

Spatio-temporal Dynamics of Beaver Ponds Across the Hudson Bay Lowlands Mapped by Satellite (Fraser et al.)

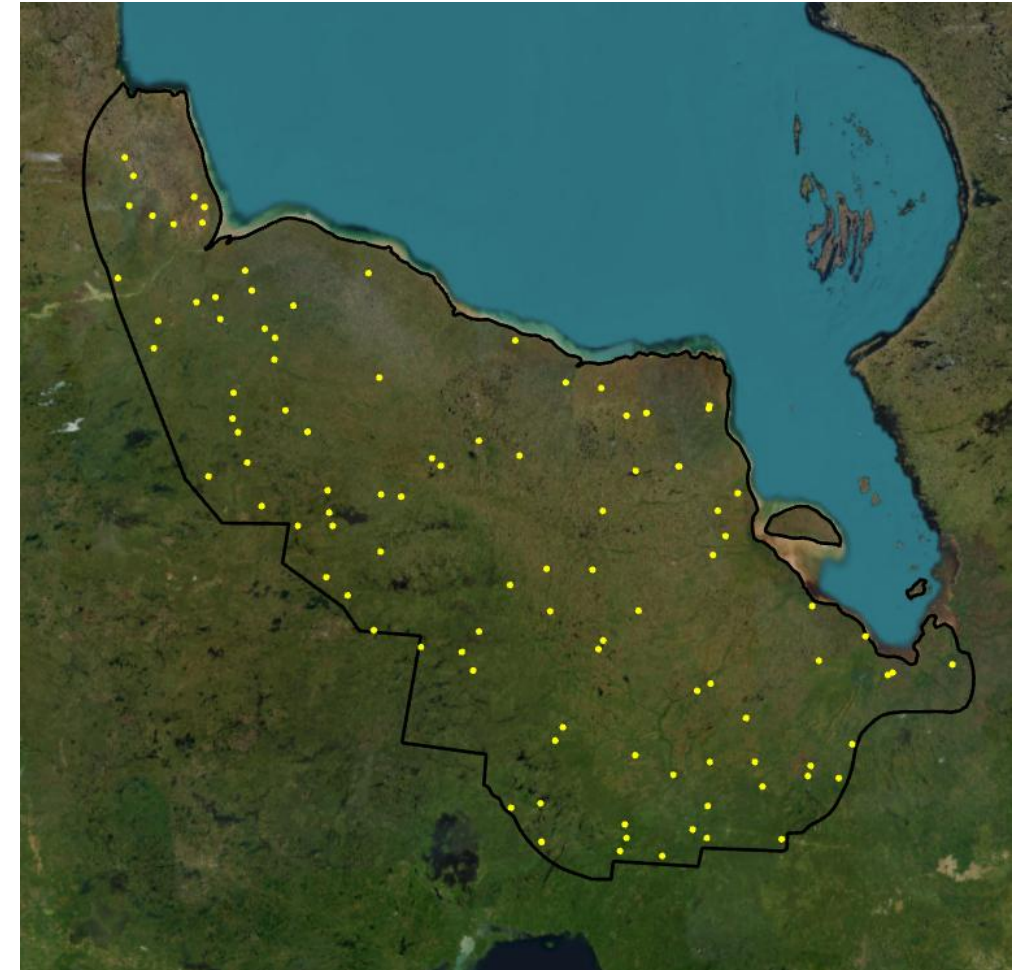
Additional Quality Assurance Step (not included in paper)

- Created a random decimal Field in ArcGIS then selected the smallest 100 values to generate a random sample from the > 90,000 beaver pond complexes that were mapped across the study region
- Examined Maxar high-resolution satellite images in ESRI Wayback for supporting evidence of dam structures
- Also compared annual Landsat sub-pixel surface water area estimates with changes visible in annual 1 km Landsat image chips (Earth Engine Landsat Time Series Explorer App by Justin Braaten)

Results

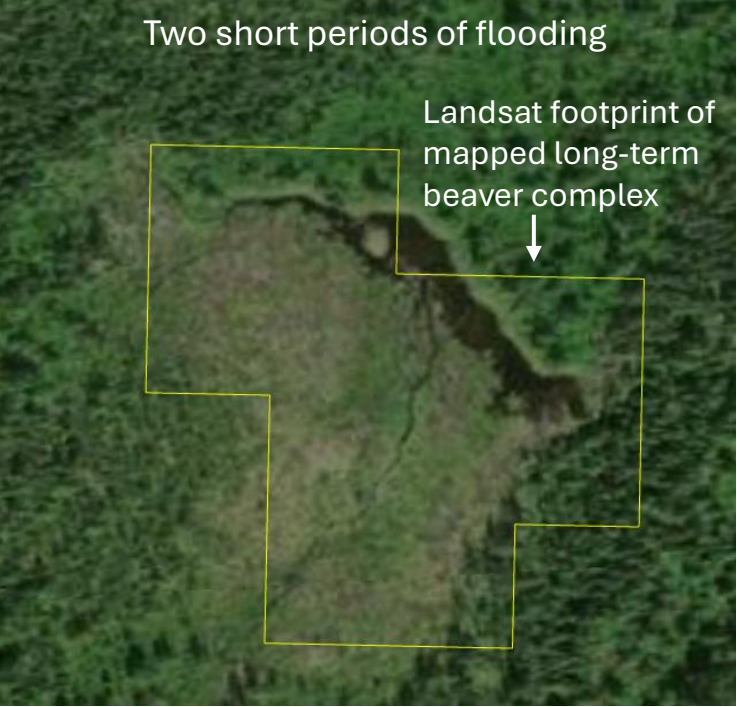
- 89/100 beaver pond complexes were high confidence, 7/100 pond complexes were ambiguous and low to medium confidence, and 4/100 pond complexes had no evidence of beaver engineering. This is consistent with the 0.92 precision reported in our paper for the 100 independent validation blocks.
- The estimated annual changes in beaver pond surface water area corresponded to changes visible in annual Landsat image chips and effectively captured long-term, flooding-drainage cycles (but need to consider that surface water estimates are based on three-year median summer reflectance, which can smooth single-year anomalies).

Random sample of 100 mapped beaver pond complexes



FID 0

High-res validation

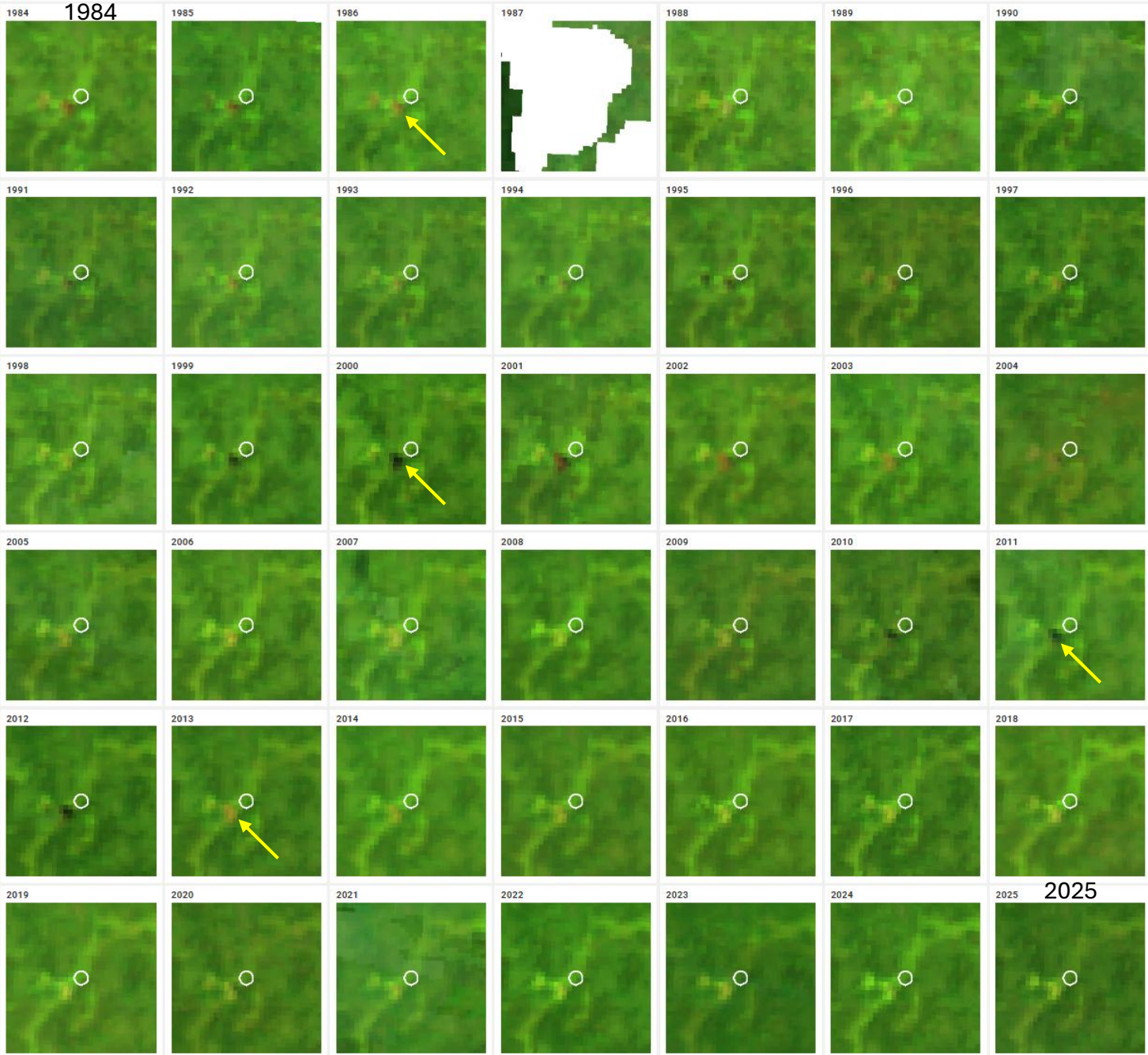


90.1525939°W 52.8425604°N

Annual area (ha)

a1985	0.0306
a1986	0
a1987	0
a1988	0
a1989	0
a1990	0
a1991	0
a1992	0
a1993	0
a1994	0.0351
a1995	0.027
a1996	0.027
a1997	0
a1998	0.0405
a1999	0.18
a2000	0.2583
a2001	0.1134
a2002	0.0639
a2003	0.0369
a2004	0
a2005	0
a2006	0
a2007	0
a2008	0
a2009	0
a2010	0.1368
a2011	0.3024
a2012	0.0459
a2013	0.0126
a2014	0.0135
a2015	0
a2016	0.0126
a2017	0
a2018	0
a2019	0.0099
a2020	0.0081
a2021	0.0099

Annual summer Landsat image chips



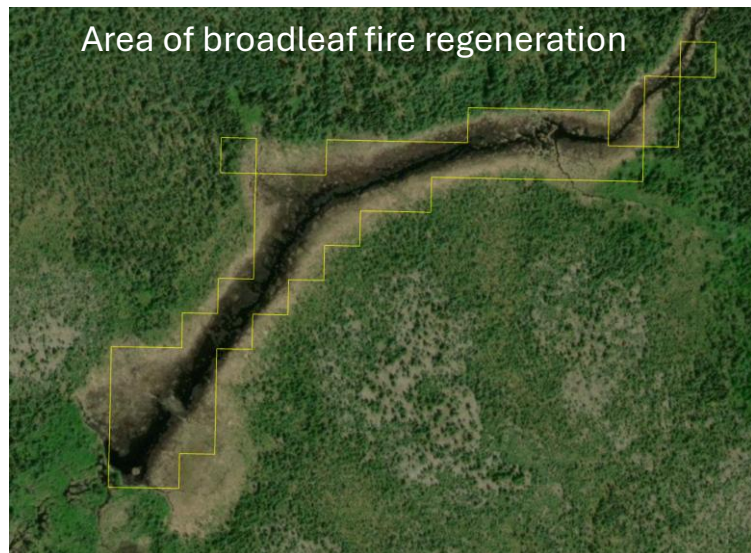
FID 1

Annual area (ha)

High-res validation



Area of broadleaf fire regeneration



89.6942161°W 52.4185571°N

a1985	0
a1986	0
a1987	0
a1988	0
a1989	0
a1990	0
a1991	0
a1992	0
a1993	0
a1994	0
a1995	0.0891
a1996	0.3618
a1997	0.4788
a1998	0.6309
a1999	0.5994
a2000	0.2862
a2001	0.1746
a2002	0.0702
a2003	0.1395
a2004	0.5004
a2005	0.7092
a2006	0.8163
a2007	1.089
a2008	0.234
a2009	0.3321
a2010	0.4932
a2011	0.7587
a2012	0.9117
a2013	0.927
a2014	0.8586
a2015	0.7119
a2016	0.7155
a2017	0.819
a2018	0.9567
a2019	1.0062
a2020	1.0827
a2021	1.0197

Annual summer Landsat image chips



FID 2

High-res validation

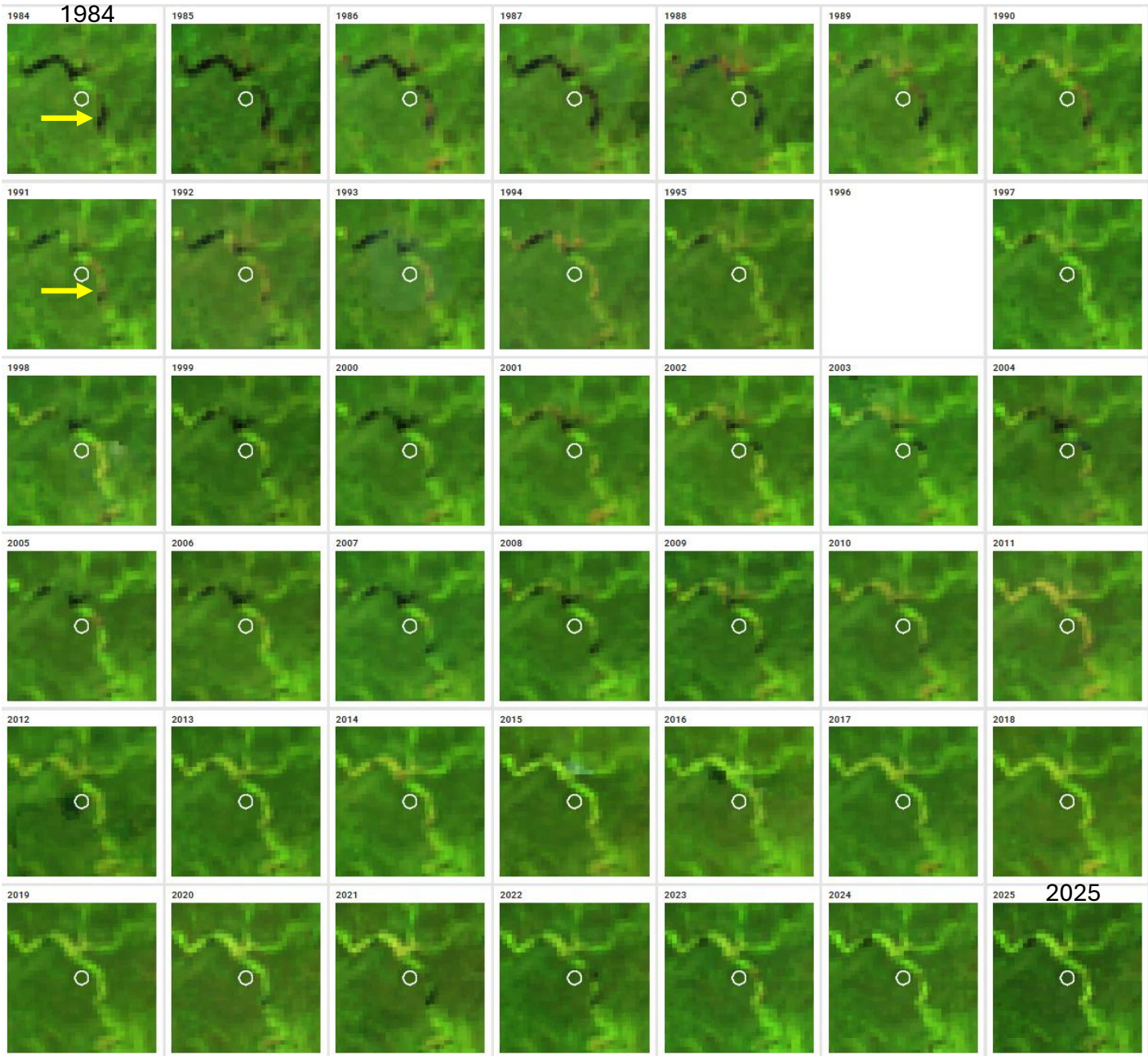


88.8290414°W 52.1908056°N

Annual area (ha)

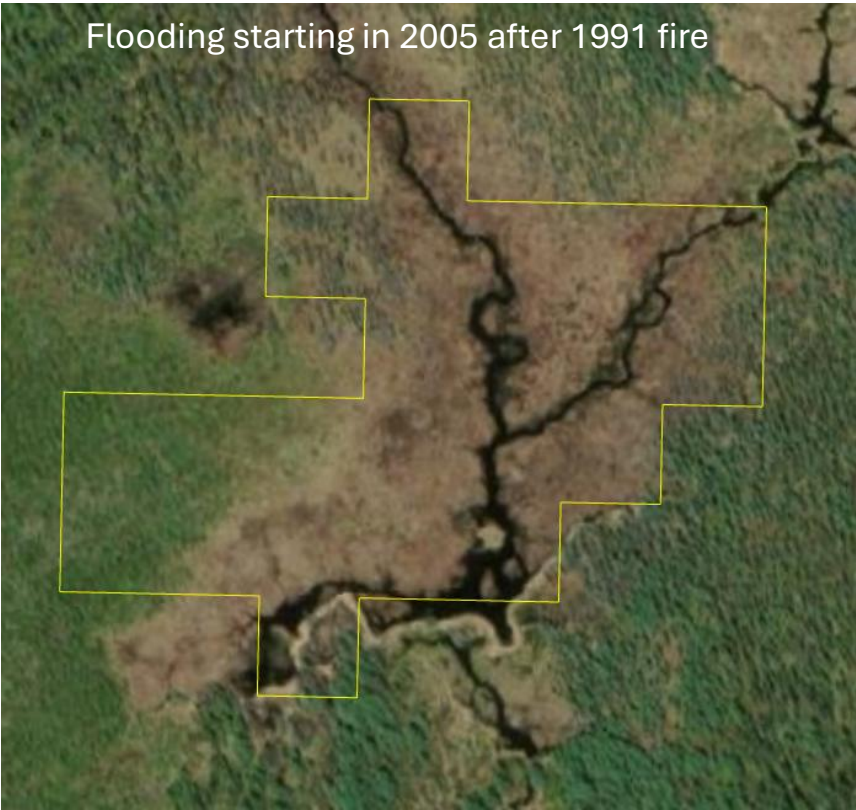
a1985	0.0225
a1986	0.2025
a1987	0.2223
a1988	0.1566
a1989	0.0693
a1990	0
a1991	0
a1992	0
a1993	0
a1994	0
a1995	0
a1996	0
a1997	0
a1998	0
a1999	0
a2000	0
a2001	0.0387
a2002	0.0945
a2003	0.1458
a2004	0.0432
a2005	0
a2006	0
a2007	0
a2008	0
a2009	0
a2010	0
a2011	0
a2012	0
a2013	0
a2014	0
a2015	0
a2016	0
a2017	0
a2018	0
a2019	0
a2020	0
a2021	0.0198

