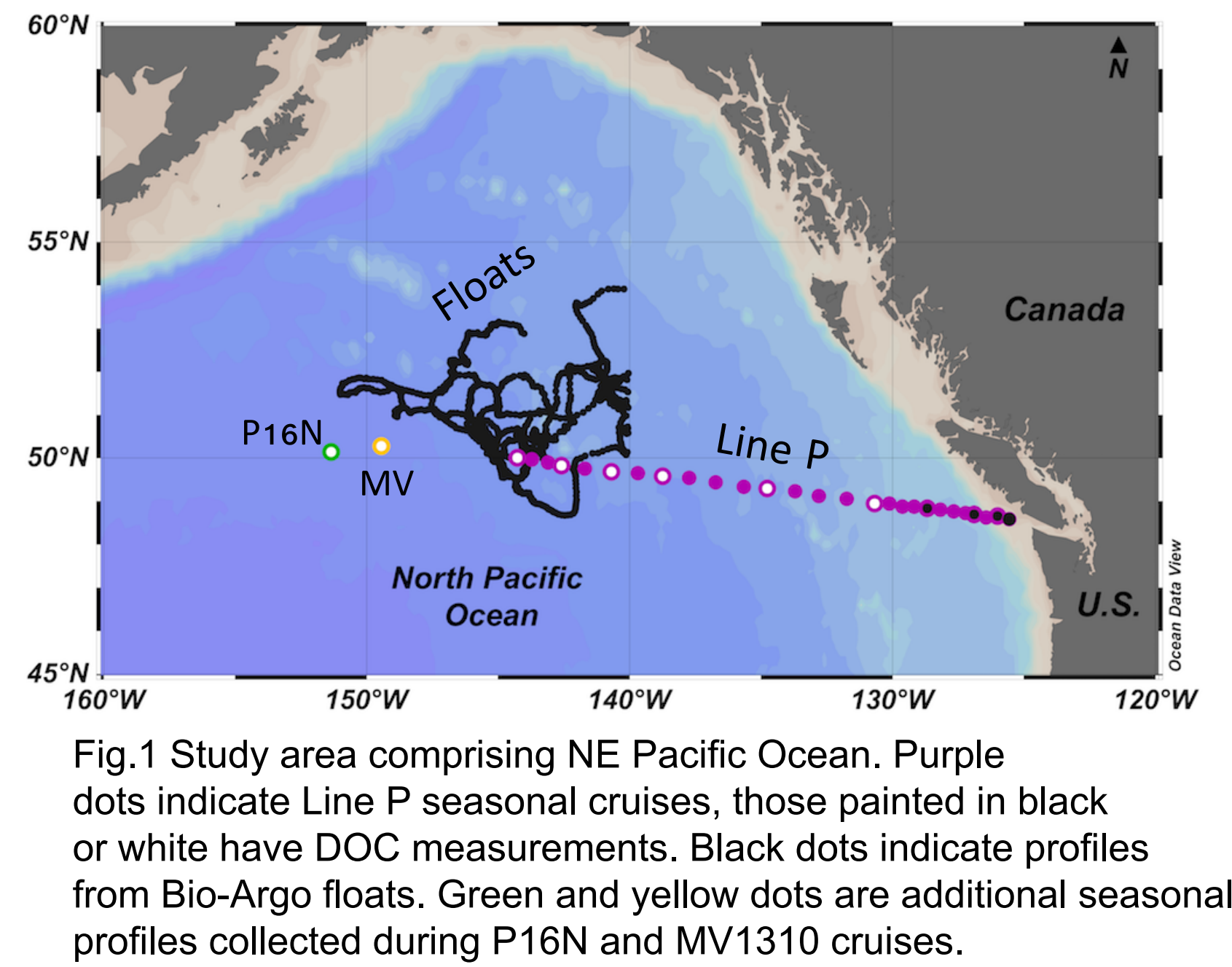


Using cruises and Bio-Argo floats data to estimate dissolved organic carbon in the Northeast Pacific Ocean

