Revisiting Abeng for Multispecies' Flourishing

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C[1] de breath in dese bones/

Who listens to the earth, to the species on it?
Who feels the shortness of breath?
Whose job is it to give warning?

In 2021 the authors presented 'Abeng for Multispecies' Flourishing' (Khan, Karrow & Bowen, 2021, website) by engaging in a collaborative poetic inquiry (Sameshima et al., 2017) to explore the place of poetry in informing the epistemic foundations of mathematics, science and technology education. The work drew on our overlapping sets of expertise as mathematics, science, technology, and data literacy educators. We wish to revisit that poetic performance and bring to the conversation our recent experiences, and emerging connections in the face of plantation and petro precarities including the multiple waves of the novel coronavirus and its variants, the occupation of Ottawa and the Russia-Ukraine war.

We start by taking a metaphor of "the breath in our bones" literally: i.e. how the literal atmosphere – a complex fluid (earth.nullschool.net, n.d., NASA, n.d.)—through its poetic meanderings comes into the myriad and "endless forms most beautiful and most wonderful" (Darwin, 1859) of some of our multispecies kin (Tsing et al., 2019). In the long shadows that continue to be cast by plantation practices associated with the founding of the modern world economy—slavery, racism, genocide and ecocide—and the many allied activist movements, we see our work as attempting to signal beyond human concerns only, to a recognition that without multispecies' flourishing (Tran et al., 2020) the probability of widespread human flourishing is limited.

In the present moment we consciously and humbly draw upon an analogy with the *abeng*, a Ghanian word meaning an animal's 'horn.' The *abeng* is the archae[2]-texture anchoring our work. The blowing of the horn in the West Indies called slaves to the canefields and allowed Maroon armies to communicate among themselves (Cliff, 1984/1995). Today, 'New World' Africans blow the abeng symbolically as "a call to arm themselves…to stand up and defend their culture and traditions against extinction" (Abengcentral, n.d.).

We wonder, what are changes in the composition of that atmosphere—the breath in our bones—due to rising anthropogenic carbon dioxide and human activity (e.g., logging/mining) doing to the bodies/'bones' of our multispecies kin? Our inquiry draws on recent scientific research into nutrient de-densification (Ebi & Loladze, 2019; Loladze et al., 2019; Zhang et al., 2020; Zhu et al., 2018) ocean acidification (Mekkes et al, 2021), changing seasonal patterns (Karrow, Khan & Fleener, 2018), biophonic 'desertification' (Krause, 2012), which we use as examples in our

[1] C, the symbol used for Carbon, is the chemical associated with all life on earth.

[2] Archaea are unicellular prokaryotes, obligate anaerobes, evolutionarily distinct from bacteria and other eukaryotes. The first species identified were known as extremophiles. They are important in oceans and in the microbiome of all species.

practice as teacher educators. Our poetic representations will be multimodal/synaesthetic, including poetic verse, visual data stories (graphs and infographics), photographs and soundscape. Our work is a form of *symbiopoetics*, riffing off of Helmreich's (2009) *symbiopolitics*. In this sense, "A breath of our mouth becomes the portrait of the world" (Herder, quoted in Heidegger, 1971/1975, p. 139) and a poetic call to gather our marooned communities together.

Our approach acknowledges the humanistic aspects of MACAS' project. Our work connects to the themes of theoretical investigations, interdisciplinarity, and critical issues in STEAM education.

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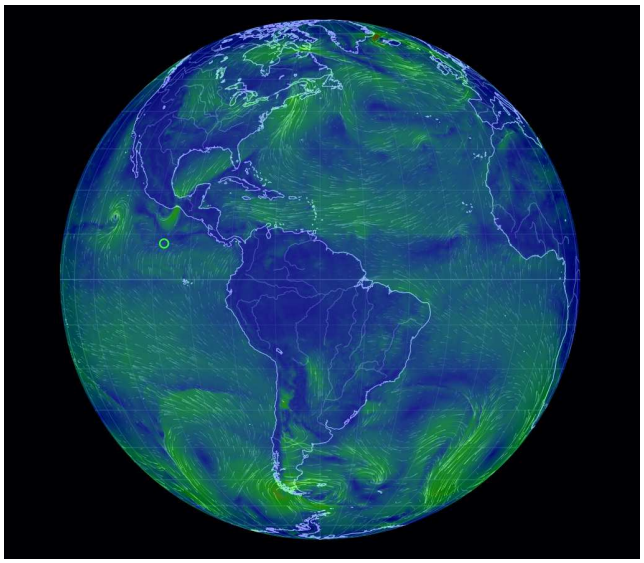
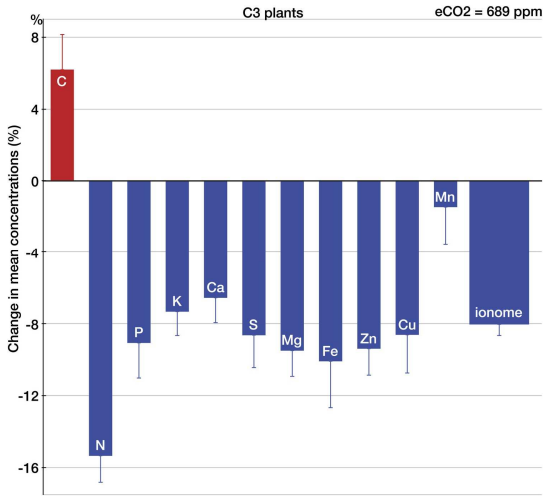
Sample Images

