**Supplementary Material for Vendettuoli et al. “Daily bathymetric surveys document how stratigraphy is built and its extreme incompleteness: One summer offshore Squamish Delta, British Columbia”**

**The supplementary material is provided as follows:**

* Table S1: Summary of previous repeat bathymetric mapping in areas of active submarine landslides and turbidity currents. References cited in Table S1 are included at the end of this document.
* Figure S1: Seafloor elevation changes through time, taken at 100 m intervals along each of the channel axes at the Squamish prodelta
* Figures S2-7: Across channel profiles illustrating the stratigraphic evolution for across channel profiles B-C-D-E-G and H at the Squamish prodelta
* Figure S8: Evolution of stratigraphic completeness over time along the three channels at the Squamish prodelta
* Ascii data for cumulative aggradation map (“cum\_aggrad.txt”) and stratigraphic completeness map (for all areas where stratigraphic completeness <0 “strat\_compl\_zero.txt” and where stratigraphic completeness >0 “strat\_compl\_positive.txt”).

**Animated videos are also presented in the online material as follows:**

* Movie S1\_NorthernChannel.avi – Time-lapse animation of stratigraphic evolution of the Northern Channel
* Movie S2\_NorthChannelProximal.avi – Time-lapse animation of stratigraphic evolution of proximal to medial parts of Northern Channel
* Movie S3\_NorthChannelDistal.avi – Time-lapse animation of stratigraphic evolution of medial to distal parts of Northern Channel
* Movie S4\_CentralChannel.avi – Time-lapse animation of stratigraphic evolution of the Central Channel
* Movie S5\_CentralChannelProximal.avi – Time-lapse animation of stratigraphic evolution of proximal to medial parts of Central Channel
* Movie S6\_CentralChannelDistal.avi – Time-lapse animation of stratigraphic evolution of medial to distal parts of Central Channel
* Movie S7\_SouthChannel.avi – Time-lapse animation of stratigraphic evolution of the Southern Channel
* Movie S8\_SouthChannelProximal.avi – Time-lapse animation of stratigraphic evolution of proximal to medial parts of Southern Channel
* Movie S9\_SouthChannel\_LTZ.avi – Time-lapse animation of stratigraphic evolution of the channel lobe transition zone of Southern Channel
* Movie S10\_SouthChannel\_LTZ\_Zoom - Time-lapse animation of stratigraphic evolution of the channel lobe transition zone of Southern Channel – zoom in
* Movie S11\_A.avi- Time-lapse animation of stratigraphic evolution of across-profile A
* Movie S12\_B.avi- Time-lapse animation of stratigraphic evolution of across-profile B
* Movie S13\_C.avi- Time-lapse animation of stratigraphic evolution of across-profile C
* Movie S14\_D.avi- Time-lapse animation of stratigraphic evolution of across-profile D
* Movie S15\_E.avi- Time-lapse animation of stratigraphic evolution of across-profile E
* Movie S16\_F.avi- Time-lapse animation of stratigraphic evolution of across-profile F
* Movie S17\_G.avi- Time-lapse animation of stratigraphic evolution of across-profile G
* Movie S18\_H.avi- Time-lapse animation of stratigraphic evolution of across-profile H

