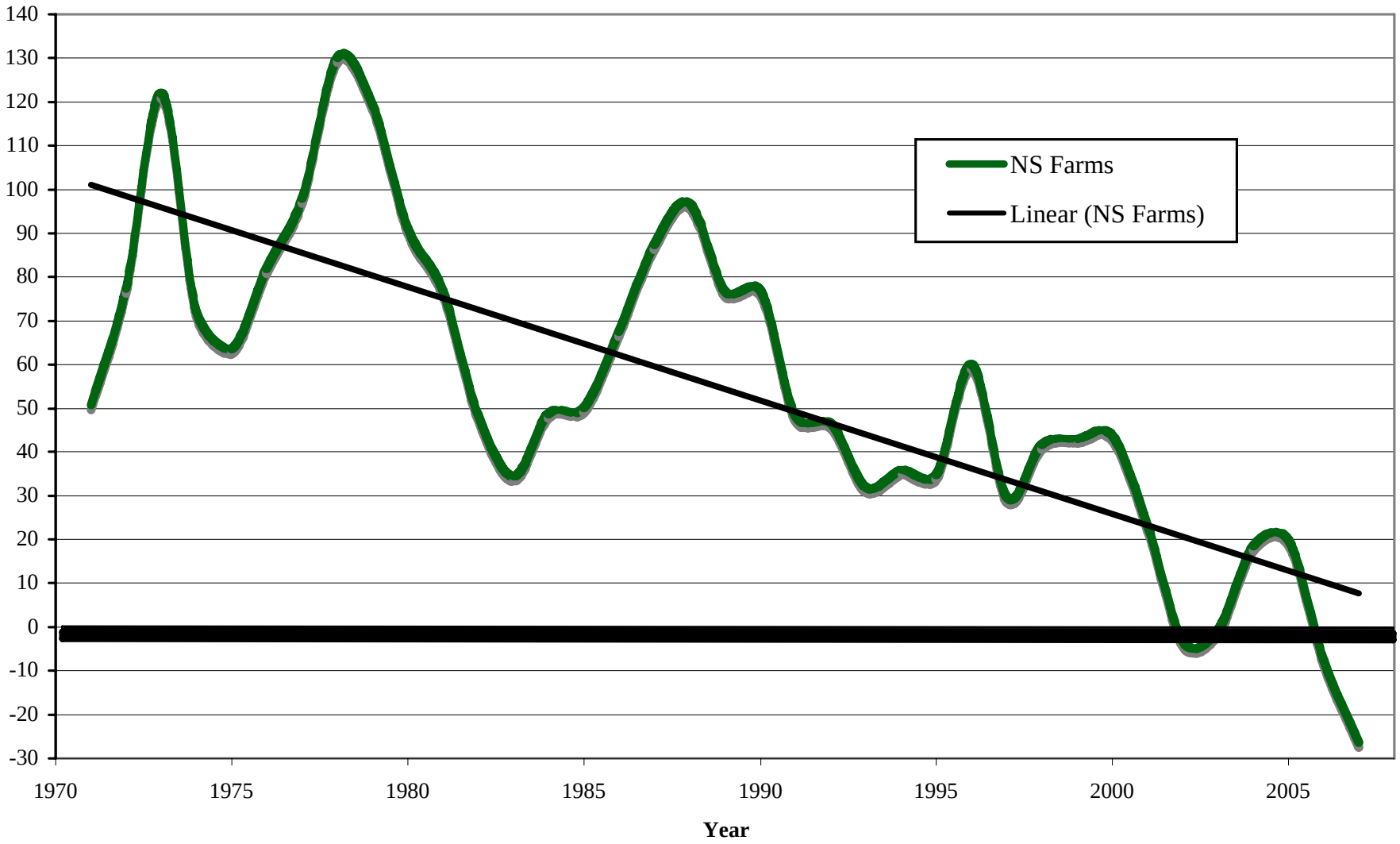
Total Farm Operating Expenses, NS & PEI, 1971–2006 (Millions of $2007)



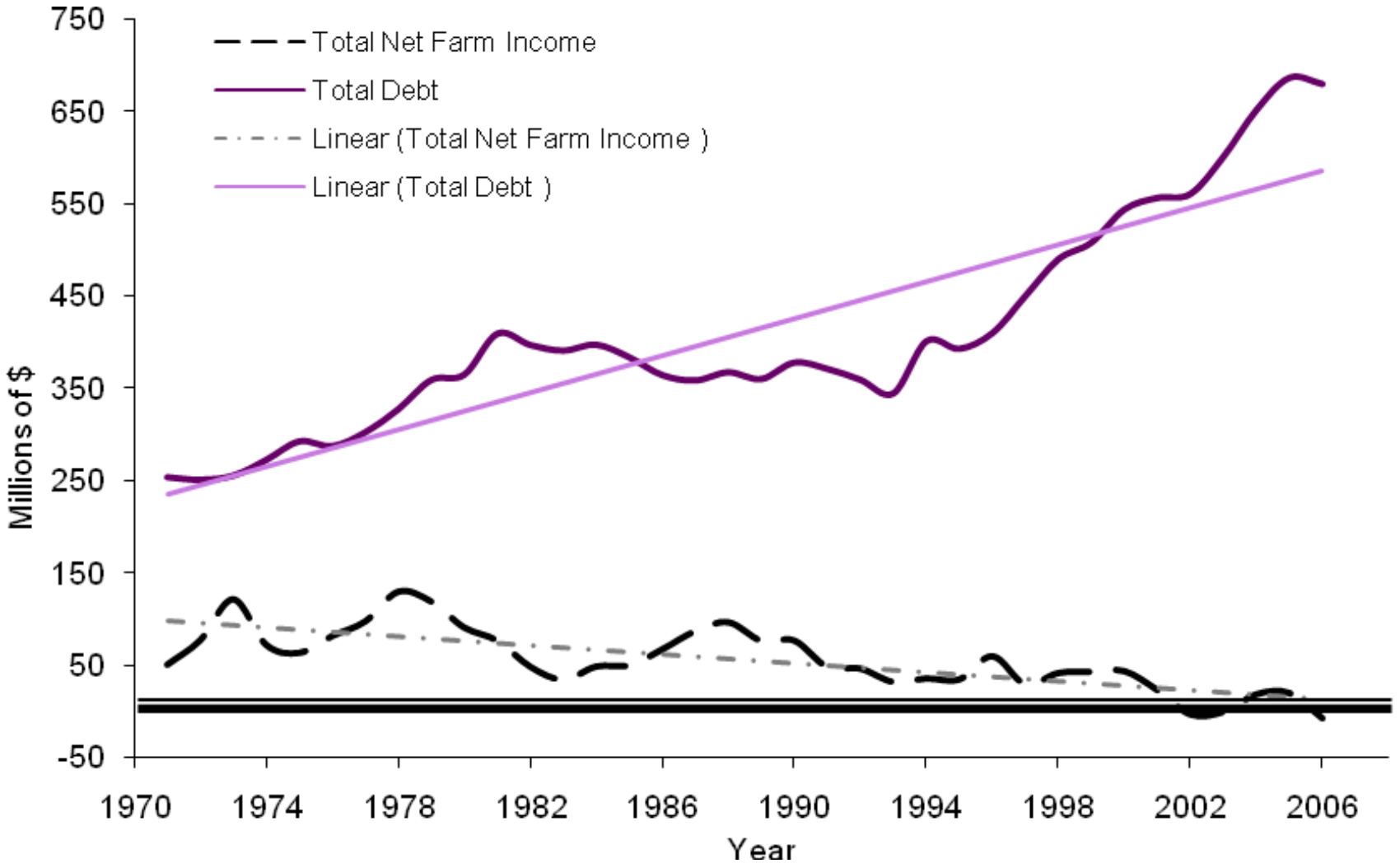
Expense to Income Ratio (%), Nova Scotia Farms, 1971–2006



Total Net Farm Income, Nova Scotia, 1971–2007 (millions of $2007)



Total Net Farm Income and Total Debt, NS Farms, 1971-2006
(millions of $2007)



Indicators & Accounts: Need *both!*

- Indicators assess ***progress*** – based on physical measures (e.g. crime rates, GHG emissions).
- Accounts assess ***value***:
  - Balance sheets, stocks = assets and liabilities
  - Flows = what we earn and spend, including costs of economic activity, crime, GHG emissions
- GDP assesses market flows, treats social and environmental costs/benefits as "externalities."

GPIAtlantic.org

Accounting/valuation examples:

- Trends in volunteerism = indicator. Volunteer work contributes $1.8 billion to NS economy = accounts
- Crime costs NS $700 million + / year
- Smoking costs NS health care $171 million / year
- Stern (WB-UK): Compared GHG control costs (1% global GDP) with climate change damage costs (5%-20% global GDP). Concluded: "The benefits of strong, early action on climate change outweigh the costs."

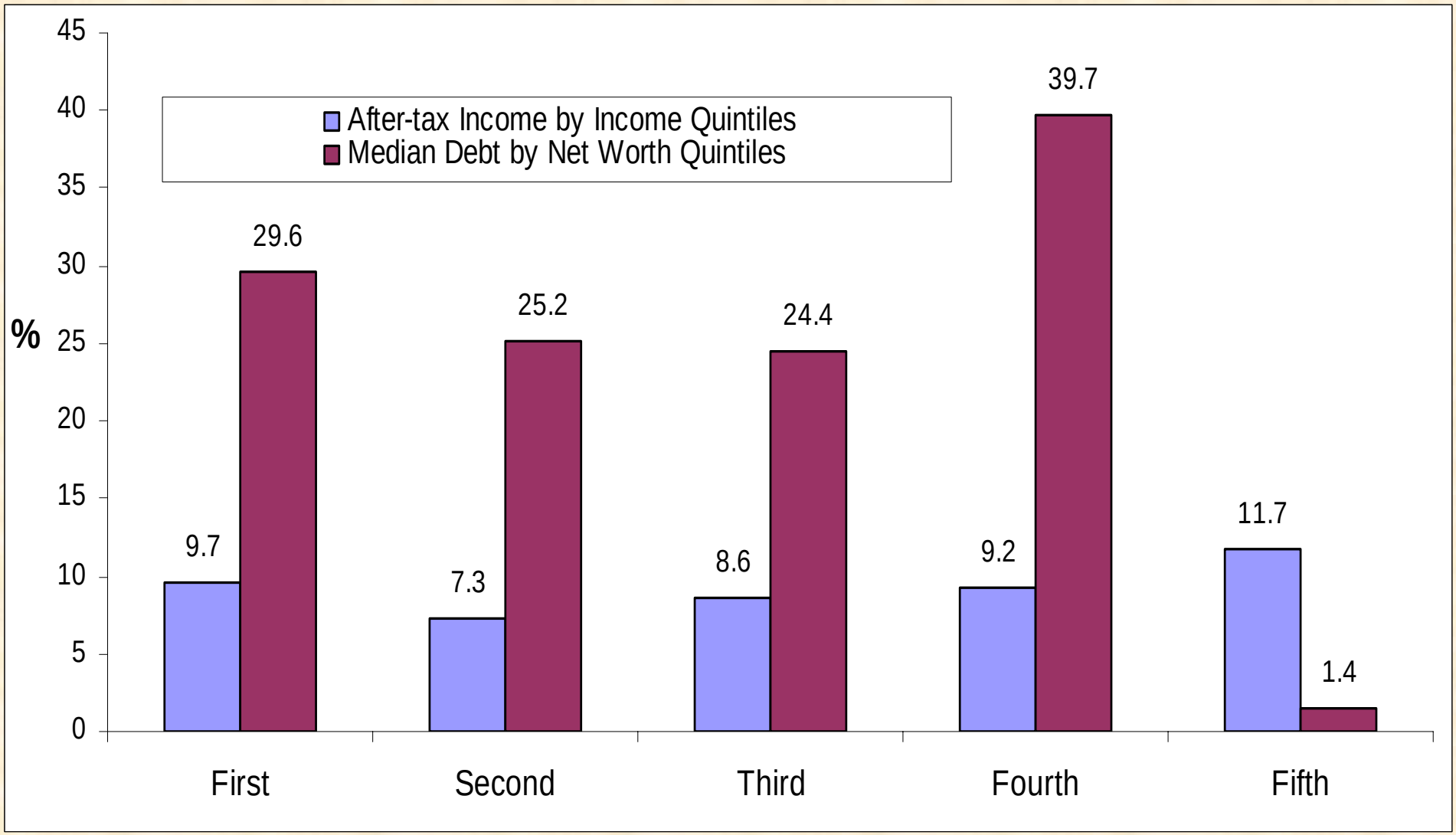
GPIAtlantic.org

The Capital Accounting Model

- To assess nation's true wealth, need to measure the value of natural, human, social, cultural, built, and financial capital.
- Only the latter two are currently valued but all capital is subject to depreciation and requires periodic re-investment. E.g. forests, health, crime, language, voluntary decline (vs car sector bailout)
- The good news – we ***are*** able to measure and even quantify aspects of the other capitals

GPIAtlantic.org

Predictive power of new accounts Early warning vs "I told you so" (vs 'expert' bank head analysis)



Examples of policy impacts:

