

Interactive comment on “Plant colonization, succession and ecosystem development on Surtsey with reference to neighbouring islands” by B. Magnússon et al.

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The authors thank Dr. John Birks for his encouraging and constructive comments and corrections. We have accepted most of the comments and made corrections to the paper (see supplementary PDF in attachment).

Our response to the specific comments:

p. 9384 line 7: Nomenclature:

We have now included a reference for the plant nomenclature (Kristinsson 2008) and made several corrections of latin plant names throughout the paper, including figures

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and tables. A reference is also included for the bird names (British Ornithologists' Union (BOU). 2013.)

p. 9384 line 25: Details on selection of the location of permanent plots:

We have made an addition to the description as follows: "The location of the plots was chosen subjectively with respect to substrate type and influence of seagulls on vegetation development on the island. The first plots were set out in the center of the developing gull colony, on bare and sandy lava. Following that plots were also established under comparable substrate conditions on other parts of the island, in areas where there were signs of plant colonization. Plots were not established in areas where no colonization had occurred at the time, e.g. on the solid palagonite ridges (Magnússon et al.)."

Is all the variation given in Table 1? In our mind the table covers the main variation of substrate types on Surtsey where the p.p. were set down. Plots have not yet been established on the solid palagonite ridges as they have remained barren and without vascular plants. With further erosion of the island and increasing impact of the seabirds on it's higher part plots will also be established on the palagonite substrate.

In Table 1 we have added information in the table text on the plots from ElliÁraey and Heimaey as they have thick, developed soil on top of the volcanic substrate. "The plots on ElliÁraey and Heimaey have thick (> 1 m), developed soils on top of substrate. "

p. 9385 line 34: Lowest intercept value of 1 cm:

We have changed the description to make it better understandable, the new version is: "Additional species within the plots not intercepted by the lines were also recorded and given an intercept value of 1 cm, equal to 0.02% cover."

p. 9389 line 4: *Salix lantana*

→ *Salix lanata* (corrected)

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p. 9392 line 27: Length of DCA axes, and DCA versus CCA.

In the paragraph on the DCA results we have now included information on eigenvalues and total gradient length of the first two axes, thus: "DCA separated plots with dense grasslands, regardless of location, from poorly developed and barren Surtsey plots on the first axis (eigenvalue 0.791, gradient final length 6.172) . Main separation along the second axis (eigenvalue 0.453, gradient final length 4.077) was between sandy and lava plots on Surtsey (Fig. 8)."

In the text with Fig. 8 we have added: ", axes units are multiplied by 100"

Our choice of using DCA rather than CCA is due to that important external variables are not quite comparable between the islands or can not with accuracy be put on the same scale, e.g. the nutrient impact of the seabirds. On Surtsey we have the gulls and a count of their nests by each plot, but on ElliÁraey we have puffins and an estimation of their nest density. However, how to put these into numbers of e.g. N-input is difficult and we did not attempt that for the present analysis. Therefore we decided to use DCA to compare vegetation similarities between the islands and successional trends.

p. 9393 line 22. Bird latin names.

They have now been included.

p. 9395 line 3. Botrychium is a fern ally

A correction has been made.

p. 9398 line 6: Why do the sites from the old islands give a meaningful comparison?

Here we have added a short text to explain this further:

"Although the grassland sites sampled on Heimaey and ElliÁraey in 2013 are small and do not represent all the different conditions and plant communities of the islands (FriÁriksson and Johnsen, 1967; FriÁriksson et al., 1972), they do provide a meaningful comparison and connection between the primary and mature stages in plant suc-

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cession on these bird impacted volcanic islands. The response of the different plant species to nutrient enrichment and early dominance of grasses in the bird colony on Surtsey is also of particular interest."

Response to the technical corrections:

We have made the corrections and further that we found, changed the use of commas and hyphens in accordance with the comments made. In the final editing by the BG we assume that rules of either British or American spelling will be followed and necessary corrections made.

Please also note the supplement to this comment:

<http://www.biogeosciences-discuss.net/11/C3204/2014/bgd-11-C3204-2014-supplement.pdf>

Interactive comment on Biogeosciences Discuss., 11, 9379, 2014.

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