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| Repeated bathymetric surveys | Location and water depth [m] | Frequency of flows/landslide  [if known] | Processed observed | Reference |
| 5 x annual surveys (2008-2004)  1 x annual survey (2009) | Oguue’ River submarine delta, Gabon  [55 m] | 10s/year | Submarine landslide | Biscara et al. (2012) |
| 2 x annual survey (in 2009 and 2004) | Begawan Solo submarine delta, East Java  [30 m] | - | Turbidity currents | Syahnur and Java (2016) |
| Survey every 6-24 months (from 2004 to 2009); survey every week day (during Spring and Summer 2011 and 2012); single survey for 6 days (June 2013); 1 x annual survey (2015)  \*5 x surveys a day for 6 days (2015) | Squamish submarine delta, British Columbia, Canada  [<200m]  \*Central Channel at Squamish Delta  [60 m] | 10s ÷ 100s/year | Delta-lip collapses, turbidity currents and bedforms migration | Hughes Clarke et al. (2012, 2014), Clare et al. (2016), Hughes Clarke (2016), Hizzett et al. (2018), Hage et al. (2018), this work; |
| Repeat surveys every 15 minutes for 10 days | Westerschelde Estuary, the Netherlands  [20 m] | 10s ÷ 100s/year | Dredging-induced slope failure, bedform migration | Mastbergen et al. (2016) |
| 6 x annual surveys (1967, 1974, 1991, 1999, 2006 and 2011) | Offshore Nice, France1  [300 m] | 10s ÷ 100s/year | Submarine landslide | Kelner et al. (2016) |
| 2 x annual surveys (September 2002 and February 2005); 2 x surveys (March 25, 2003 and March 26, 2006); 1 x annual survey (September 2003); 2 x surveys (September 2004 and November 2004); | Monterey Canyon, California, USA  [300 m] | 10s ÷ 100s/year | Submarine landslide, bedforms migration | Smith et al. (2007); Xu et al. (2008); Paull et al. (2010) |
| 1 x annual surveys (1891); 1 x annual survey (between December 2012 and November 2013); 4 x surveys (1986, 2000, 2008, 2012) | Lake Geneva, Western Europe  [<300 m] | ~10s ÷ 100s/flows | Turbidity currents, mass transport events | Silva et al. (2018); Corella et al. (2016) |
| 1 x annual survey (2007); 1 x annual survey (2012) | Lower St. Lawrence Estuary, Eastern Canada [350 m] |  | Turbidity currents, bedform migration | Normandeau et al. (2014) |
| 2 x annual surveys (2005 and 2008); 1 x annual survey (2010) | Knight, Bute and Toba Inlets, British Columbia, Canada  [up to 400 m] | 10s/year | Slope failure, turbidity currents | Conway et al. (2012); |
| 2 x annual surveys (between 2005 and 2007) | Fiumara Mounths, Western Messina Strait, Italy  [up to 2000 m] | ~100s/year | Hyperpycnal flows, landslides | Casalbore et al. (2011) |
| 2 x surveys (2016) | Kaikoura Canyon, New Zealand  [2000 m] | ~100s/year | Canyon flashing | Mountjoy et al. (2018) |
| 1 x annual survey (1994, 2001, 2003, 2005); 2 x surveys (May 2006 and September 2006) | Fraser River Delta, Western Canada  [up to 110 m] | ~ 10s/year | Turbidity currents, slope failure | Hill et al. (2008); Lintern et al. (2018) |

