

VISIONING LOCAL FUTURES: THE DEVELOPMENT OF A COMPUTERIZED TOURISM PLANNING SUPPORT SYSTEM

SPATIAL KNOWLEDGE AND
INFORMATION CANADA
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Tourism in Nova Scotia



- Contributes \$1.3 Billion to the Nova Scotia economy
- Directly employs 8% of provincial workforce
- Several planning challenges;
 - ▣ Distance to main markets
 - ▣ Highly seasonal
 - ▣ Weak transportation linkages

Nova Scotia Ports of Entry



Loss of Yarmouth Ferry



- What impact could this have on tourist visitation to Yarmouth?
 - ▣ Loss of main entry point for SW Nova Scotia
 - ▣ Access point for American market to Nova Scotia
- This is a variable rich, complex problem
 - ▣ Distance (willingness to travel)
 - ▣ Seasonality (ferry runs May to October)
 - ▣ Tourist awareness of destinations
 - ▣ Competition (interchangeable products)

Agent Based Modeling (ABM)



- The use of ABM to provide planning support is an emerging research area (Bolte, Hulse, et al, 2006; Deadman & Gimblett, 1994; Ligmann-Zielinska & Jankowski, 2007)
- Uses computer ‘agents’ to represent real-life entities (tourists) and environments (destinations)
- Agents interact on a geo-referenced landscape, according to a series of rule-based behaviours
- Behaviours reflect tourist preferences (activity, accommodation, distance, awareness)

Port of Entry Scenario



- Alter tourist port of entry to explore possible effects on visitation
- Two scenarios: base (4%) and no ferry (0%) at Yarmouth
- Same total number of tourists, but allocated differently

TourSim Model Setup Page

TourSim - AnyLogic 6 [EDUCATIONAL USE ONLY]

AnyLogic

TourSim: Port of Entry Scenario

Model Setup Page

Welcome to TourSim, an interactive model of tourism development in Nova Scotia. Please take a look at the tutorial that goes with this model, available at: www.tourism.wordpress.com/tutorial

This scenario allows you to experiment with how changing where tourists enter NS can affect tourist visitation and income derived from tourism.

Getting started is easy; just pick a view option (destination and tourist type), click "Run the Model" and watch the simulation and dynamic charts unfold. To change percentage of tourists entering at each port, move the slider bars under Model Parameters.

The simulation ends after one year, when you will be able to click on a button to add the results of the simulation to the results comparison charts to right of your screen. Next, select the same view options, and change some of the model parameters. Run the model again, and see what effect the changes have on how the system functions.

Model Parameters

Percentage of Tourists entering at each port:

Port	Percentage
Halifax	24
Amherst	56
Pictou	6
Tidnish	4
North Sydney	4
Yarmouth	4
Digby	2
Total of all percentages	100