- NS voluntary work worth $1.8 billiion/year
- Preventable chronic disease costs NS $500m in excess health care costs –> DHPP
- Costs tobacco, obesity, inactivity –> e.g. HRM planning process; smoke-free legislation
- Full CBAs – e.g. Solid Waste; Halifax Harbour cleanup; HRM transportation

GPIAtlantic.org

Caveat: New GPI accounts do not seek to replace GDP

- … But replace the misuse of GDP as a measure of progress, wellbeing, and prosperity: Cite Kuznets warnings on proper use of GDP – *what* is growing
- Anything can make economic grow, incl. depletion of natural wealth + activities that signify decline in wellbeing, prosperity (e.g. crime, crashes, pollution)
- *Quantitative* measure of size cannot assess *quality* of life, though GDP will always have role in assessing size of *market* economy – less important

GPIAtlantic.org

To sum up so far:.....
What do we measure? = Step 1

- What matters? – Community consultations on vision, goals = ownership
- 2 questions: (a) What kind of London, Dundee, Eden/Cornwall do we want to leave our children (10, 20, 50 years); (b) Are we better off today than we were at our children's age?
- Universal vs partisan values, vision, goals + unique to culture, place -> specific indicators (vs vague, general)
- Participant circumstances, use of measures

GPIAtlantic.org

Step 2 = How: (a) Data collection, survey instruments

- Random sample methods – stratification, sample size (statistical validity), cross-tabs.
- Construct survey instrument, test (ambiguity and meaningful results), data entry (e.g. GB = community training), data cleaning, data analysis. ***Transparency on data limitations***
- Use of qualitative research (e.g. focus groups) and local wisdom
- Trends (indicators) and value (accounts) - CBA

GPIAtlantic.org

Economic valuation: Full-Cost Accounting - 3 basic principles:

- Internalize 'externalities' (e.g. GHG emissions)
- Recognize economic value of non-market assets (e.g. voluntary sector, natural capital)
- Fixed -> variable costs (e.g. car registration, insurance a/c km driven)

$ values - strategic only = inadequacy of $ as valuation instrument. "Value" = larger

GPIAtlantic.org

EXAMPLES (a speed tour): E.g. Transport Accounts

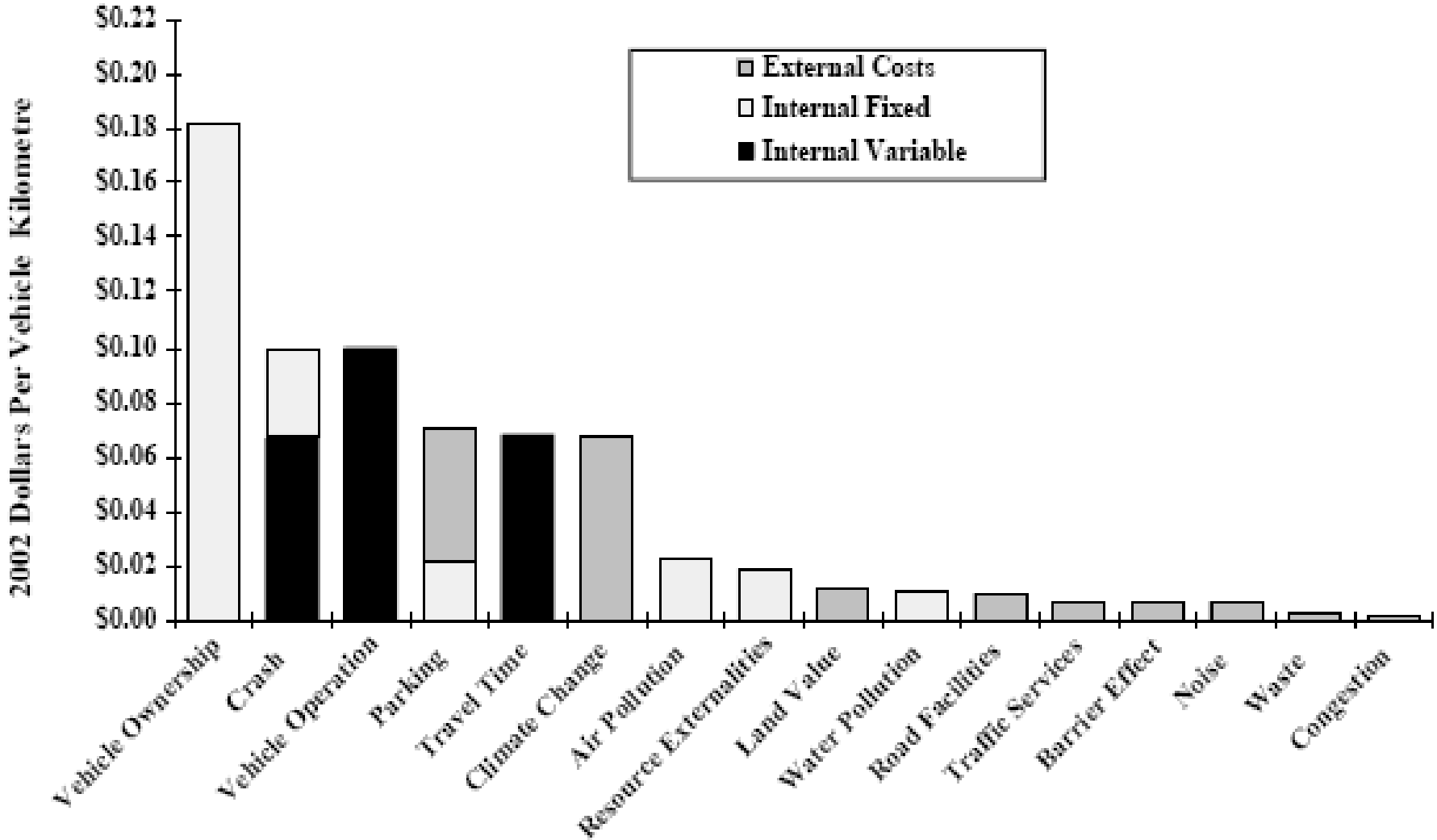
	Per Capita Costs			Total Costs (million$)	
	Internal-Variable	Internal-Fixed	External	Low***	High***
Vehicle Ownership		$1,913		$1,788	$3,648
Travel Time	$1,236			$1,155	$1,155
Vehicle Operation	$1,052			$983	$1,112
Climate Change**			$700	$99	$4,672
Internal Crash	$695			$650	$650
External Parking			$507	$474	$474
Air Pollution**			$236	$56	$384
External Crash			$347	$325	$325
Internal Parking		$220		$206	$206
Resource Externalities			$213	$199	$199
Land Value			$125	$117	$117
Water Pollution			$103	$96	$96
Road Facilities			$98	$91	$91
Barrier Effect*			$72	$67	$67
Traffic Services			$71	$67	$67
Noise			$67	$62	$62
Waste			$16	$15	$15
Operating Subsidy*			$13	$12	$12
Congestion*			$13	$12	$12
Per Capita Costs:	*$2,982*	*$2,133*	*$2,483*		
Total Per Capita Costs:	*$7,598*			*Totals:*	*$6,382*	*$13,273*

Each cost a potential headliner
E.g. Congestion costs NS $12m/yr

- Lost time, gas, excess GHGs
- ***Conservative:*** Recurrent congestion only (not snow, roadworks, accidents etc.), AM-PM only, no freight, arterials only (no side-streets), based on <50% posted limit, etc.
- = Small portion total costs

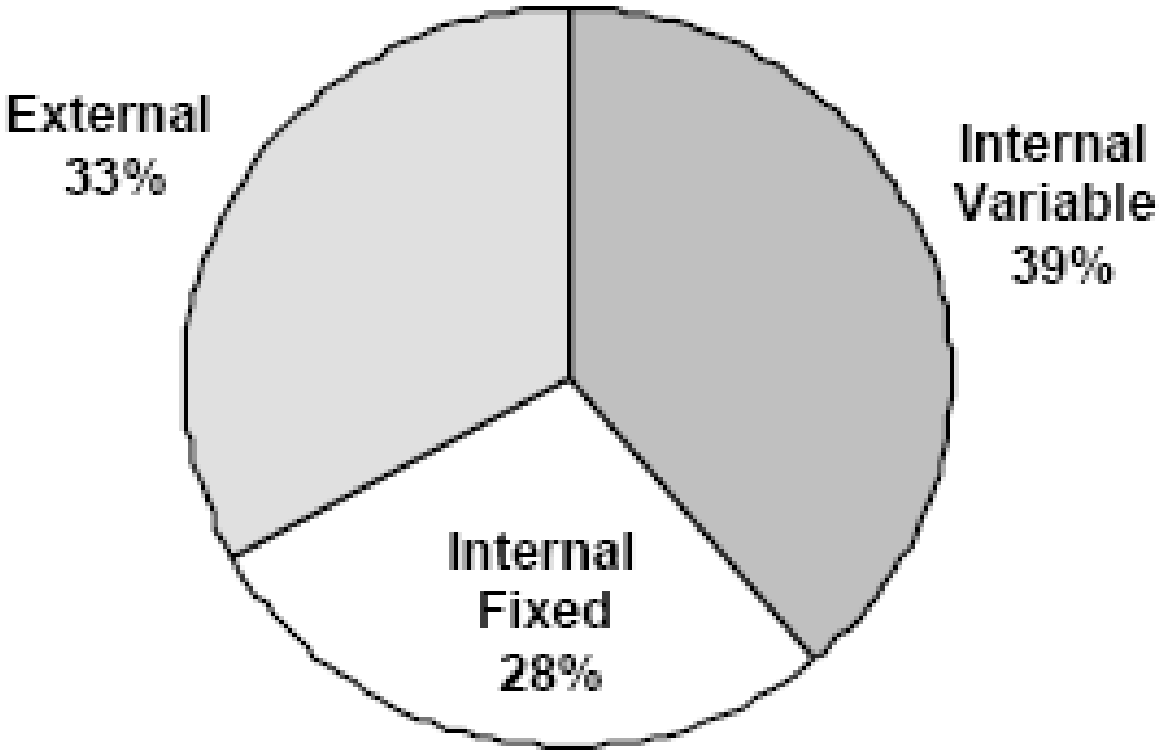
GPIAtlantic.org

Average Car Costs (per vehicle-km) Ranked by Magnitude



Note: This figure shows average car costs per vehicle-kilometre, ranked by magnitude.

Aggregate Distribution of Costs for an Average Car



Full-Cost Accounting Results

- Overall full cost of N.S. road transportation system in 2002: **$6.4 billion - $13.3 billion**
- True cost is about **$7,598/capita**, of which **$4,562** are **"invisible"** costs
- Fixed and external costs account for **over 2/3 of total cost**
- These results indicate an inefficient, unsustainable transportation system where externalities conceal the full costs to society

GPIAtlantic.org

THE NOVA SCOTIA GPI SOLID WASTE-RESOURCE ACCOUNTS

COSTS	Low	Medium	High
Operating and amortized capital costs	$ 72,500,000	$ 72,500,000	$ 72,500,000
Beveraging Container Recycling Program (net)	$ 14,300,000	$ 14,300,000	$ 14,300,000
Used Tire Management Program (net)	$ 2,700,000	$ 2,700,000	$ 2,700,000
Etc			
Etc			
Costs to increase participation	$ 5,000,000	$ 7,000,000	$ 9,500,000
Total Costs	**$ 96,600,000**	**$ 99,400,000**	**$ 102,700,000**
Cost Per Capita	**$ 103**	**$ 106**	**$ 109**
BENEFITS			
Employment benefits (direct)	$ 2,800,000	$ 3,300,000	$ 3,900,000
Employment benefits (indirect)	$ 3,700,000	$ 4,250,000	$ 5,100,000
Reduction in greenhouse gas emissions	$ 3,300,000	$ 34,200,000	$ 84,300,000
Reduction in air pollutant emissions	$ 9,500,000	$ 42,600,000	$ 67,400,000
Extended landfill life	$ 18,800,000	$ 18,800,000	$ 18,800,000
Avoided siting costs	$ 175,000	$ 175,000	$ 175,000
Avoided compensation	$ 1,300,000	$ 1,600,000	$ 1,900,000
Export revenue	$ 1,100,000	$ 1,400,000	$ 1,650,000
Tourism	$ 190,000	$ 190,000	$ 190,000
Energy savings from recycling	$ 28,700,000	$ 28,700,000	$ 28,700,000
RRFB diversion credits	$ 4,980,000	$ 4,980,000	$ 4,980,000
RRFB approved programs	$ 4,400,000	$ 4,400,000	$ 4,400,000
RRFB investment	$ 250,000	$ 250,000	$ 250,000
Total benefits	**$ 79,195,000**	**$ 144,845,000**	**$ 221,745,000**
Benefits per capita	**$ 84**	**$ 154**	**$ 236**
Net annual cost ( ) or benefit	**$ (17,400,000)**	**$ 45,400,000**	**$ 120,000,000**
Annual cost ( ) or benefit per capita	**$ (18)**	**$ 48**	**$ 127**
Net savings compared to pre-Strategy cost	**$ 31,200,000**	**$ 94,000,000**	**$ 167,800,000**
Annual savings per capita	**$ 33**	**$ 100**	**$ 178**

