



Global data set for nitrogen and carbon stable isotopes of tunas

Nathalie Bodin, Heidi Pethybridge, Leanne Duffy, Anne Lorrain, Valérie Allain, John Logan, Brittany Graham, Frédéric Ménard, C. Anela Choy, Christopher Somes, et al.

► To cite this version:

Nathalie Bodin, Heidi Pethybridge, Leanne Duffy, Anne Lorrain, Valérie Allain, et al.. Global data set for nitrogen and carbon stable isotopes of tunas. *Ecology*, 2021, 102 (3), 10.1002/ecy.3265 . hal-03203941

HAL Id: hal-03203941

<https://hal.science/hal-03203941>

Submitted on 21 Apr 2021

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Distributed under a Creative Commons Attribution 4.0 International License

Data Paper

Ecology, 102(3), 2021, e03265
© 2020 The Authors. *Ecology* © 2020 The Ecological Society of America

Global data set for nitrogen and carbon stable isotopes of tunas

NATHALIE BODIN ^{1,2,12} HEIDI PETHYBRIDGE ³ LEANNE M. DUFFY ⁴ ANNE LORRAIN ⁵ VALÉRIE ALLAIN,⁶
JOHN M. LOGAN ⁷ FRÉDÉRIC MÉNARD,⁸ BRITTANY GRAHAM,⁹ C. ANELA CHOY ¹⁰, CHRISTOPHER J. SOMES ¹¹,
ROBERT J. OLSON ⁴ AND JOCK W. YOUNG³

¹Research Institute for Sustainable Development (IRD), Fishing Port, Victoria, Mahe P.O Box 449 Seychelles

²Sustainable Ocean Seychelles (SOS), BeauBelle, Mahe, Seychelles

³CSIRO Oceans and Atmosphere, Castray Esplanade, Battery Point, Hobart, Tasmania 7004 Australia

⁴Inter-American Tropical Tuna Commission (IATTC), 8901 La Jolla Shores Drive, La Jolla, California 92037-1509 EE.UU. USA

⁵IRD, University of Brest, CNRS, Ifremer, LEMAR, Technopôle Brest-Iroise, Rue Dumont d'Urville, Plouzané 29280 France

⁶Pacific Community (SPC), 95 Promenade Roger Laroque BP D5, Nouméa 98848 New Caledonia

⁷Massachusetts Division of Marine Fisheries, 836 S Rodney French Blvd, New Bedford, Massachusetts 02744 USA

⁸Aix Marseille University, University of Toulon, CNRS, IRD, MIO, Campus de Luminy-Océanomed, Marseille 13009 France

⁹National Institute of Water and Atmospheric Research (NIWA), 301 Evans Bay Parade, Hataitai, Wellington 6021 New Zealand

¹⁰Scripps Institution of Oceanography, University of California San Diego, 9500 Gilman Drive, La Jolla, California 92093-0218 USA

¹¹GEOMAR Helmholtz Centre for Ocean Research Kiel, Düsternbrooker Weg 20, Kiel 24105 Germany

Citation: Bodin N., H. Pethybridge, L. M. Duffy, A. Lorrain, V. Allain, J. M. Logan, F. Ménard, B. Graham, C. A. Choy, C. J. Somes, R. J. Olson, and J. W. Young. 2021. Global data set for nitrogen and carbon stable isotopes of tunas. *Ecology* 102(3):e03265. 10.1002/ecy.3265

Abstract. Nitrogen and carbon stable isotope data sets are commonly used to assess complex population to ecosystem responses to natural or anthropogenic changes at regional to global spatial scales, and monthly to decadal timescales. Measured in the tissues of consumers, nitrogen isotopes ($\delta^{15}\text{N}$) are primarily used to estimate trophic position while carbon isotopes ($\delta^{13}\text{C}$) describe habitat associations and feeding pathways. Models of both $\delta^{15}\text{N}$ and $\delta^{13}\text{C}$ values and their associated variance can be used to estimate likely dietary contributions and niche width and provide inferences about consumer movement and migration. Stable isotope data have added utility when used in combination with other empirical data sets (e.g., stomach content, movement tracking, bioregionalization, contaminant, or fisheries data) and are increasingly relied upon in food web and ecosystem models. While numerous regional studies publish tables of mean $\delta^{15}\text{N}$ and $\delta^{13}\text{C}$ values, limited individual records have been made available for wider use. Such a deficiency has impeded full utility of the data, which otherwise would facilitate identification of macroscale patterns. The data provided here consist of 4,498 records of individuals of three tuna species, *Thunnus alalunga*, *T. obesus*, and *T. albacares* sampled from all major ocean basins from 2000 to 2015. For each individual tuna, we provide a record of the following: species name, sampling date, sampling location, tuna length, muscle bulk and baseline corrected $\delta^{15}\text{N}$ values, and muscle bulk and, where available, lipid corrected $\delta^{13}\text{C}$ values. We provide these individual records to support comparative studies and more robust modeling projects seeking to improve understanding of complex marine ecosystem dynamics and their responses to a changing environment. There are no copyright restrictions for research and/or teaching purposes. Users are requested to acknowledge their use of the data in publications, research proposals, websites, and other outlets following the citation instructions in Class III, Section B.

Key words: baseline isotopic variability; food web dynamics; Global Ocean; marine top predators; pelagic ecosystem; scombrids; trophic position.

The complete data sets corresponding to abstracts published in the Data Papers section in the journal are published electronically as Supporting Information in the online version of this article at <http://onlinelibrary.wiley.com/doi/10.1002/ecy.3265/supinfo>.

Manuscript received 8 May 2020; accepted 26 October 2020. Corresponding Editor: William K. Michener.

¹²E-mail: natbod@gmail.com