View Options

Destinations

- View All
- Baddeck
- Digby
- Yarmouth
- Cheticamp
- Halifax
- Lunenburg

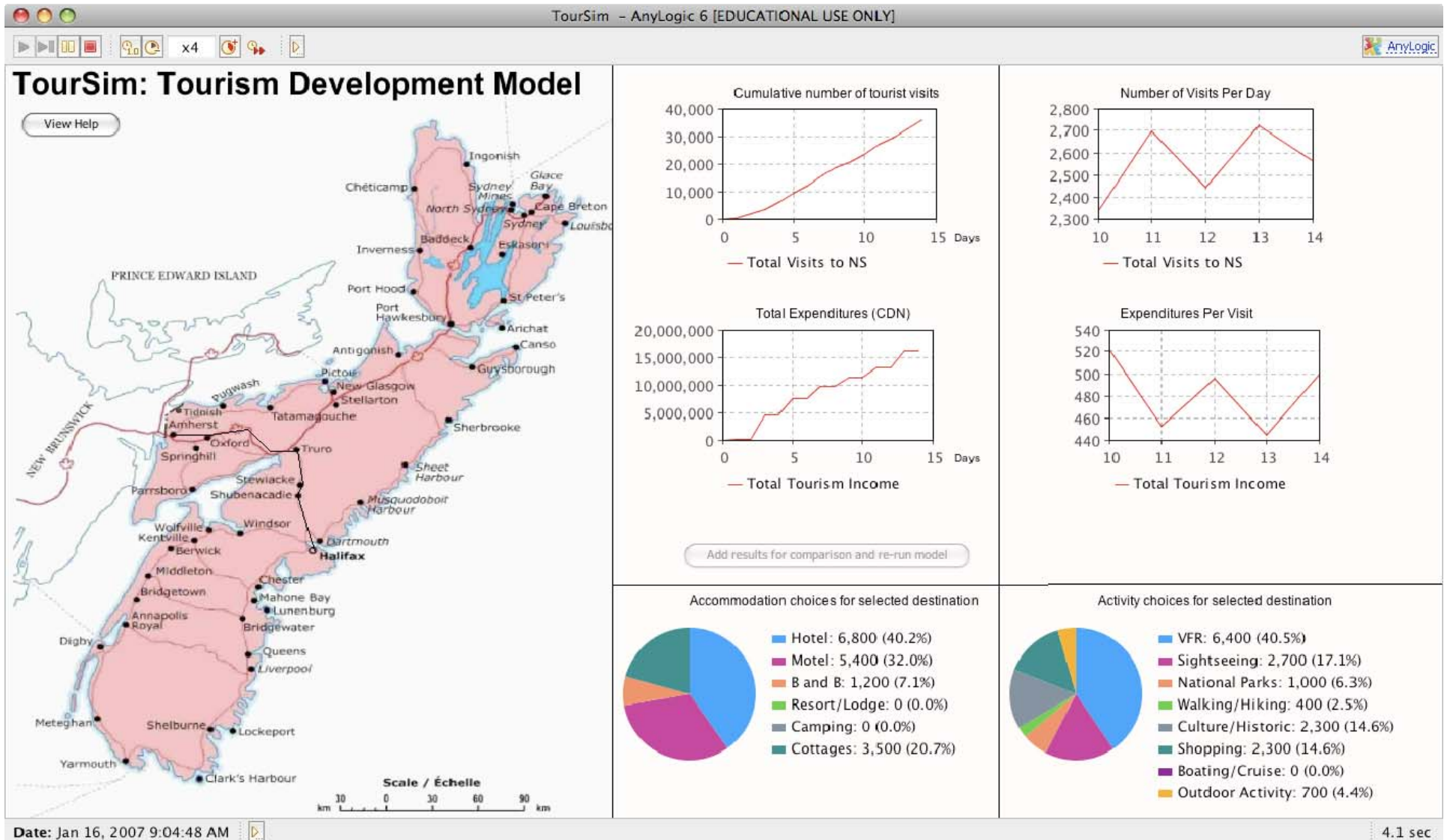
Tourist Types

- All Tourists
- Domestic
- American
- International

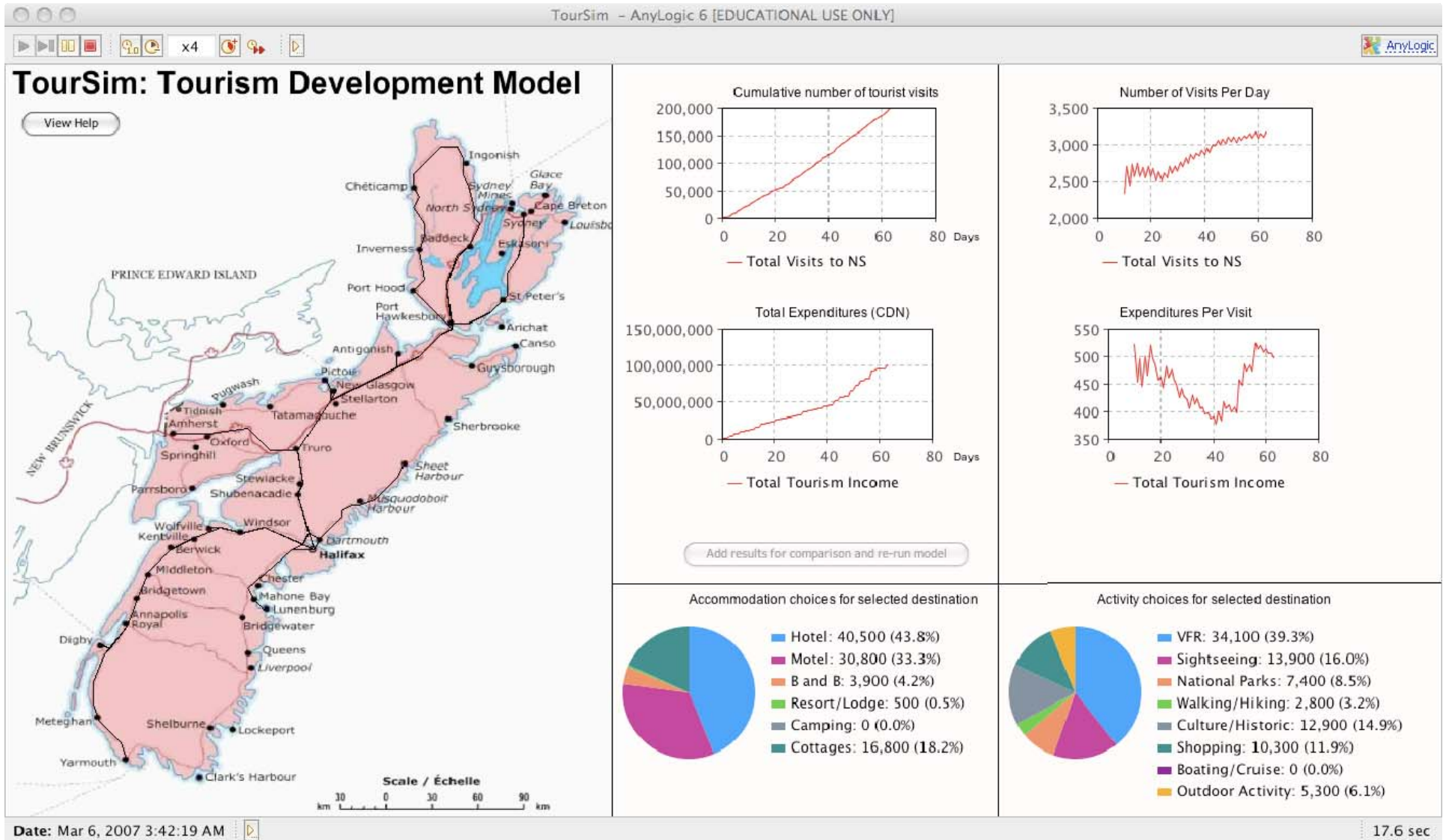
Results Comparison Chart

The Results Comparison Chart contains four empty coordinate systems for plotting simulation results. Each chart has a vertical axis from -1 to 1 and a horizontal axis labeled 'Days' from -1 to 1. The charts are titled: 'Cumulative number of tourist visits', 'Number of Visits Per Day', 'Total Expenditures (CDN)', and 'Expenditures Per Visit'.