Conventional Accounting Results

- Implementing Solid Waste-Resource Strategy led to an increase in operating and amortized costs from $48.6 million ($53/capita) in 1996 to $72.5 million ($77/capita) in 2001
  - Increased cost of $24 million ($25/capita) for implementing the changes
  - ***Conventional accounts stop there***

GPIAtlantic.org

Full cost Accounting Results = can be Good News

- The new NS solid waste-resource system in 2001 produced net ***savings*** of at least $31.2 million, when compared to the old 1996 solid waste-resource system
- This translates into savings of $33 for each Nova Scotian, versus a cost of $25 as suggested when comparing strictly the operating and amortized capital costs of the two systems

GPIAtlantic.org

Benefits

- Total benefits of 2000-01 system range from $79 million to $221 million =$84-$236 pp, incl:
  - $3.3 - $84.3 million in GHG emission reductions;
  - $9 - $67 million in air pollutant reductions
  - $18.8 million in extended landfill life
  - $28.6 million in energy savings from recycling
  - $6.5 - $8.9 million in employment benefits
  - $1.2 - $1.9 million in avoided liability costs
  - $1.1 - $1.7 million in export revenue of goods and services
  - $187,000 in additional tourism

GPIAtlantic.org

Energy savings per tonne of waste recycled

Material	Energy savings
Paper	8.5 million Btu
Plastic	20.1 million Btu
Glass	2.4 million Btu
Steel Cans	18.4 million Btu
Aluminium Cans	166.9 million Btu

GPIAtlantic.org

Costs

- Total **costs** of 2000-01 solid waste-resource system were $**96.6-102.7 million:**
  - $72.4 m. in operating and amortized capital costs
  - $14.3 m. for beverage container recycling prog.
  - $2.7 million for used tire management program
  - $1.6 million in RRFB operating and admin costs
  - $5 - $9.5 million to increase participation
  - $220,000 - $1.8 million in nuisance costs

GPIAtlantic.org

Indicators of Genuine Progress

- % diversion from landfills: <5%% -> 50%
- Access to curbside recycling in Nova Scotia jumped from less than 5% in 1989 to 99% today
- 76% of residents now have access to curbside organics pickup
- Access =by far the highest rates in the country, NS = global leader
- This is “genuine progress”

GPIAtlantic.org

Cumulative potential damage cost avoidance through achieving the NS Environmental Goals and Sustainable Prosperity Act and Suzuki Foundation Targets (based on graduated emission reductions from 2008-2020)

Year	EGSPA Target (10% below 1990)			Suzuki Target (25% below 1990)		
	Emission Reductions (tonnes)	Damage Cost Avoidance (C$2005 millions)		Emission Reductions (tonnes)	Damage Cost Avoidance (C$2005 millions)	
		$36 per tonne	$1,230 per tonne		$36 per tonne	$1,230 per tonne
2008	397,000	$14.3	$488.3	622,000	$22.4	$765.1
2009	794,000	$28.6	$976.6	1,244,000	$44.8	$1,530.1
2010	1,191,000	$42.9	$1,464.9	1,866,000	$67.2	$2,295.2
2011	1,588,000	$57.2	$1,953.2	2,488,000	$89.6	$3,060.2
2012	1,985,000	$71.5	$2,441.6	3,110,000	$112.0	$3,825.3
2013	2,382,000	$85.8	$2,929.9	3,732,000	$134.4	$4,590.4
2014	2,779,000	$100.0	$3,418.2	4,354,000	$156.7	$5,355.4
2015	3,176,000	$114.3	$3,906.5	4,976,000	$179.1	$6,120.5
2016	3,573,000	$128.6	$4,394.8	5,598,000	$201.5	$6,885.5
2017	3,970,000	$142.9	$4,883.1	6,218,000	$223.8	$7,648.1
2018	4,367,000	$157.2	$5,371.4	6,840,000	$246.2	$8,413.2
2019	4,764,000	$171.5	$5,859.7	7,462,000	$268.6	$9,178.3
2020	5,161,000	$185.8	$6,348.0	8,084,000	$291.0	$9,943.3
Total	**36,127,000**	**$1,300.6**	**$44,436.2**	**56,594,000**	**$2,037.4**	**$69,610.6**

Cumulative potential co-benefits through achieving the NS Environmental Goals and Sustainable Prosperity Act and Suzuki Foundation Targets (based on graduated emission reductions from 2008-2020)

Year	EGSPA Target (10% below 1990)			Suzuki Target (25% below 1990)		
	Emission Reductions (tonnes)	Co-Benefits (C$2005 millions)		Emission Reductions (tonnes)	Co-Benefits (C$2005 millions)	
		$13 per tonne	$20 per tonne		$13 per tonne	$20 per tonne
2008	397,000	$5.2	$7.9	622,000	$8.1	$12.4
2009	794,000	$10.3	$15.9	1,244,000	$16.2	$24.9
2010	1,191,000	$15.5	$23.8	1,866,000	$24.3	$37.3
2011	1,588,000	$20.6	$31.8	2,488,000	$32.3	$49.8
2012	1,985,000	$25.8	$39.7	3,110,000	$40.4	$62.2
2013	2,382,000	$31.0	$47.6	3,732,000	$48.5	$74.6
2014	2,779,000	$36.1	$55.6	4,354,000	$56.6	$87.1
2015	3,176,000	$41.3	$63.5	4,976,000	$64.7	$99.5
2016	3,573,000	$46.4	$71.5	5,598,000	$72.8	$112.0
2017	3,970,000	$51.6	$79.4	6,218,000	$80.8	$124.4
2018	4,367,000	$56.8	$87.3	6,840,000	$88.9	$136.8
2019	4,764,000	$61.9	$95.3	7,462,000	$97.0	$149.2
2020	5,161,000	$67.1	$103.2	8,084,000	$105.1	$161.7
Total	**36,127,000**	**$469.7**	**$722.5**	**56,594,000**	**$735.7**	**$1,131.9**

Control cost estimates of meeting the NS Environmental Goals and Sustainable Prosperity Act and Suzuki Foundation Targets (based on graduated emission reductions from 2008-2020)

Year	EGSPA Target (10% below 1990)			Suzuki Target (25% below 1990)		
	Emission Reduction (tonnes)	Control Cost (C$2005 millions)		Emission Reductions (tonnes)	Control Cost (C$2005 millions)	
		$12 per tonne	$142 per tonne		$12 per tonne	$142 per tonne
2008	397,000	$4.8	$56.4	622,000	$7.5	$88.3
2009	794,000	$4.8	$56.4	1,244,000	$7.5	$88.3
2010	1,191,000	$4.8	$56.4	1,866,000	$7.5	$88.3
2011	1,588,000	$4.8	$56.4	2,488,000	$7.5	$88.3
2012	1,985,000	$4.8	$56.4	3,110,000	$7.5	$88.3
2013	2,382,000	$4.8	$56.4	3,732,000	$7.5	$88.3
2014	2,779,000	$4.8	$56.4	4,354,000	$7.5	$88.3
2015	3,176,000	$4.8	$56.4	4,976,000	$7.5	$88.3
2016	3,573,000	$4.8	$56.4	5,598,000	$7.5	$88.3
2017	3,970,000	$4.8	$56.4	6,218,000	$7.5	$88.3
2018	4,367,000	$4.8	$56.4	6,840,000	$7.5	$88.3
2019	4,764,000	$4.8	$56.4	7,462,000	$7.5	$88.3
2020	5,161,000	$4.8	$56.4	8,084,000	$7.5	$88.3
Total	**36,127,000**	**$61.9**	**$732.9**	**56,594,000**	**$97.0**	**$1,148.2**

Summary of damage avoidance benefits and control costs in year 2020 and cumulatively 2008-2020, (C$2005 mill.)

CO2 Equivalent Reduction	In Year 2020		Cumulative Over 2008-2020	
	Low Estimate	High Estimate	Low Estimate	High Estimate
Maximum EGSP Act (5,150,000 tonnes)				
Damage Avoidance				
Climate Change Mitigation	$185.8	$6,348.0	$1,300.6	$44,436.2
Co-Benefits	$67.1	$103.2	$469.7	$722.5
Total Damage Avoidance	$252.9	$6,451.2	$1,770.3	$45,158.7
Control Costs	$4.8	$56.4	$61.9	$732.9
Ratio of Damage Avoidance to Control Costs	53:1	114:1	29:1	62:1
Net Benefits	**$248.1**	**$6,394.8**	**$1,708.4**	**$44,425.8**
Maximum Suzuki (8,075,000 tonnes)				
Damage Avoidance				
Climate Change Mitigation	$291	$9,943.3	$2,037.4	$69,610.6
Co-Benefits	$105.1	$1,61.7	$735.7	$1,131.9
Total Damage Avoidance	$396.1	$10,105.0	$2,773.1	$70,742.5
Control Costs	$7.5	$88.3	$97	$1,148.2
Ratio of Damage Avoidance to Control Costs	53:1	114:1	29:1	62:1
Net Benefits	**$388.6**	**$10,016.7**	**$2,676.1**	**$69,594.3**

Cost-effectiveness:

- Every $1 invested in reducing GHG emissions through 2008-2020 will save $29 in avoided damages.
- When subtract control costs from benefits attained by avoiding climate change damages + achieving co-benefits (cleaner air), net cumulative benefit =
  $846 million (10% below 1990 by 2020)
  $1.8 billion (25% below 1990 by 2020)
- Stern: **"The benefits of strong, early action on climate change outweigh the costs."**

GPIAtlantic.org

Valuing Natural Capital Health

For example, a healthy forest effectively:

- Prevents soil erosion/sediment control
- Protects watersheds
- Regulates climate regulation/sequesters carbon
- Provides habitat for wildlife / biodiversity
- Supports recreation, tourism, aesthetic quality
- Provides timber

GPIAtlantic.org

Valuing wetlands a/c function

- Flood prevention
- shoreline protection, erosion prevention
- storm control
- water purification
- storage and recycling of human waste
- spawning and nursery habitat for fish and shellfish

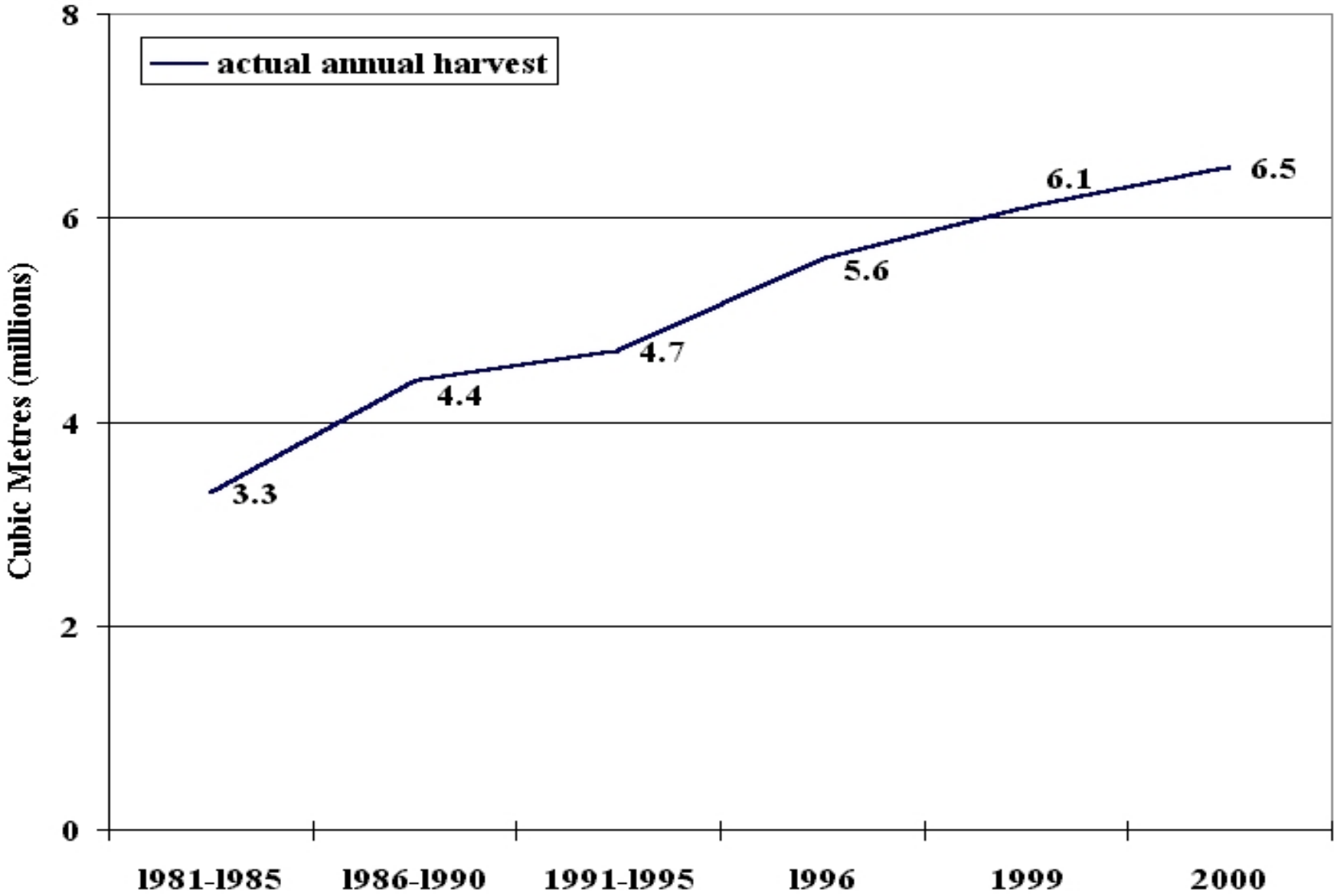
GPIAtlantic.org

Wetland functions (ctd)

