The Climate, Weather, and Tourism Initiative of ECU’s Center for Sustainability

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Wind, humidity, temperature, drought, storm conditions, snow conditions, water temperature, and degree of sunshine are a few of the factors that affect the visitors’ decisions, satisfaction, and spending—that important economic "bottom line" for tourism businesses and tourism destinations. (www.sustainabletourism.org)

Gaps exist in our understanding of these relationships:

“Current studies either have a rudimentary representation of the effect of weather and climate but a detailed representation of substitution between holiday destination and activities, or a detailed representation of the immediate impact of climate change but a rudimentary representation of alternatives to the affected destinations or activities.” (IPCC WGII, 2014 draft report)
What about the Carolinas?

<table>
<thead>
<tr>
<th>State</th>
<th>Spending</th>
<th>Tax Receipts</th>
<th>Employment</th>
</tr>
</thead>
<tbody>
<tr>
<td>North Carolina</td>
<td>$19 billion</td>
<td>$2.9 billion</td>
<td>196,080 jobs (6.2%)</td>
</tr>
<tr>
<td>South Carolina</td>
<td>$11.4 billion</td>
<td>$1.6 billion</td>
<td>117,346 jobs (8.1%)</td>
</tr>
</tbody>
</table>

US Travel Association

- Weather and climate related impacts on tourism in the Carolinas:
  - Droughts, floods, water quality problems, sea level rise, storm surge, heat stress, poor air quality, ice and snow, extreme weather events (Ingram et al. 2013)
What about the Carolinas?

- Impacted tourism sectors:
  - Golf
  - Skiing
  - Beaches
  - Water sports
  - Fishing
  - Sightseeing
  - Agrotourism
How climate influences the tourism sector

MACRO-SCALE SECTORAL INFLUENCING FACTORS

Economic Growth/Recession
Transport Access/Cost
Political Stability/Security
Technological Change
Demographic Change
Currency Exchange Rates
Border Agreements

Climate

Seasonality
Inter-Annual Variability
Extreme Events
Climate Change

INDIRECT CLIMATE IMPACTS

Environmental Change
Economic Change
Socio-Political Change (security, land-use, etc.)

DIRECT CLIMATE IMPACTS

TOURISM SYSTEM

Source Markets
Tourists
- Travel Motivations
- Capacity to Travel
- Destination Perceptions
Transport Systems
Destinations
- Tourism Operators (accommodations, activities, transport, retail)
Communities
- National Tourism Organizations
Regulators
Insurers/Investors

Climate Policy (mitigation and transport costs)
History at ECU

- January 2007: Thirty representatives from research industry and environmental organizations discussed relationships between climate and Colorado Plateau tourism industries (Long)

- Center relocated to East Carolina University in Fall 2007

- November 2008: Approximately 100 scientists, academics, public policy officials, nonprofit leaders, and business owners addressed the short- and long-term impacts of weather and climate fluctuations on the economic vitality of the tourism industry (Long, Curtis, Arrigo, Covington)

- 2012-present: Membership on the World Meteorological Organization’s Commission for Climatology Open Panel of Experts on Climate Information for Adaptation and Risk Management (Long)

- April 2014: First Masters thesis by Emily Ayscue
1. The need for a systems approach

2. A meaningful engagement of the media, business, and public officials

3. Full confrontation of the effects of climate change on the natural resources and infrastructure that support the tourism industry (Curtis et al., 2011)
Other Projects from the Center

- A study of weather preferences and sensitivities at North Carolina Outer Banks beaches
- Town of Beaufort focus group
- Climate and Weather tip sheets
- A study of weather and restaurant occupancy in Nags Head, NC
- The *Seasonal Weather & Tourism Dispatch*
Tourist Destination Perceptions
Table 1. Climate Perception and Reality. Survey asked if the following conditions were ideal for an outing at the beach. Underlined values are closest to the August climatology for Cape Hatteras (NCDC), provided in the last column.