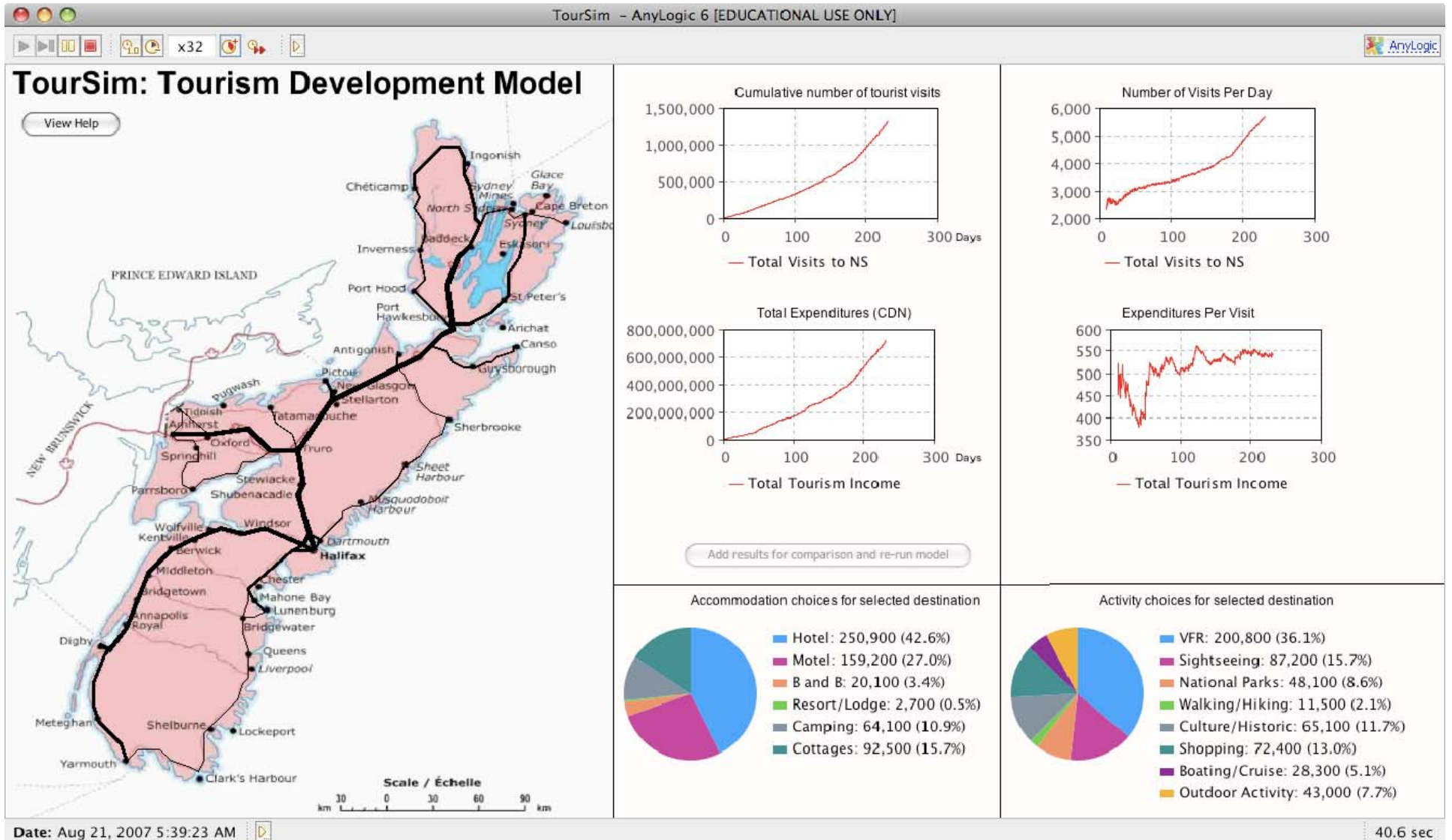
TourSim Scenario Running 1



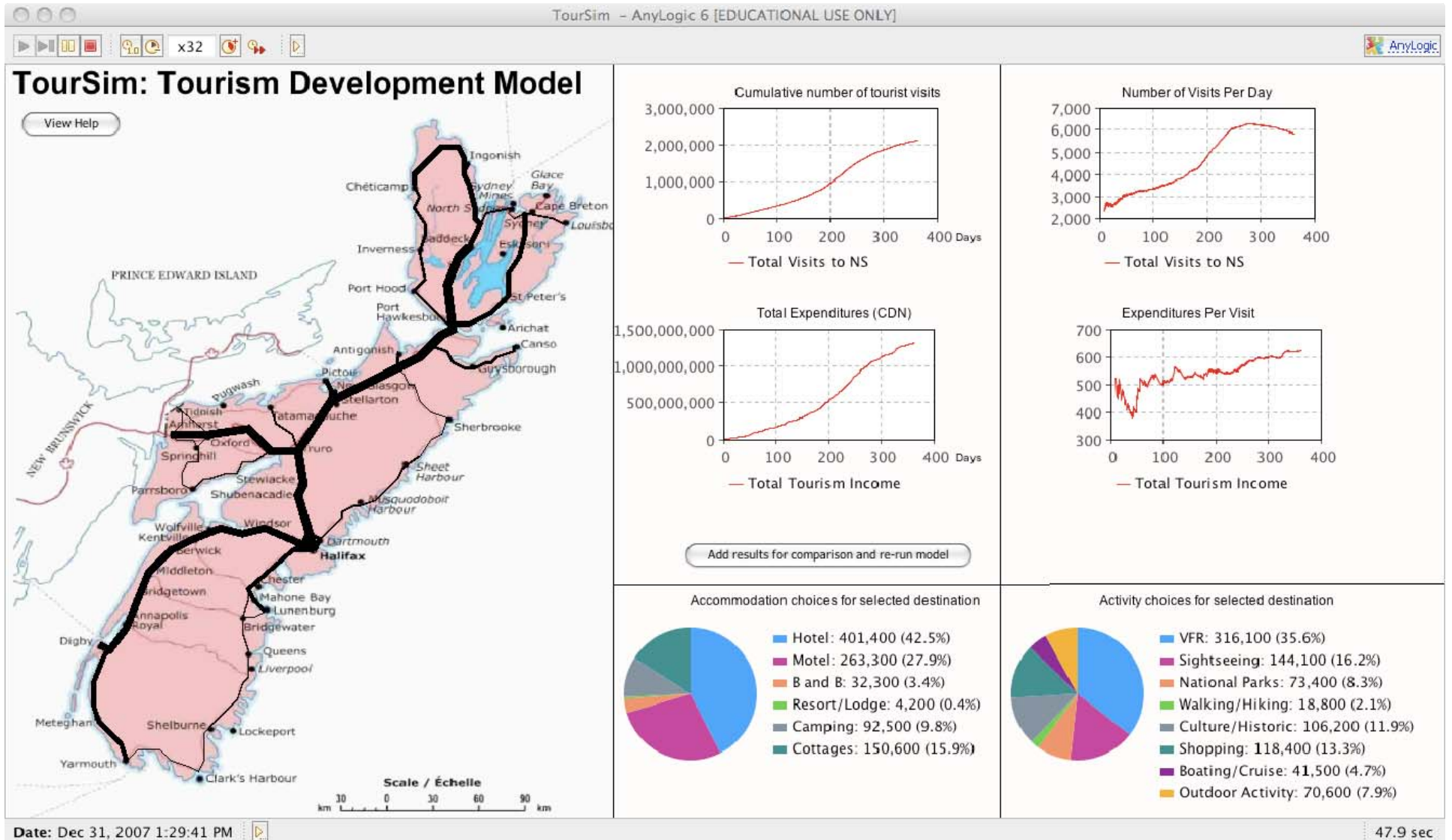
TourSim Scenario Running 2



TourSim Scenario Running 3



TourSim Scenario Running 4



Compare Model Results

TourSim - AnyLogic 6 [EDUCATIONAL USE ONLY]

TourSim: Port of Entry Scenario

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Model Parameters

Percentage of Tourists entering at each port:

Halifax	<input type="range" value="24"/>	24
Amherst	<input type="range" value="49"/>	49
Pictou	<input type="range" value="6"/>	6
Tidnish	<input type="range" value="4"/>	4
North Sydney	<input type="range" value="4"/>	4
Yarmouth	<input type="range" value="4"/>	4
Digby	<input type="range" value="9"/>	9
Total of all percentages		100

View Options

Destinations	Tourist Types
<input checked="" type="radio"/> View All	<input checked="" type="radio"/> All Tourists
<input type="radio"/> Baddeck	<input type="radio"/> Domestic
<input type="radio"/> Digby	<input type="radio"/> American
<input type="radio"/> Yarmouth	<input type="radio"/> International
<input type="radio"/> Cheticamp	
<input type="radio"/> Halifax	
<input type="radio"/> Lunenburg	

Results Comparison Chart

Cumulative number of tourist visits

— Digby = 185500
— Digby = 211900

Number of Visits Per Day

— Digby = 510 — Digby = 582

Total Expenditures (CDN)