- Carbon sequestration and storage
- sanctuary, breeding, nursery habitat for terrestrial, near-shore, & migratory birds
- feeding habitat for terrestrial wildlife
- nutrient recycling, production & storage
- recreation, education, science
- waste treatment
- food production

GPIAtlantic.org

Forests a/c Conventional Accounts



Forests: Age and species structure = *key* indicators of forest health / multiple functions

- NS forests have seen a sharp decline in valuable species such as white pine, eastern hemlock, yellow birch, and oak
- Forests more than 80 years now account for just over 1% of NS forest land – down from 25% in 1958 (not pristine)

GPIAtlantic.org

Figure 2. Provincial Forest Area by Age Classes over 61 yrs., Percentage of Total Forest Area, 1958-2003

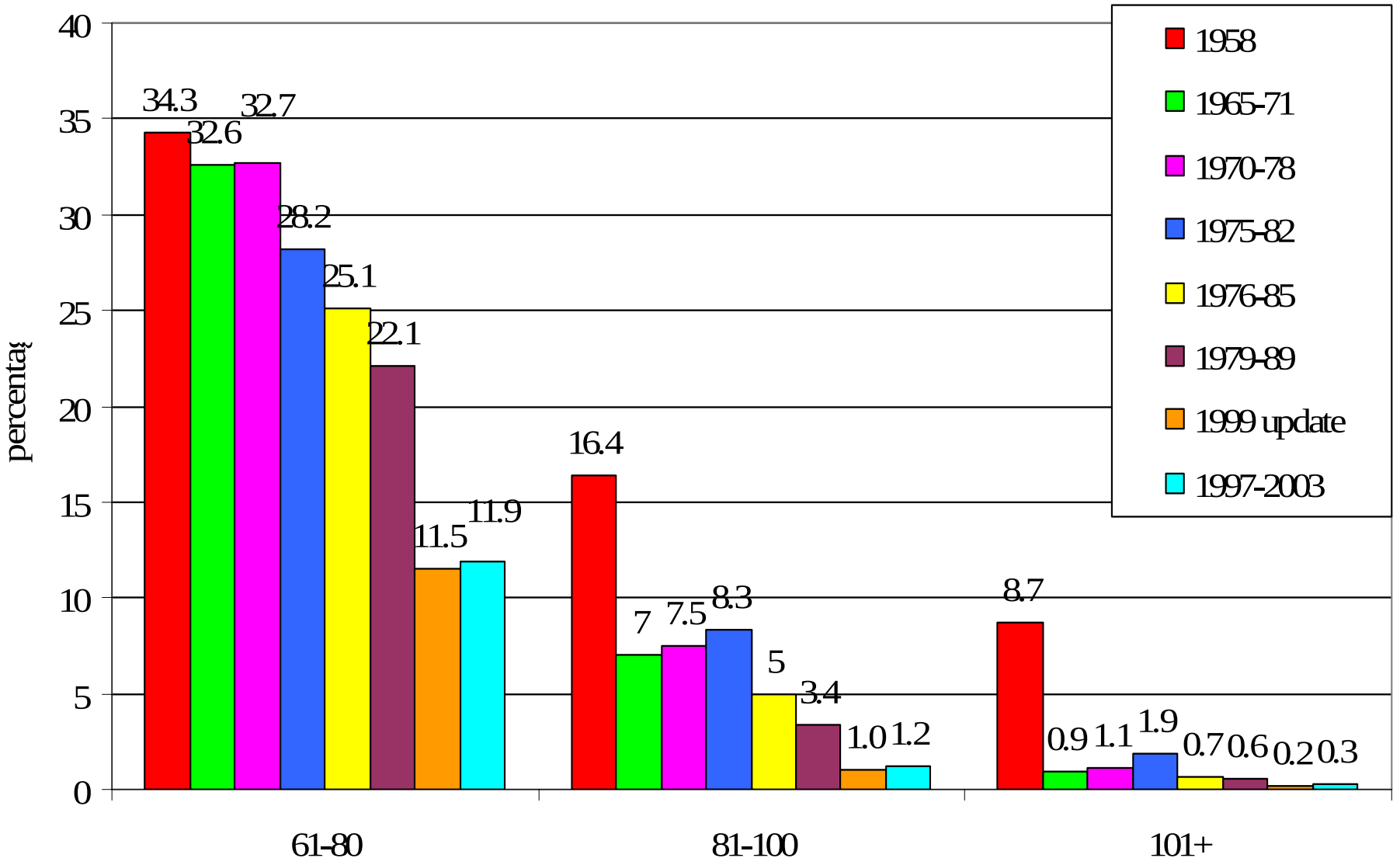
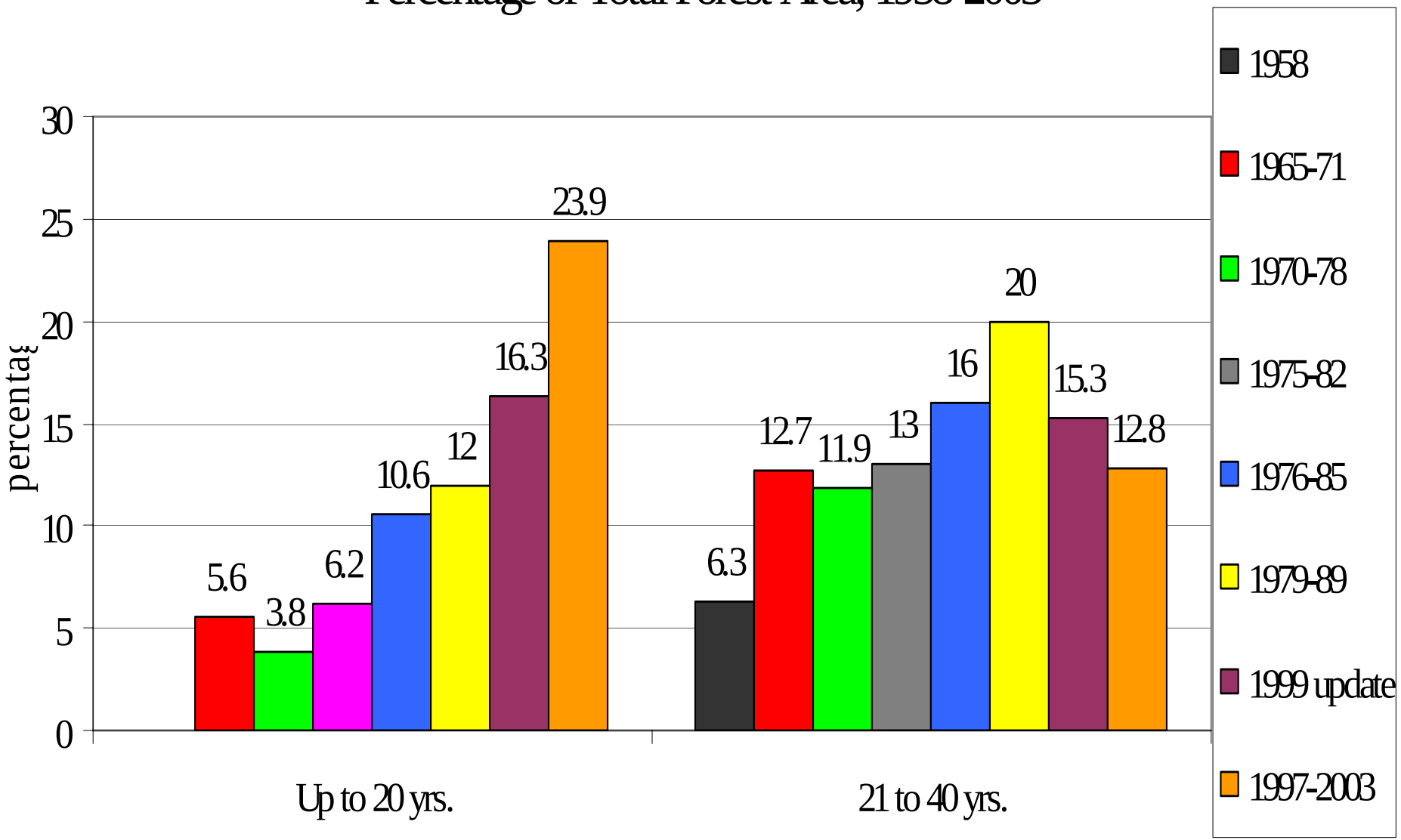


Figure 3. Provincial Forest Area by Age Classes up to 40 years of age, Percentage of Total Forest Area, 1958-2003

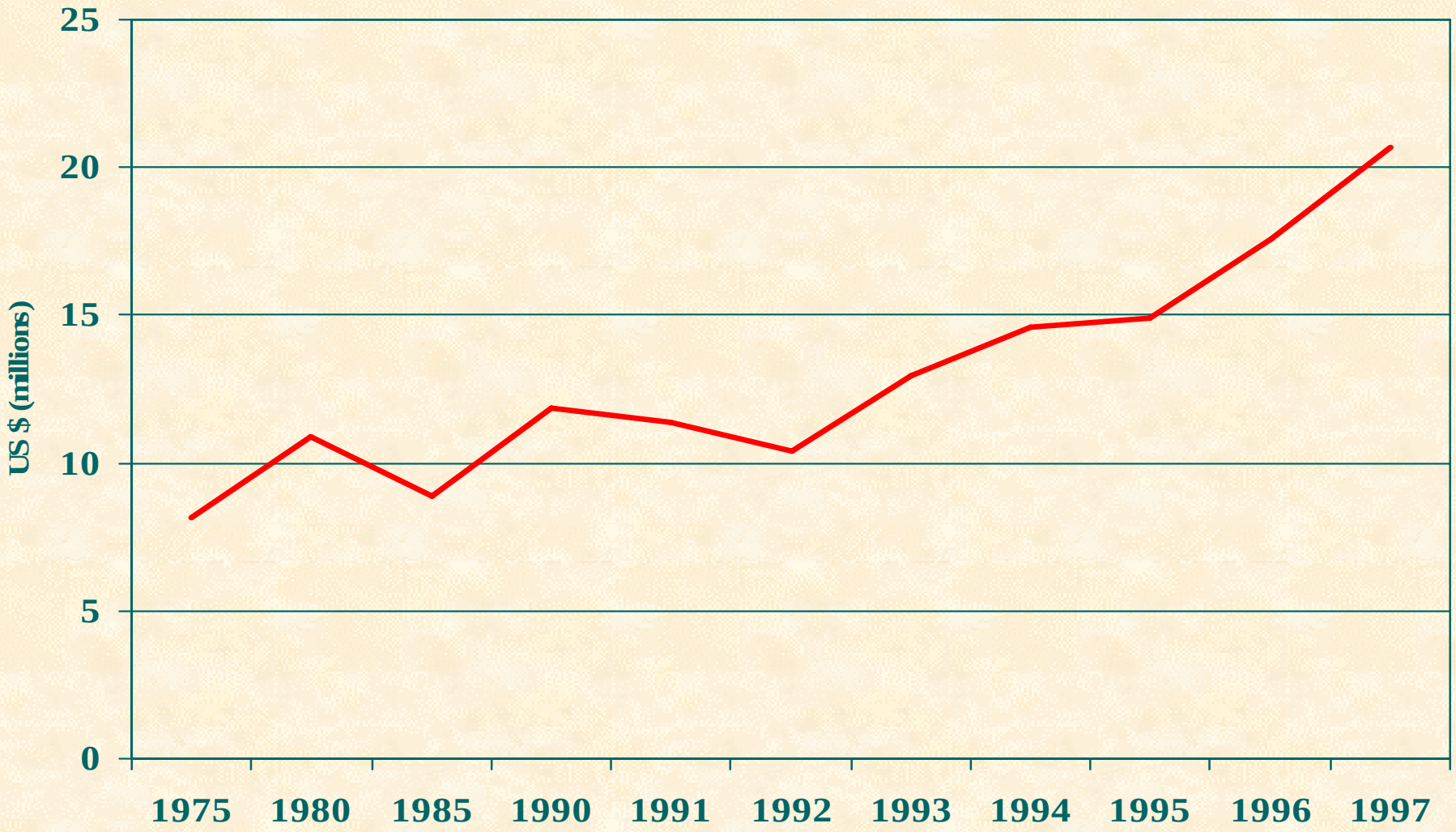


E.g. Economic valuation: NS Carbon loss = $1.3 bill.

