

Testing the Provenance of Santonian- Maastrichtian lobe of the Ceduna Delta

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TITLE

Testing the Provenance of Santonian-Maastrichtian lobe of the Ceduna Delta

RUNNING TITLE

Provenance of the Upper Ceduna Delta Lobe

ABSTRACT

The Ceduna Delta represents a vast Cretaceous stacked delta system located in the Bight Basin and is currently the focus of considerable petroleum exploration. Two competing models have been suggested for the source of the upper Santonian-Maastrichtian delta lobe. Originally, it was proposed that both the upper and lower lobes of the delta were sourced from the Australian Eastern Highlands via a continent scale river. A recent study suggested that the two lobes had different sources, with the upper lobe instead being sourced proximally from the western Eromanga Basin and within present day South Australia. This new model was primarily based on existing and new, but sparse apatite fission track data. This study tested the two competing models, by comparing the detrital zircon U/Pb age distribution and Lu-Hf isotopic composition of samples from the Late Cretaceous Winton Formation in the eastern Eromanga Basin (part of the proposed source of the upper Ceduna delta) with samples from the Gnarlyknots-1A well within the Ceduna Sub-basin of the Bight Basin. Zircon U/Pb data and hafnium isotopic data from the Gnarlyknots-1A well and eastern Eromanga Winton Formation demonstrates the similarity in provenance of the two formations and that both ultimately are sourced from the Australian Eastern Highlands.

KEYWORDS

Provenance, U-Pb Age, Hafnium Isotopes, Geochemistry, Ceduna Delta, Bight Basin

TABLE OF CONTENTS

Title.....	I
Running title	I
Abstract.....	I
Keywords.....	I
Table of Contents	II
List of Figures and Tables	IV
Introduction	1
Background.....	6
Geological Setting.....	7
Bight Basin.....	7
Eromanga Basin	9
Methods	10
Observations and Results	12
Existing U-Pb detrital zircon data	12
Gnarlyknots-1A Sample 74317 (data from MacDonald et al. (2013b)).....	12
Gnarlyknots-1A Sample 74318 (data from MacDonald et al. (2013b)).....	12
Gnarlyknots-1A Sample 74319 (data from MacDonald et al. (2013b)).....	13
Gnarlyknots-1A Sample 74320 (data from MacDonald et al. (2013b)).....	13
Gnarlyknots-1A Sample 74321 (data from MacDonald et al. (2013b)).....	14
Gnarlyknots-1A Sample 74323 (data from MacDonald et al. (2013b)).....	14
Gnarlyknots-1A Sample 74324 (data from MacDonald et al. (2013b)).....	14
Gnarlyknots-1A Sample 74325 (data from MacDonald et al. (2013b)).....	15
Gnarlyknots-1A Sample 74326 (data from MacDonald et al. (2013b)).....	15
Winton Formation Samples 8622-61 and 8642-168 (data from MacDonald and Holford pers. comm. 2014).....	18
Eromanga-1 (Data from Tucker et al. (2013)).....	20
Isisford (Data from Tucker et al. (2013))	20
Lark Quarry Conservation Park (Data from Tucker et al. (2013)).....	20
Bladensburg National Park (Data from Tucker et al. (2013)).....	21
Longreach-1 (Data from Tucker et al. (2013))	21
Hughes-2 Sample 1069106 (data from MacDonald and Holford pers. Comm. 2014)	23
Hughes-2 Sample 1069111 (data from MacDonald and Holford pers. Comm. 2014)	24
New U-Pb Data	25
Gnarlyknots-1A Sample 74322	25

Hughes-2 Sample 106988	26
Gnarlyknots-1A Hafnium Analyses	27
Discussion.....	29
Maximum Depositional Ages.....	29
U-Pb Age Provenance of the Cretaceous in South Australia	31
Hafnium Isoptic Constraints on the Provenance of the Ceduna Sub-Basin	36
Conclusions	38
Acknowledgments	39
References	40
Appendix A: Detailed Methods.....	42
Uranium-Lead Geochronology.....	42
Hafnium Isotopic Analysis	42
Appendix B: NEW U-Pb and Hf Isotope Data.....	44