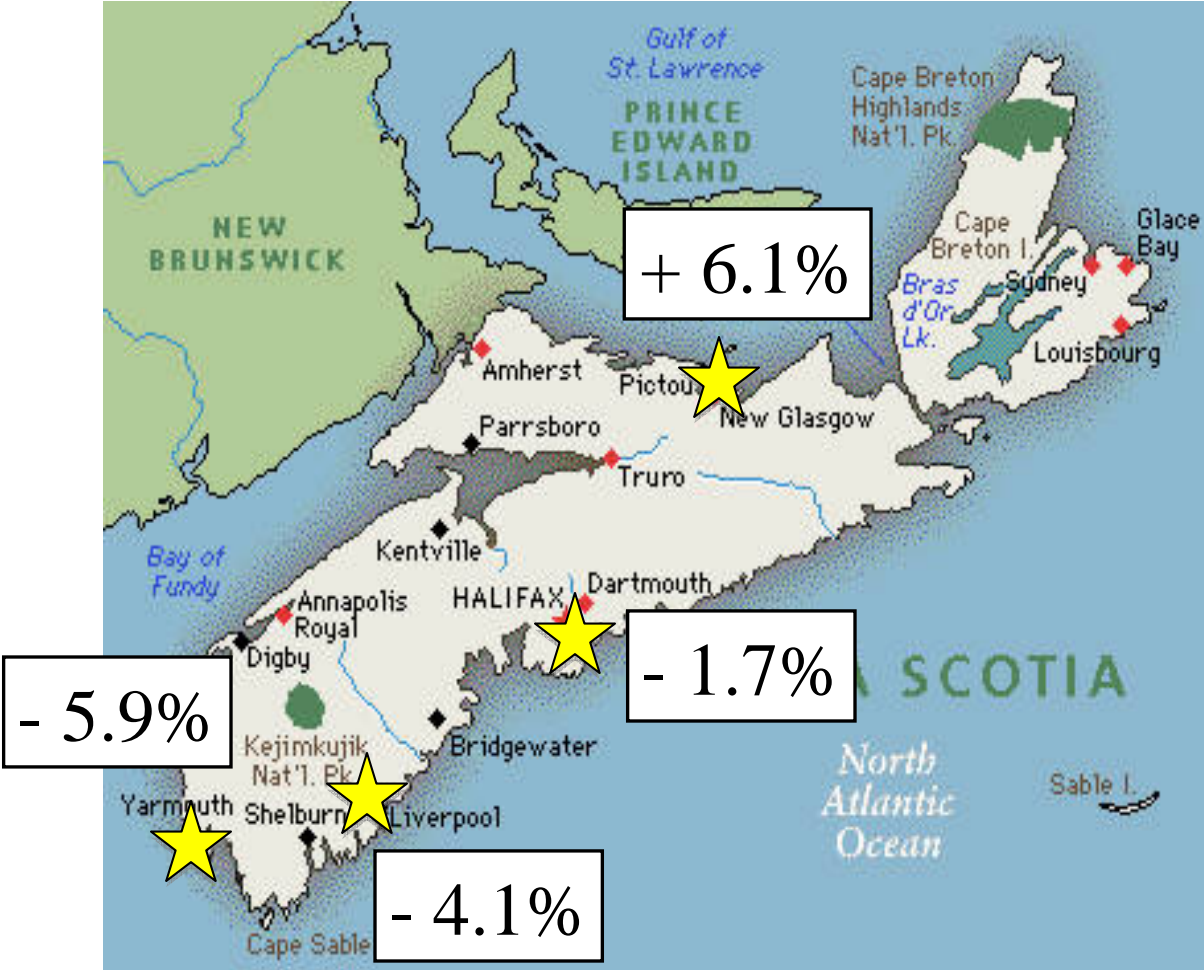
— Digby = 109600000
— Digby = 116784300

Expenditures Per Visit

— Digby = 591
— Digby = 551

Date: Dec 31, 2007 1:29:41 PM
19.5 sec

Scenario Results



Research Goals



- Develop an agent-based Planning Support System (PSS) to represent tourism dynamics in Nova Scotia
- Test case for the application of ABM to real-world tourism planning use
- Work with tourism planners in Nova Scotia to determine:
 - ▣ where can this add value
 - ▣ what are barriers to adoption

Usability Evaluation



- Participants will evaluate a series of scenarios based on:
 - ▣ Technical constraints (interface, usability)
 - ▣ Applicability to tourism planning tasks (fit with current responsibilities)
 - ▣ Organizational constraints (role of simulation technology in the workplace, cost)

Future directions



- Possibilities for other scenarios
 - ▣ Product development at specific destinations
 - ▣ Managing seasonality: possibility for shoulder season development
- TourSim as a compliment to other tourism planning activities
 - ▣ Interactive visioning tool within a community consultation framework

Tourism Simulation and Modeling

Blog Tutorial Tourism Scenarios Surveys Contact search in blog...

Big improvements!

February 5, 2008 at 2:59 am | In New, Nova Scotia Tourism, Simulation Modeling | No Comments

I've been hard at work adding more realistic element to TourSim. Some of the highlights include:

- 1) **Seasonality:** Certain accommodation and activity types (like camping and boating) are now active only from May 1st to October 1st. All ferries now operate according to their schedules as well.
- 2) **Adjustable length of stay:** Slider bars allow the user to set the average length of stay for each of three types of tourist (domestic, American, and international). This lets you see the effect of greater retention of tourists compared to a high turnover. The default setting is 3.8 days per tourist.
- 3) **Tourism growth rate:** Again, slider bars let you increase or decrease the total numbers of tourists entering the model. The default settings create a scenario similar to 2007 values.
- 4) **Model view choices and dynamic charts:** Select one of six different destinations, and one of three different tourist types. You can also select provincial values to be shown in four charts (total visitation, visitation per day, total expenditures, and average expenditure per tourist).
- 5) **Activity and Accommodation choice charts:** dynamic pie charts show the percentage of tourists that choose a particular activity or accommodation. This selection changes depending on your destination selection.
- 6) **Tourist routes:** The routes that tourists follow grow dynamically as the model runs. You

PAGES

- Contact
- Surveys
- Tourism Scenarios
- Tutorial

LINKS

- McGill University, Department of Geography
- Nova Scotia Key Tourism Indicators
- On-line guide for newcomers to ABM in social sciences

Search

www.toursim.wordpress.com

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