**S1. OxCal Code**

**Model 1: without reservoir**

Plot()

 {

 Sequence("main")

 {

 Boundary("start");

 Phase("Below and early channels")

 {

 Sequence("UbaidBelowCH3")

 {

 Boundary("startUbaid4",Date(BC(4900)));

 Phase("Ubaid")

 {

 R\_Date("13012\_TG38",6020,30);

 R\_Date("16006",5750,30);

 R\_Date("13007\_TG33",5710,30);

 R\_Date("13009\_TG35",5640,30);

 };

 Boundary("endUbaid4",Date(BC(4500)));

 R\_Date("TG-E6",5590,30);

 Boundary("PostUbaid4");

 };

 Sequence("CH3-early")

 {

 Boundary("CH3-earlystart");

 R\_Date("TH2-SH1-145",6860,30);

 R\_Date("TH12-SH1-40",6090,30);

 Boundary("CH3-earlyend");

 };

 Sequence("CH2sequence")

 {

 Boundary("startCH2phase1");

 R\_Date("TH10-SH1-80",6050,30);

 R\_Date("TH1-SH4-40",5930,30);

 Boundary("endCH2phase1");

 };

 Sequence("CH7sequence")

 {

 Boundary("startCH7phase1");

 R\_Date("TH3-SH1-400",6520,30);

 R\_Date("TH8-SH2-75",6280,30);

 R\_Date("TH8-SH1-60",4940,30);

 Boundary("endCH7phase1");

 };

 };

 Boundary("EDIstart",Date(BC(2900)));

 Phase("Channels\_Finalphase")

 {

 Phase(CH6E)

 {

 R\_Date("TH9-CH1-70",4080,30);

 };

 Sequence("HarbourSequence")

 {

 Boundary("startHarbour");

 R\_Date("TH13-SH6-130",4380,30);

 R\_Date("TH13-SH1-76",3850,30);

 Boundary("endHarbour");

 };

 Sequence("CH5sequence")

 {

 Boundary("startCH5");

 R\_Date("TH6-SH5-120",4440,30);

 R\_Date("TH6-SH4-100",6210,30)

 {

 Outlier();

 };

 Boundary("endCH5");

 };

 Sequence("CH6Wsequence")

 {

 Boundary("startCH6W");

 R\_Date("TH7-SH3-100",4370,30);

 R\_Date("TH7-SH2-90",4130,30);

 Boundary("endCH6W");

 };

 Sequence("CH2-1-3")

 {

 Boundary("startCH2late");

 R\_Date("TH15-SH2-35",4410,30);

 R\_Date("TH14-SH1-60",5840,30)

 {

 Outlier();

 };

 R\_Date("16014-SH2-320",4150,30);

 Boundary("endCH3late");

 };

 };

 Boundary("OldBabylonian",Date(BC(1800)));

 };

 };

**Model 2: with reservoir correction**

Plot()

 {

 Sequence("main")

 {

 Curve("IntCal20","intcal20.14c");

 Curve("Offset","intcal20.14c")

 {

 Reservoir(345,60);

 };

 Boundary("start");

 Phase("Below and early channels")

 {

 Sequence("UbaidBelowCH3")

 {

 Boundary("startUbaid4",Date(BC(4900)));

 Phase("Ubaid")

 {

 Curve("=Offset");

 R\_Date("13012\_TG38",6020,30);

 Curve("=IntCal20");

 R\_Date("16006",5750,30);

 R\_Date("13007\_TG33",5710,30);

 R\_Date("13009\_TG35",5640,30);

 };

 Boundary("endUbaid4",Date(BC(4500)));

 Curve("=IntCal20");

 R\_Date("TG-E6",5590,30);

 Boundary("PostUbaid4");

 };

 Sequence("CH3-early")

 {

 Boundary("CH3-earlystart");

 Curve("=Offset");

 R\_Date("TH2-SH1-145",6860,30);

 R\_Date("TH12-SH1-40",6090,30);

 Boundary("CH3-earlyend");

 };

 Sequence("CH2sequence")

 {

 Boundary("startCH2phase1");

 Curve("=Offset");

 R\_Date("TH10-SH1-80",6050,30);

 R\_Date("TH1-SH4-40",5930,30);

 Boundary("endCH2phase1");

 };

 Sequence("CH7sequence")

 {

 Boundary("startCH7phase1");

 Curve("=Offset");

 R\_Date("TH3-SH1-400",6520,30);

 R\_Date("TH8-SH2-75",6280,30);

 R\_Date("TH8-SH1-60",4940,30);

 Boundary("endCH7phase1");

 };

 };

 Boundary("EDIstart",Date(BC(2900)));

 Phase("Channels\_Finalphase")

 {

 Phase(CH6E)

 {

 Curve("=IntCal20");

 R\_Date("TH9-CH1-70",4080,30);

 };

 Sequence("HarbourSequence")

 {

 Boundary("startHarbour");

 Curve("=Offset");

 R\_Date("TH13-SH6-130",4380,30);

 R\_Date("TH13-SH1-76",3850,30);

 Boundary("endHarbour");

 };

 Sequence("CH5sequence")

 {

 Boundary("startCH5");

 Curve("=Offset");

 R\_Date("TH6-SH5-120",4440,30);

 R\_Date("TH6-SH4-100",6210,30)

 {

 Outlier();

 };

 Boundary("endCH5");

 };

 Sequence("CH6Wsequence")

 {

 Boundary("startCH6W");

 Curve("=Offset");

 R\_Date("TH7-SH3-100",4370,30);

 R\_Date("TH7-SH2-90",4130,30);

 Boundary("endCH6W");

 };

 Sequence("CH2-1-3")

 {

 Boundary("startCH2late");

 Curve("=Offset");

 R\_Date("TH15-SH2-35",4410,30);

 R\_Date("TH14-SH1-60",5840,30)

 {

 Outlier();

 };

 R\_Date("16014-SH2-320",4150,30);

 Boundary("endCH3late");

 };

 };

 Boundary("OldBabylonian",Date(BC(1800)));

 };

 };