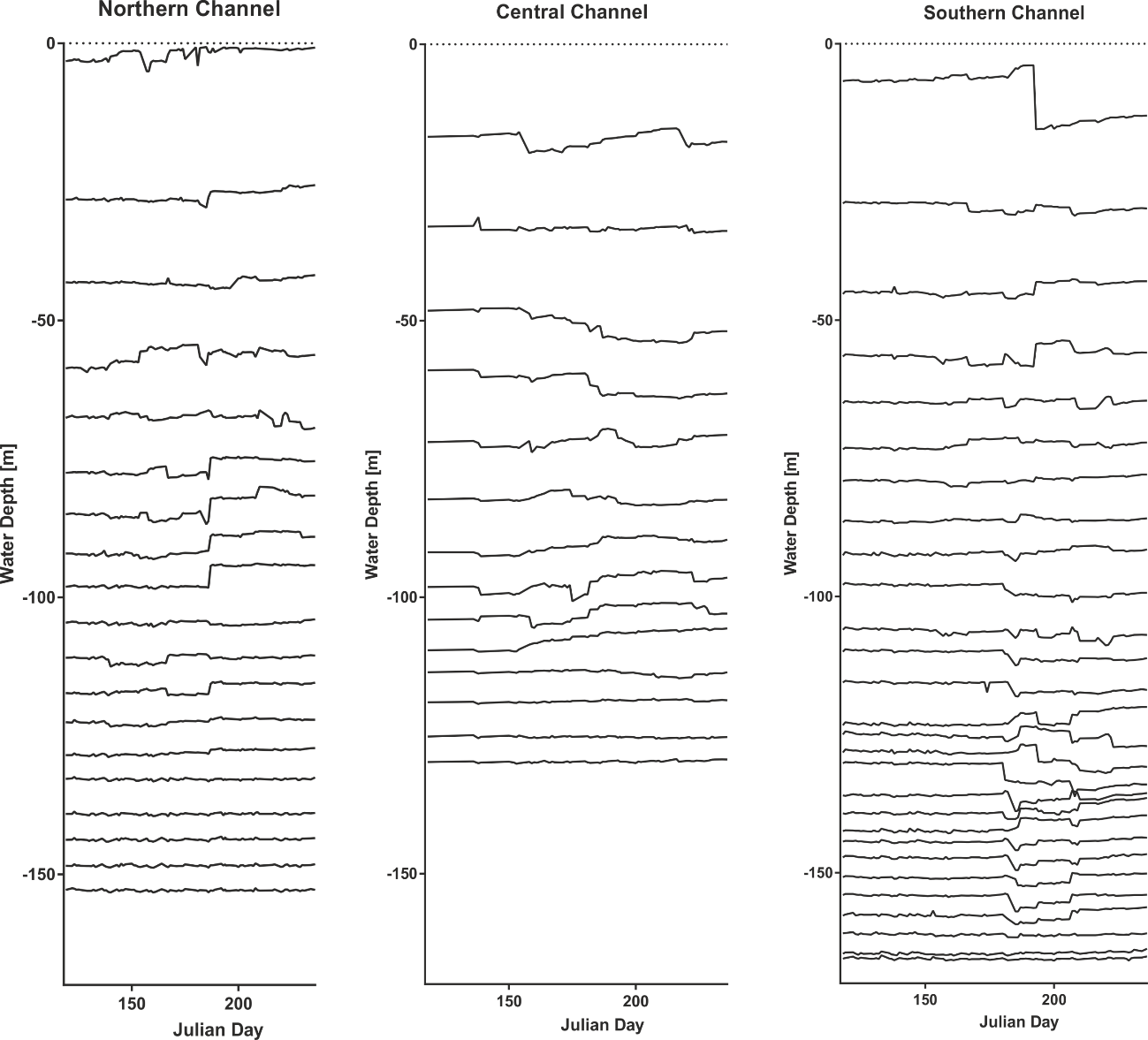


Figure S1: Seafloor elevation changes through time, taken at 100 m interval along single points of the thalweg for each of the three channels at the Squamish prodelta

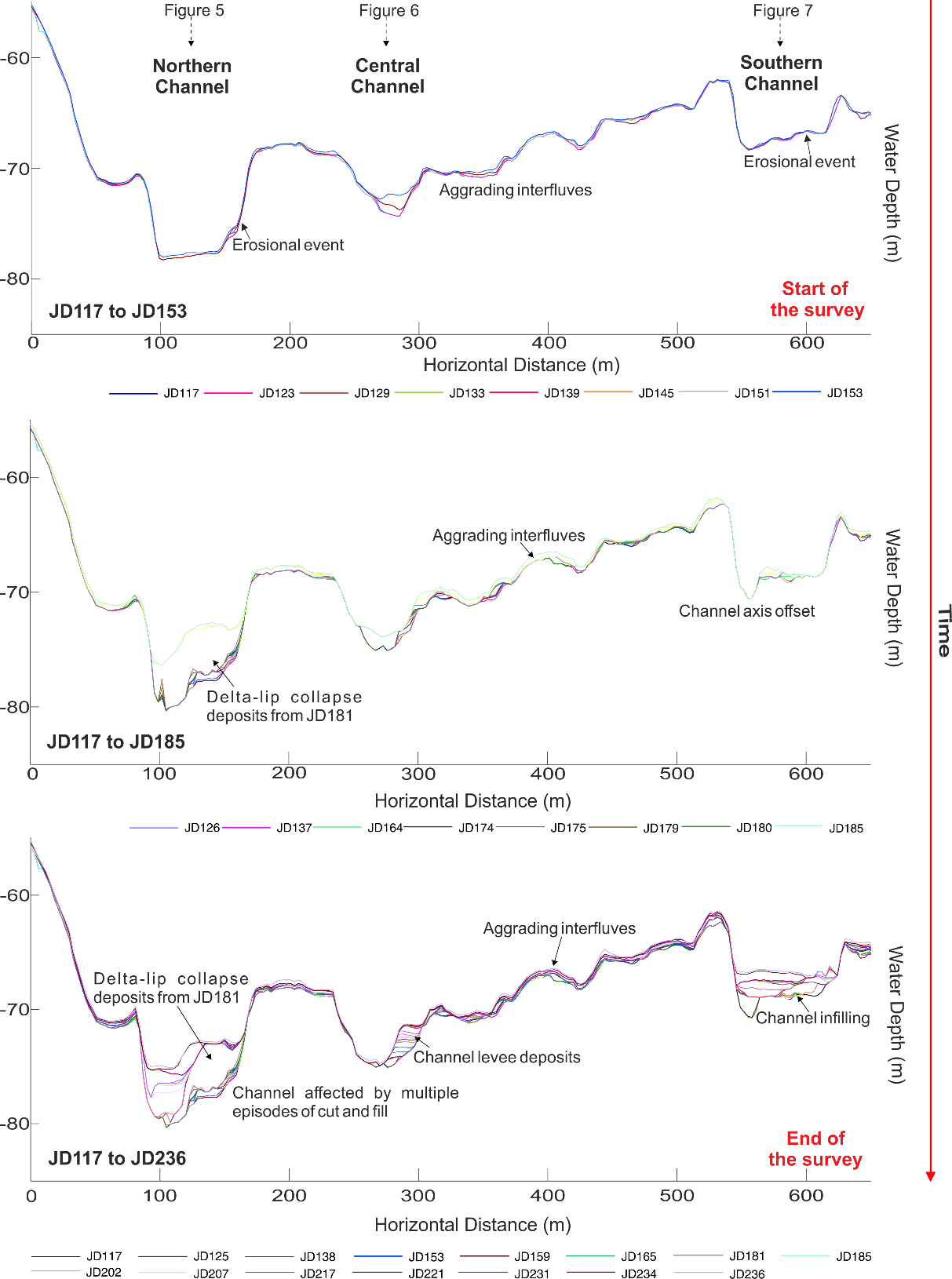


Figure S2: Across channel profile B (see Figure 2B in the main text for the location of the profile; vertical exaggeration: 9x)

