Tourism impacts natural resources in a variety of ways, including waste production (United Nations WTO, 2005). Every international tourist in Europe generates on average 1kg/2.2lb of solid waste per day & up to 2 kg/4.4lb per person per day in the U.S. (UNEP 2003).

Minimizing waste is important to sustain both natural resources & the tourism industry itself (Cummings, 1992, 1997). Few studies, however, assess waste minimization practices in the tourism industry or track their implementation over time. A European study even found decreasing interest in waste minimization from hoteliers over time (Bohdanowicz 2005).

This study documented implementation of waste minimization practices through time & across tourism entities in a U.S. state.

Methods

Questionnaire   Online survey MN tourism organizations
Content     Included waste minimization practices (no attempt to completed/ongoing)
Sample size   2007 n=451, rate = 19%
2010 n=581, rate = 17%
2013 n=426, rate = 12%
Analysis Descriptive & Kruskal-Wallis in SPSS

Results: Waste Minimization 2013

Results mirror past research as the majority of respondents have a recycling program (Bohdanowicz, 2006; Nicholls & Kang, 2012) & buy products that contain recycled materials (Erdogan & Tosun, 2009). The significant increase in implementing recycling suggests momentum for adoption, at least in this locale.

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Results: Implementation through time

The majority of respondents implemented 7 of 8 waste minimization practices assessed during each survey period. Over time, 6 of 8 practices significantly changed (Table 1).

3 recycling-related practices decreased slightly but eventually surpassed 2007 levels
2 items significantly decreased from 2007 to 2010, but rebounded to 2007 levels
1 building item increased but then decreased significantly below 2007 levels

Table 1: Change in 11 energy efficiency practices from 2007 (n=384) through 2010 (n=511) to 2013 (n=336)

<table>
<thead>
<tr>
<th>Practice</th>
<th>Mean ranks 2007</th>
<th>Mean ranks 2010</th>
<th>Mean ranks 2013</th>
<th>Chi-Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Have a recycling program</td>
<td>666</td>
<td>644</td>
<td>658</td>
<td>2.89*</td>
</tr>
<tr>
<td>Buy products that contain recycled materials</td>
<td>640</td>
<td>634</td>
<td>706</td>
<td>11.26**</td>
</tr>
<tr>
<td>Provide recycling receptacles for staff and customers</td>
<td>639</td>
<td>630</td>
<td>705</td>
<td>15.89***</td>
</tr>
<tr>
<td>Safely store chemical products</td>
<td>592</td>
<td>562</td>
<td>600</td>
<td>6.61*</td>
</tr>
<tr>
<td>Donate leftover guest amenities, old furniture, etc.</td>
<td>523</td>
<td>491</td>
<td>534</td>
<td>6.61*</td>
</tr>
<tr>
<td>Use renewable building materials in facility construction</td>
<td>422</td>
<td>416</td>
<td>447</td>
<td>2.39</td>
</tr>
<tr>
<td>Consult U.S. Green Building Council when constructing or remodeling</td>
<td>406</td>
<td>421</td>
<td>372</td>
<td>7.54*</td>
</tr>
<tr>
<td>Require vendors to take back packaging materials</td>
<td>349</td>
<td>338</td>
<td>311</td>
<td>4.92</td>
</tr>
</tbody>
</table>

Note: All items rated on a scale where 1=No attempt, 2=Under consideration, 3=Just beginning, 4=Completed/Ongoing.
*p<0.005, **p<0.0005.

Discussion

Given the lack of research on these topics and the descriptive nature of the data, implications are tentative at best. Certainly, the U.S. & MN economy may have influenced the decreases in practices during the 2010 data collection. Future research will enlighten reasons for these changes & provide ideas to explore further.

Future research

- Repeat across sectors, states & time frames
- Assess fiscal & resource savings as an outcome of implementation
- Assess willingness of tourism organizations to participate in ongoing monitoring efforts

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