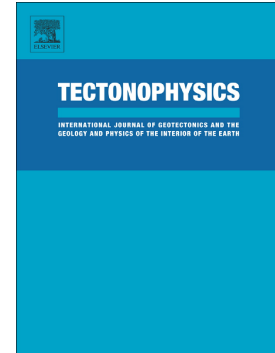


Accepted Manuscript

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PII: S0040-1951(18)30102-1
DOI: doi:[10.1016/j.tecto.2018.03.005](https://doi.org/10.1016/j.tecto.2018.03.005)
Reference: TECTO 127795
To appear in: *Tectonophysics*
Received date: 16 December 2017
Revised date: 3 March 2018
Accepted date: 7 March 2018

Please cite this article as: Brandon T. Bishop, Susan L. Beck, George Zandt, Lara S. Wagner, Maureen D. Long, Hernando Tavera , Foreland uplift during flat subduction: Insights from the Peruvian Andes and Fitzcarrald Arch. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. Tecto(2017), doi:[10.1016/j.tecto.2018.03.005](https://doi.org/10.1016/j.tecto.2018.03.005)

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Foreland uplift during flat subduction: Insights from the Peruvian Andes and Fitzcarrald Arch

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ABSTRACT

Foreland deformation has long been associated with flat-slab subduction, but the precise mechanism linking these two processes remains unclear. One example of foreland deformation corresponding in space and time to flat subduction is the Fitzcarrald Arch, a broad NE-SW trending topographically high feature covering an area of more than $4 \times 10^5 \text{ km}^2$ in the Peruvian Andean foreland. Recent imaging of the southern segment of Peruvian flat slab shows that the shallowest part of the slab, which corresponds to the subducted Nazca Ridge northeast of the present intersection of the ridge and the Peruvian trench, extends up to and partly under the southwestern edge of the arch. Here, we evaluate models for the formation of this foreland arch and find that a basal-shear model is most consistent with observations. We calculate that $\sim 5 \text{ km}$

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