LIST OF FIGURES AND TABLES

Figure 1: Location of Gnarlyknots-1A drill hole, Hughes-2 drill hole, the Ceduna sub-basin and Gnarlyknots-1A sample depths	1
Figure 2: Map of Australia showing the locations where uranium-lead and hafnium isotope data was sourced, major basins of Australia coloured according to age. The black box represents the inset for Figure 1. The major basins of interest, the Eromanga and Bight Basins, are outlined in black.	5
Figure 3: Bight Basin correlation chart showing link between the sea level curve, lithostratigraphy, sequence stratigraphy and basin phases. After Totterdell et al. (2003)	8
Figure 4: Stratigraphic chart of the Eromanga Basin showing the relationship to sea level curve. After Cotton et al. (2006b).....	10
Figure 5A-J: Uranium-lead Concordia plots showing all data for each Gnarlyknots-1A sample with corresponding kernel density estimate (green shading, adaptive bandwidth), probability density plot (black line) and histogram (grey boxes, net frequency on Y-axis, 100 Ma bin width) using 90-110 concordant data with each datum represented by a black circle on the X-axis.	18
Figure 6A&B: Uranium-lead Concordia plots showing all data for two western Eromanga basin samples from Dullingari-1 and Burely-2 drill holes with corresponding kernel density estimate (green shading, adaptive bandwidth), probability density plot (black line) and histogram (grey boxes, net frequency on Y-axis, 100 Ma bin width) using 90-110 concordant data with each datum represented by a black circle on the X-axis.....	19
Figure 7A-E: Uranium-lead Concordia plots showing all data for five central and eastern Eromanga basin samples with corresponding kernel density estimate (green shading, adaptive bandwidth), probability density plot (black line) and histogram (grey boxes, net frequency on Y-axis, 100 Ma bin width) using 90-110 concordant data with each datum represented by a black circle on the X-axis.....	23
Figure 8A&B: Uranium-lead Concordia plots showing all data for Hughes-2 drill hole samples 109106 and 1069111 with corresponding kernel density estimate (green shading, adaptive bandwidth), probability density plot (black line) and histogram (grey boxes, net frequency on Y-axis, 100 Ma bin width) using 90-110 concordant data with each datum represented by a black circle on the X-axis.....	24
Figure 9A&B: Uranium-lead Concordia plots showing new uranium-lead data (A) and previous data from MacDonald et al. (2013b) (B) for Gnarlyknots-1A sample 74322 with corresponding kernel density estimate (green shading, adaptive bandwidth), probability density plot (black line) and histogram (grey boxes, net frequency on Y-axis, 100 Ma bin width) using 90-110 concordant data with each datum represented by a black circle on the X-axis.	26
Figure 10: Uranium-lead Concordia plots showing all data for Hughes-2 sample 106988 with corresponding kernel density estimate (green shading, adaptive bandwidth), probability density plot (black line) and histogram (grey boxes, net frequency on Y-axis, 100 Ma bin width) using 90-110 concordant data with each datum represented by a black circle on the X-axis.	27

Figure 11: Plot showing epsilon hafnium in relation to uranium-lead age of Gnarlyknots-1A zircon samples. A chondritic uniform reservoir reference line (purple) plots along (x, 0), the epsilon hafnium depleted mantle line (aqua) shows the modelled mantle epsilon hafnium values and the epsilon hafnium new crust line (grey) shows the new epsilon hafnium mantle model values as suggested by Dhuime et al. (2011). The epsilon hafnium values provide information about the material that melted to form the magma from which the zircon crystallised. Negative epsilon hafnium values indicate involvement of existing continental crust in magma genesis; conversely positive epsilon hafnium values indicate the source had experienced a prior depletion event. Data points below the chondritic uniform reservoir are considered evolved, above the depleted mantle are highly depleted and between the chondritic uniform reservoir and depleted mantle are considered juvenile. The kernel density estimate (green shaded area) and probability density plot (black solid line) are overlain for visual correlation of zircon populations. 29

Figure 12 A-D: Maximum depositional ages determined by the youngest near concordant U^{238}/Pb^{206} age errors plotted at the 2σ level, for: (A) Mackunda Formation (Longreach-1), and Winton Formation, (B) Loongana Formation from Hughes-2 and (C) Potoroo Formation (GN 74317-74319) and Wigunda Formation (GN 74320-74326). A slight trend of decreasing age (using only <160 Ma, $<10\%$ discordant zircons) with increasing sample depth for the Gnarlyknots-1A samples is shown in (D). This suggests progressive erosion of a normally layered sedimentary succession. 31

Figure 13: Combined display of zircon uranium-lead ages for Hughes-2, Bight Basin, showing histogram (grey rectangles, net frequency shown on Y-axis, bin-width of 100), kernel density estimate (green shading, adaptive bandwidth) and probability distribution plot (black line). Each datum is represented by a black circle on the X-axis..... 32

Figure 14: Combined display of zircon uranium-lead ages for Winton Formation samples, showing histogram (grey rectangles, net frequency shown on Y-axis, bin-width of 100), kernel density estimate (green shading, adaptive bandwidth) and probability distribution plot (black line). Each datum is represented by a black circle on the X-axis 33

Figure 15: Combined display of zircon uranium-lead ages for Gnarlyknots-1A, Ceduna Sub-basin, showing histogram (grey rectangles, net frequency shown on Y-axis, bin-width of 100), kernel density estimate (green shading, adaptive bandwidth) and probability distribution plot (black line). Each datum is represented by a black circle on the X-axis..... 35

Figure 16: Corrected ϵHf values for Gnarlyknots-1A, the Rakaia Terrane in New Zealand (Acott 2013), the Musgrave Province (Smithies et al. 2011, Kirkland et al. 2013) and the Mount Painter Province (Kromkhun et al. 2013). 37

Supplementary Table 1: U-Pb data collected for Gnarlyknots-1A sample 74322 44

Supplementary Table 2: U-Pb data collected for Hughes-2 sample 106988..... 46

Supplementary Table 3: Hf data collected for gnarlyknots-1A, sample 74318 48

Supplementary Table 4: Hf data collected for Gnarlyknots-1A, sample 74319 49

Supplementary Table 5: Hf data collected for Gnarlyknots-1A, sample 74321 50

Supplementary Table 6: Hf data collected for Gnarlyknots-1A, sample 74322 51

Supplementary Table 7: Hf data collected for Gnarlyknots-1A, sample 74323 52
Supplementary Table 8: Hf data collected for Gnarlyknots-1A, sample 74326 53