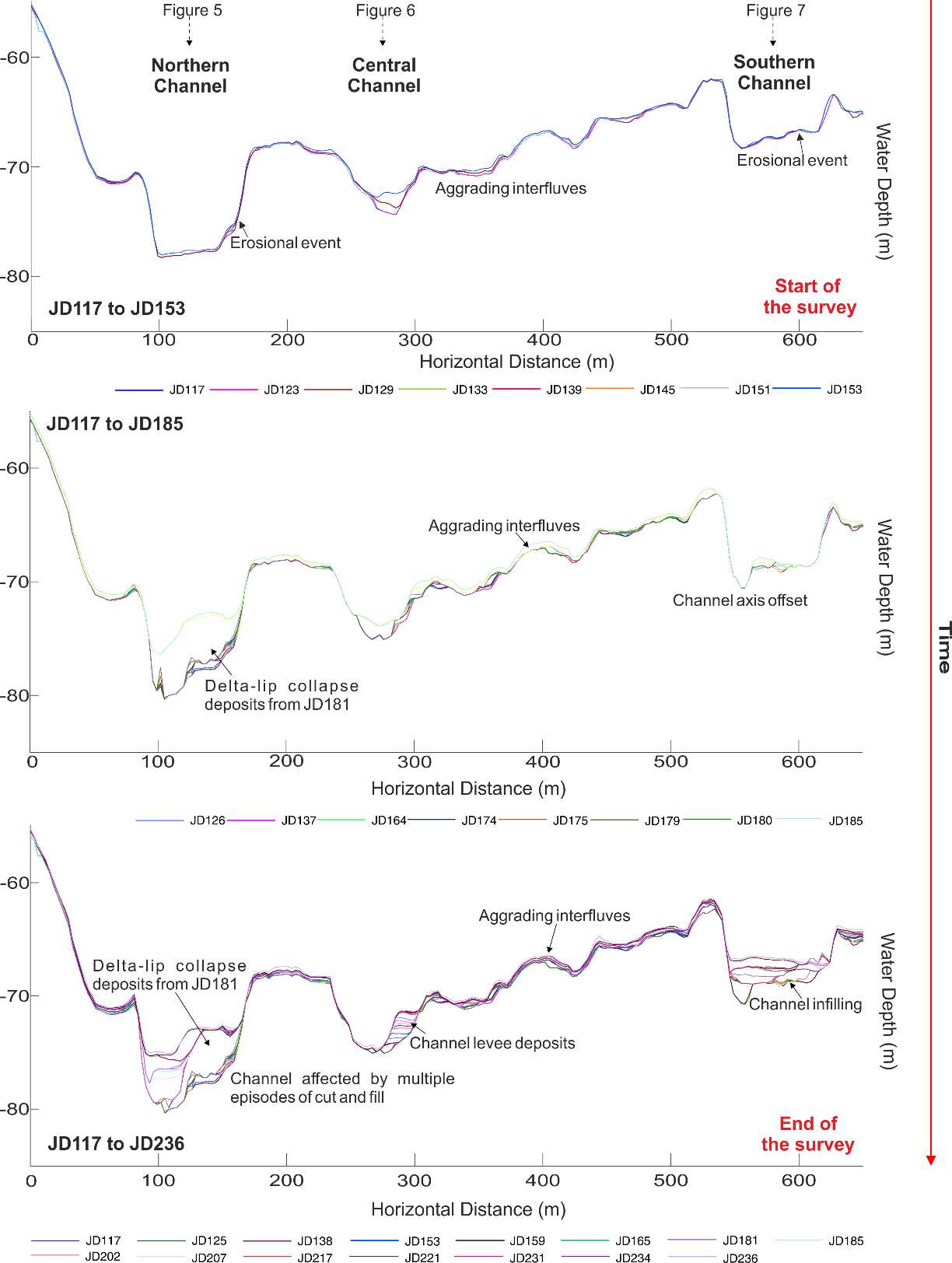


Figure S3: Across channel profile C (see Figure 2B in the main text for the location of the profile; vertical exaggeration: 9x)