Annual summer Landsat image chips



FID 3

High-res validation

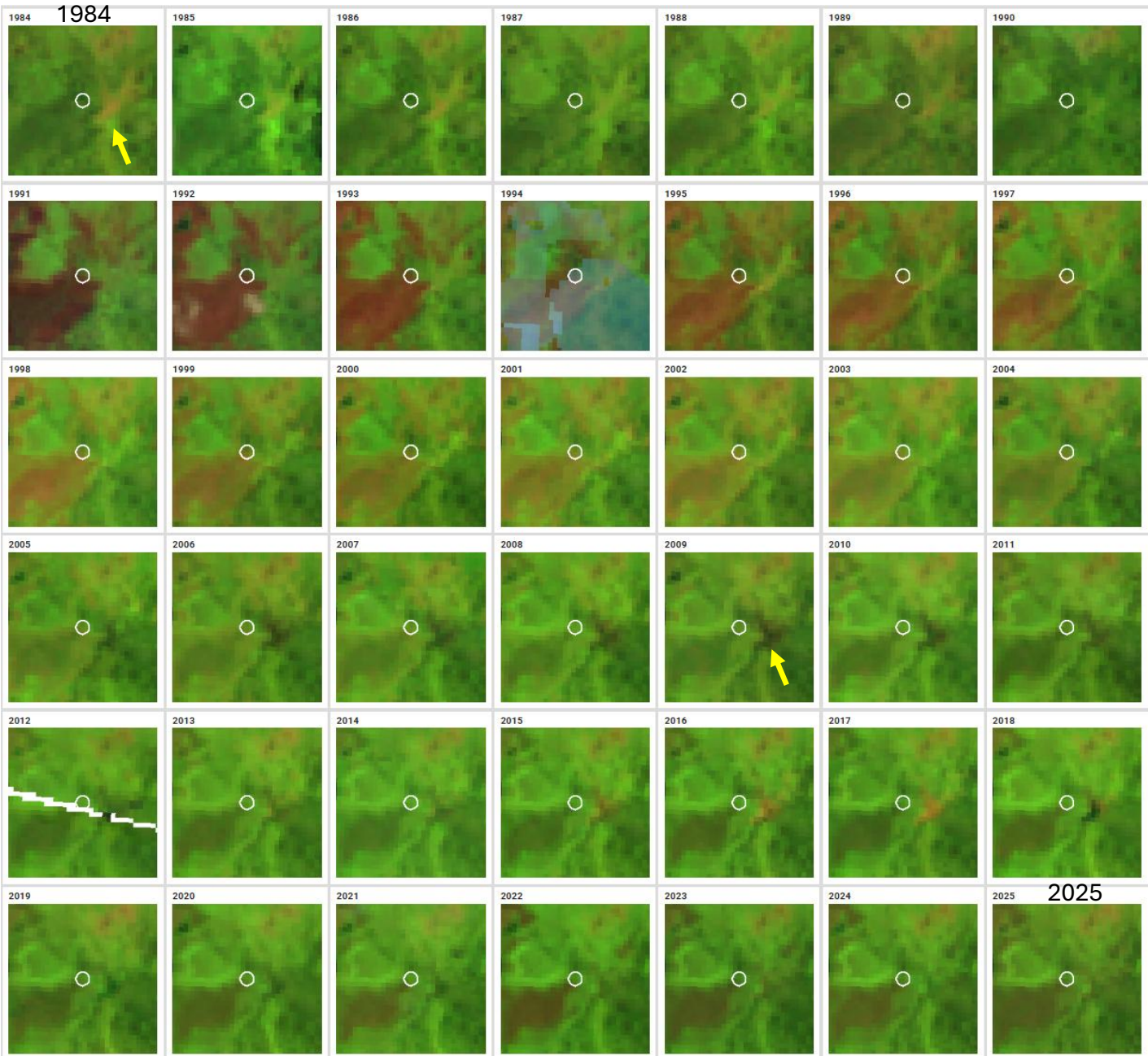


90.5404833°W 53.0643877°N

Annual area (ha)

a1985	0
a1986	0
a1987	0
a1988	0
a1989	0
a1990	0.0351
a1991	0.1071
a1992	0
a1993	0
a1994	0
a1995	0
a1996	0
a1997	0
a1998	0
a1999	0
a2000	0
a2001	0
a2002	0
a2003	0
a2004	0.0216
a2005	0.1431
a2006	0.2313
a2007	0.1629
a2008	0.2412
a2009	0.2259
a2010	0.1944
a2011	0.0882
a2012	0
a2013	0
a2014	0
a2015	0
a2016	0
a2017	0.0324
a2018	0.1701
a2019	0.2718
a2020	0.1413
a2021	0

Annual summer Landsat image chips



FID 4

Annual area (ha)

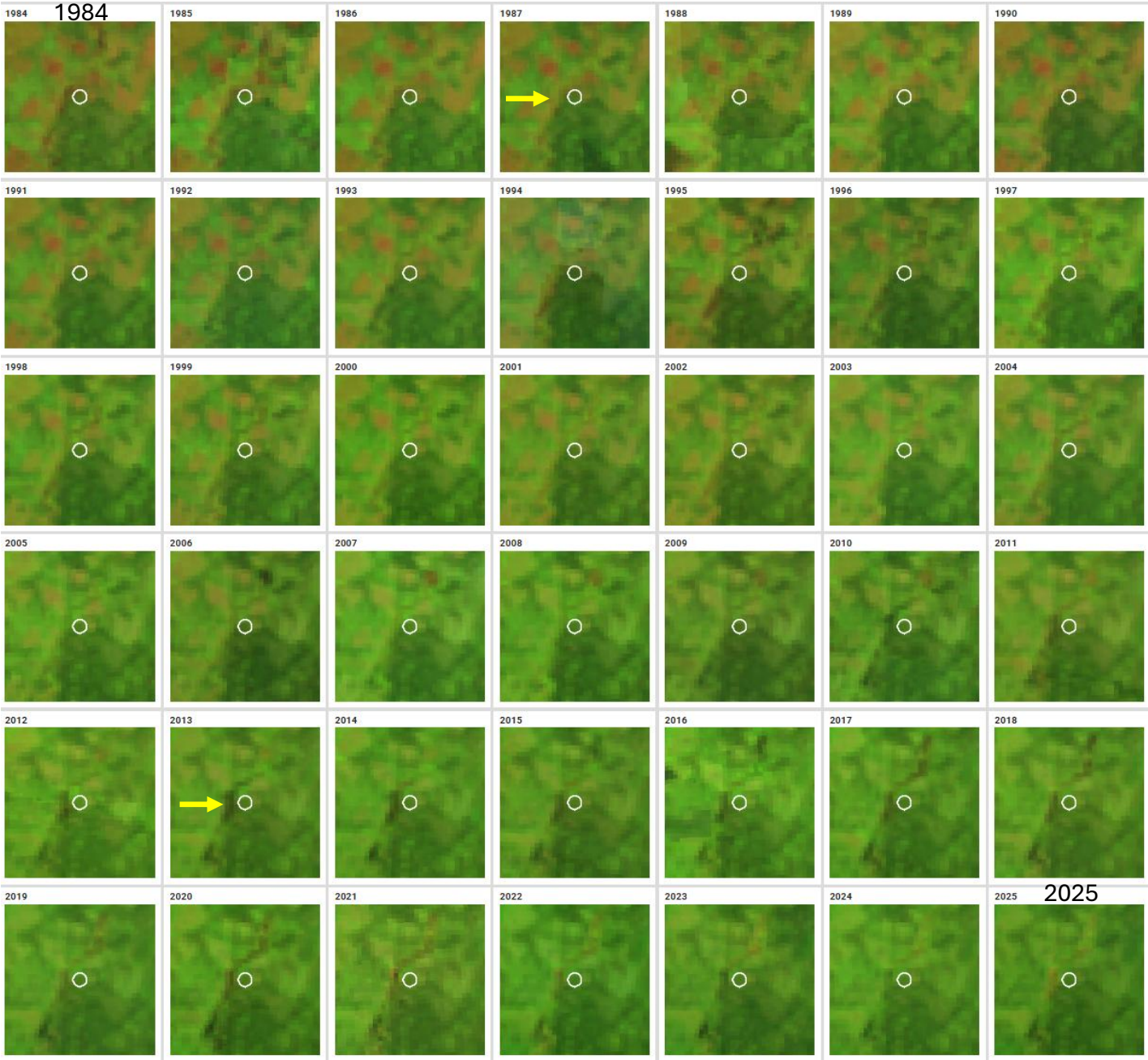
Annual summer Landsat image chips

High-res validation



89.4704044°W 53.3246799°N

a1985	0.018
a1986	0.0198
a1987	0
a1988	0
a1989	0
a1990	0
a1991	0
a1992	0
a1993	0.018
a1994	0.0189
a1995	0.0144
a1996	0.0162
a1997	0.0162
a1998	0
a1999	0
a2000	0
a2001	0
a2002	0
a2003	0
a2004	0
a2005	0
a2006	0
a2007	0
a2008	0
a2009	0
a2010	0.0117
a2011	0.0621
a2012	0.1476
a2013	0.1602
a2014	0.1404
a2015	0.0954
a2016	0.0666
a2017	0.108
a2018	0.0828
a2019	0.1116
a2020	0.0477
a2021	0.0225



FID 5

High-res validation

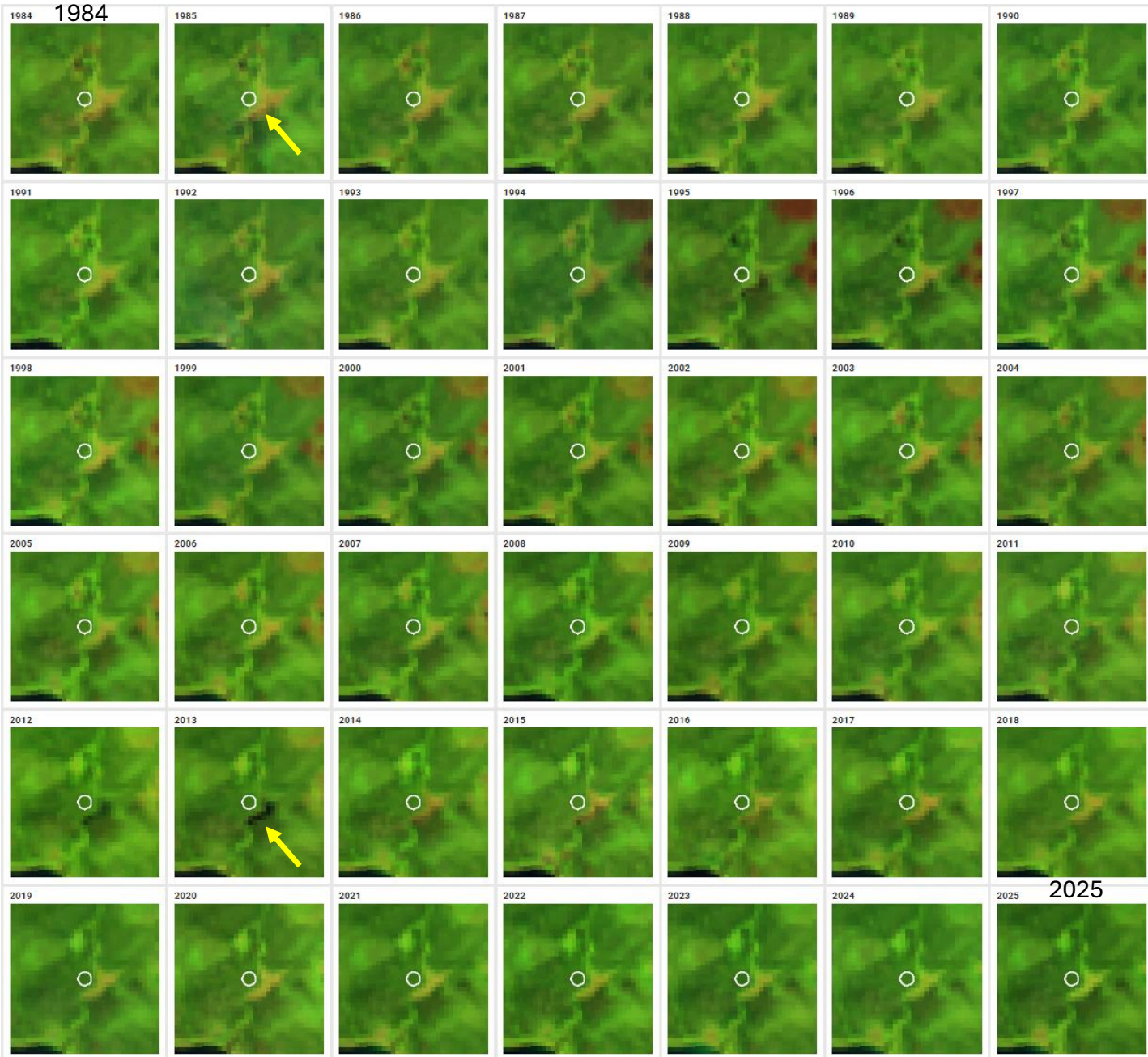


87.8919525°W 51.8702681°N

Annual area (ha)

a1985	0.0666
a1986	0.0369
a1987	0.0369
a1988	0.036
a1989	0.036
a1990	0.0378
a1991	0.0387
a1992	0.0333
a1993	0.0333
a1994	0.1251
a1995	0.2205
a1996	0.1053
a1997	0.0432
a1998	0.0432
a1999	0.0369
a2000	0.0333
a2001	0.036
a2002	0.0342
a2003	0.0306
a2004	0.0297
a2005	0.0288
a2006	0.0243
a2007	0.0252
a2008	0.036
a2009	0.045
a2010	0.1539
a2011	0.3582
a2012	0.5238
a2013	0.5913
a2014	0.4401
a2015	0.2367
a2016	0.1287
a2017	0.0837
a2018	0.0576
a2019	0.0306
a2020	0.0324
a2021	0.036

Annual summer Landsat image chips



FID 6

High-res validation

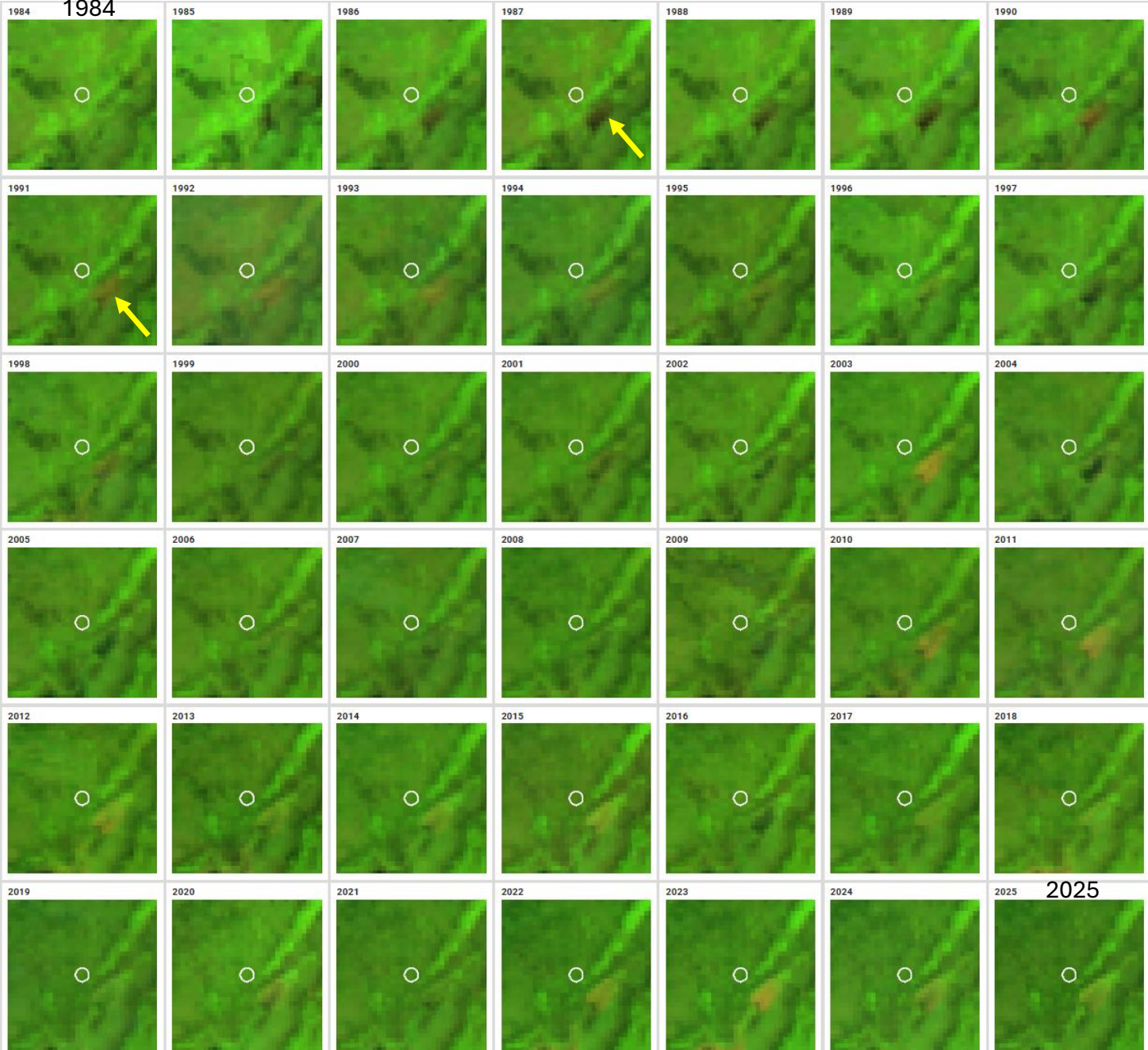


87.7166997°W 52.3135355°N

Annual area (ha)

a1985	0
a1986	0.2052
a1987	0.216
a1988	0.27
a1989	0.2052
a1990	0.1314
a1991	0.0261
a1992	0
a1993	0
a1994	0
a1995	0
a1996	0.0315
a1997	0.0252
a1998	0.0468
a1999	0.0441
a2000	0.0702
a2001	0.0963
a2002	0.0531
a2003	0.0576
a2004	0.0549
a2005	0.0864
a2006	0.0513
a2007	0.0252
a2008	0.0252
a2009	0.027
a2010	0
a2011	0
a2012	0
a2013	0
a2014	0
a2015	0
a2016	0
a2017	0
a2018	0
a2019	0
a2020	0
a2021	0

Annual summer Landsat image chips



FID 7

High-res validation



Dammed lake
(smaller variability)

88.0671610°W 52.0946698°N

Annual area (ha)