<table>
<thead>
<tr>
<th>Variable</th>
<th>75</th>
<th>80</th>
<th>85</th>
<th>90</th>
<th>95</th>
<th>Climatology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max daily temperature (F)</td>
<td></td>
<td></td>
<td>✔</td>
<td>✔</td>
<td></td>
<td>84.8</td>
</tr>
<tr>
<td>Cloud cover</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cloudy</td>
<td>✗</td>
<td>✗</td>
<td>✔</td>
<td>✔</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mostly cloudy</td>
<td></td>
<td></td>
<td>✔</td>
<td>✔</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Partly cloudy</td>
<td></td>
<td></td>
<td>✔</td>
<td>✔</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mostly sunny</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clear</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>26% clear</td>
<td>32% var. clouds</td>
<td>42% cloudy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wind speed (mph)</td>
<td></td>
<td></td>
<td>✔</td>
<td>✔</td>
<td></td>
<td>9.5</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>5</td>
<td>10</td>
<td>15</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Relative Humidity (%)</td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0-20</td>
<td>20-40</td>
<td>40-60</td>
<td>60-80</td>
<td>80-100</td>
<td>69</td>
</tr>
</tbody>
</table>
Tourism businesses and travel destinations are turning more to weather and climate information to aid in focusing traveler marketing efforts during periods when climate conditions are favorable (Curtis et al. 2009, page 3)

It is also important that tourism businesses and destination communities have access to short and long-term weather and climate data in a form that is easy to interpret (Curtis et al. 2009, page 5)
Heather Blair, Sarah Jessop, Scott Curtis

Study Findings

1. A wide range of complimentary tourism offerings, both indoor and outdoor, are offered in the Beaufort area that attract and serve the needs of a traveling public seeking a coastal and historic experience.

2. Weather conditions today are different than in the past.
   - Today's conditions are described as ideal for a tourism-dependent coastal environment.
   - Conditions differ over open water from over land.
   - Differences frequently exist between what is forecasted by the media and actual weather conditions.
   - Rainfall is highly variable across the immediate region.
   - Weather is influenced by the “Landing Strip” effect of the neighboring Air Force base.
   - Lack of any observable strong trends due to climate change.

3. Telephone, email and websites used primarily for cancellation and securing travel insurance policies.
   - Most offer alternative suggestions for inclement weather but could advertising these more strategically.
   - Somewhat sensationalized weather forecasts affect cancellations despite efforts by tourism businesses to communicate actual weather conditions; weather assessments by individual travelers are also problematic.
   - Operators answer tourists' daily weather questions with seasonal based responses.
   - Boaters and pilots are the savviest about weather.

4. Weather and climate do not appear to be changing dramatically in the minds of tourism operators.
   - Increased storm surges are being observed and the wind seems to blow more often now than before.
   - An observable increase in jellyfish, fewer hurricanes, and more erosion and deposition on nearby shoals and banks.
   - Tourism businesses desire a realistic forecast, less hype over hurricane season, and weather language that indicates more “mostly sunny” days than “partly cloudy”.

Carolinas Climate Resilience Conference 4/28/14
Weather Marketing: Let Weather Promote Your Tourism Business

Weather marketing is a form of marketing that uses weather to promote tourism. It can be an effective way to attract visitors to a destination and increase tourism revenue. Weather marketing can be used to promote a variety of tourism businesses, including hotels, resorts, and attractions. It can also be used to promote specific events, such as festivals or fairs.

Step I: Understand Weather Effects On Your Demand

Why: Understanding your clientele is the first and most important step when considering how weather and climate impact your business. If you do not know your demand, you will not be ready to begin analysis, and any weather marketing results will be ill-informed. You must know your clientele and how they behave with respect to the weather—your customers' behavior.

How do I do this?
1. Review how your business is most affected by the weather.
2. Look at your log books and tally your daily attendance counts.
3. Observe daily historical weather data for your area.
4. Plot the weather and attendance variables and explain how your customers have reacted to the weather.

Step II: Realize Types of Weather Marketing

Weather marketing comes in many forms. Some firms choose to offer weather guarantees, others give compensation to differentiate from the competition, while still others choose location branding based upon a type of "great weather." Remember, you do not need to focus solely on good weather to utilize weather marketing. Weather marketing is flexible, so you the business owner can adapt in both good and bad times.

