**OAR OUTSTANDING SCIENTIFIC PAPER AWARD**

**Nomination and Justification Form**

**Nominating Official:**

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| NAME: | **Derek Manzello** | LAB: | AOML | PROGRAM  OFFICE: | Choose an item. | STAFF OFFICE: | Choose an item. |
| TITLE: | **Research Oceanographer** | | | DIVISION: | **Ocean Chemistry and Ecosystems Division** | | |
| WORK EMAIL: | **Derek.manzello@noaa.gov** | | | WORK PHONE: |  | | |

**Title of Paper and Journal Citation:**

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| **TITLE:**  Shift from Coral to Macroalgae Dominance on a Volcanically Acidified Reef  **Journal Citation**: Nature Climate Change 5:1083-1088, doi:10.1038/nclimate2758  **Full Citation:**  Enochs IC, Manzello DP, Donham E, Kolodziej G, Okano R, Johnston L, Young C, Iguel J , Edwards C, Fox M, Valentino L, Johnson S, Benavente D, Clark S, Carlton RD, Burton T, Eynaud Y, Price N (2015) Shift from Coral to Macroalgae Dominance on a Volcanically Acidified Reef. Nature Climate Change 5:1083-1088, doi:10.1038/nclimate2758 |

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| **Ocean and Great Lakes** |

**Category of Paper:**

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| NAME: | Ian Enochs | | | | | SALUTATION: | | Dr. | | |
| FEDERAL EMPLOYEE | | | **No** | LAB | AOML | PROGRAM OFFICE: | Choose an item. | | STAFF OFFICE: | Choose an item. |
| TITLE: | **Associate Scientist** | | | | | DIVISION: | **Ocean Chemistry and Ecosystems Division** | | | |
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**Primary Author Information:**

**Co-Author(s) Information (if applicable) - Please fill in the information for each co-author, copying the table as needed:**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| NAME: | 17 co-authors, 1 NOAA Fed, 5 NOAA contractors | | | | | SALUTATION: | | | Choose an item. | | |
| FEDERAL EMPLOYEE | | | Choose an item. | LAB | Choose an item. | PROGRAM OFFICE: | Choose an item. | | | STAFF OFFICE: | Choose an item. |
| TITLE: |  | | | | | DIVISION: |  | | | | |
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**Name of Proposed Expert Reviewer:**

**Dwight Gledhill (NOAA, dwight.gledhill@noaa.gov);**

**Katharina Fabricius (external, k.fabricius@aims.gov.au)**

Note: Dwight Gledhill is the deputy director of the NOAA Ocean Acidification Program with experience conducting research on acidification impacts to coral reefs. Katharina Fabricius published the first study utilizing a volcanic CO2 seep to document the ecosystem impacts of ocean acidification on coral reefs.

**JUSTIFICATIONS (No word count limit):**

**What are the current citation statistics for the paper? How many times has the paper been cited?**

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| **11 Citations as of 8 September 2016** |

**How does the paper relate to other recent work in the field, particularly with regard to originality in approach?**

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| This is the first study to report a shift from a coral to macroalgae dominated ecosystem in a natural setting at pH conditions projected to occur by the end of the century. Many coral reefs that are degraded, either via direct man-made stressors (e.g., overfishing, land-based sources of pollution) or other climate stressors (warming), often undergo a phase-shift whereby corals become outcompeted and overgrown by algae. This study shows that ocean acidification, by itself, can cause this phase shift, which was previously unknown. Healthy coral reefs provide food and shelter for abundant fisheries, support tourism and protect shorelines from storms. A shift from coral to algae-covered rocks is typically accompanied by a loss of species diversity and the benefits that reefs provide. |

**What is the evidence or likelihood that the paper will have an important and enduring impact on progress in its field?**

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| Coral reefs are the “poster child” for ocean acidification impacts to marine ecosystems and this study represents one of three documented volcanic CO2 seeps impacting coral reefs in the entire world. Field-based evidence carries more weight than laboratory investigations because it includes both physical and biological feedbacks, such as competition, that cannot be replicated in a lab. Given that this represents one of three such studies, this will have a lasting impact on the field of ocean acidification. Thus, this paper is a cornerstone in the knowledge of how coral reefs will respond to a high CO2 world and will continue to be cited across disciplines. |

**What is the relevance of the paper to NOAA missions in terms of applied research contribution or the value of contribution in terms of pure research?**

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| This study provides real-world evidence **to understand and predict changes in …oceans.** Specifically, this work has shown that one possible end-state for coral reefs in a high-CO2 world is dominance by macroalgae. This is both informative and predictive. |