Monitoring aesthetic value of the Great Barrier Reef

Stakeholder Update – October 2017

Project aim

The Great Barrier Reef is inscribed as a UNESCO World Heritage site for multiple criteria, including its outstanding heritage value that includes significant aesthetic characteristics. Aesthetic values, like ecological values, are under multiple pressures and better understanding of how ‘beauty’ can be measured, and how environmental changes affect aesthetic value is imperative. Focusing on the underwater landscapes of the Reef, this research uses advanced technology to elicit what environmental and experiential attributes contribute to aesthetic value. A Big Data platform using artificial intelligence is being created to ultimately assess large volumes of visitor-supplied imagery and to map aesthetic value. The project is funded by the NESP Tropical Water Quality Hub.

Findings to date

Determining aesthetic value

Several phases of eye-tracking research were conducted to explore how to best measure aesthetic value using eye-tracking technology. An important indicator is ‘attention’, which can be measured by total fixation duration, fixation count and total visit duration. The findings show that there are significant correlations between the picture’s beauty and the participant’s attention to the picture. Moreover, the perceived beauty of one particular Area of Interest (AOI) (e.g. a turtle) relates positively with the overall beauty of the image. If the participant has paid more attention a particular AOI it usually means that he/she also rates the beauty of this area higher.

What makes a picture of the GBR beautiful? Conjoint analysis results

In the next stage of the research, an online survey was conducted (n= 630) to determine the relative importance of various elements of an underwater scene in determining the beauty of a picture. Four factors were examined:

1. Presence of fish (none, non-vivid and vivid coloured fish),
2. Presence of coral (none, non-vivid and vivid coloured coral),
3. Low or high image contrast, and
4. Presence or absence of a turtle.

To combine and rank these four factors in any possible combination would require too much effort on the part of respondents. Thus, the Orthoplan subroutine in SPSS was used to produce nine pictures that represent selected combinations of attributes for ranking (see Figure 1 below).

The results of a conjoint analysis reveal that the presence of vividly coloured fish is the most important (preferred) factor that influences the perceived beauty of a GBR picture. This is followed by colour contrast.
of the photo with high contrast photos preferred. Next the presence of vividly coloured coral and lastly the presence or absence of a turtle. A beautiful picture of the GBR should include vivid fish and coral with high image contrast, and will be ranked higher in beauty if it contains a turtle.

Figure 1: Different factors represented in nine images for ranking the beauty of a GBR image.

What makes a picture of the GBR beautiful?

At the end of the online survey, participants were asked to give their comment on which factors make a picture of GBR beautiful. Answers were recoded and analysed using Leximancer for thematic analysis. The concept maps generated visualise five big themes in order of relevance: variety of colours, coral, variety of marine life, marine species and clean water (Figure 2 below). The size of a bubble reflects the number of different concepts represented in a cluster/theme.

Figure 2: Analysis of written comments.

Outputs

- You can also watch a youtube video: https://www.youtube.com/watch?v=Wi3CWxXfRSc

Contact

Prof Susanne Becken; Griffith Institute for Tourism
Griffith University; Phone: (+61) 0438 636 697
Email: s.becken@griffith.edu.au