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1. Overview and motivation

- Measurements of dissolved organic carbon (DOC) in the ocean still require ships, and the chemical analysis is very time-consuming
- DOC concentrations can be estimated from net community production (NCP) if a constant fraction of NCP seasonally accumulates as DOC, called Net Dissolved Production Ratio (NDPr)
- NCP can be calculated for a region using nitrate profiles collected through seasons
- Cruises in the NE Pacific are carried out seasonally, and the last station (Papa) is nearby Bio-Argo floats equipped with nitrate sensors
- We calculated NDPr from seasonal DOC concentrations in NE Pacific (Line P seasonal cruises from 2017), and applied to NCP derived from Bio-Argo floats data in order to estimate DOC
- Data is shown from years from 2009 to 2018



2. Approach

Seasonal cruises
Line P/2017,
P16N winter +
MV1310 Summer

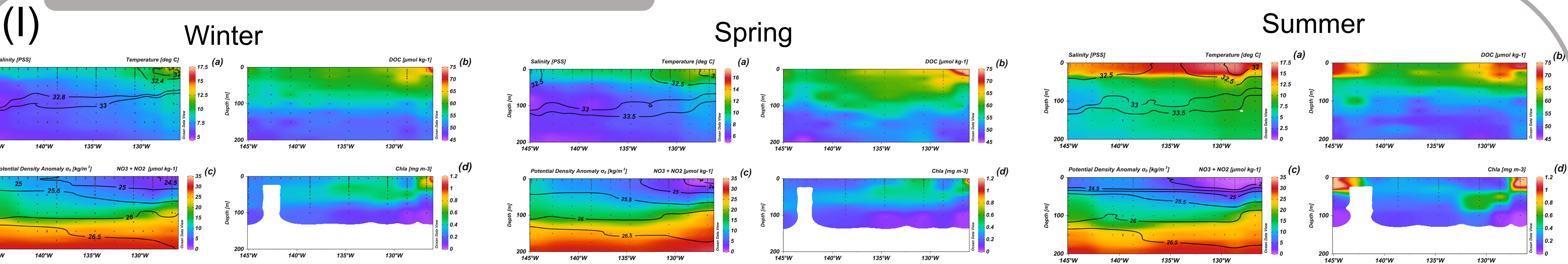
- DOC concentrations (TOC analyzer)
- NCP = $\Delta\text{NO}_3^- \cdot 6.6$ Estimated for spring and summer/2017
- NDPr = $\Delta\text{DOC}/\text{NCP}$
- NDPr is constant nearby Papa, NDPr = 0.26±0.2

Bio Argo Floats
2009-2018

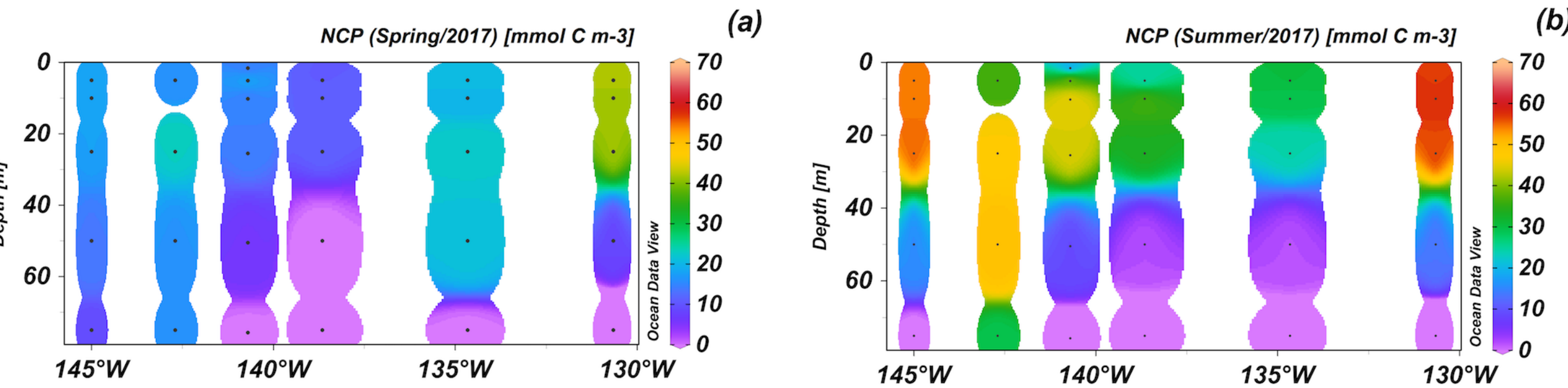
$\text{DOC}_{\text{estimated}} = 0.26 \cdot \text{NCP}$