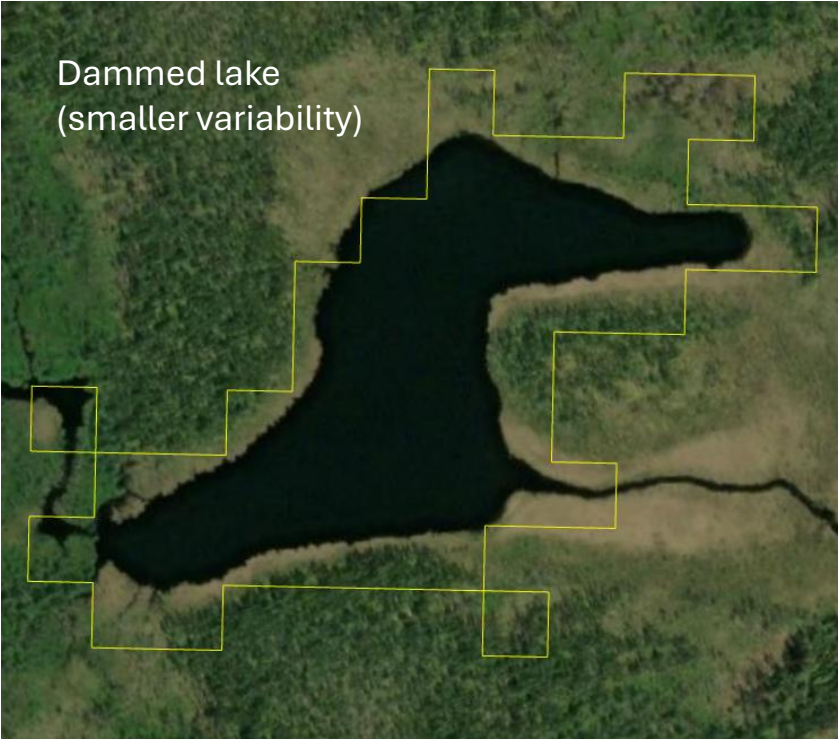
a1985	9.7047
a1986	9.7677
a1987	9.5913
a1988	9.6777
a1989	9.8163
a1990	10.1529
a1991	10.2312
a1992	10.5444
a1993	10.9998
a1994	11.0556
a1995	10.9728
a1996	11.0799
a1997	10.8162
a1998	10.7991
a1999	10.6569
a2000	10.7847
a2001	10.8297
a2002	10.7154
a2003	10.566
a2004	10.3752
a2005	10.1268
a2006	9.8028
a2007	9.4311
a2008	9.0972
a2009	9.0522
a2010	9.1512
a2011	8.9676
a2012	8.7291
a2013	8.6211
a2014	8.6841
a2015	8.8308
a2016	8.8074
a2017	8.8254
a2018	8.5662
a2019	8.3754
a2020	8.2062
a2021	8.3367

Annual summer Landsat image chips



FID 8

High-res validation



87.0410028°W 52.8120122°N

Annual area (ha)

a1985	1.6605
a1986	1.7487
a1987	1.7739
a1988	1.8441
a1989	1.764
a1990	1.7793
a1991	1.6875
a1992	1.7757
a1993	1.8549
a1994	1.8765
a1995	1.7586
a1996	1.7532
a1997	1.9296
a1998	1.8135
a1999	1.8189
a2000	1.989
a2001	2.0736
a2002	2.0502
a2003	1.9863
a2004	1.8765
a2005	1.8396
a2006	1.8567
a2007	1.8423
a2008	1.8027
a2009	1.7829
a2010	1.7361
a2011	1.764
a2012	1.8009
a2013	1.8522
a2014	1.926
a2015	1.9845
a2016	1.9737
a2017	1.8675
a2018	1.8585
a2019	1.764
a2020	1.827
a2021	1.8315

Annual summer Landsat image chips



FID 9

High-res validation

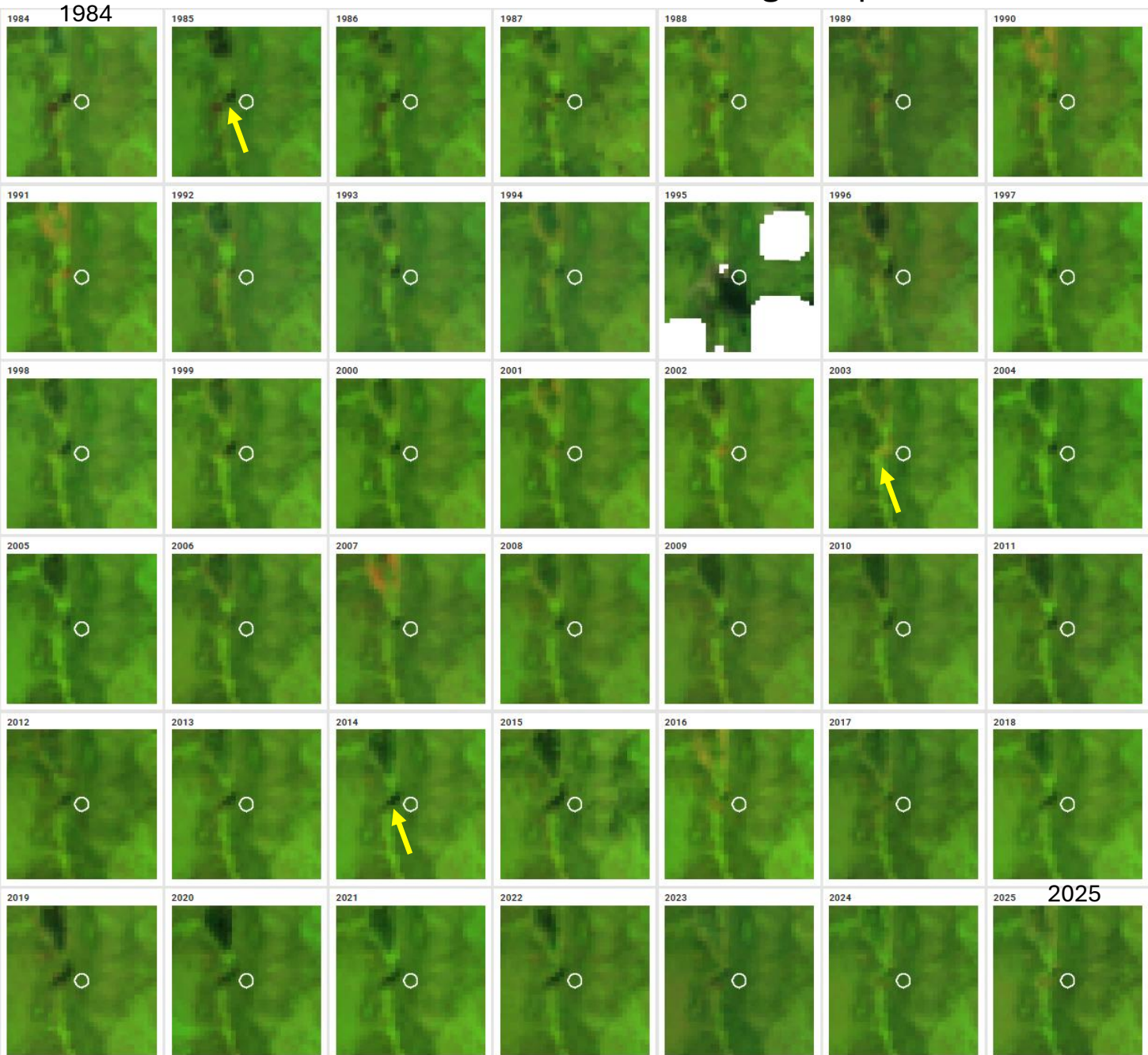


92.7847417°W 54.2761981°N

Annual area (ha)

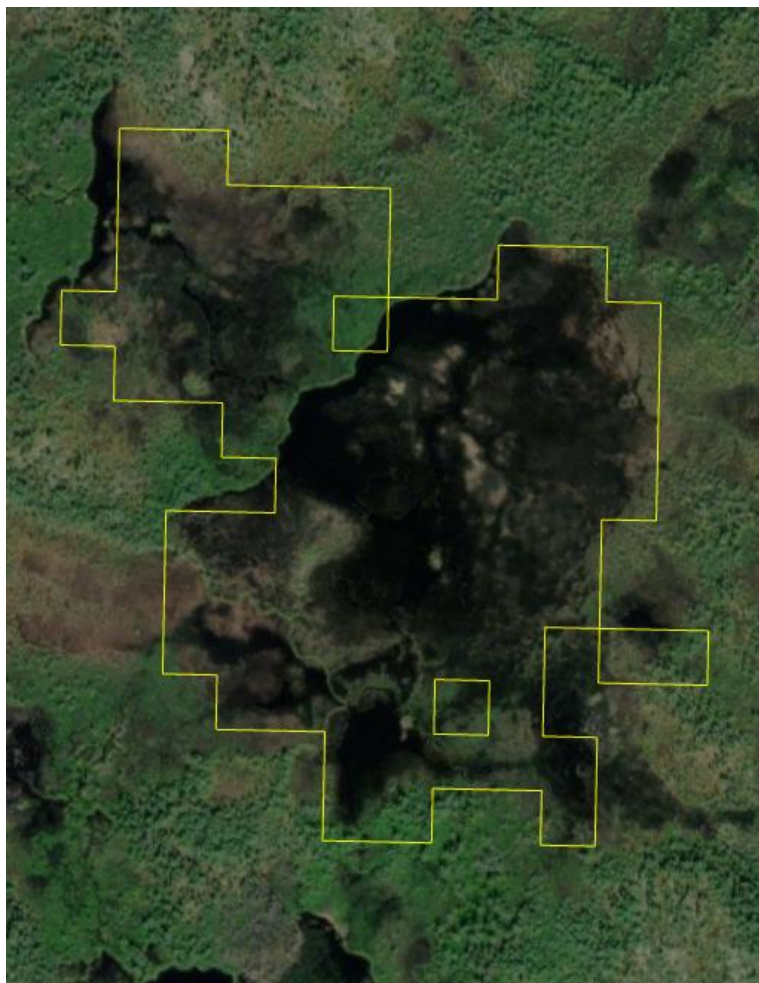
a1985	0.3456
a1986	0.2988
a1987	0.1755
a1988	0.1485
a1989	0.1332
a1990	0.0891
a1991	0.0441
a1992	0.0612
a1993	0.1251
a1994	0.1746
a1995	0.1728
a1996	0.1386
a1997	0.1503
a1998	0.1593
a1999	0.1647
a2000	0.1215
a2001	0.0378
a2002	0
a2003	0
a2004	0.0459
a2005	0.0495
a2006	0.0423
a2007	0.054
a2008	0.0981
a2009	0.1215
a2010	0.1278
a2011	0.1611
a2012	0.198
a2013	0.2232
a2014	0.2475
a2015	0.1809
a2016	0.0459
a2017	0.1026
a2018	0.1872
a2019	0.2421
a2020	0.2583
a2021	0.2178

Annual summer Landsat image chips



FID 10

High-res validation

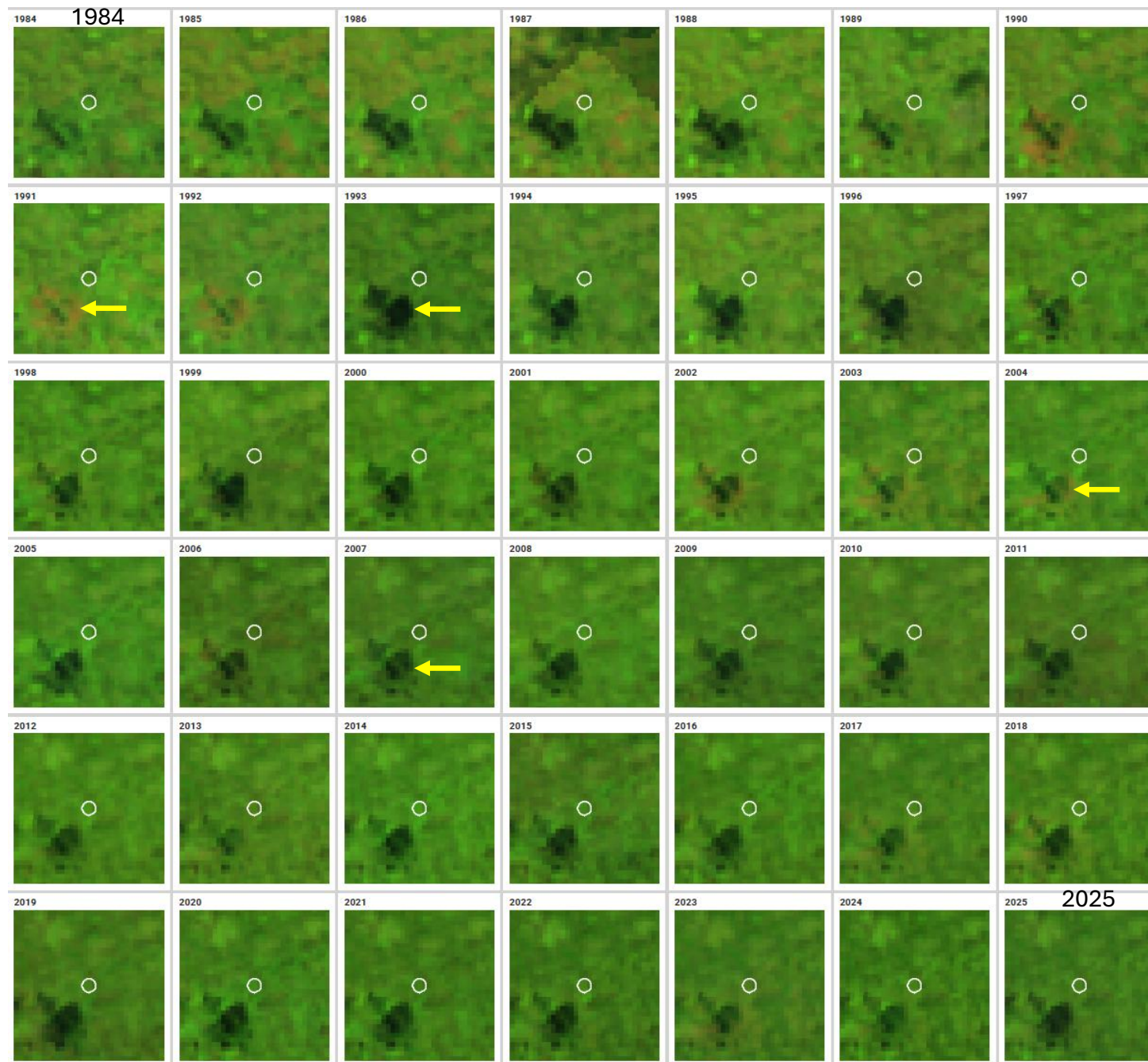


92.2864779°W 54.9477215°N

Annual area (ha)

a1985	1.0503
a1986	1.3788
a1987	1.8621
a1988	1.7811
a1989	1.1349
a1990	0.7398
a1991	0.3537
a1992	2.1609
a1993	2.5074
a1994	2.5515
a1995	2.2797
a1996	2.1888
a1997	2.1402
a1998	1.7082
a1999	1.6146
a2000	1.6767
a2001	1.6038
a2002	1.0278
a2003	0.5634
a2004	0.6471
a2005	1.3023
a2006	1.4634
a2007	1.5543
a2008	1.575
a2009	1.6794
a2010	1.7082
a2011	1.7712
a2012	1.4409
a2013	1.2609
a2014	1.503
a2015	1.7514
a2016	1.4778
a2017	1.4013
a2018	1.2735
a2019	1.9071
a2020	2.1213
a2021	1.8999

Annual summer Landsat image chips



FID 11

High-res validation



92.1758858°W 54.7842670°N

Annual area (ha)

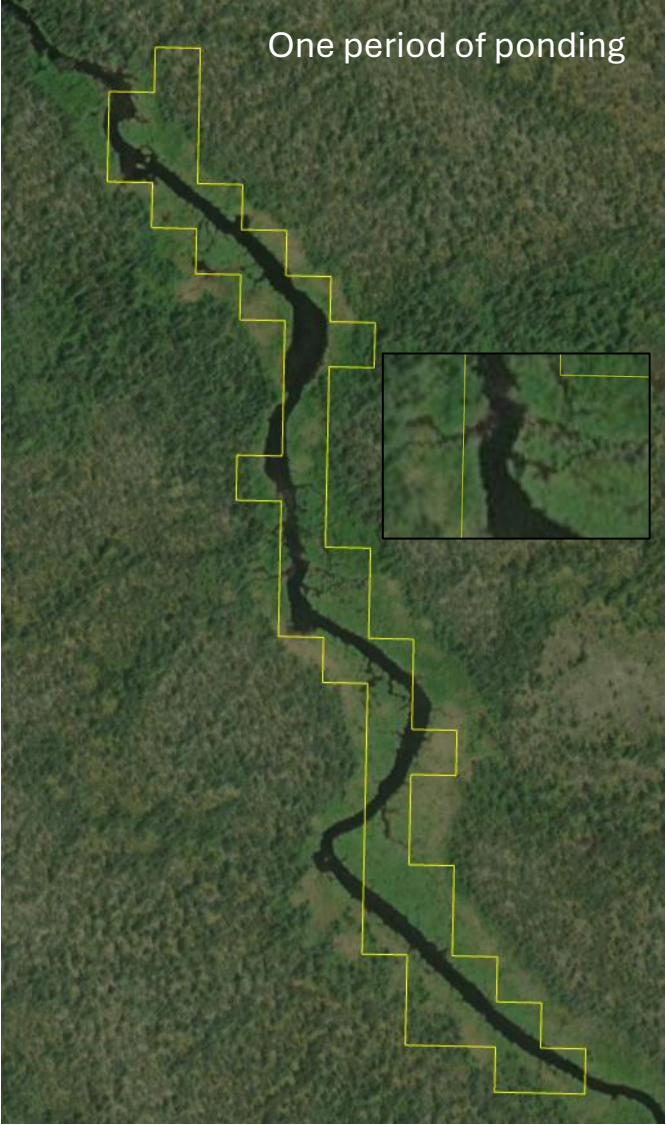
a1985	0
a1986	0
a1987	0
a1988	0
a1989	0
a1990	0.126
a1991	0.0927
a1992	0.0684
a1993	0.2619
a1994	0.3996
a1995	0.3465
a1996	0.306
a1997	0.2484
a1998	0.2295
a1999	0.2628
a2000	0.2457
a2001	0.207
a2002	0.1368
a2003	0.1458
a2004	0.0684
a2005	0.0837
a2006	0.0477
a2007	0.0288
a2008	0
a2009	0
a2010	0
a2011	0.0855
a2012	0
a2013	0
a2014	0
a2015	0
a2016	0.0189
a2017	0.1395
a2018	0.09
a2019	0.1035
a2020	0.0432
a2021	0.0126

