Differences in perception and reaction of beach users' groups to beach marine debris that can influence a loss of tourism revenue in coastal areas.

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Problems and impacts to marine biodiversity are perceived and measured. Economic effects to coastal communities are perceived, but rarely measured/estimated.
Marine Debris X Economics

Number of Publications

Period

0 1000 2000 3000 4000 5000 6000 7000


Marine litter/marine debris Economic losses Tourism Tourism Revenue

0.5%
“Better to be safe than sorry…”

• To change the actual scenario of “perception-only”, it is necessary to find adequate methods

• *Estimating* might be an useful tool for decision-makers (prevention vs. paliative)

• How to “*predict*”, instead of measuring the impacts, after their occurrence?
Objective

• We decided to adapt methodologies that estimate impacts from marine debris *a posteriori* to estimate potential lost sales of producers due to increased marine debris (*a priori* - preventive).

• Sun-and-beach Brazilian district, using a Formulae adapted from Jang *et al.* (2014).
Takeaway message

• It is possible to estimate the deterred tourism revenue before the impact

• Increase in marine debris may be potentially responsible by a 39.1% reduction to the tourism income of the city

• Each US$ 1 (beach cleaning) prevents at least US$ 4.4 lost sales of producers, which finally represents decrease tourism revenue!
But before...

• The beaches we have studied in Southern Brazil
• How we proceded the research (questionnaires we made, the differences we found in beach users groups and how we estimated the economic effects)
• Finally we discuss the economic effects of users deterrence: increasing marine debris is a potential risk for local economies
Pontal do Paraná

- Subtropical coastal city - approximately 25,000 inhabitants
- Paraná’s coastal population density is 41.9 inhabitants/km²
- During summer, this number can reach 252.5 individuals/km² (December to February)
Methods

• 319 questionnaires - both tourists and shou, during austral summer (Jan/Feb 2015 and 2016)

• Who are the beach goers? (Second home owners/users -> SHOU or Tourists)

• Are there differences between these groups?

• How tolerant are they to beached marine debris?

• What would be the impact of their dissuasion?
Methods

• We used pictures of scenarios of increasing pollution and they should elicit the scenario in which they would be firstly deterred.

• Based on the number of deterred users and their socioeconomic characteristics (number of days per trip, daily expenditure) it was calculated the economic effects per scenario.

\[ \text{DTR} = [(\# \text{ of deterred users}) \times (\text{Daily expenses})] \times \#\text{days} \]

*calculations made per users group and per scenario*
Results
S.H.O.U.  X  TOURIST

- Beach trips frequency (more than once - 58.4%)
- Longer period of permanence: 6.8 days
- Lower daily expenditure: US$14.24
- Education level* (UNIVERSITY - 42.2%)
- Greater economic effects (US$96.83 per trip)

- Beach trips frequency (only once 62%)
- Shorter period of permanence: 3.5 days
- Higher daily expenditure: US$23.93
- Education level* (HIGH SCHOOL - 42.7%)
- Lower economic effects (US$83.75 per trip)
Perception X Reaction
# Beach users' perception X Economic effects

<table>
<thead>
<tr>
<th>Items/m²</th>
<th>2.5 Items/m²</th>
<th>6 Items/m²</th>
<th>15 Items/m²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beach users deterred</td>
<td>20.4%</td>
<td>38.7%</td>
<td>83.9%</td>
</tr>
<tr>
<td>Potential decrease in income from tourism</td>
<td>4 - 10%</td>
<td>7.5 - 19.3%</td>
<td>15 - 39.1%</td>
</tr>
<tr>
<td>Decreased tourism revenue (DTR in million dollars)</td>
<td>US$ 0.88 - 2.29</td>
<td>US$ 1.65 - 4.28</td>
<td>US$ 3.27 - 8.53</td>
</tr>
</tbody>
</table>
Better to be safe than sorry?

• Estimated costs of cleaning US$200,000

• Preventing at least US$ 880,000 of decreased tourism revenue (could reach 10 times more!)

• It means that each dollar invested in beach cleaning avoids 4.4 dollars of decreased tourism revenue
Conclusions

- We have found that Second Home Owners/Users and Tourists are effectively distinguishable groups.
- However groups were dissuaded by similar amounts of litter.
- Economic effects may be significant even especially to small cities.
- Estimating the potential economic effects (*a priori*) is possible and essential to communicate with managers, to plan long term.
- However substituting palliative to preventive measures may take longer than we would like... 😞
Differences in perception and reaction of tourist groups to beach marine debris that can influence a loss of tourism revenue in coastal areas

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