Good weather examples:
- "Most months of many days in the region."
- "More reliable snowfall than any other resort."
- "When snows winter lasting into December."

Bad weather examples:
- "Your conference will be hurricane-free, or it's on us."
- "Beat the heat; 1/2 off admission on days above 90 degrees."
- "Snow days = half-price admission for all students."

Step III: Do Your Climatological Homework

Why: If you do not understand your climate then your weather marketing ideas will either sound trite or overly ambitious. Either way it will be bad for business and open your business to financial loss. You must do your climatological homework to understand what types of guarantees are reasonable, as one will gamble.

How do I do this?
1. Luckily you do not have to be a meteorologist or even fully weather-wise to get your information. Do it yourself or have weather professionals answer your questions and consult you on the next steps.
2. For more information see the Center's tip sheet titled "Weather and Climate Resources for the Triangle Industry."

Step IV: Guarantee Your Weather Marketing Financially

Why: The worst thing you can do is offer a promotion to a customer you can't keep. This wastes all the time and money you spent trying to get the customer. You must consider how to counter the liabilities of your mistake. Weather marketing does not save you worry if it is unlikely a customer will ever collect. As in casinos, patrons have to win sometimes; otherwise, the marketing efforts are pointless.

What can I use to guarantee?
- Probability: Determine probabilities for weather events and calculate payout probability. [Low cost, simple]
- Assurance: Guarantee offered can be backed up through assurance claims with proof of profit loss. [Middle cost, more advanced]
- Diversification: Purchase a financial option for certain weather events and if events occur, payout is automatic. [High cost, advanced]

This document is part of a "Climate, Weather, and Tourism" suite made possible through a partnership between the Center for Sustainable Tourism at East Carolina University, East Carolina University, Office of Business and Economic Development, the North Carolina Division of Parks and Recreation, and the University of North Carolina at Greensboro. The planning team included DJ Perkins, director of the Center for Sustainable Tourism at East Carolina University, Dr. Keith Delbene, and Dr. Patrick Long (ECU). Information provided is subject to change and must be confirmed with the source of the data. While every effort has been made to ensure the accuracy of information, the respective parties they represent from third parties. Under no circumstances shall The State of North Carolina be held liable for any actions taken or decisions made from reliance on any information contained herein. Those whose source states the state to have the authority to examine or access to any such data are the sole entities to take the any other responsibility from any individual claims. Members of this project should be consulted by the State of North Carolina.
Sam & Omies, Nags Head

- Landmark restaurant near Jennette’s Pier and Aquarium
- Number of customers at breakfast, lunch, dinner, and in-between and qualitative description of weather recorded by proprietor
- Log acquired from 2003 to 2009 and numbers compared to Hatteras (GHCND:USW00093729) daily $T_{\text{max}}$

[Graph showing data trends with a note on Hurricane Isabel]
Average daily numbers

- "Cool" the day before
- "Warm" the day before

Nick Carter, Scott Curtis

Carolinias Climate Resilience Conference 4/28/14
Seasonal Forecasts: The Seasonal Weather & Tourism Dispatch

- We are looking for sponsorship!

Emily Ayscue, DJ Perkins, Scott Curtis, and Alex Naar

http://www.icontact-archive.com/I8yMX0z7uorwIkyBtvQnxnEX6-iUaqy?w=3
Center of Sustainability at ECU is one of the only academic centers in the nation to have a weather-climate-tourism initiative

Active engagement in...

- Research
- Education (Masters in Sustainable Tourism)
- Outreach
Thank you!

Questions?
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www.sustainabletourism.org
How weather and forecasts influence travel

Trip Planning

- Climate
  - Months
  - Week
  - Day

Forecasts

Trip

- Weather
  - Day
  - Weeks/Months

Destination Choice
- "Last Minute" Holiday
- On-site Behaviour/Activity Choice
  - use, avoid, change, adapt, accept
- Spending
- Trip Satisfaction

Timing of Travel
- Destination Choice

Activity Planning
- Activity Planning
- Travel Routing

Insurance Needs