- NS forests store 107 mill tonnes carbon, avoiding $2.2 billion in climate change damage costs
- But increased cutting, and loss of old growth and mature forests in NS since 1958, drastically reduced NS carbon storage capacity by 38%, costing estimated $1.3 billion in lost value.
- Based on the 1958 forest inventory, carbon stored would be worth $3.5 billion. Carbon loss in Nova Scotia's forests is now contributing to global climate change.

GPIAtlantic.org

Estimated Annual Cost of Carbon Released due to Timber Harvest, NS, 1975-97



Excess clearcutting, loss of natural age & species diversity have resulted in loss of:

- valuable species
- wide diameter and clear lumber that fetch premium market prices
- resilience and resistance to insect infestation
- wildlife habitat, & bird population declines
- forest recreation values -> nature tourism

GPIAtlantic.org

- decline in forested watershed protection & 50% drop in shade-dependent brook trout
- soil degradation and leaching of nutrients that can affect future timber productivity
- substantial decline in carbon storage capacity & increase in biomass carbon loss
- decline in essential forest ecosystem services

This represents substantial depreciation of a valuable natural capital asset.

GPIAtlantic.org

Importance of Good News: E.g. V. 2: Best Forestry Practices in N. S.

- Selection harvesting increases forest value and provides more jobs
- Shift to value-added creates more jobs
- Restoration forestry is a good investment
- What incentives can encourage restoration

NB: Parallels to wetland restoration efforts

GPIAtlantic.org

Natural Resource Accounts are not enough! - Onus on producers

- Measuring the demand side of the sustainability equation
- e.g. Forests: 20% of world's people consume 84% paper; 20% consume 1%
- The equity dimension of sustainability
- Reporting to Canadians on impacts of behaviour - e.g. GHGs

GPIAtlantic.org

Ecological footprint

- Demonstrates relationship between income, consumption, and environmental impact. Higher income groups have larger footprint: 30% of people are responsible for 70% of global resource consumption and waste generation
- It cuts through illusions that we can improve the living standards of the poor without also examining the consumption patterns of the rich and that we can “maintain” current excess

GPIAtlantic.org

Local consumption patterns have global consequences

- Local consumption may involve natural resource depletion far away
- We may indulge unsustainably high levels of consumption in Canada and NS, perhaps even without depleting local resources, but rather by "appropriating the carrying capacity" of other countries through trade
- Footprint demonstrates accounting approach without monetization + indicator trend

GPIAtlantic.org

Current Footprint Exceeds Sustainable Capacity of Earth

- If everyone in world consumed at NS levels, we'd need ***4*** *planets Earth* to provide the necessary resources + waste assimilation capacity
- Raising global living standards to current levels in the wealthy countries would therefore put an intolerable strain on the Earth's resources.

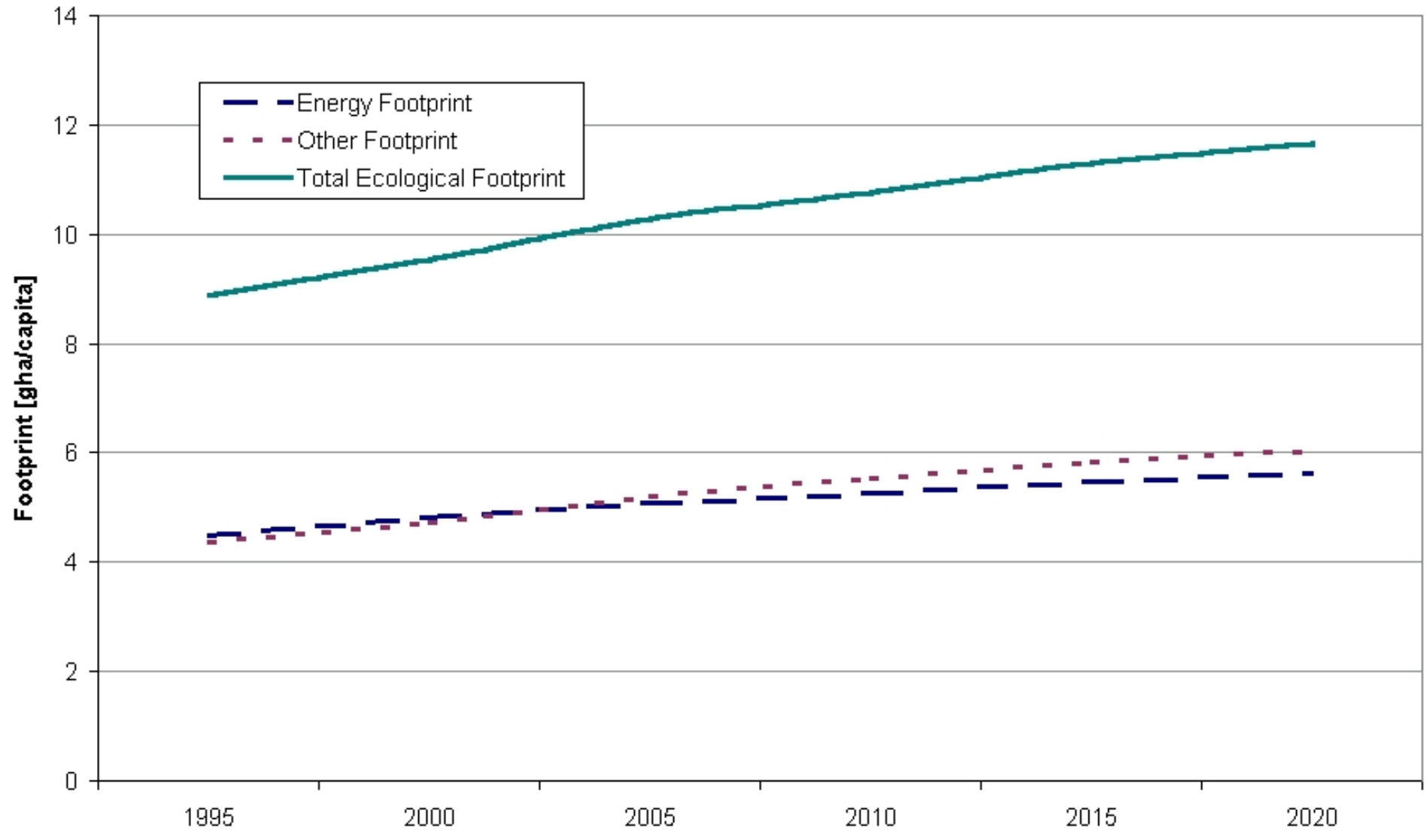
GPIAtlantic.org

Global "ecological overshoot" is temporarily possible by:

- depleting reserves of natural capital (e.g., natural gas, old growth forests);
- over-harvesting renewable resources to the brink of collapse (e.g. fish stocks);
- causing irreversible ecological damage (e.g., species extinction)
- overloading environment with waste products (air & water pollution, GHGs - climate change, ozone depletion, etc.)

GPIAtlantic.org

Ecological Footprint Projections, Canada, 1995-2020



Action–present/communicate + 10 types policy use and application

A. Short-term / immediate:

1. Goals / ***targets*** – only need baseline data (e.g. alcoholism, poverty, GHG emissions...). Researchers and policy makers work together to set ambitious yet realistic targets

2. Informed decision-making: What ***programs*** can achieve above results? (E.g. train comm. health workers, NS teen smoking prevention). + Identify particular needs = cost-effective

GPIAtlantic.org

A. Short-term, ctd.

3. ***Education***: demonstrate linkages among domains, interdependence of reality (e.g. education/ culture/environment)

4. Provide ongoing ***commentary*** – e.g. weekly media column, articles: GPI lens on key policies (e.g. stimulus packages). Advice: (a) state findings humbly, (b) include good news

GPIAtlantic.org

Medium-term – requires *trend* data over time

5. ***Early warning signals*** – predictive power of new measures -> can trigger preventive remedial action

6. ***Evaluate programs*** – which work and which don't to meet community goals & targets

7. ***Hold government accountable*** – at election time a/c objective standards – did gov't attain targets during office; basis for election promises

GPIAtlantic.org

Long-term structural change

8. ***Unifying*** force esp. in democracy – agreement on consensus goals/principles; parties debate strategy – how best to achieve goals.

9. Creative, innovative & new solutions to ***global*** issues & crises created by old paradigm, & even reverse destructive trends: e.g. layoffs/economic collapse; fish stocks; climate change; decline of Indigenous languages/culture/knowledge.... By ***valuing*** natural, human, social, cultural capital

GPIAtlantic.org

10. Policy uses of FCA – Where we are and where we want to go

Four Steps (we are at doorstep of #2):

- Build new accounting system – under way / feasible (beyond indicators)
- ***Political will to adopt fully and properly*** (Bhutan 1st sovereign nation to adopt officially?)
- System of financial incentives and penalties = government action (e.g. tax shifts)
- Prices that reflect true benefits and costs

GPIAtlantic.org

Politics and Uptake: Measuring progress is normative

But GPI based on consensus values

- Economic and livelihood security
- Health, free time
- Educational attainment
- Strong and safe communities, vibrant culture
- Clean environment, healthy natural resources

GPIAtlantic.org

Political implications

- Non-partisan; Evidence-based decision making
- Consensus on goals, vision. Politics is about ***how*** to get there. E.g. GHG reductions, poverty reduction – goal vs strategy
- No “bad news” unless hidden from view. Shine spotlight – suggests solutions (e.g. vs layoffs)

3. Why Now? – Opportunities in the current downturn

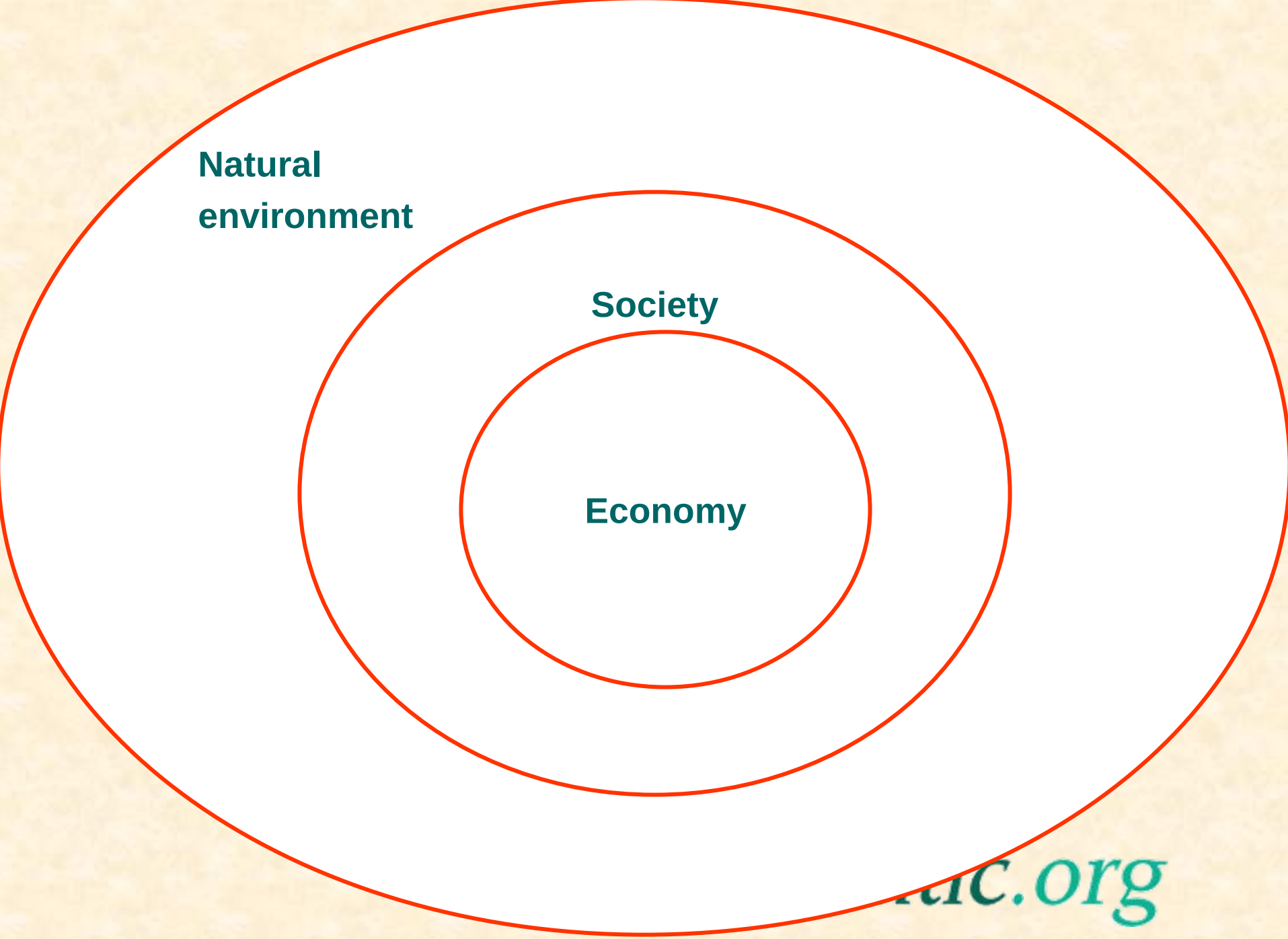
or

How our economic system has failed us and why we need a new paradigm

Growth-based economics

- The language – e.g. London Times
- How we measure growth
- Kuznets' warning
- Fatal flaws in the growth paradigm
- How economics is taught (incl. media)

GPIAtlantic.org



From that perspective, begin with a different question:
What kind of world are we leaving our children…?