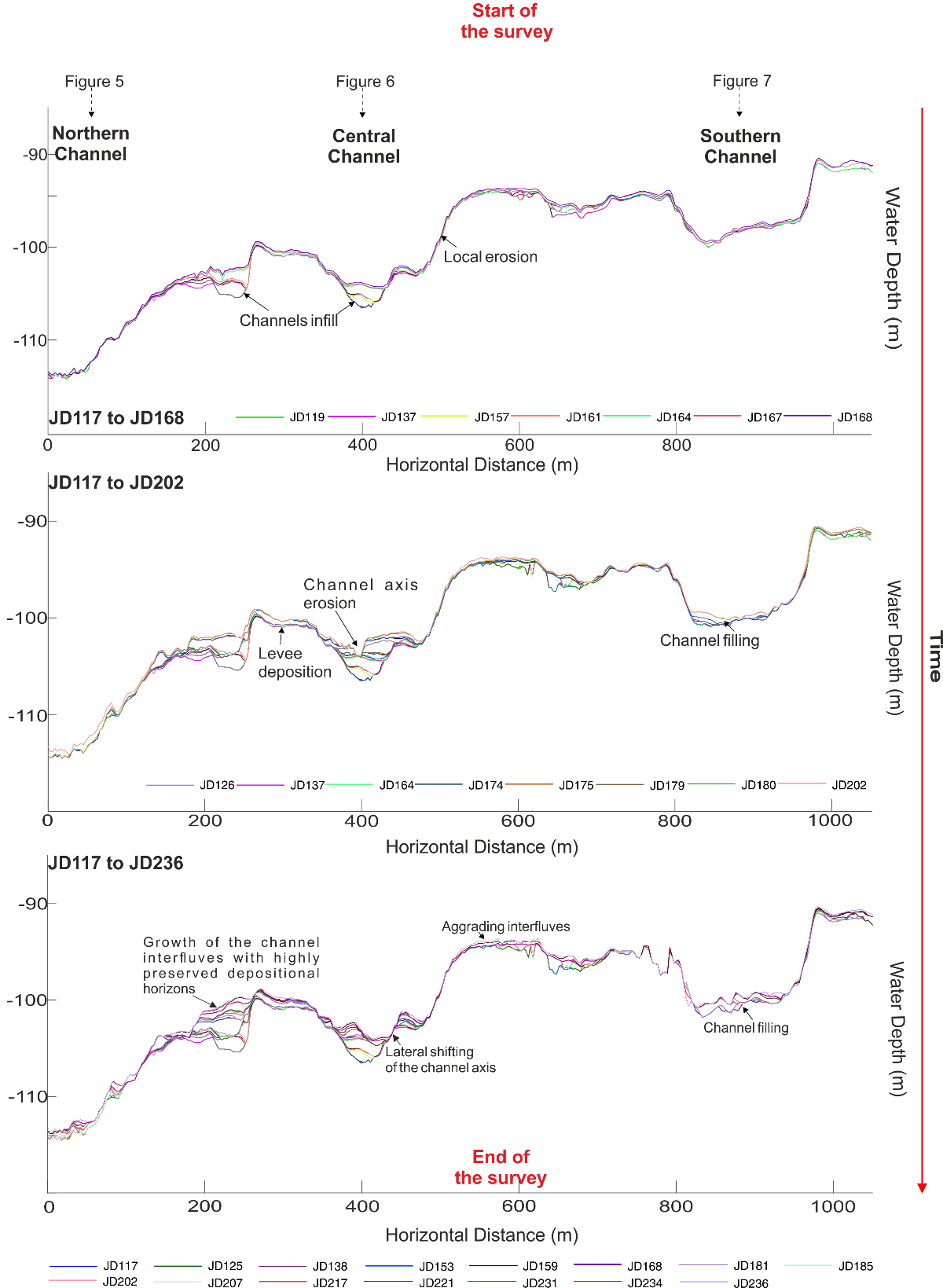


Figure S4: Across channel profile D (see Figure 2B in the main text for the location of the profile; vertical exaggeration: 12x)