Annual summer Landsat image chips



FID 12

High-res validation

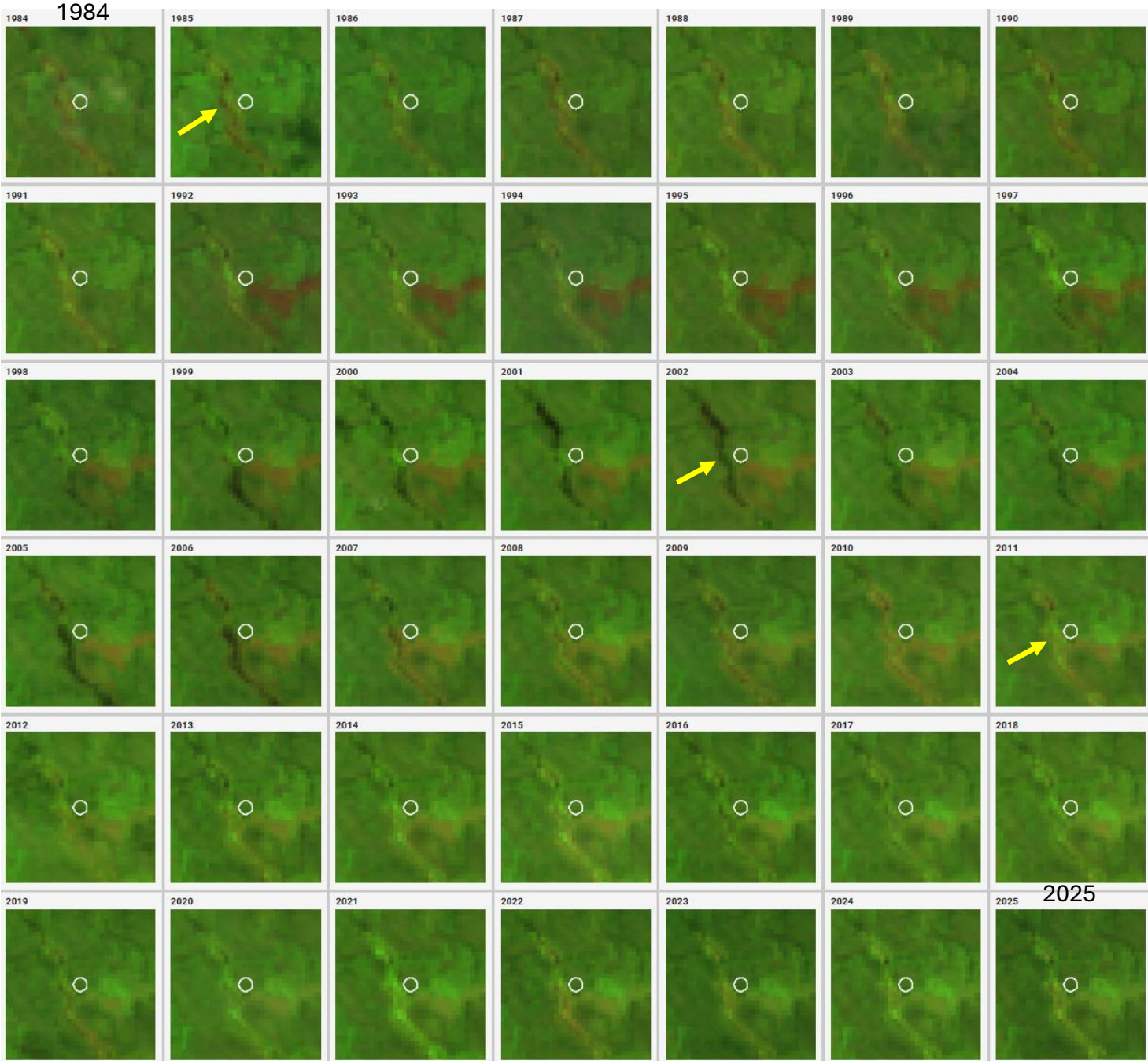


92.0051124°W 54.4239465°N

Annual area (ha)

a1985	0.0297
a1986	0.0279
a1987	0.0288
a1988	0.0315
a1989	0.0297
a1990	0.0243
a1991	0.0261
a1992	0.0261
a1993	0.0198
a1994	0.027
a1995	0
a1996	0.0306
a1997	0.0153
a1998	0.2826
a1999	0.333
a2000	0.7236
a2001	0.7119
a2002	0.7506
a2003	0.5454
a2004	0.4419
a2005	0.504
a2006	0.5139
a2007	0.1395
a2008	0.0225
a2009	0.0225
a2010	0.0234
a2011	0
a2012	0
a2013	0
a2014	0
a2015	0
a2016	0
a2017	0
a2018	0
a2019	0.0216
a2020	0
a2021	0

Annual summer Landsat image chips



FID 13

High-res validation

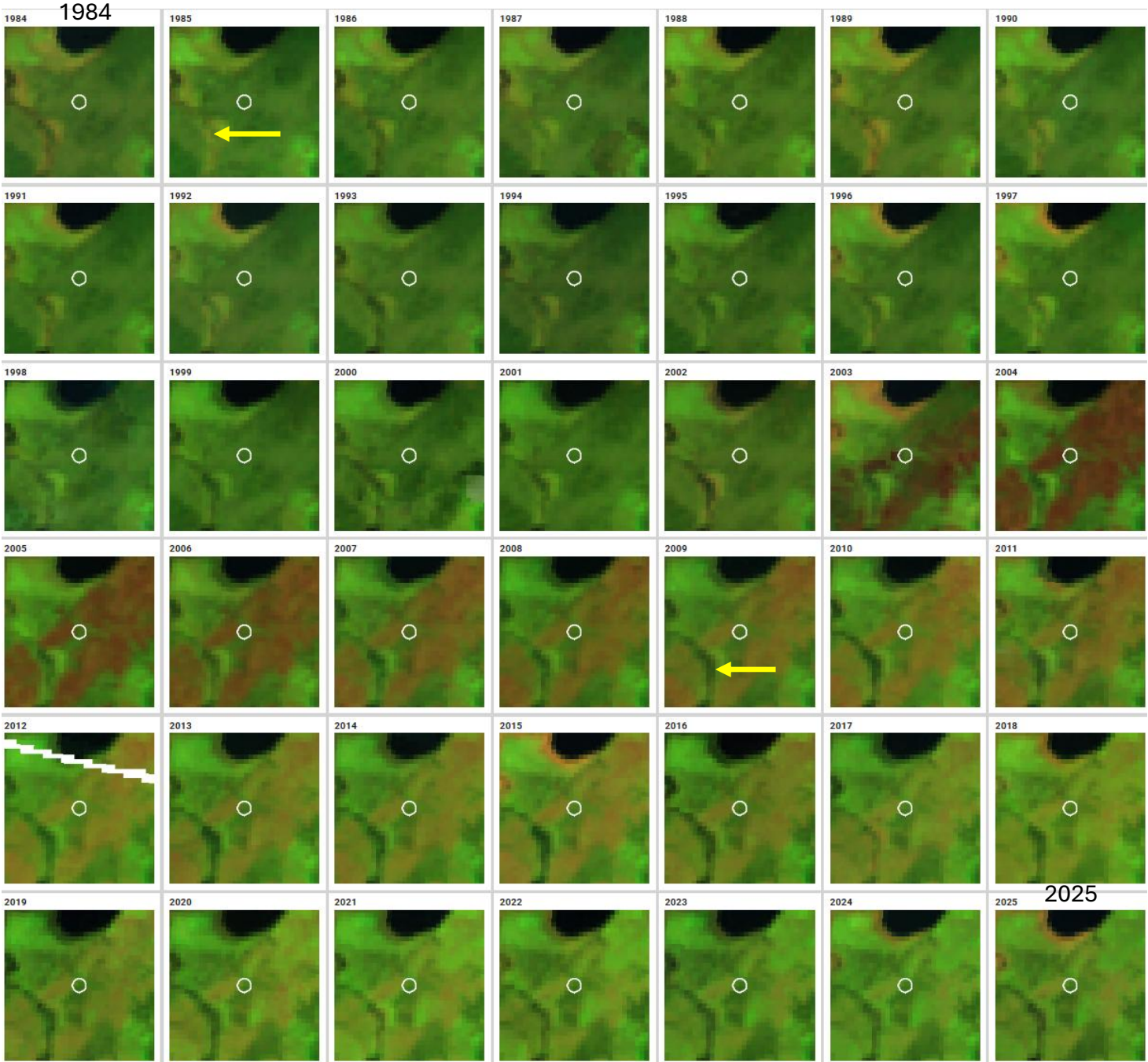


91.7438893°W 53.9160327°N

Annual area (ha)

a1985	0
a1986	0
a1987	0.0315
a1988	0.0351
a1989	0.0198
a1990	0.018
a1991	0
a1992	0.0828
a1993	0.1008
a1994	0.0873
a1995	0.0414
a1996	0
a1997	0.0153
a1998	0.0819
a1999	0.0828
a2000	0.0855
a2001	0.0855
a2002	0.1215
a2003	0.1512
a2004	0.0657
a2005	0.0387
a2006	0.0396
a2007	0.0666
a2008	0.1449
a2009	0.2628
a2010	0.2961
a2011	0.2952
a2012	0.3582
a2013	0.2844
a2014	0.2655
a2015	0.2358
a2016	0.1908
a2017	0.1917
a2018	0.1053
a2019	0.2457
a2020	0.0945
a2021	0.0279

Annual summer Landsat image chips



FID 14

High-res validation

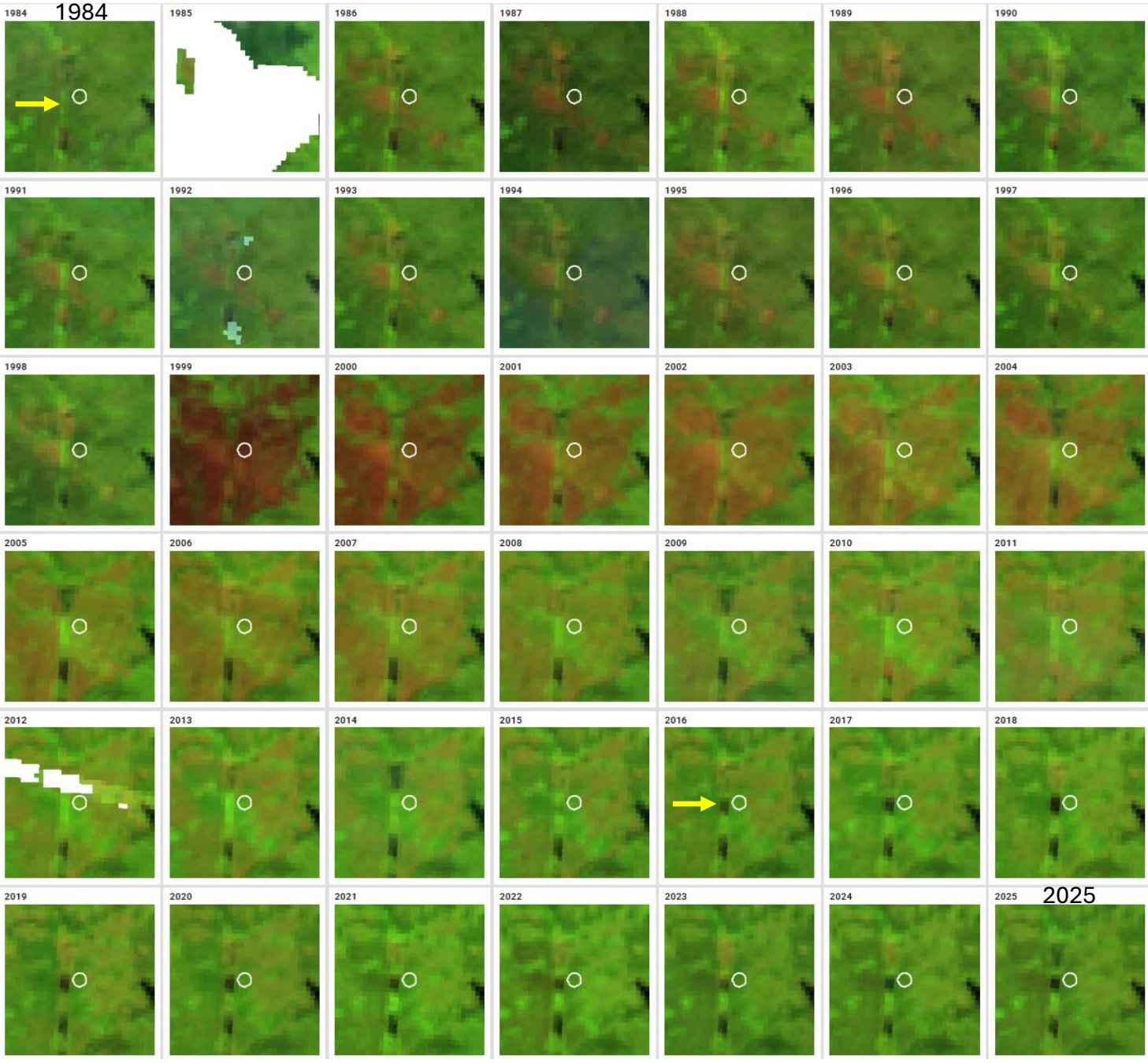


90.4281898°W 53.8124611°N

Annual area (ha)

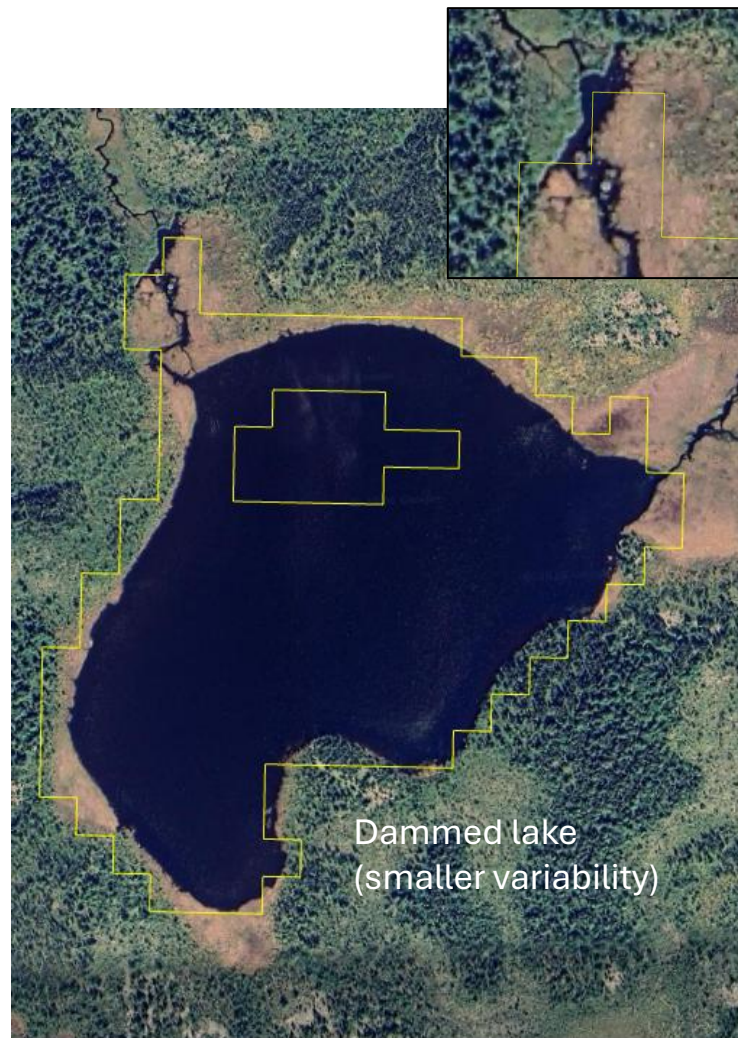
a1985	0
a1986	0
a1987	0
a1988	0
a1989	0
a1990	0
a1991	0
a1992	0
a1993	0
a1994	0
a1995	0
a1996	0
a1997	0
a1998	0
a1999	0
a2000	0
a2001	0
a2002	0
a2003	0
a2004	0
a2005	0
a2006	0
a2007	0
a2008	0
a2009	0
a2010	0
a2011	0
a2012	0
a2013	0
a2014	0
a2015	0
a2016	0.1566
a2017	0.2637
a2018	0.2673
a2019	0.2961
a2020	0.2178
a2021	0.1512

Annual summer Landsat image chips



FID 15

High-res validation



90.3715510°W 53.6566309°N

Annual area (ha)

a1985	10.1538
a1986	10.3545
a1987	10.5399
a1988	10.9845
a1989	10.737
a1990	10.3788
a1991	10.2411
a1992	10.2726
a1993	10.3995
a1994	10.3752
a1995	10.3806
a1996	10.4166
a1997	10.4958
a1998	10.5408
a1999	10.5993
a2000	10.7073
a2001	10.7361
a2002	10.5957
a2003	10.7235
a2004	10.7127
a2005	10.6983
a2006	10.7172
a2007	10.7073
a2008	10.6605
a2009	10.6344
a2010	10.6533
a2011	10.9683
a2012	11.0241
a2013	10.7685
a2014	10.791
a2015	10.7109
a2016	10.818
a2017	10.7118
a2018	10.674
a2019	10.7937
a2020	10.782
a2021	10.6812