Reality-based economics

- Species extinction, large fish, forests
- Climate change – Stern (WB) report: **"The benefits of strong, early action on climate change outweigh the costs."** (1% GDP vs 5-20% GDP "now and forever")
- The natural world – Recession achieves what we could not achieve through Kyoto: Bailing out the auto industry?

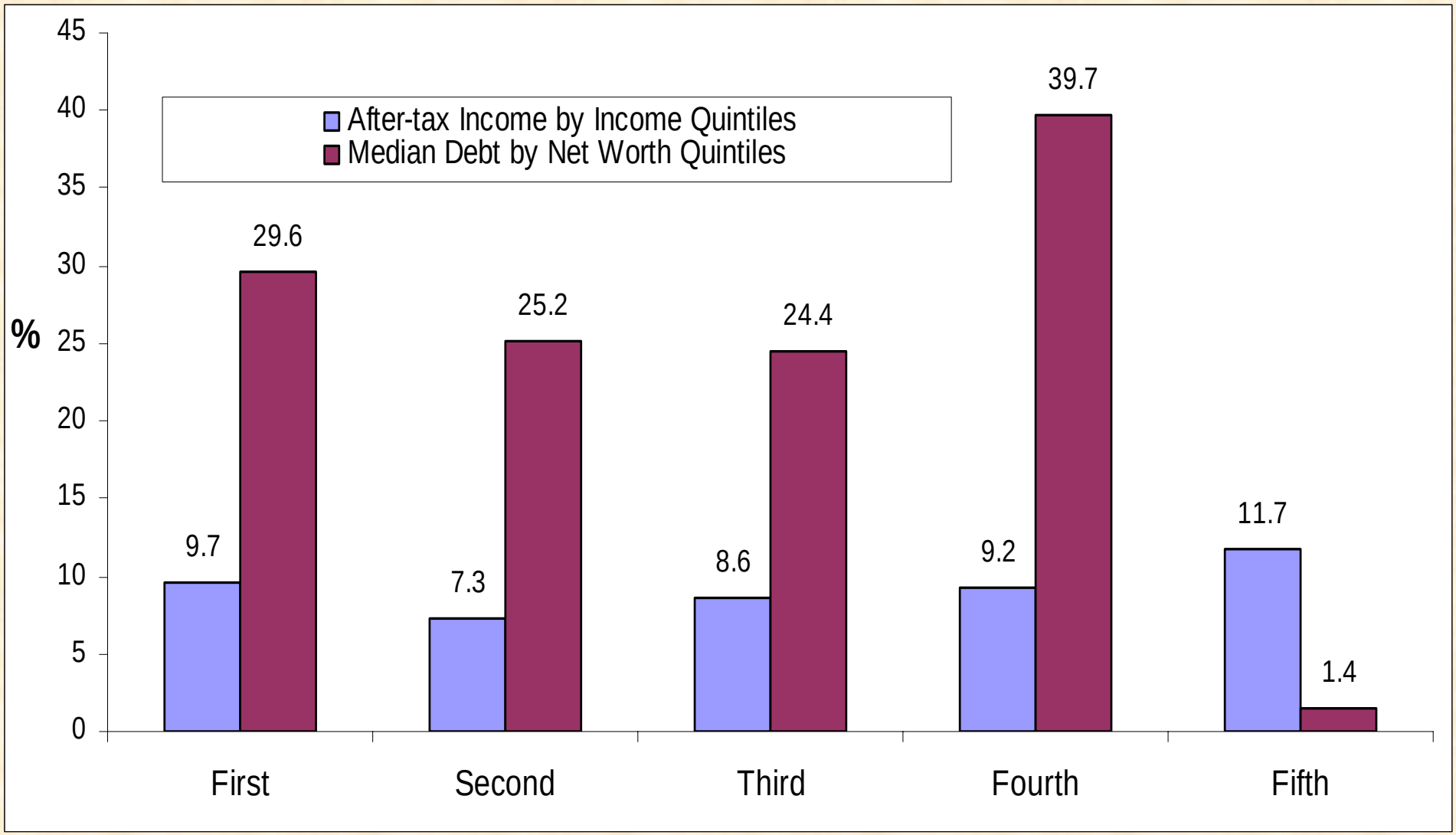
GPIAtlantic.org

Reality-based accounting – a balanced (net vs gross) approach

- To assess nation's true wealth, need to measure the value of natural, human, social, cultural, built, and financial capital.
- Only latter two are currently valued but ***all*** capital is subject to depreciation and requires periodic re-investment. E.g. forests, health, culture, education
- Good accounts require: Stocks (balance sheets – assets/liabilities) + flows

GPIAtlantic.org

Predictive power of new accounts Early warning vs "I told you so" (cf 'expert' bank head analysis)

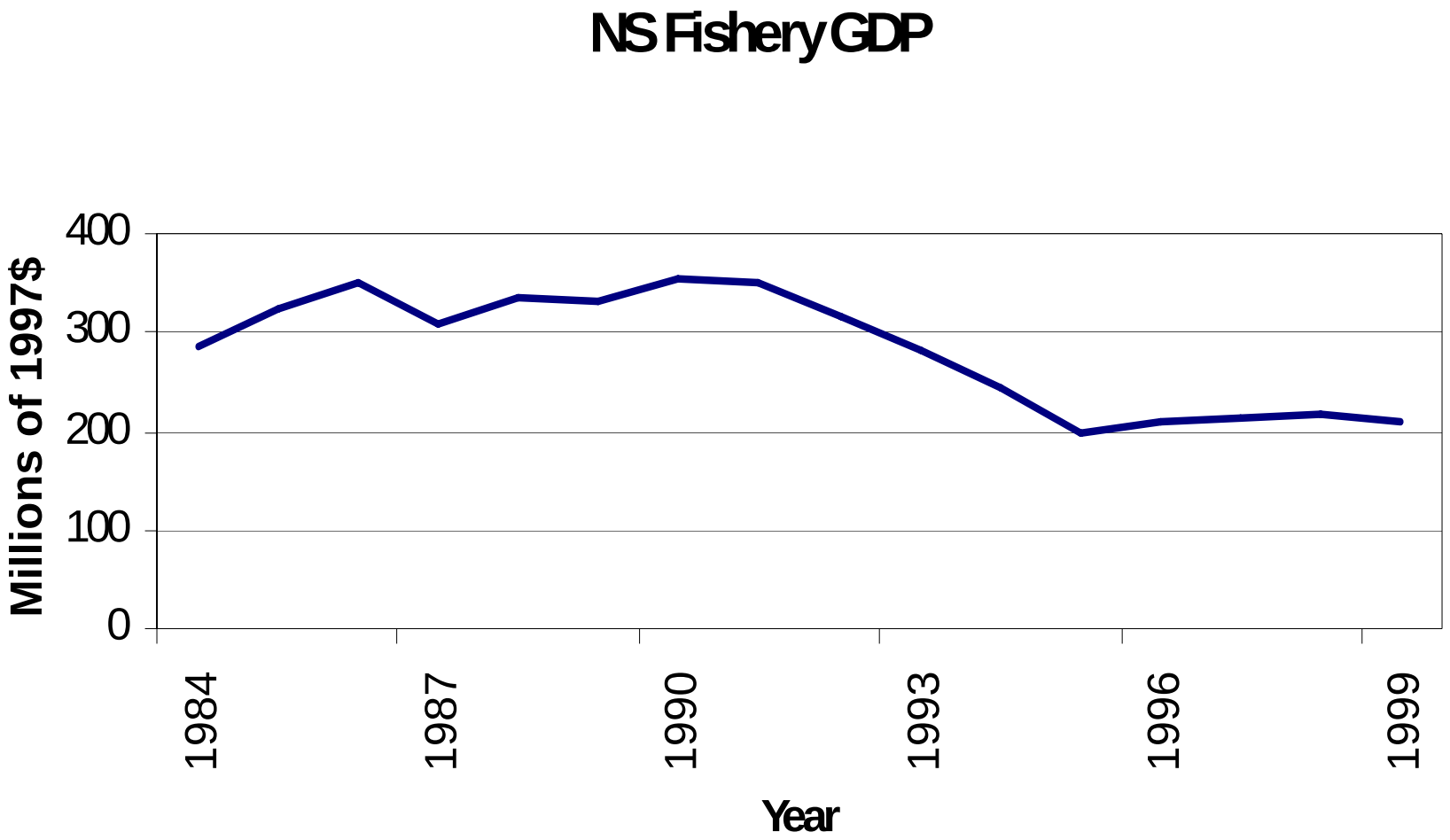


The fatal flaw – and why current 'solutions' will fail

- Debt-fuelled growth got us into this mess (personal/mortgage debt ***and*** ecological debt). Yet proposed solution = ***more*** debt-fuelled growth (governments)
- But root causes are in excess production/ consumption; boom and bust cycles that raise unrealistic expectations -> cruel disappointments

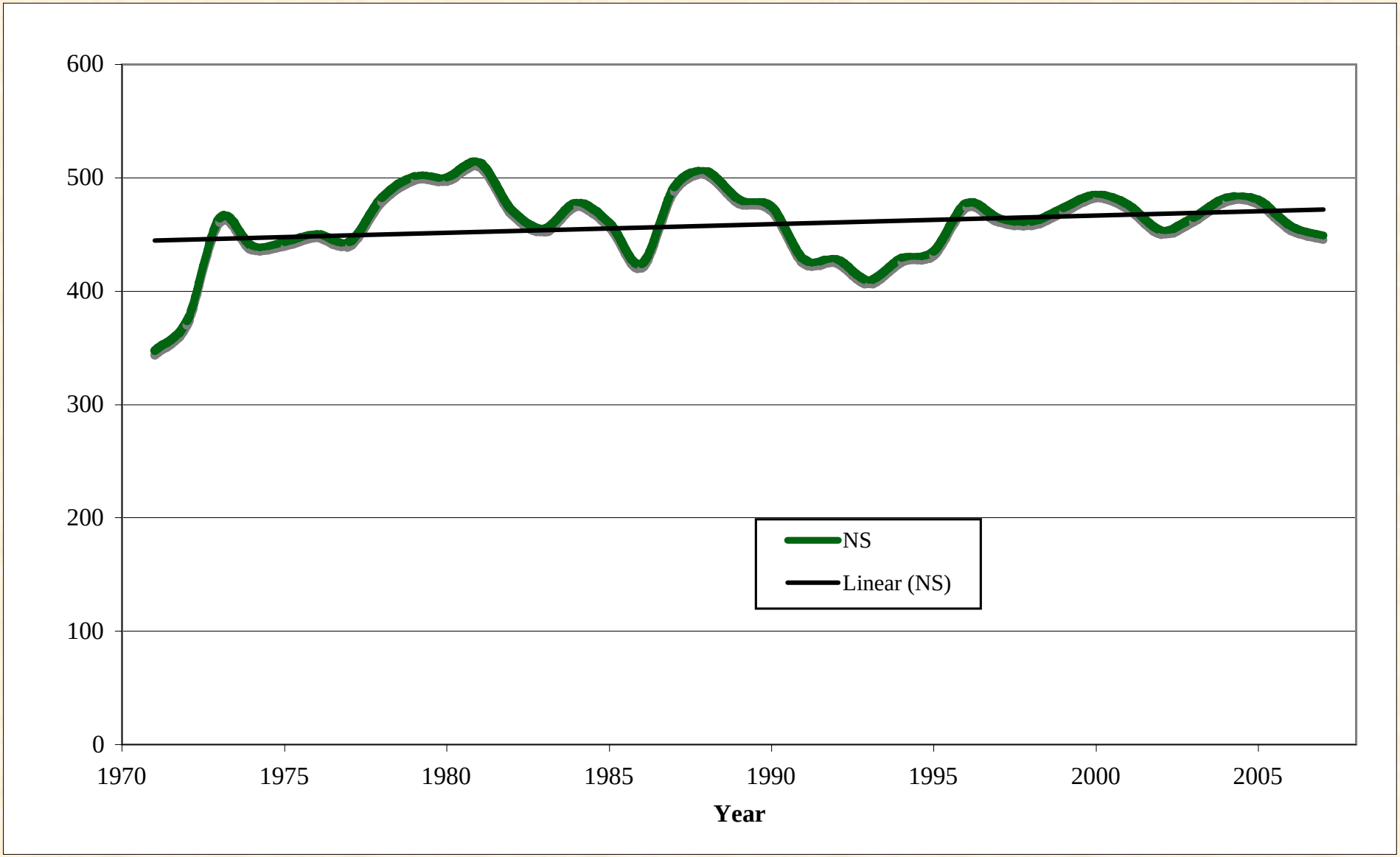
GPIAtlantic.org

Fishery GDP for Nova Scotia, 1984-1999 (1997$ millions): Depletion of Natural Wealth as Economic Gain