- DOC profiles 2009-2018

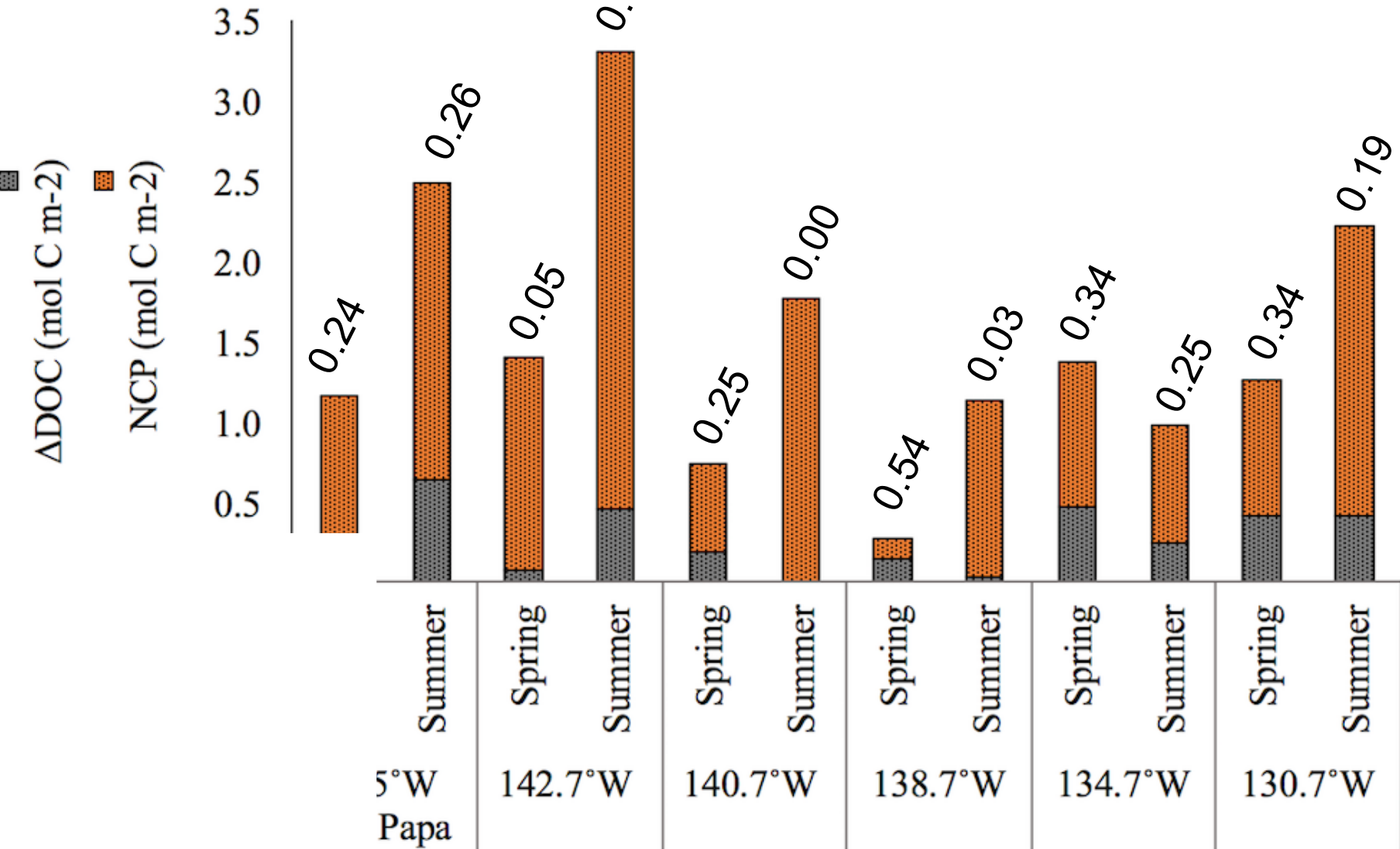
3. Seasonal cruises: DOC, NCP, NDPr



(II) Seasonal NCP along