Annual summer Landsat image chips



FID 16

High-res validation

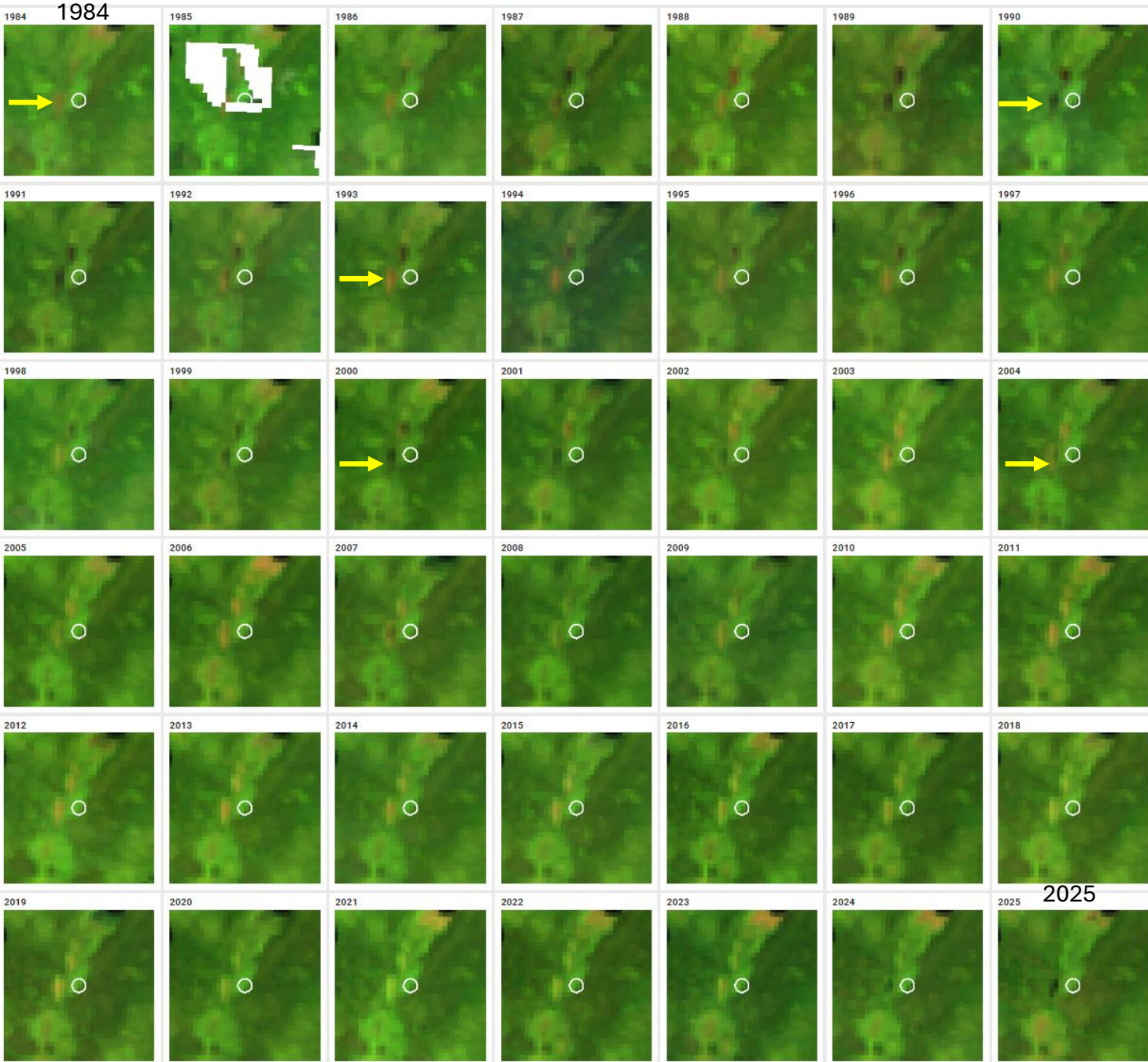


91.0516237°W 53.6765314°N

Annual area (ha)

a1985	0
a1986	0.0711
a1987	0
a1988	0.1593
a1989	0.2565
a1990	0.2043
a1991	0.126
a1992	0.0558
a1993	0
a1994	0
a1995	0
a1996	0
a1997	0
a1998	0.027
a1999	0.1359
a2000	0.1818
a2001	0.1791
a2002	0.1071
a2003	0.0261
a2004	0
a2005	0
a2006	0
a2007	0
a2008	0
a2009	0
a2010	0
a2011	0
a2012	0
a2013	0
a2014	0
a2015	0
a2016	0
a2017	0
a2018	0
a2019	0
a2020	0
a2021	0

Annual summer Landsat image chips



FID 17

High-res validation

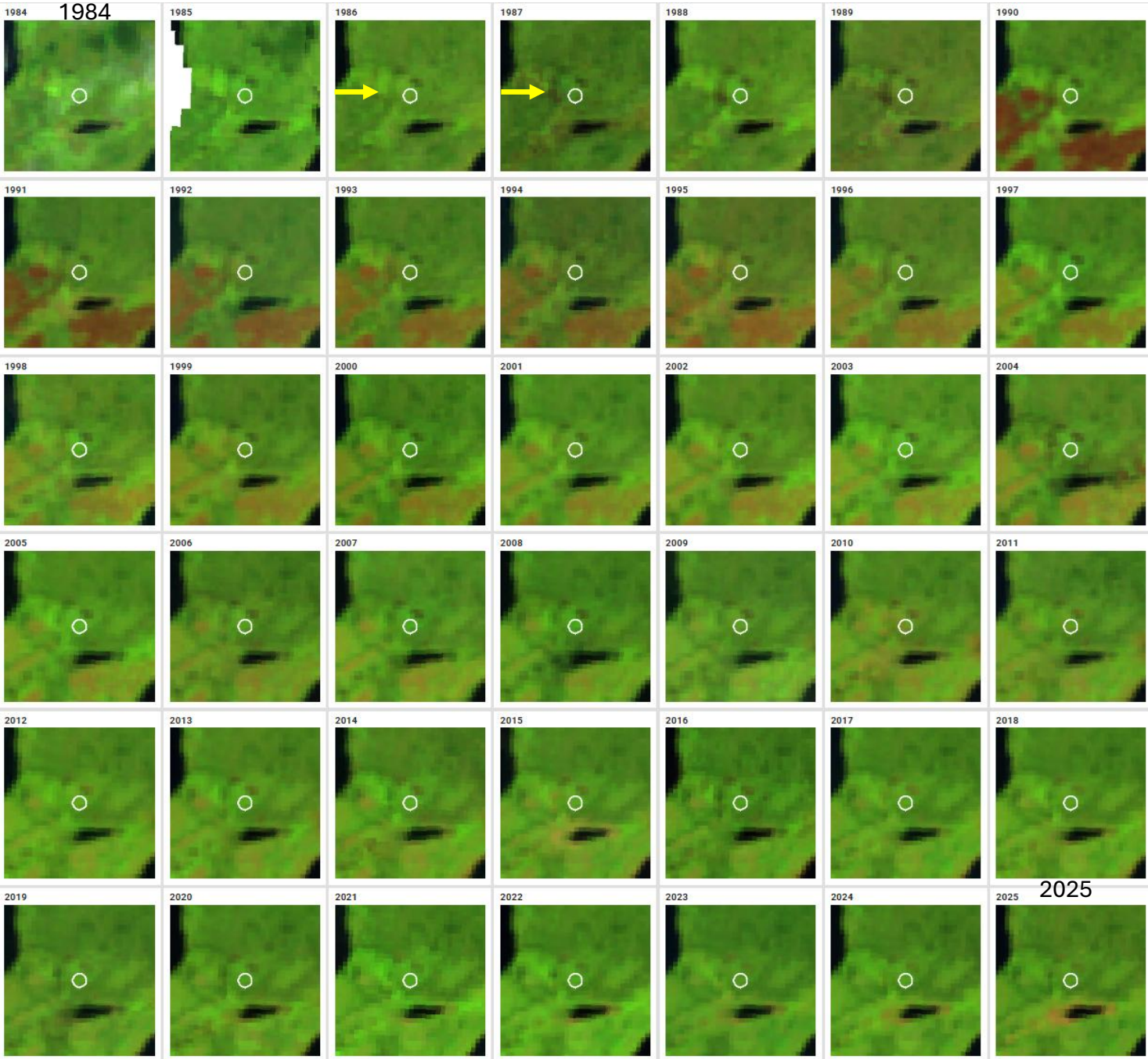


90.4329520°W 54.0681676°N

Annual area (ha)

a1985	0
a1986	0
a1987	0.0252
a1988	0.18
a1989	0.1413
a1990	0.1026
a1991	0.0612
a1992	0
a1993	0
a1994	0
a1995	0
a1996	0
a1997	0
a1998	0
a1999	0
a2000	0
a2001	0
a2002	0
a2003	0
a2004	0
a2005	0
a2006	0
a2007	0
a2008	0
a2009	0
a2010	0
a2011	0
a2012	0
a2013	0
a2014	0
a2015	0
a2016	0
a2017	0
a2018	0
a2019	0
a2020	0
a2021	0

Annual summer Landsat image chips



FID 18

High-res validation

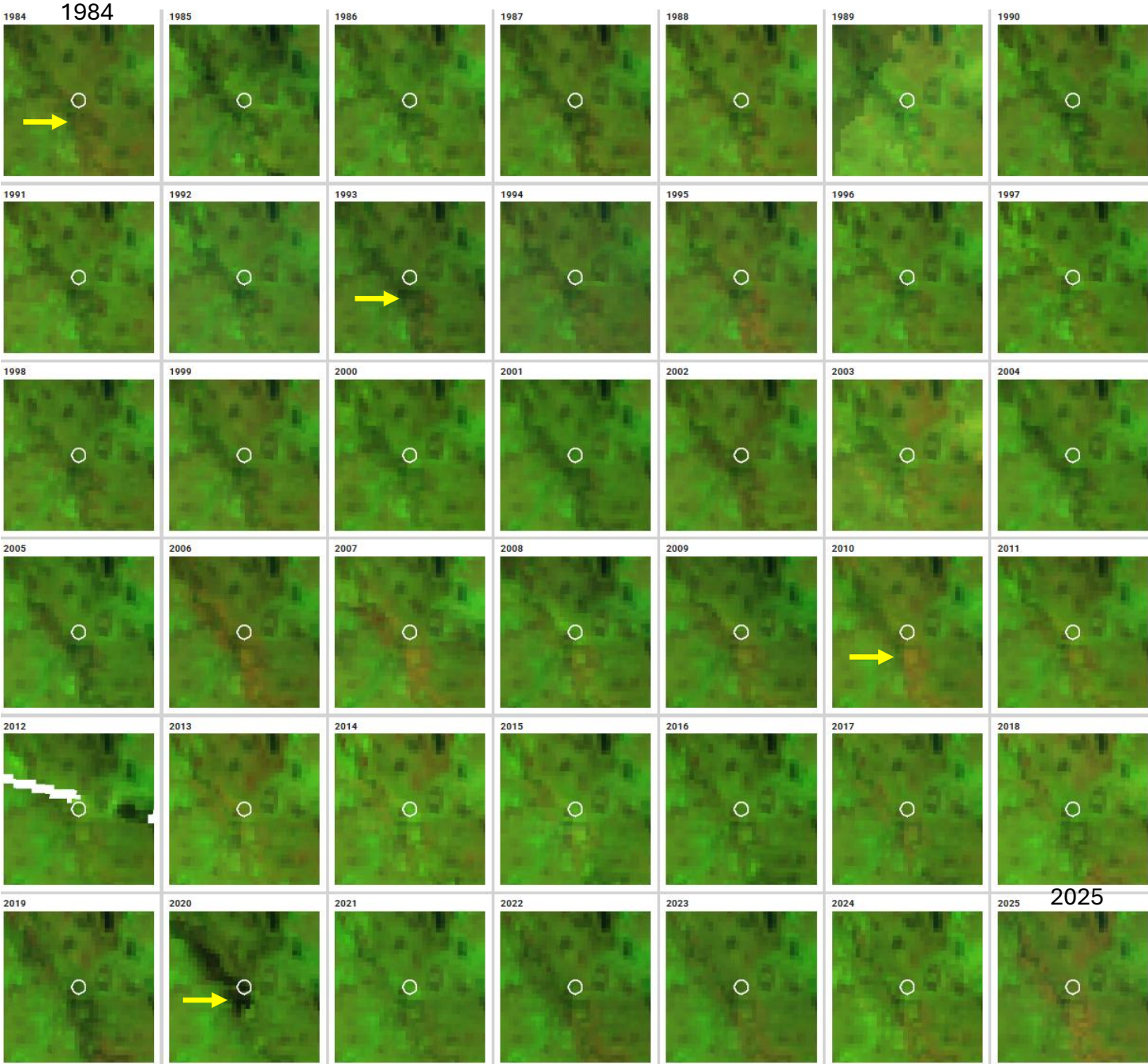


91.2081296°W 55.0235851°N

Annual area (ha)

a1985	0.0576
a1986	0.063
a1987	0.0648
a1988	0.0954
a1989	0.144
a1990	0.1557
a1991	0.1521
a1992	0.2484
a1993	0.1746
a1994	0.1539
a1995	0.0666
a1996	0.0648
a1997	0.0639
a1998	0.0522
a1999	0.0378
a2000	0.0234
a2001	0.0423
a2002	0.0342
a2003	0
a2004	0
a2005	0.0306
a2006	0.027
a2007	0.0117
a2008	0.0189
a2009	0.018
a2010	0
a2011	0
a2012	0
a2013	0
a2014	0
a2015	0
a2016	0
a2017	0.0225
a2018	0.0234
a2019	0.0567
a2020	0.1143
a2021	0.1179

Annual summer Landsat image chips



FID 19

High-res validation

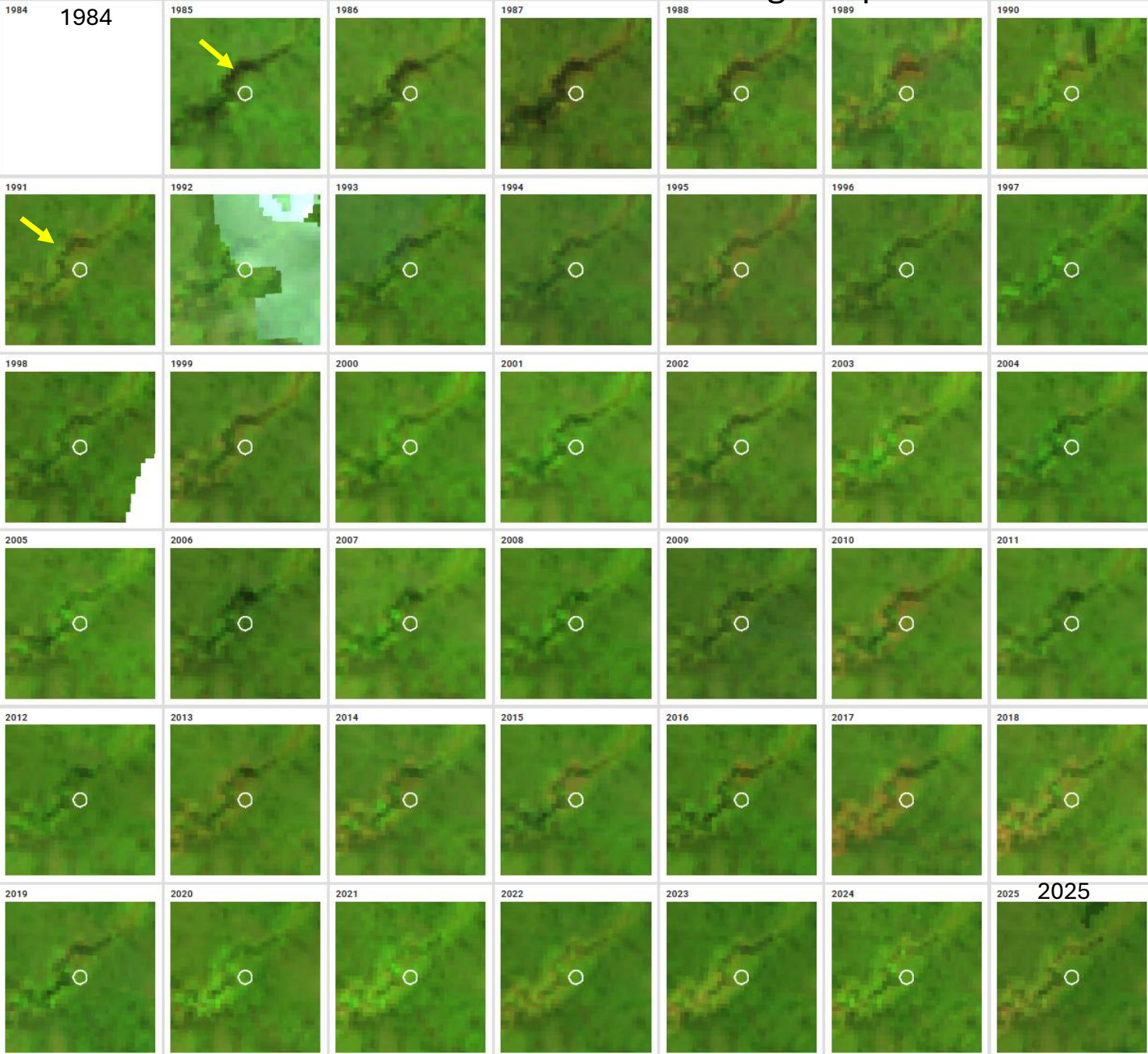


90.7742631°W 54.7631555°N

Annual area (ha)

a1985	1.6731
a1986	1.7298
a1987	1.6884
a1988	1.2438
a1989	0.8829
a1990	0.2907
a1991	0.1431
a1992	0.3177
a1993	0.7164
a1994	0.6975
a1995	0.6156
a1996	0.6678
a1997	0.6561
a1998	0.5688
a1999	0.2763
a2000	0.1899
a2001	0.1908
a2002	0.1566
a2003	0.1449
a2004	0.1287
a2005	0.8901
a2006	0.8433
a2007	0.8262
a2008	0.5481
a2009	0.6804
a2010	0.7434
a2011	0.6381
a2012	0.6066
a2013	0.6417
a2014	0.6732
a2015	0.6777
a2016	0.7137
a2017	0.675
a2018	0.5067
a2019	0.3411
a2020	0.1116
a2021	0

Annual summer Landsat image chips



FID 20

High-res validation

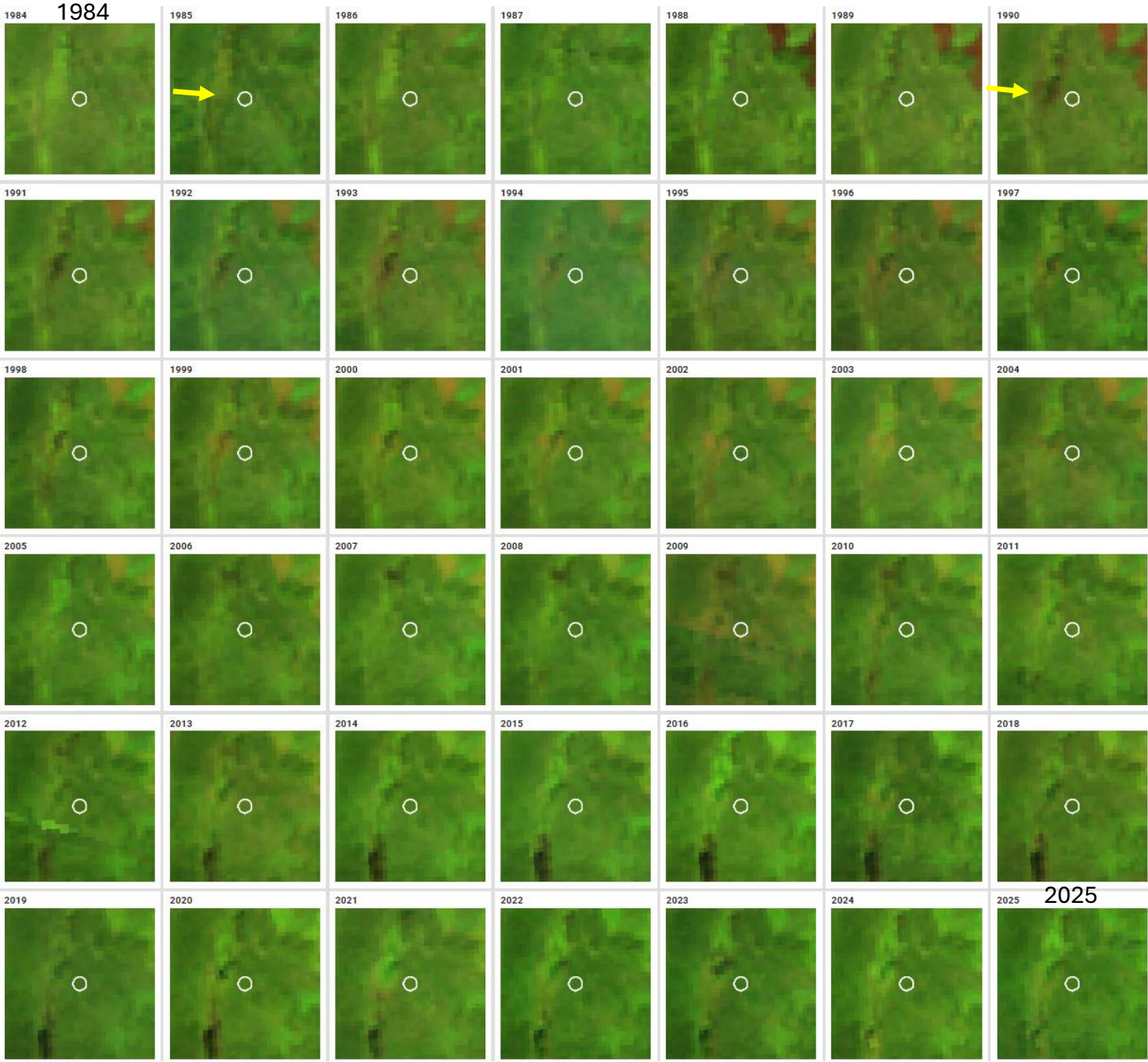


89.3859065°W 53.9863254°N

Annual area (ha)

a1985	0
a1986	0
a1987	0
a1988	0
a1989	0
a1990	0.1908
a1991	0.1926
a1992	0.2187
a1993	0.234
a1994	0.207
a1995	0.1854
a1996	0.1152
a1997	0.0891
a1998	0.0675
a1999	0.0189
a2000	0.0423
a2001	0
a2002	0
a2003	0
a2004	0
a2005	0
a2006	0
a2007	0
a2008	0
a2009	0
a2010	0
a2011	0
a2012	0
a2013	0.0189
a2014	0
a2015	0
a2016	0
a2017	0.0324
a2018	0.0711
a2019	0.0954
a2020	0.0864
a2021	0.0279