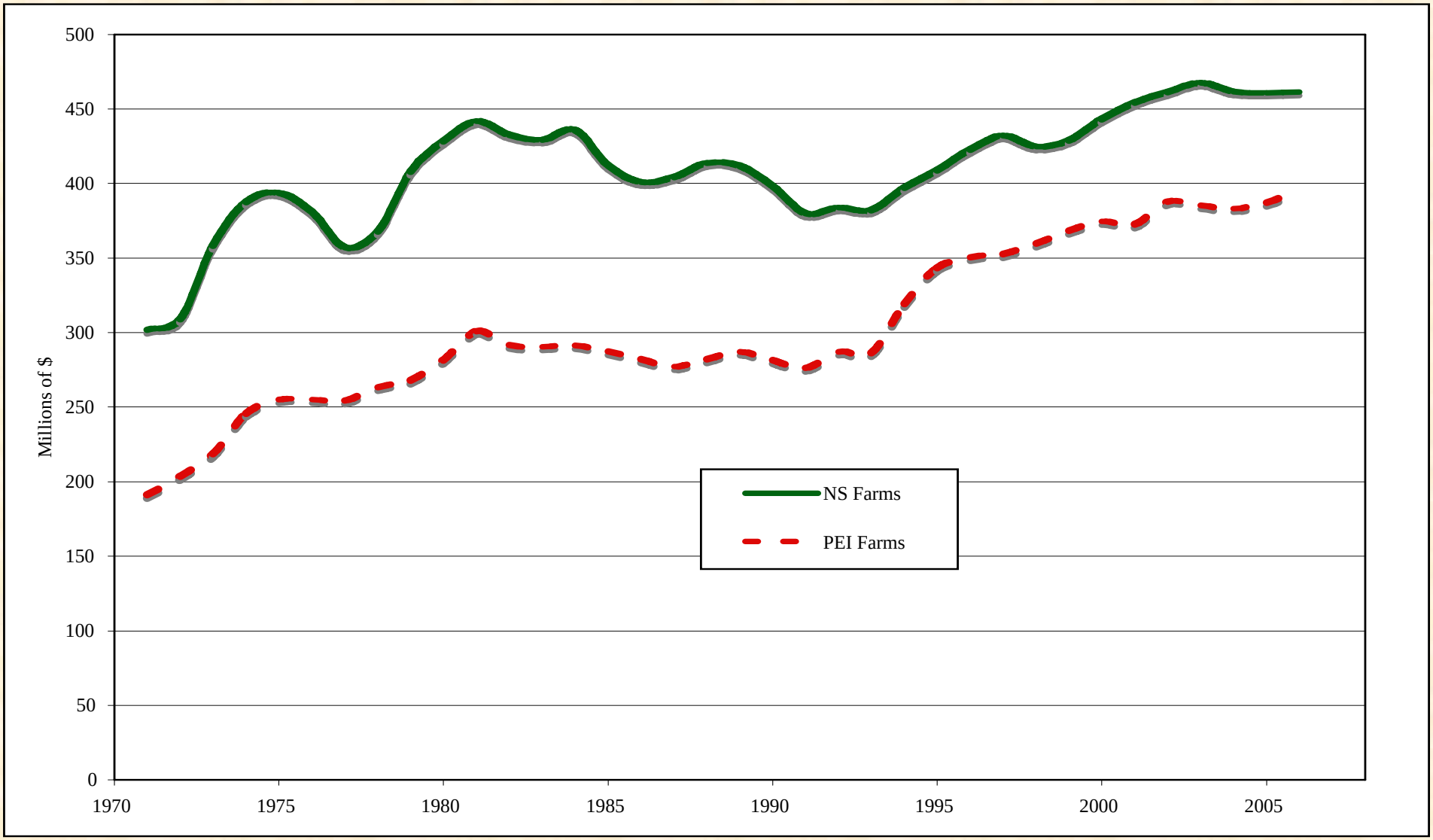


Total Farm Cash Receipts, NS, 1971–2007

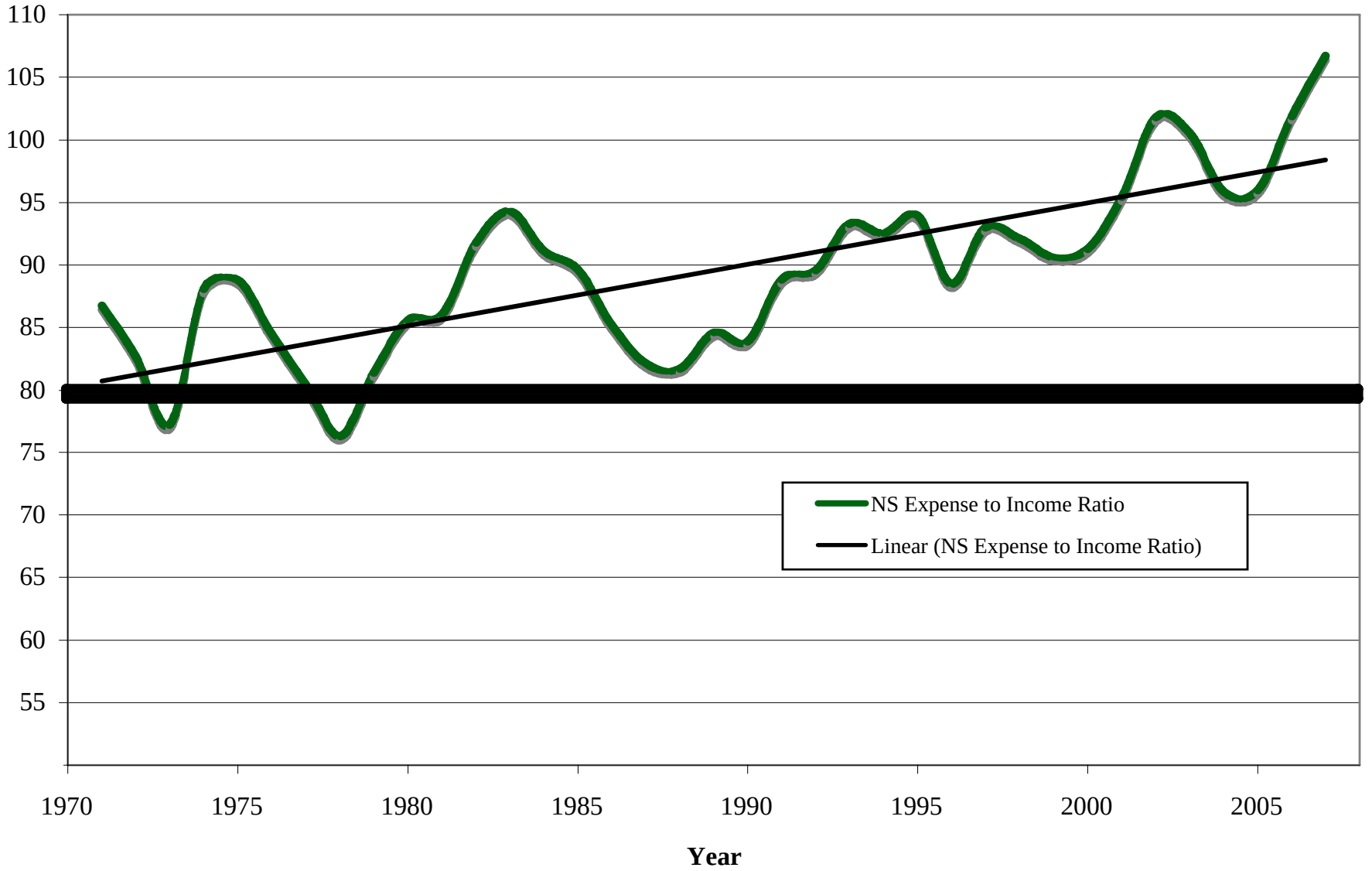
(Millions of $2007) = no early warning



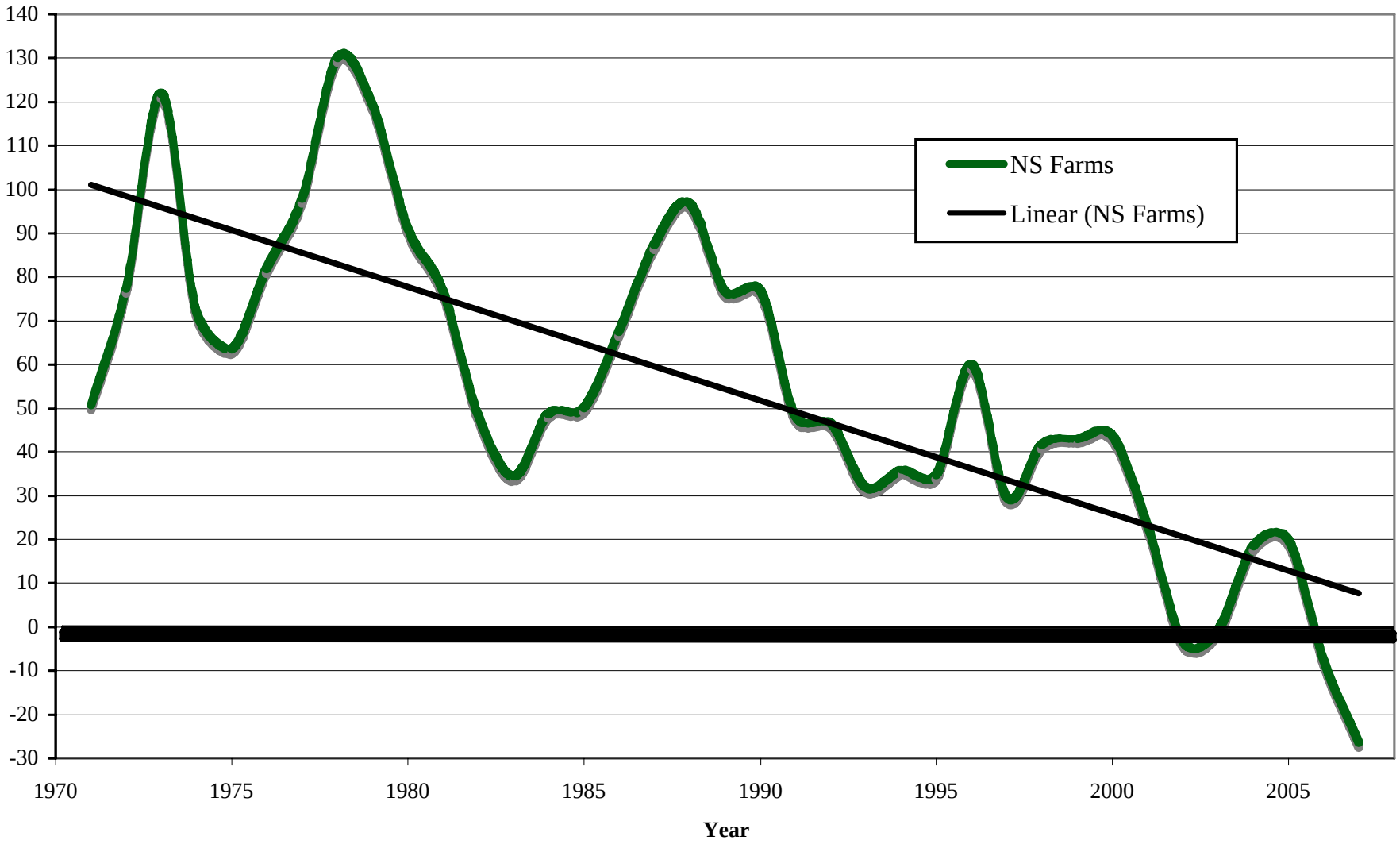
Total Farm Operating Expenses, NS & PEI, 1971–2006 (Millions of $2007)



