

Interactive comment on “Transition to El Niño conditions in the eastern tropical Pacific in October 2015” by Lothar Stramma et al.

Anonymous Referee #2

Received and published: 28 April 2016

The authors report on changes observed during the strong Eastern Pacific ‘El Niño’ event developed in early 2015, and compare this event to previous similar events, neutral, and one ‘La Niña-like’ event. As expected from models and previous observations, the SSTs increase in the eastern equatorial Pacific, the surface salinity drops, the EUC and other equatorial currents weaken, and the thermocline deepens. As a consequence, the concentration of nutrients decreases, the concentration of oxygen increases, and the OMZ shifts deeper. The effects of ‘el Niño’ do not spread all the way to the southern station by October 2015, off the coast in Peru.

I think that the paper is interesting and worth publishing, but I think that it would vastly improve if the writing is improved in some sections. There are several awkward sentences, and it is difficult to follow the flow of the paper if not an expert on the topic (especially the Introduction). I have minor comments mostly referred to organization

C1

and flow.

The abstract and the Conclusions contain almost exactly the same information. I would suggest reducing the abstract substantially (it is too long), and keeping the Conclusions section as it is.

The Introduction is disorganized and difficult to follow. For example, changes due to climate change are discussed in Page2L5 and again in Page2L19. These should be discussed together. And before, the two types of el Nino should be explained. It makes it difficult to follow for non-experts. The description of indices in Page2L11 could go into Section 2 that could be called Datasets and Methods (or similar). If indices are discussed in the Intro, maybe not in the first paragraph.

I think that it is a good idea to move some of the Intro material into the mini-introductions in Section 4 and 5 (as it is), but the authors should avoid repetition with elements already described in the more general Introduction (Section 1). I suggest reducing the general Intro to avoid repetition, or put it all in the general Introduction (in which case you could include all the Seasonality changes together), or ... (but avoiding the repetition of material).

Supplementary Fig. 1 should be a main Figure as it is crucial to understand the whole picture (maybe together with current Fig. 1?).

Could you somehow combine Fig. 3 and 4? (perhaps with irregular axis, with larger resolution from 0 to 100m).

Fig. 6 (add to the caption the date. . . October 2015, so that it's easier to follow without going back to text or Fig. 1)

Specific Comments:

Page1L11 “At the equator. . . October 2015” awkward phrasing

Page1L21 to L26 rephrase

C2

Page2L4-5 rephrase Page2L5 “In contrast . . .” rephrase as for example ‘There has been evidence., different from the common cold tongue, Eastern Pacific El Nino events. . . ‘ This sentence should come after describing the two types of El Nino. Why is it relevant to talk about the Modoki type if none of the described events fall into this category? (or maybe I missed something). If it is significant, comment on it in the Conclusions?

Page3L5 avoid repetition of EUC description with text later on the draft.

Page3L18-25 “Oxygen increases as a result of circulation changes + explanation” This paragraph talking about oxygen needs more coherence and flow. The explanation about local winds is confusing and needs to be better linked with the following sentence (deeper thermocline) as it is counterintuitive. More upwelling but deeper thermocline? Etc. . .

Are all the changes in oxygen due to circulation or are any of these due to reduced primary production (L26)?

Page5L26 rephrase the sentence starting with ‘ Different. . . ‘ (suggestion: The SST distribution in fall 2015 shows a strong and prominent SST increase along Central America and in . . . that differs from the typical EP el Nino distribution.)

Page6L18 “The equatorial spreading of the thermocline. . . “ rephrase and also explain what spreading of thermocline means.

Page7L8-11 rephrase paragraph? Not clear why salinity higher during EN events.

Page8L4 “In October 2015. . . salinity lower because reduced equatorial upwelling. . .” and because increased precipitation?

Page8L8 “In the profiles. . .” rephrase

Page9L3-8 What about March 1993? Oxygen is also high only in the high 60m. . . I would suggest to rephrase it so that it is easier to follow the author’s logics, and more

C3

clear. For example: The oxygen concentration was slightly higher only in the upper 60 m for both El Nino events in March 1993 and in October 2015 compared to However, earlier selected measurements. . . showed a clear oxygen increase to a depth of 350m, hence we conclude that el Nino influence on the water mass distribution. . . .

Page9L20 “The modeled EUC transports. . .” are you giving some examples from OGCMs in the sentence before, or these are all the OGCMs used? Make it clear. . .

Page9L23 somewhat repeated information from the General Intro?

Page10L6-9 this segment belongs to intro.

From Page13 onwards the writing flows much better. . .

Page14L5-14 I don’t understand why nitrate was lower (contrary to El Nino expectations). Clarify in the text?

End of page 15 You could move the summary of this sub-section (L18 onwards) into the conclusions.

Interactive comment on Ocean Sci. Discuss., doi:10.5194/os-2016-14, 2016.

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