Annual summer Landsat image chips



FID 21

High-res validation



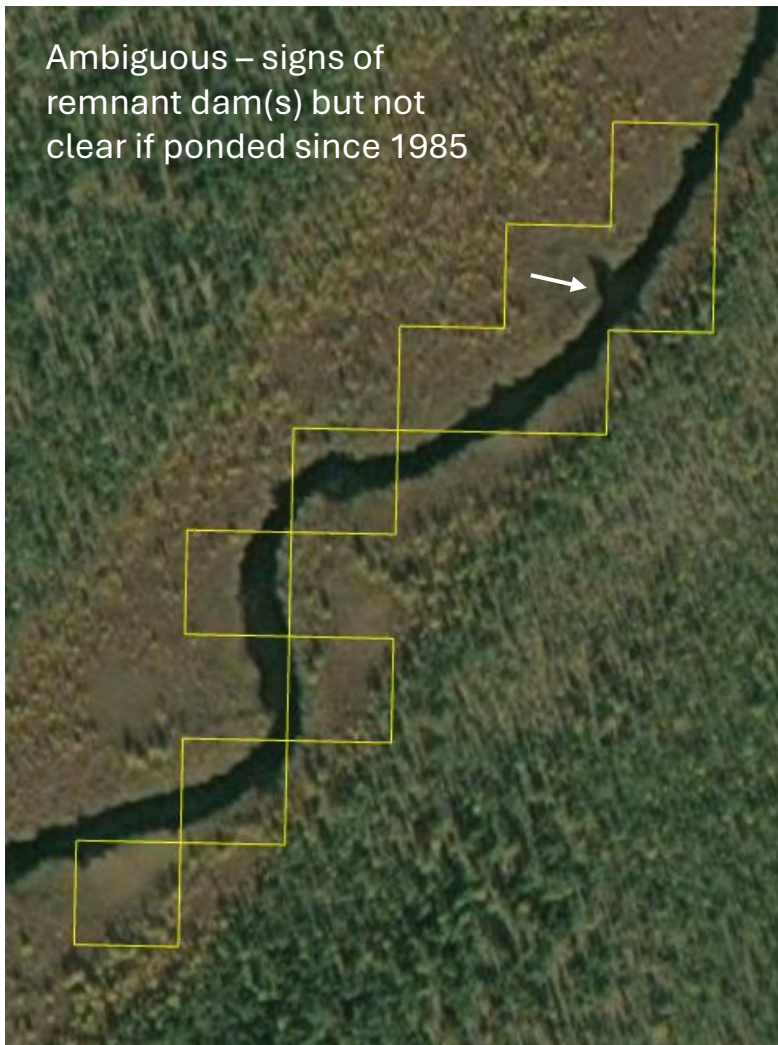
Annual area (ha)

Annual summer Landsat image chips

a1985	0.0432
a1986	0.0972
a1987	0
a1988	0
a1989	0
a1990	0
a1991	0
a1992	0
a1993	0
a1994	0
a1995	0
a1996	0
a1997	0
a1998	0.0774
a1999	0.0252
a2000	0.0261
a2001	0.1134
a2002	0.1233
a2003	0
a2004	0
a2005	0.0198
a2006	0
a2007	0
a2008	0
a2009	0.072
a2010	0.1296
a2011	0.1413
a2012	0.0459
a2013	0.0657
a2014	0
a2015	0
a2016	0
a2017	0
a2018	0
a2019	0.0702
a2020	0.0666
a2021	0



Ambiguous – signs of remnant dam(s) but not clear if ponded since 1985



88.9916005°W 53.9426188°N

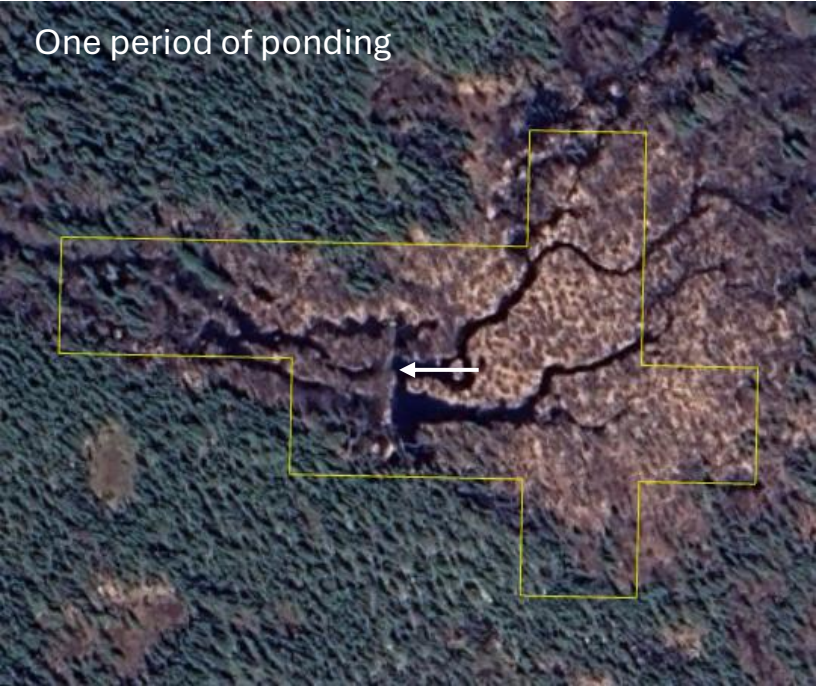
FID 22

High-res validation



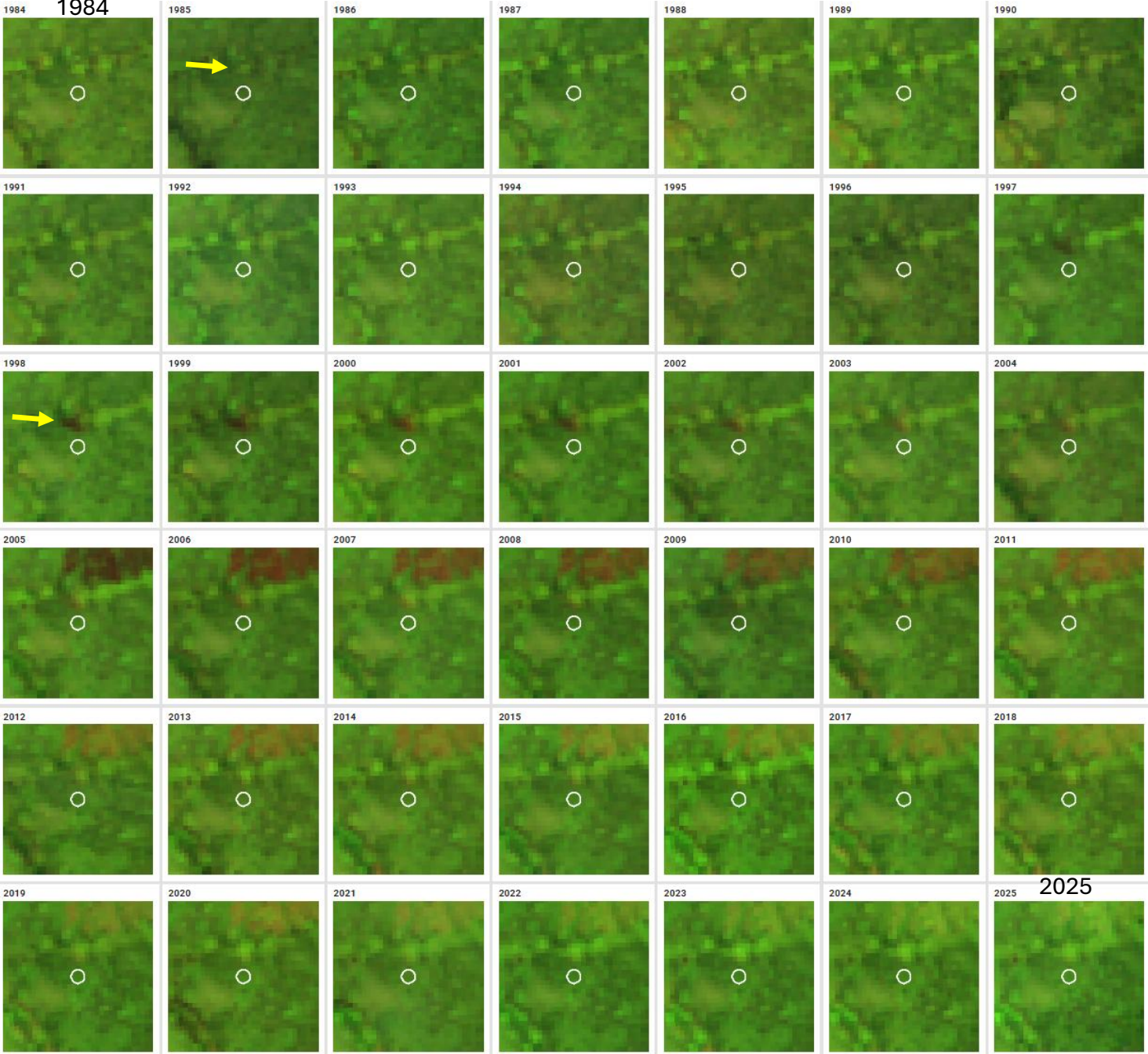
Annual area (ha)

Annual summer Landsat image chips



88.3272310°W 54.3595464°N

a1985	0.0288
a1986	0.0225
a1987	0.0018
a1988	0
a1989	0
a1990	0
a1991	0
a1992	0
a1993	0
a1994	0
a1995	0.09
a1996	0.1539
a1997	0.2088
a1998	0.2655
a1999	0.2664
a2000	0.1782
a2001	0.1305
a2002	0.1386
a2003	0.0864
a2004	0.0666
a2005	0.0648
a2006	0.0504
a2007	0.0495
a2008	0.0198
a2009	0.0135
a2010	0.0126
a2011	0
a2012	0
a2013	0
a2014	0
a2015	0
a2016	0
a2017	0
a2018	0
a2019	0
a2020	0
a2021	0



FID 23

High-res validation

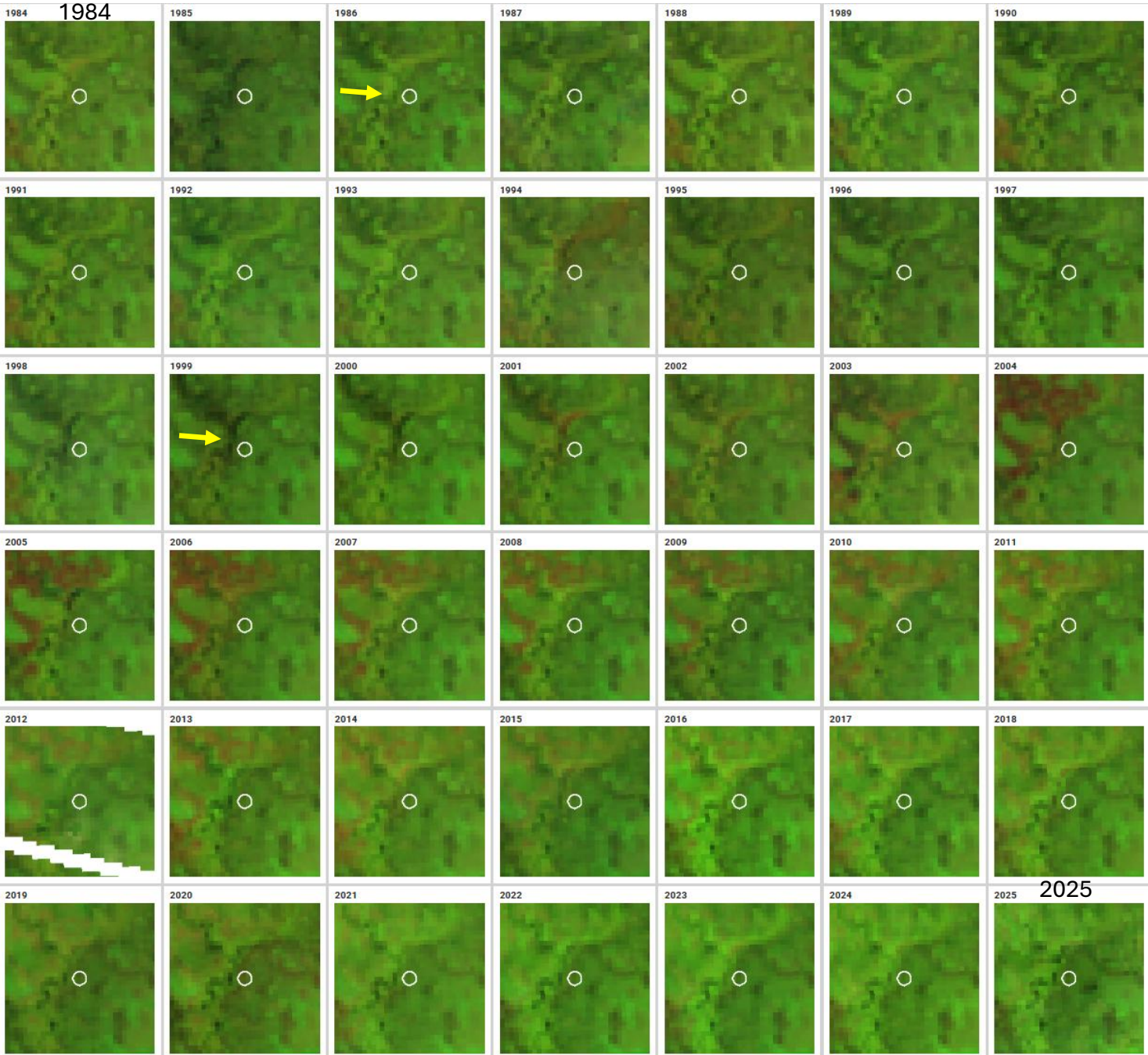


88.1617796°W 54.2634585°N

Annual area (ha)

a1985	0.0207
a1986	0.0459
a1987	0
a1988	0
a1989	0
a1990	0
a1991	0
a1992	0
a1993	0
a1994	0
a1995	0.0558
a1996	0.0648
a1997	0.1215
a1998	0.1584
a1999	0.1656
a2000	0.1521
a2001	0.1278
a2002	0.0756
a2003	0.0423
a2004	0.0486
a2005	0.081
a2006	0.0576
a2007	0.0162
a2008	0
a2009	0
a2010	0
a2011	0
a2012	0.0315
a2013	0.0486
a2014	0.0468
a2015	0
a2016	0
a2017	0
a2018	0.018
a2019	0.0225
a2020	0.0216
a2021	0

Annual summer Landsat image chips



FID 24

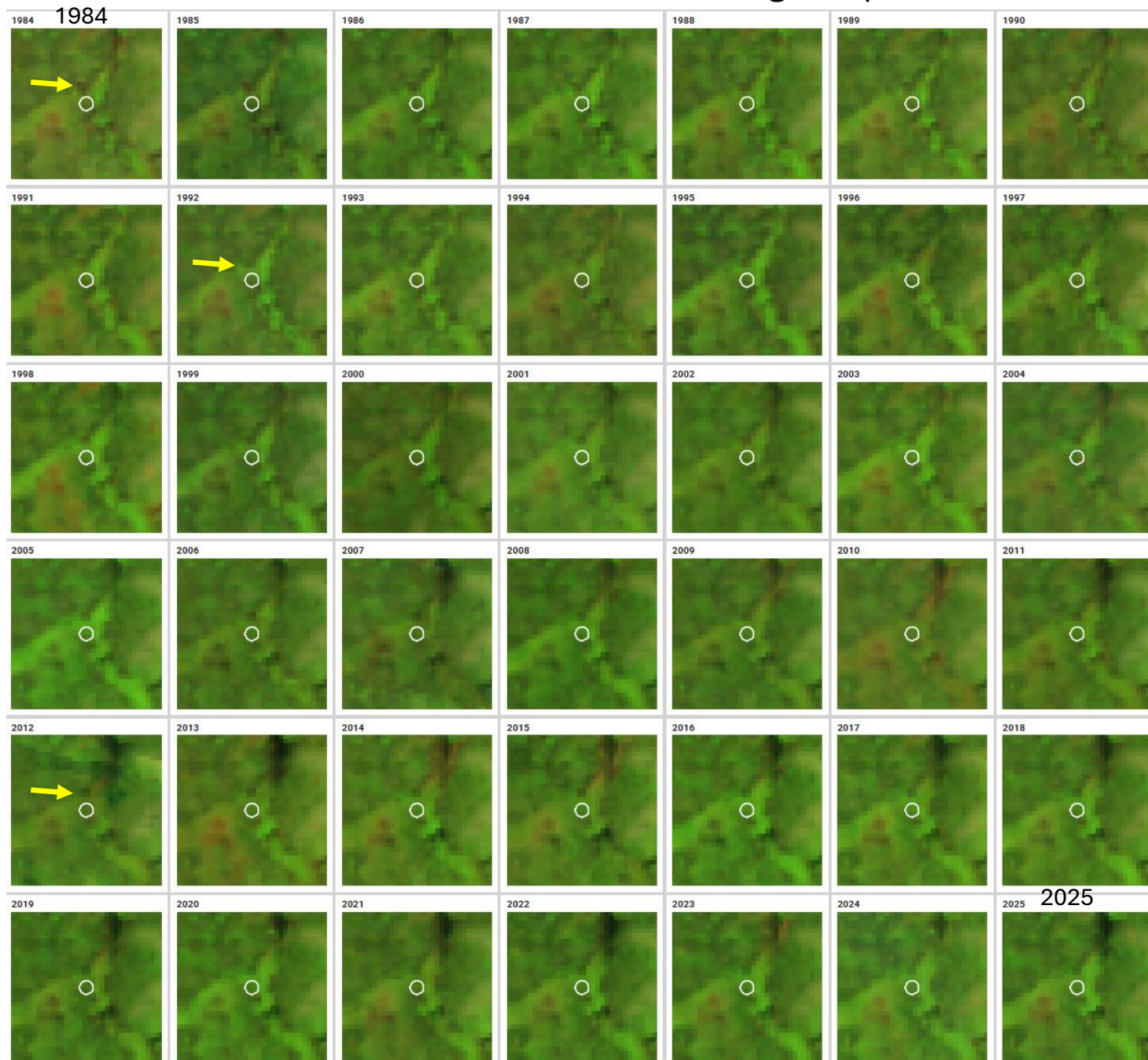
High-res validation



Annual area (ha)

a1985	0.0828
a1986	0.063
a1987	0.0657
a1988	0.0711
a1989	0.0819
a1990	0.0351
a1991	0
a1992	0
a1993	0
a1994	0
a1995	0.0198
a1996	0
a1997	0.0189
a1998	0.0657
a1999	0.0675
a2000	0.0684
a2001	0.0441
a2002	0.0252
a2003	0
a2004	0
a2005	0.0252
a2006	0.0306
a2007	0.072
a2008	0.0612
a2009	0.0423
a2010	0.0603
a2011	0.0648
a2012	0.09
a2013	0.09
a2014	0.072
a2015	0.0198
a2016	0
a2017	0
a2018	0.0207
a2019	0.0234
a2020	0.0342
a2021	0