Line P: Spring, Summer



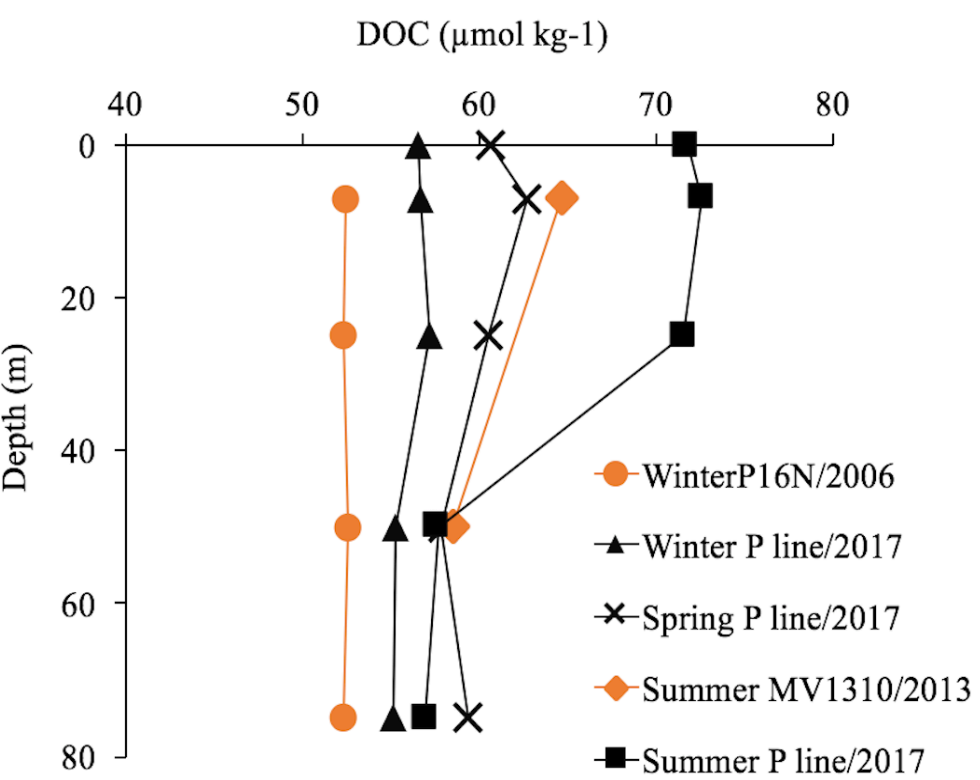
(III) Integrated NCP and net dissolved production ratio (NDPr)