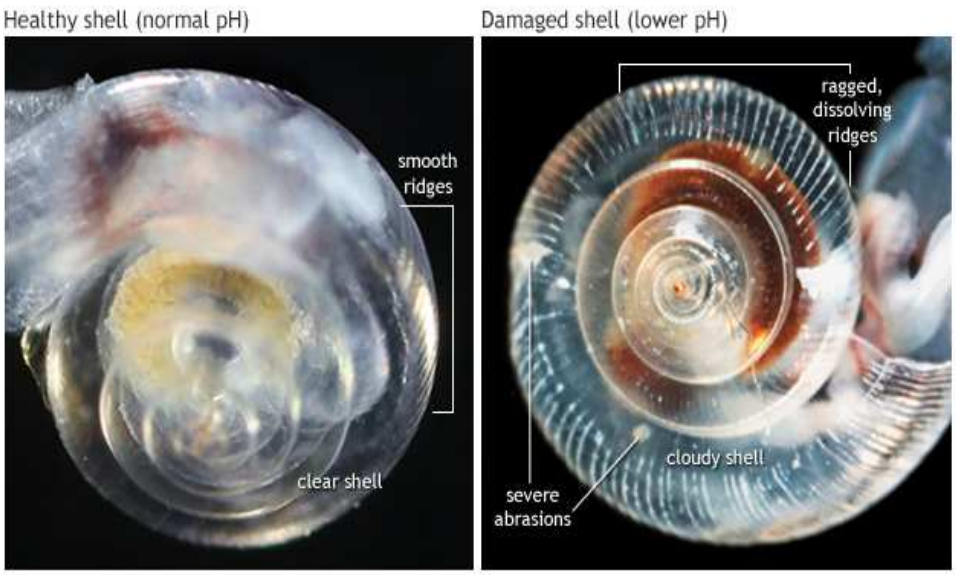


The atmosphere as a complex fluid – Source - https://earth.nullschool.net/

A visual representation of missing nutrients in plants under elevated CO2 levels.



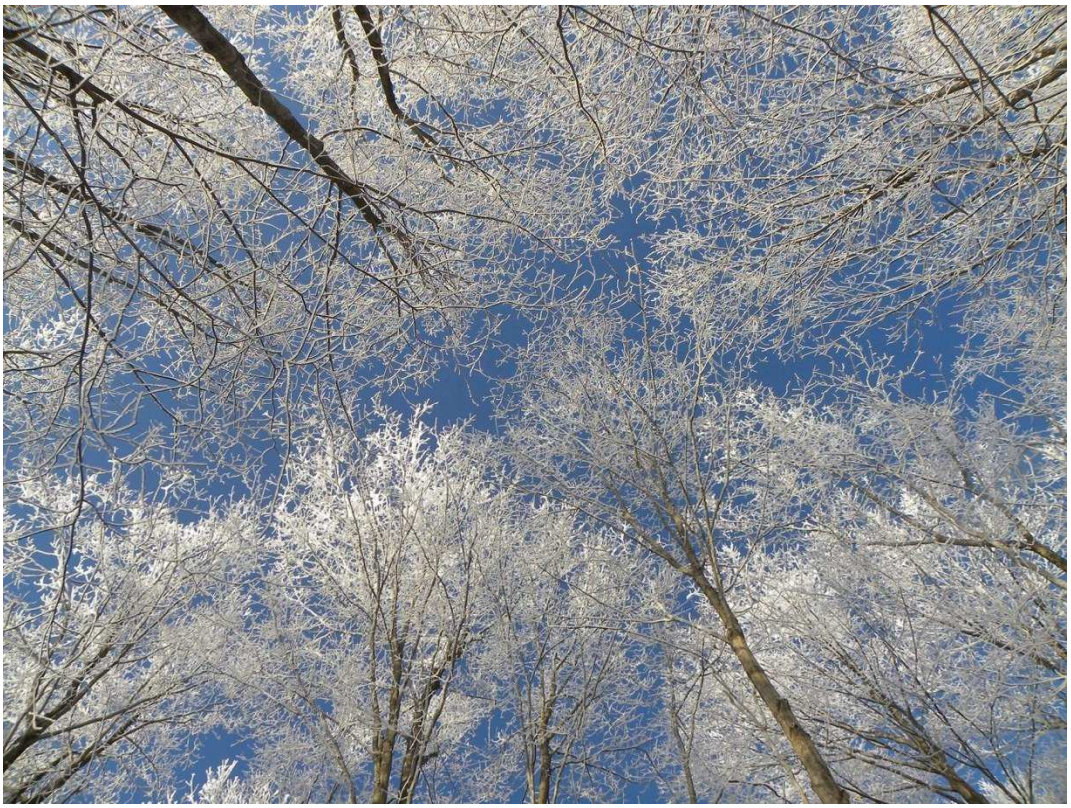
A graphical representation of changes in nutrient concentrations under elevated CO2 levels of C3 plants.



(left) A healthy ocean snail has a transparent shell with smoothly contoured ridges. (right) A shell exposed to more acidic, corrosive waters is cloudy, ragged, and pockmarked with 'kinks' and weak spots. Photos courtesy Nina Bednarsek, NOAA PMEL.

Scientific photograph of changes affecting shell integrity due to ocean acidification.

Spring melt



Tapping the Sugar Maples