Annual summer Landsat image chips



Six Landsat pixels – approaching
the limit of reliable detectability

87.3632748°W 54.5143740°N

FID 25

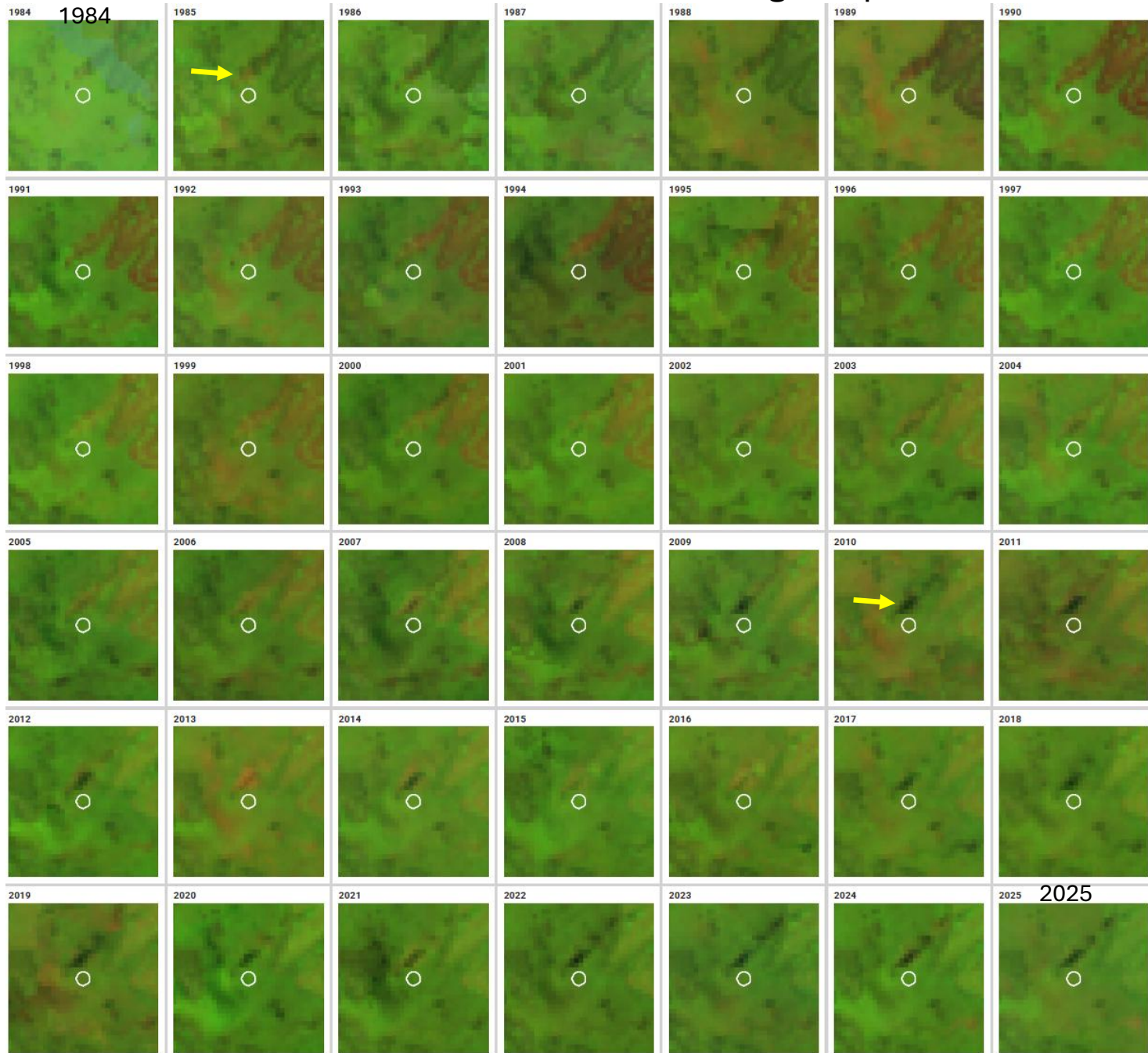
High-res validation



Annual area (ha)

a1985	0
a1986	0
a1987	0.036
a1988	0.0243
a1989	0.0414
a1990	0.018
a1991	0
a1992	0.0198
a1993	0.0171
a1994	0.0171
a1995	0.0486
a1996	0
a1997	0
a1998	0
a1999	0
a2000	0
a2001	0
a2002	0.0135
a2003	0.0153
a2004	0
a2005	0
a2006	0
a2007	0.0234
a2008	0.1629
a2009	0.225
a2010	0.3312
a2011	0.2916
a2012	0.1665
a2013	0.0738
a2014	0.0252
a2015	0.0819
a2016	0.1521
a2017	0.1899
a2018	0.2313
a2019	0.2574
a2020	0.27
a2021	0.2871

Annual summer Landsat image chips



93.7908878°W 56.0901668°N

FID 26

High-res validation



93.8750870°W 55.7714946°N

Annual area (ha)

a1985	0.2718
a1986	0.2745
a1987	0.1314
a1988	0.1152
a1989	0.0765
a1990	0.0378
a1991	0
a1992	0
a1993	0
a1994	0
a1995	0
a1996	0
a1997	0
a1998	0
a1999	0
a2000	0
a2001	0
a2002	0
a2003	0
a2004	0.0315
a2005	0.0702
a2006	0.0711
a2007	0.0666
a2008	0.0333
a2009	0.0351
a2010	0.0342
a2011	0.0648
a2012	0.0639
a2013	0.0963
a2014	0.1332
a2015	0.1629
a2016	0.1476
a2017	0.1827
a2018	0.1854
a2019	0.2619
a2020	0.2178
a2021	0.1368

Annual summer Landsat image chips



FID 27

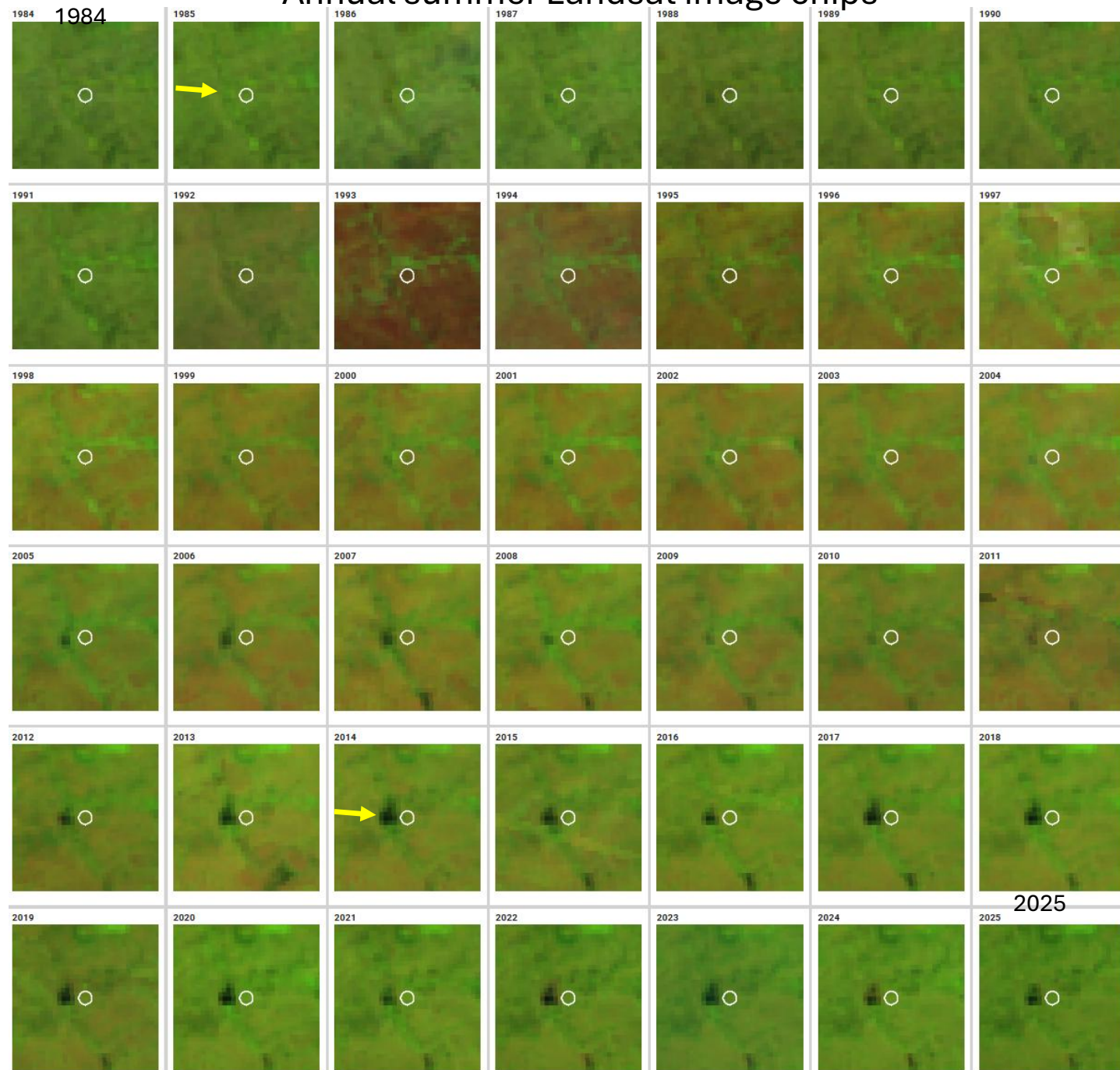
High-res validation



Annual area (ha)

a1985	0
a1986	0
a1987	0
a1988	0
a1989	0
a1990	0
a1991	0
a1992	0
a1993	0
a1994	0
a1995	0
a1996	0
a1997	0
a1998	0
a1999	0
a2000	0
a2001	0
a2002	0
a2003	0
a2004	0
a2005	0.0936
a2006	0.0981
a2007	0.1287
a2008	0.0342
a2009	0.0279
a2010	0.0729
a2011	0.1224
a2012	0.225
a2013	0.4986
a2014	0.5976
a2015	0.4986
a2016	0.5751
a2017	0.5751
a2018	0.6336
a2019	0.54
a2020	0.4086
a2021	0.405

Annual summer Landsat image chips

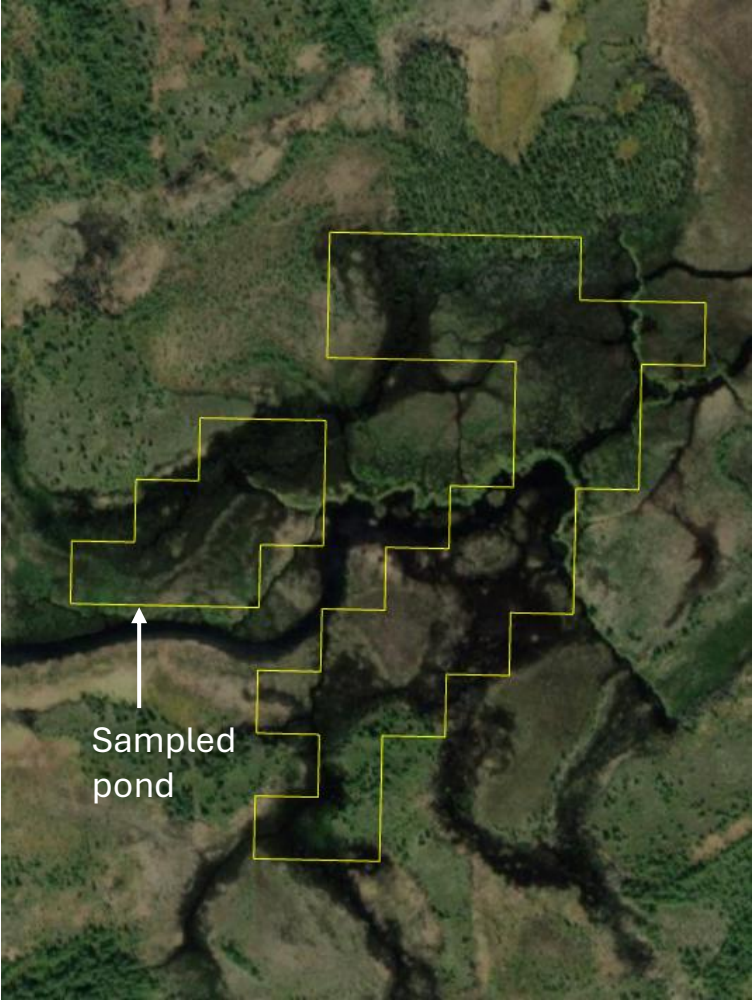


Ponding 12 years after 1993 fire

94.6464336°W 56.5884984°N

FID 28

High-res validation

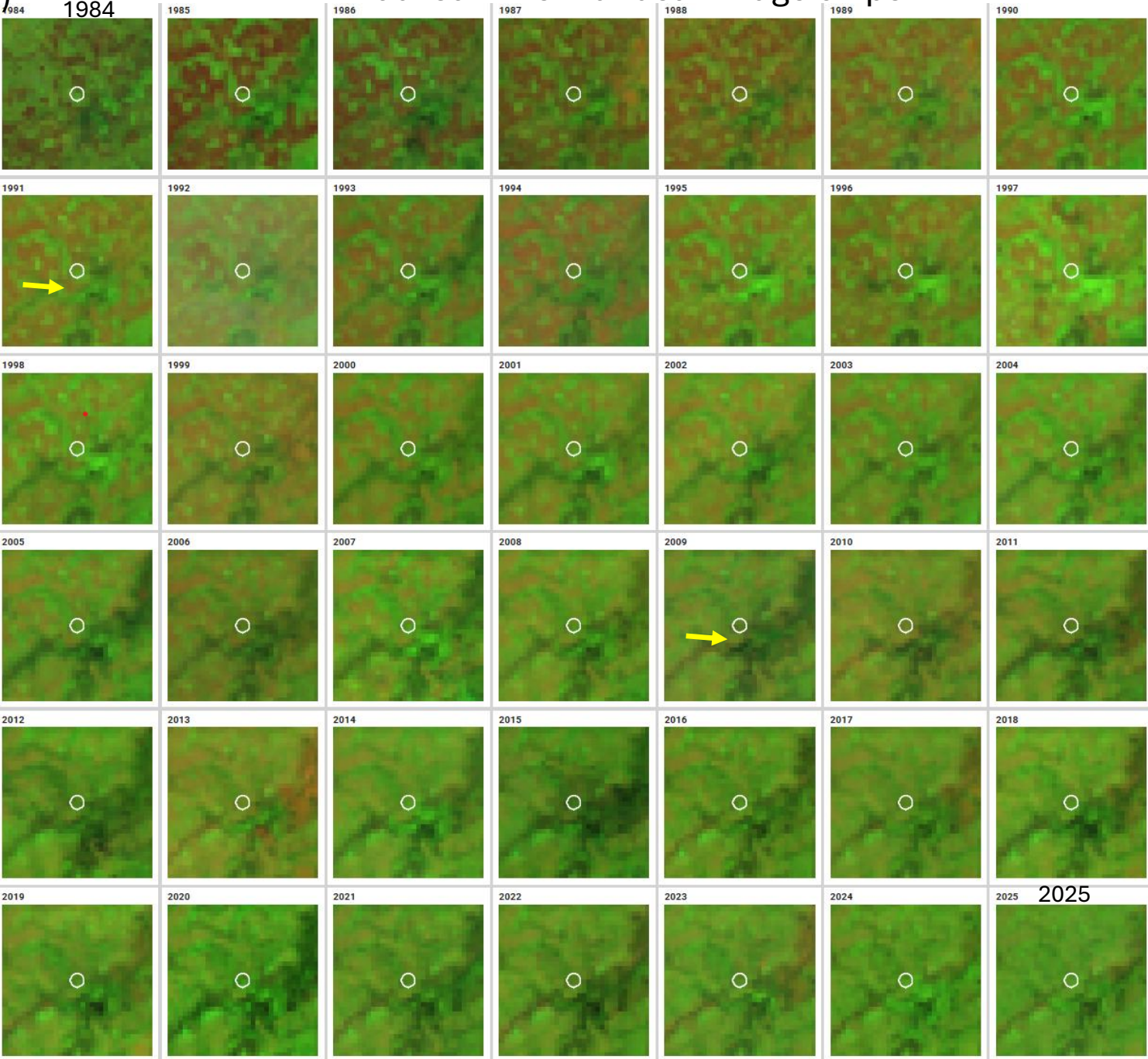


92.9887263°W 56.3096614°N

Annual area (ha)

a1985	0
a1986	0.0036
a1987	0.0009
a1988	0
a1989	0
a1990	0
a1991	0
a1992	0
a1993	0
a1994	0
a1995	0
a1996	0
a1997	0
a1998	0
a1999	0
a2000	0
a2001	0
a2002	0
a2003	0
a2004	0
a2005	0
a2006	0.0135
a2007	0
a2008	0
a2009	0.0756
a2010	0.1674
a2011	0.1899
a2012	0.0639
a2013	0
a2014	0.027
a2015	0.1098
a2016	0.0522
a2017	0.1089
a2018	0.0558
a2019	0.1602
a2020	0.0225
a2021	0.1071