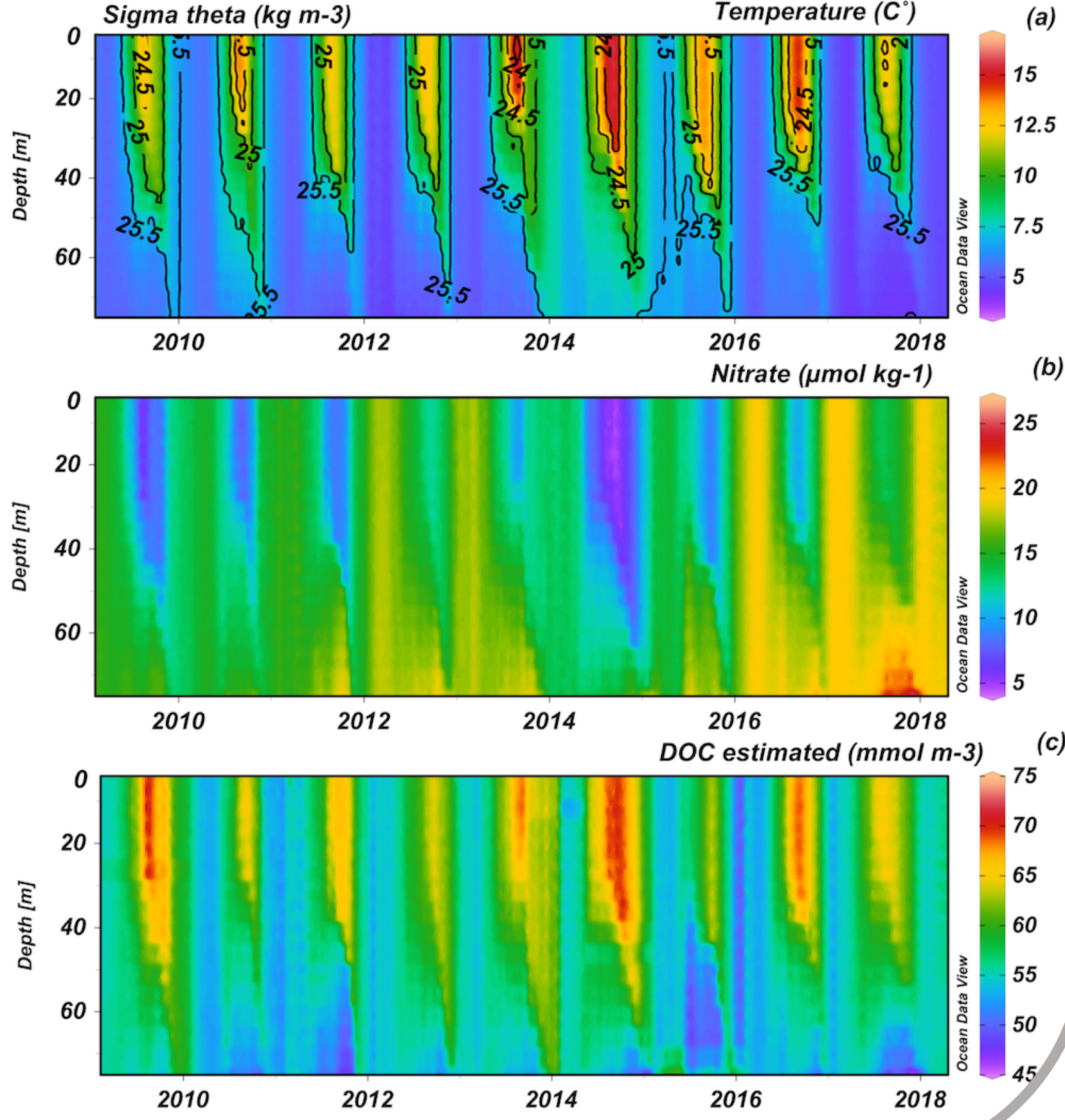
*Numbers indicate NDPr for each station

Stability of NDPr nearby Station Papa:

Cruise	NCP (mol C m ⁻²)	ΔDOC (mol C m ⁻²)	NDPr
Line P spring	1.15	0.28	0.24
Line P summer	2.48	0.65	0.26
P16N/MV summer	1.6	0.44	0.28



4. Estimated DOC nearby Station Papa



Acknowledgements