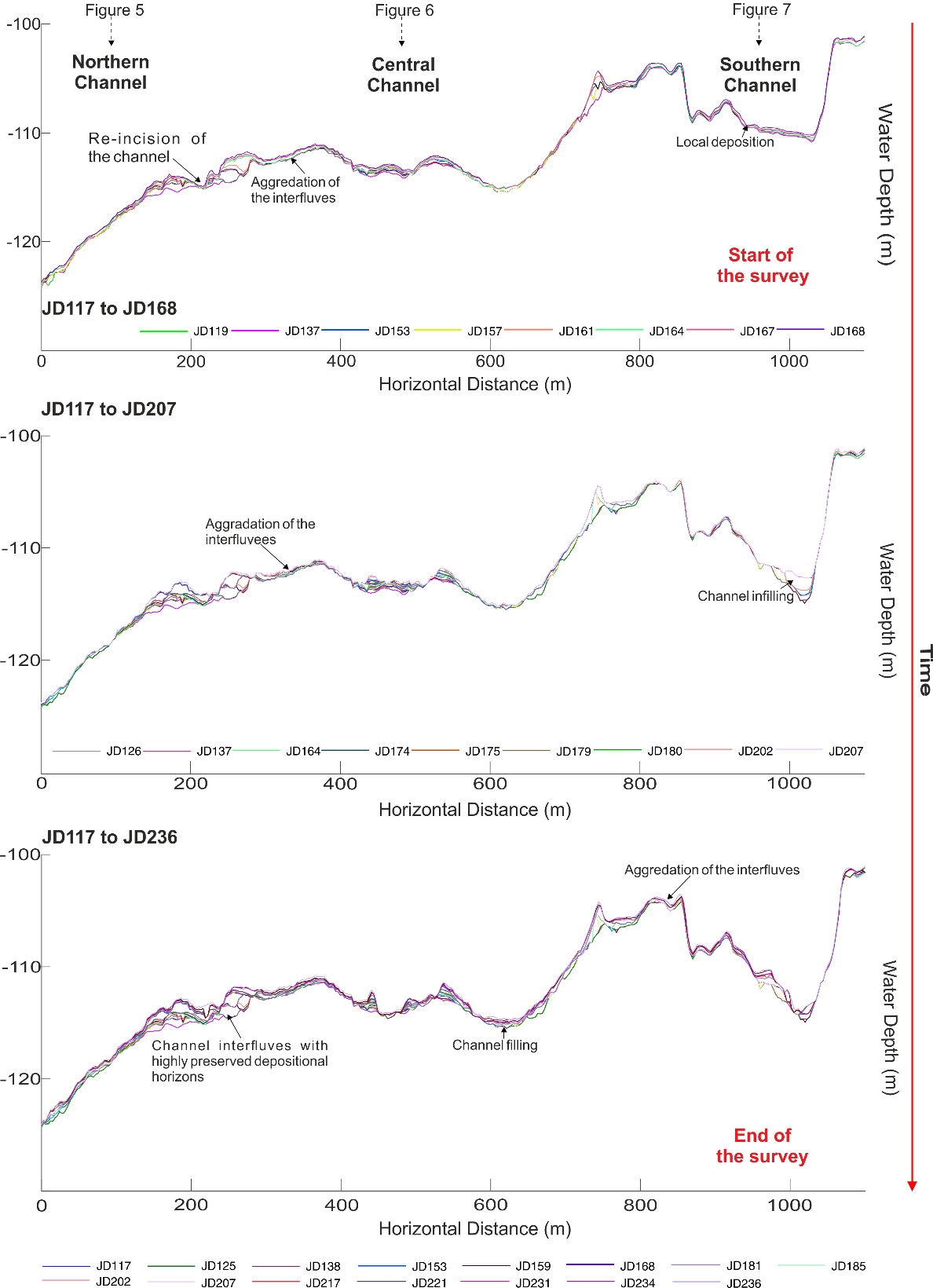


Figure S5: Across channel profile E (see Figure 2B in the main text for the location of the profile; vertical exaggeration: 14.5x)