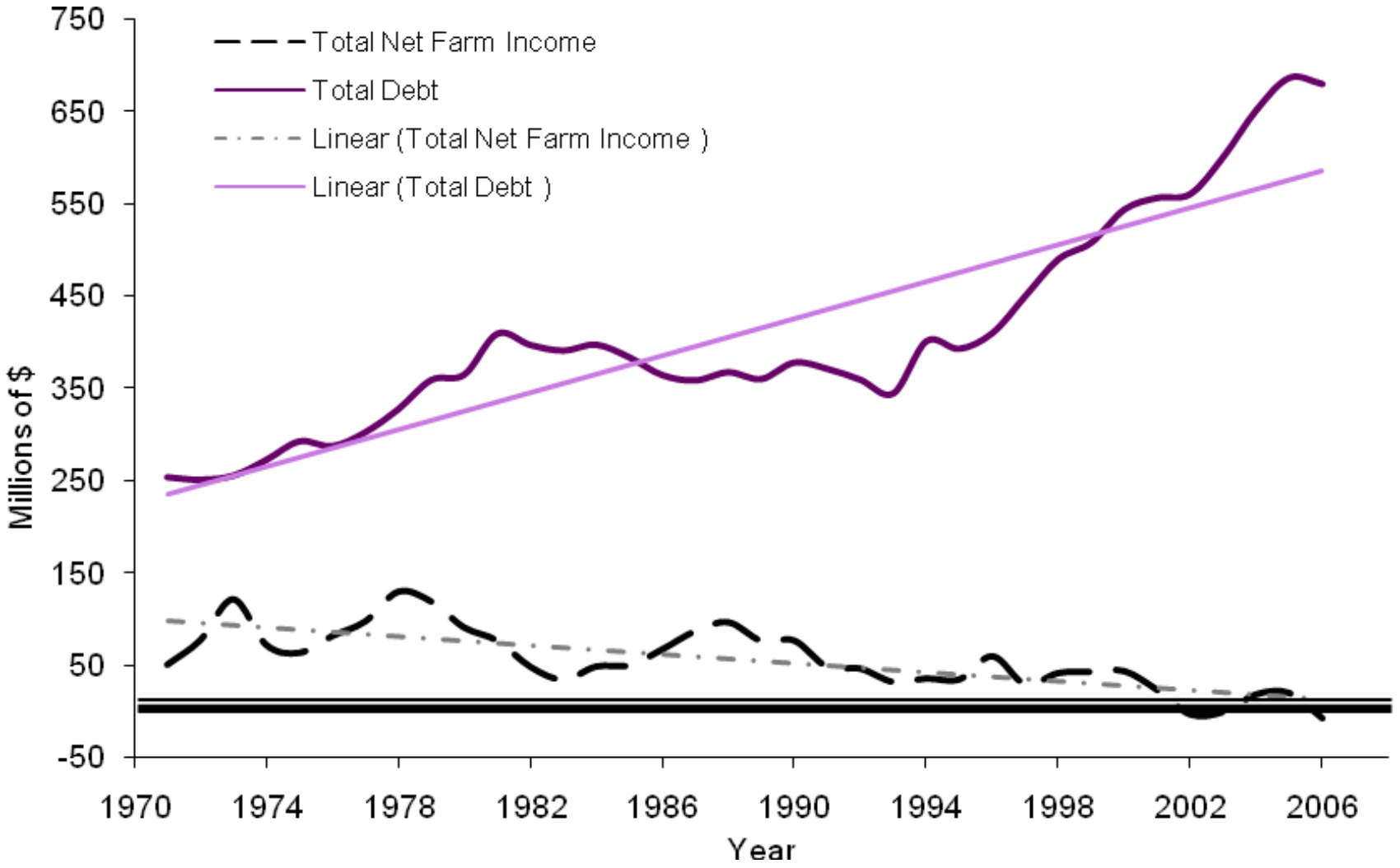
Expense to Income Ratio (%), Nova Scotia Farms, 1971–2006



Total Net Farm Income, Nova Scotia, 1971–2007 (millions of $2007)



Total Net Farm Income and Total Debt, NS Farms, 1971-2006
(millions of $2007)



Opportunity and timing

- Conventional system bankrupt, “experts” fooled, shocked (Greenspan confession)
- Desperation -> fighting fire with fire, close ranks – Rep/Dem, G20 consensus
- In 6-9 months, when stimulus fails to stimulate and debt grows, open to alternative...: Lay the ground now:.....

GPIAtlantic.org

Creative solutions

- Shrink creatively, fewer cars, reduce GHGs, waste, consumption, conserve resources. Dare we say: “Perhaps economy got too big!”
- Shorter work time vs layoffs, improve quality of life, increase free time, strengthen voluntary sector
- Redistribution – income/time/work; “sufficiency” economy; balance; self-reliance; fair trade vs free (more) trade = new economic mantras/principles

GPIAtlantic.org

SWT = multiple forms/benefits

- Netherlands 1980s, KPMG, Rogers – reduce unemployment (and its costs – crime/sickness etc.), keep productive workers & know-how, avoid re-hiring, retraining costs, improve productivity
- 4-day week, longer vacations, sabbaticals, phased retirement (Sweden), reduce o'time, shorter workday (match school schedules)...
- Gov't action: short-time incentive: 10% pay cut for 20% work cut (Belgian civil service)

GPIAtlantic.org

In accord with core values

% Rating 8-10	Self	Others
Family (requires time)	**94.9**	55.9
Responsibility	**93.3**	50.8
Freedom	88.4	80.6
Friendship (requires time)	**87.3**	54.2
Financial Security	76.3	76.9
Generosity (e.g. volunteerism)	**75.8**	36.6
Pleasure	69.6	**76.1**
Spiritual	**59.5**	29.4
Career Success	62.8	**92.4**
Material Wealth	27.4	**67.8**

GPIAtlantic.org

Value Alienation?

- Large majority of respondents in both communities believe they are socially motivated individuals living in a materialistic society
- Is dominant commercial culture, materialism out of touch with what matters most to people?
- Factor analysis: Positive social values intrinsically related to positive wellbeing while materialistic values were not - Consistent with growing research literature

GPIAtlantic.org

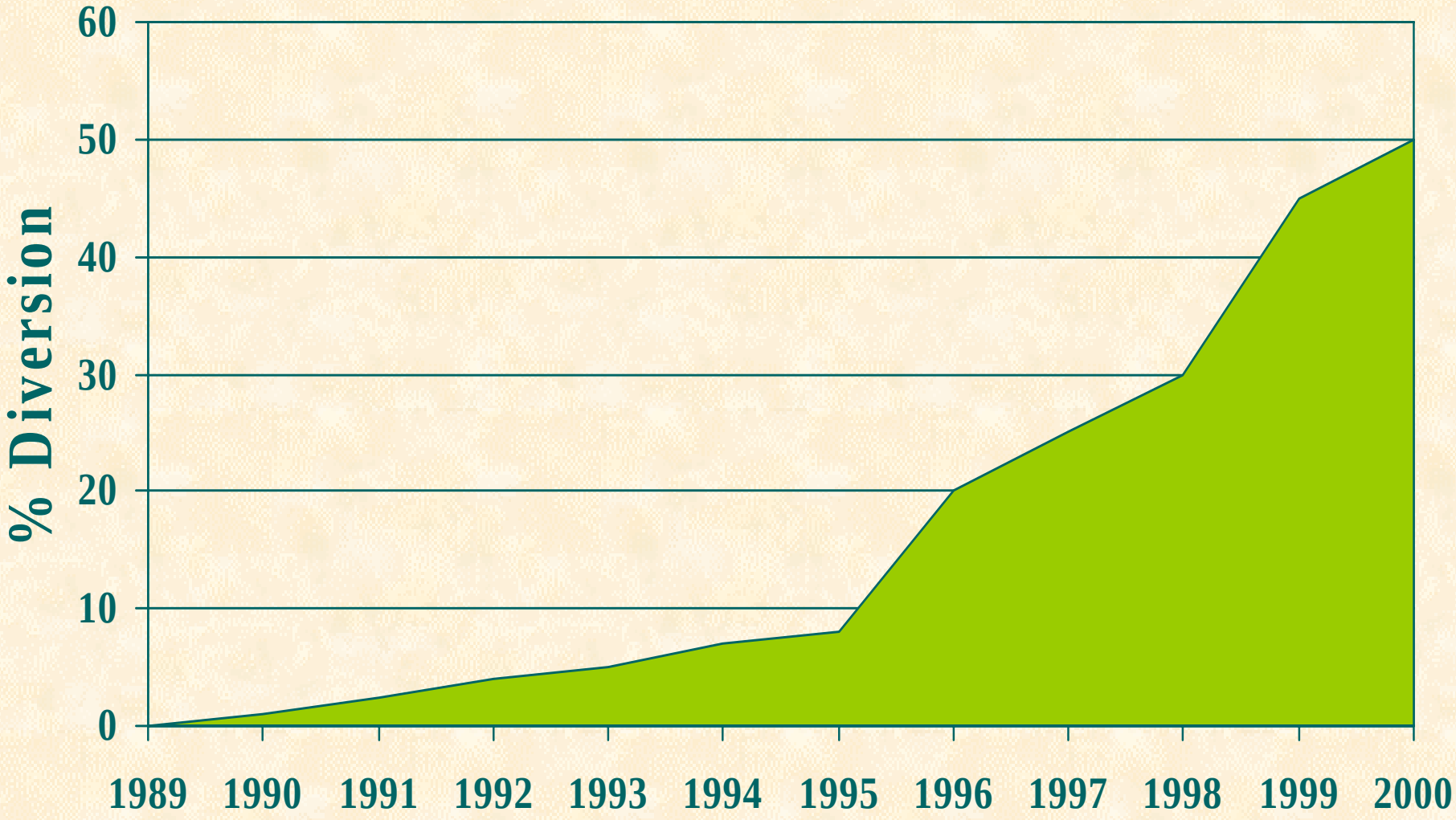
In accord with ecological reality

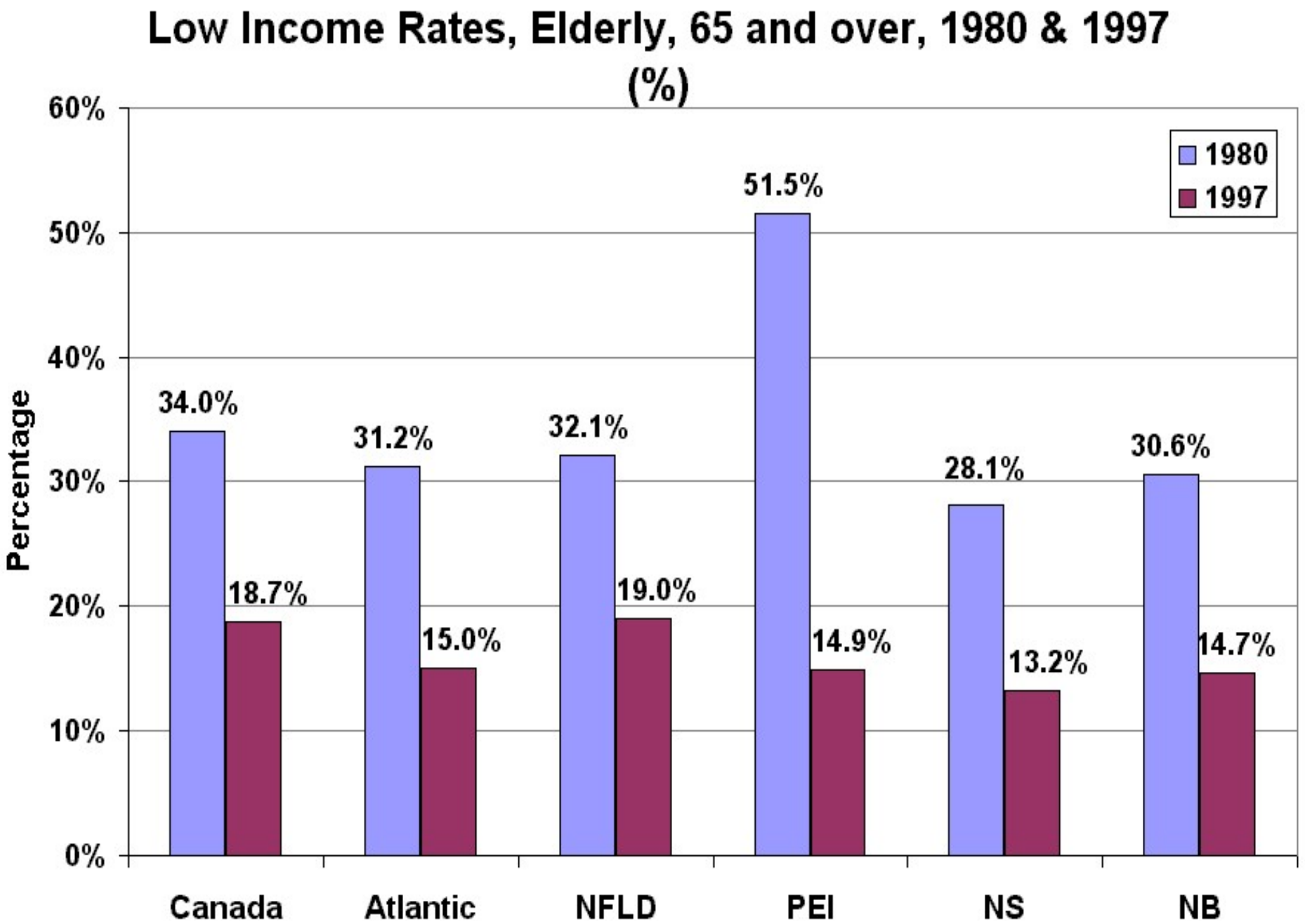
- 20% consume 80% resources
- 20% = 84% paper; 20% = 1%
- 4 planets needed for all to consume a/c living standards of Canadians
- Excess consumption not correlated with wellbeing

GPIAtlantic.org

Can we do it?

Percentage Waste Diversion in Nova Scotia




Low Income Rates, Elderly, 65 and over, 1980 & 1997
(%)
60%
50%
40%
30%
20%
10%
0%
Percentage
1980
1997
34.0%
18.7%
31.2%
15.0%
32.1%
19.0%
51.5%
14.9%
28.1%
13.2%
30.6%
14.7%
Canada
Atlantic
NFLD
PEI
NS
NB

Measuring what we value to create a better future for our children

GPI*Atlantic*

Genuine Progress Index for Atlantic Canada
Indice de progrès véritable - Atlantique

www.gpiatlantic.org