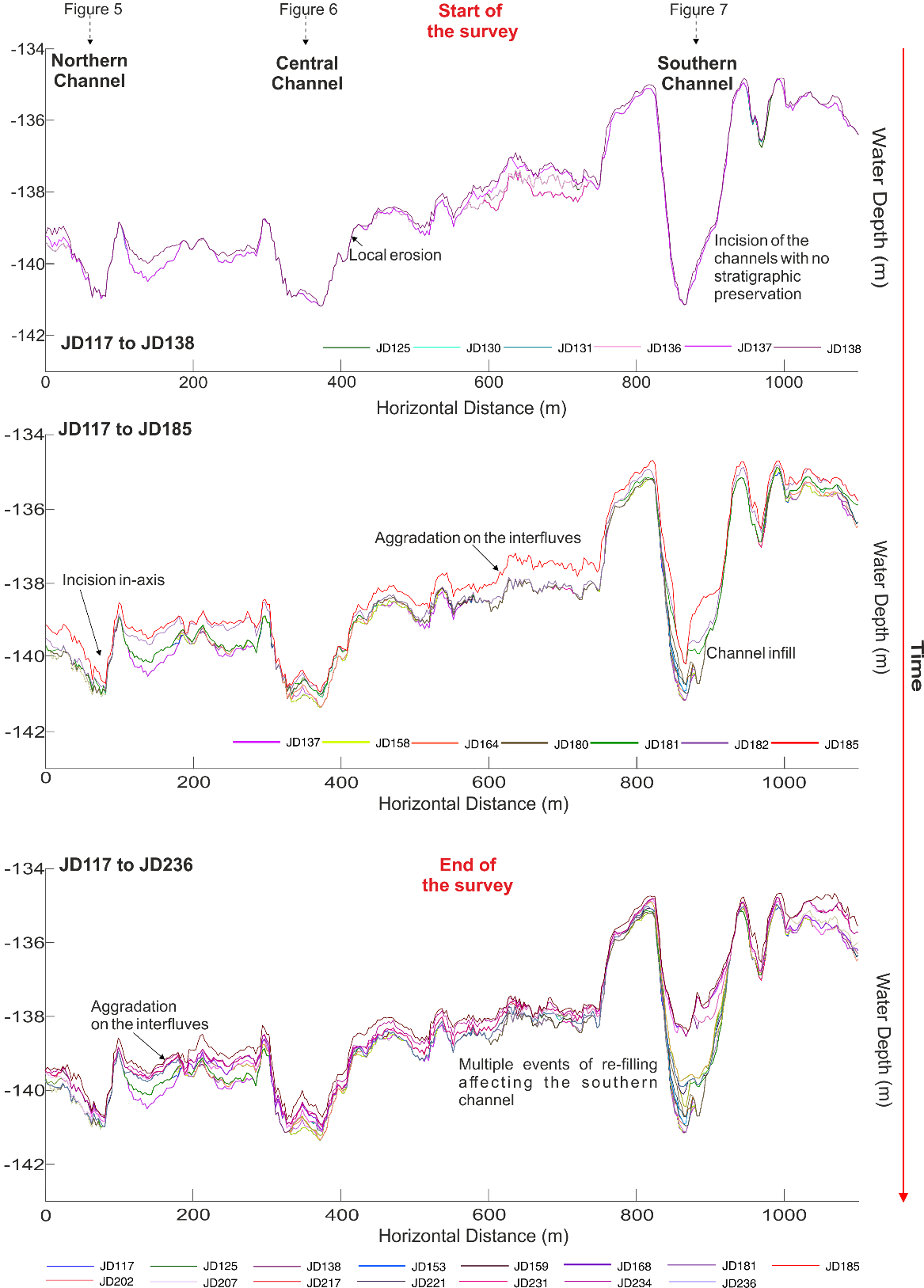


Figure S6: Across channel profile G (see Figure 2B in the main text for the location of the profile; vertical exaggeration: 48x)

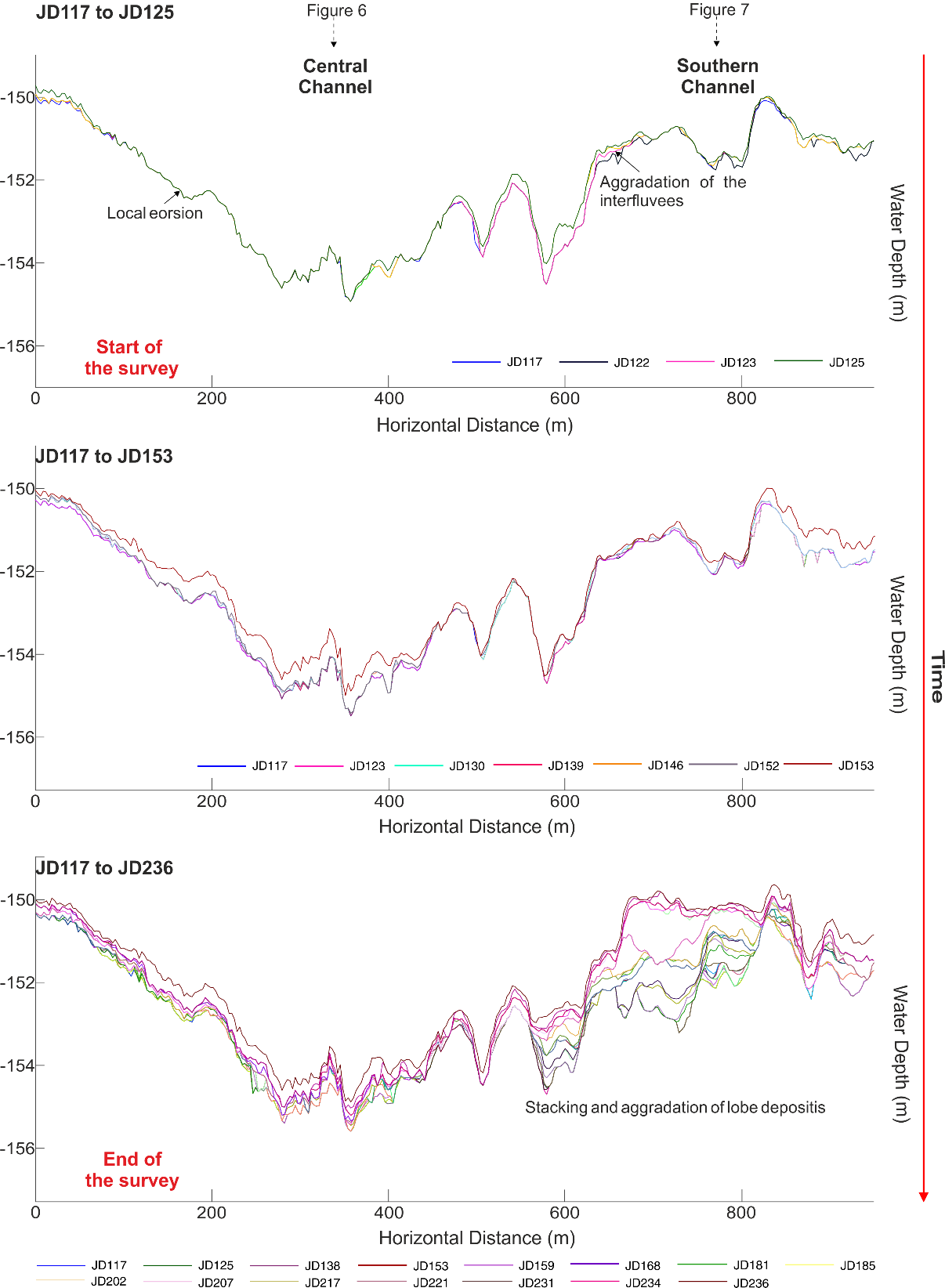


Figure S7: Across channel profile H (see Figure 2B in the main text for the location of the profile; vertical exaggeration: 47.5x)

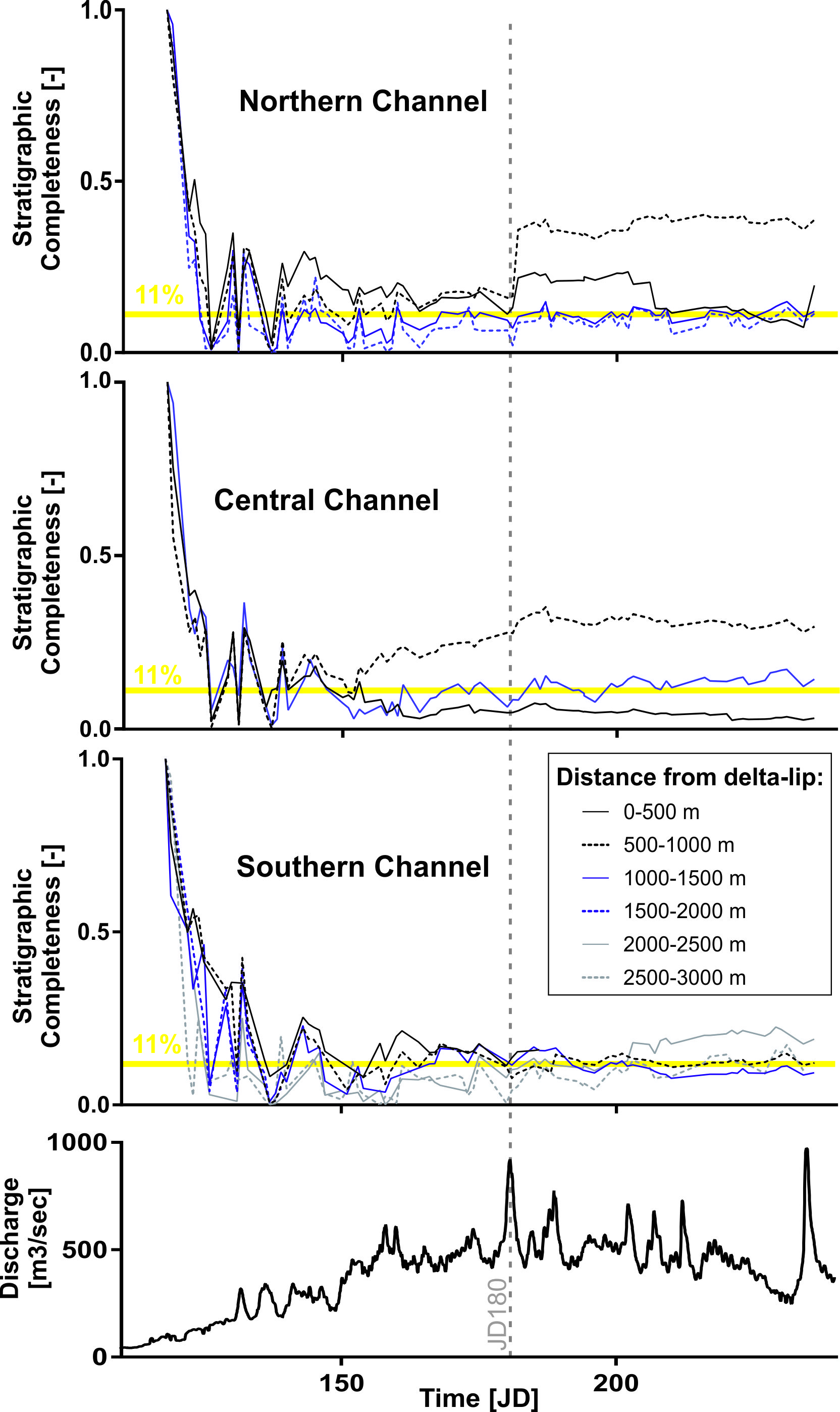


Figure S8: River discharge rata and evolution of stratigraphic completeness over time along the three channel at the Squamish prodelta

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