Annual summer Landsat image chips



FID 29

High-res validation

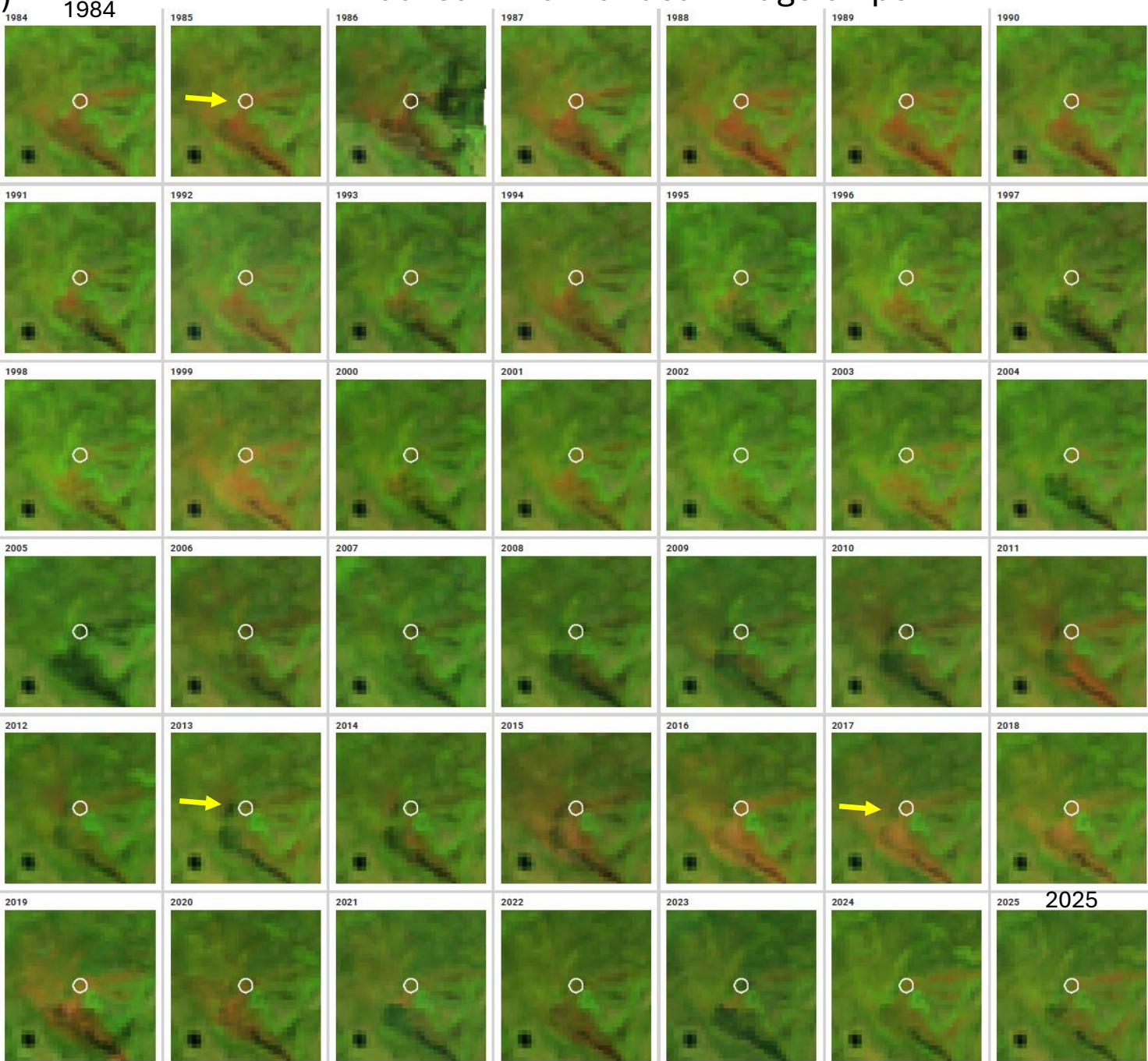


91.9464355°W 56.6664042°N

Annual area (ha)

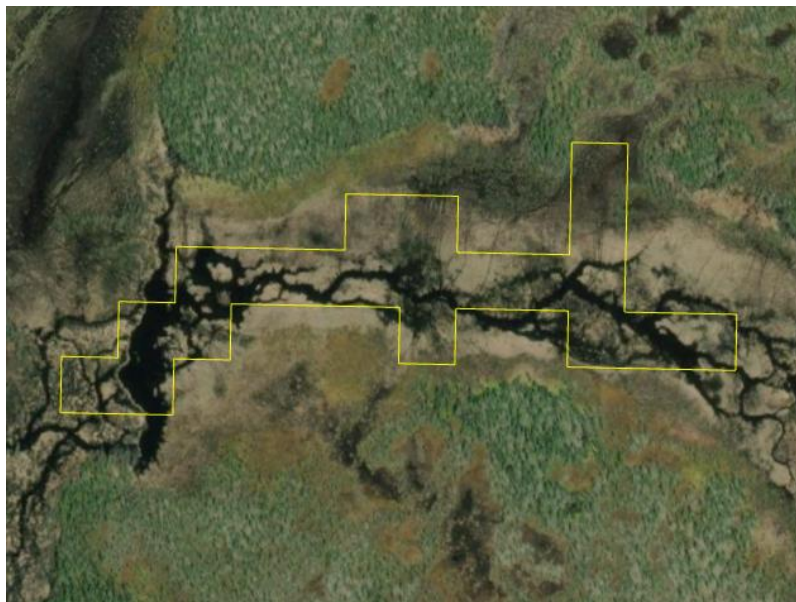
a1985	0
a1986	0
a1987	0
a1988	0
a1989	0
a1990	0
a1991	0
a1992	0
a1993	0
a1994	0
a1995	0
a1996	0
a1997	0
a1998	0
a1999	0
a2000	0
a2001	0
a2002	0
a2003	0
a2004	0
a2005	0
a2006	0
a2007	0
a2008	0.0396
a2009	0.0972
a2010	0.0954
a2011	0.1134
a2012	0.1251
a2013	0.108
a2014	0.1107
a2015	0.0594
a2016	0.0153
a2017	0
a2018	0
a2019	0
a2020	0
a2021	0

Annual summer Landsat image chips



FID 30

High-res validation

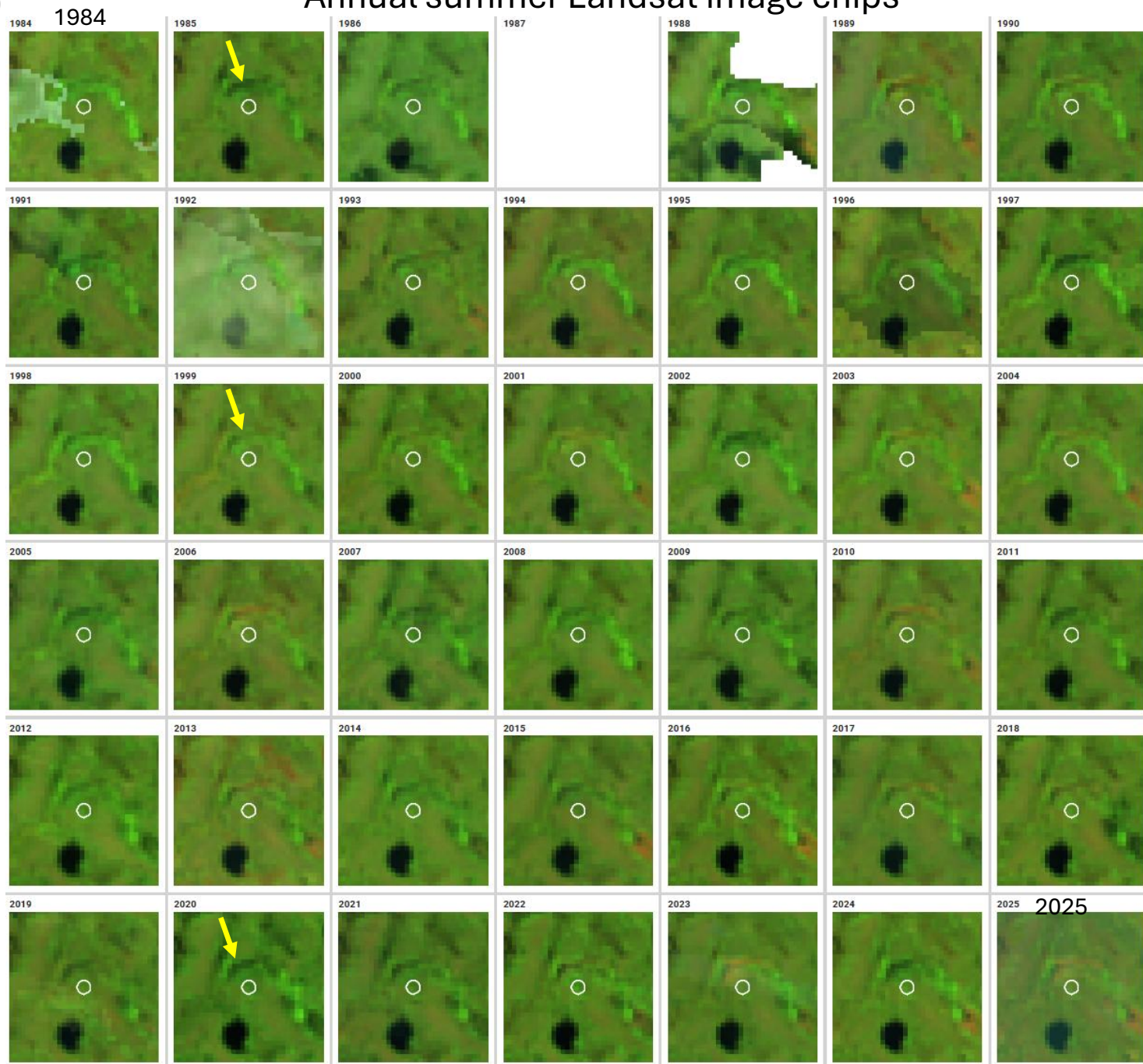


92.5901034°W 56.3617724°N

Annual area (ha)

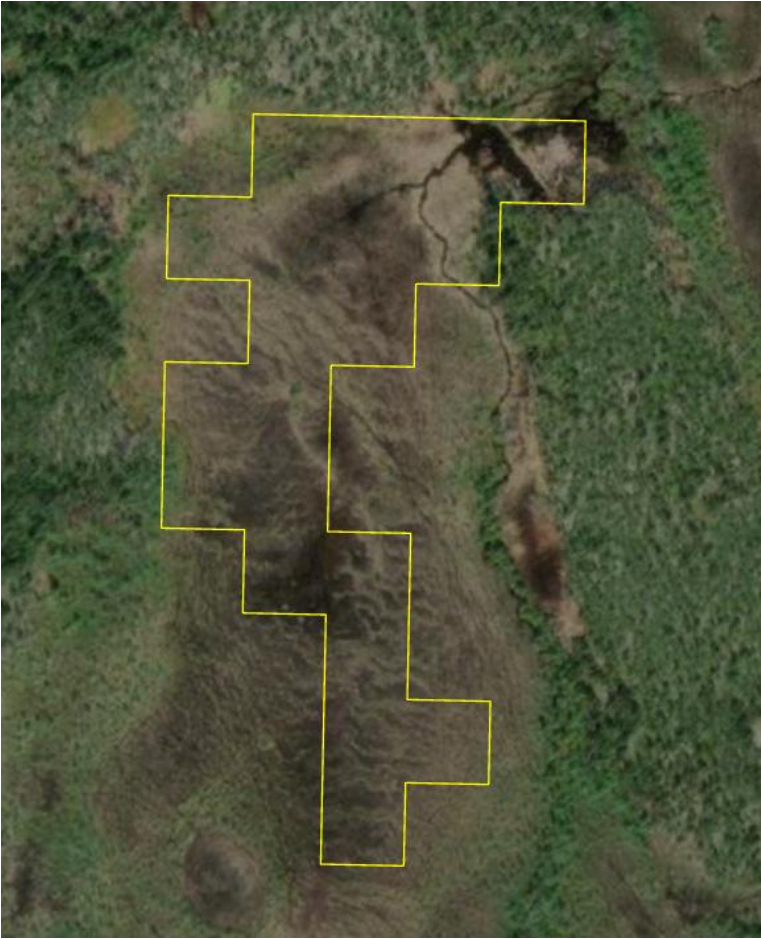
a1985	0.3411
a1986	0.4131
a1987	0.3807
a1988	0.2691
a1989	0.0783
a1990	0.0495
a1991	0.1044
a1992	0.2502
a1993	0.0648
a1994	0.0243
a1995	0
a1996	0.2115
a1997	0.0837
a1998	0.054
a1999	0
a2000	0
a2001	0
a2002	0
a2003	0
a2004	0
a2005	0
a2006	0.0171
a2007	0.0162
a2008	0
a2009	0
a2010	0.1296
a2011	0.1188
a2012	0.1098
a2013	0.0513
a2014	0.0855
a2015	0.0864
a2016	0.1323
a2017	0.072
a2018	0.0684
a2019	0.1107
a2020	0.189
a2021	0.1296

Annual summer Landsat image chips



FID 31

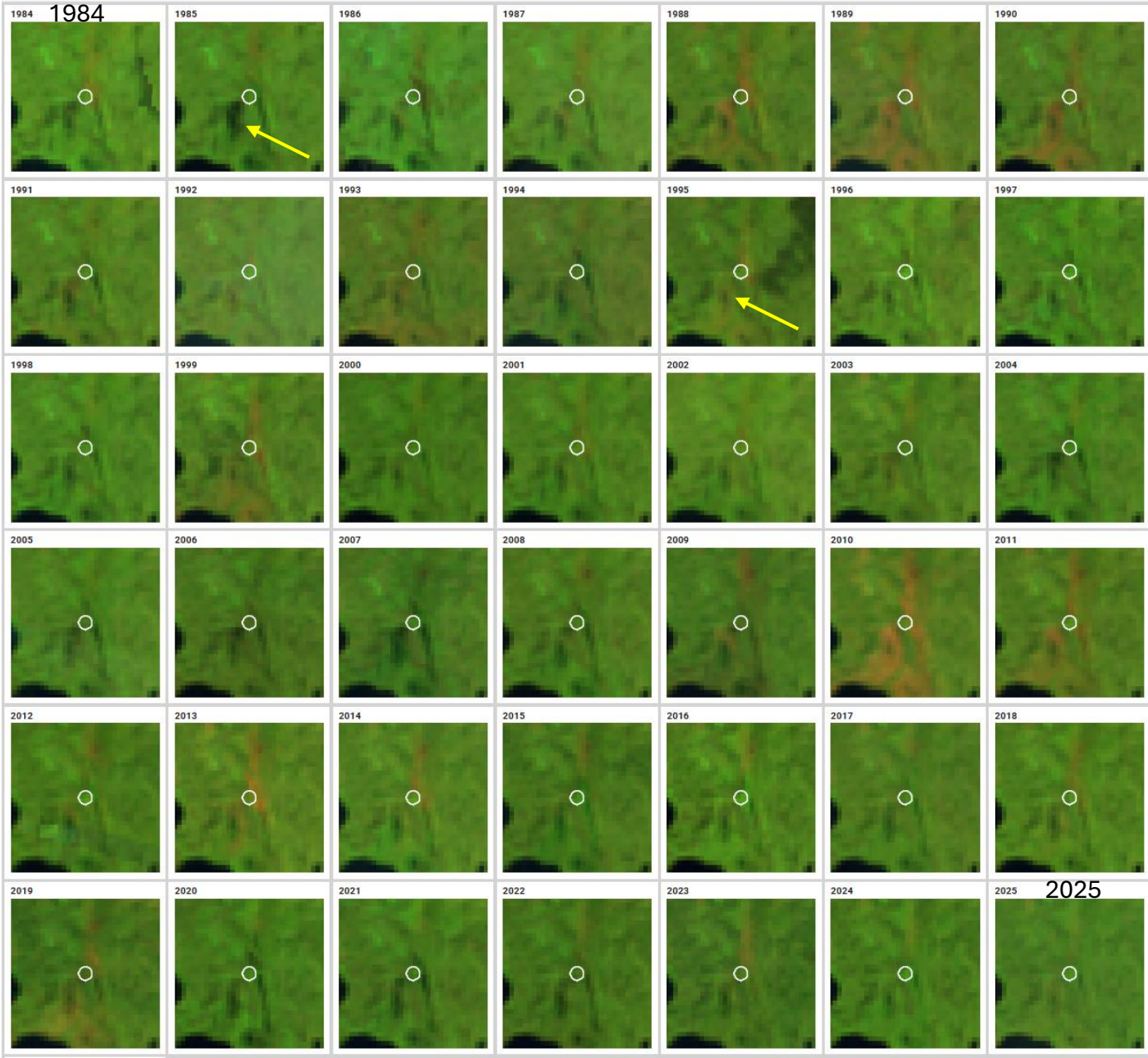
High-res validation



Annual area (ha)

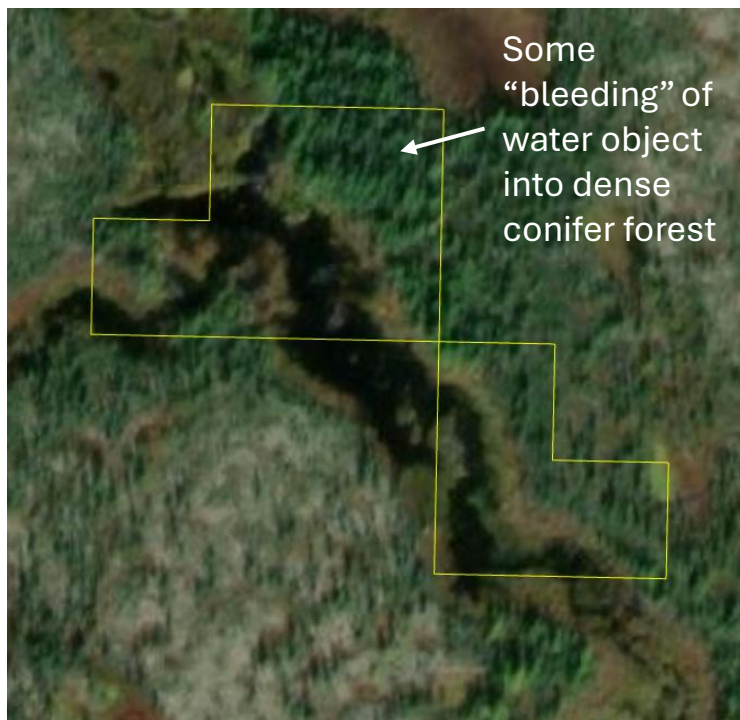
a1985	0.3771
a1986	0.3339
a1987	0.1899
a1988	0.1053
a1989	0.0738
a1990	0.0621
a1991	0.1161
a1992	0.0936
a1993	0.0873
a1994	0.1242
a1995	0.0594
a1996	0.0639
a1997	0.1305
a1998	0.1332
a1999	0.1071
a2000	0.1053
a2001	0.0963
a2002	0.1089
a2003	0.243
a2004	0.2547
a2005	0.279
a2006	0.288
a2007	0.2754
a2008	0.1926
a2009	0.0918
a2010	0.0711
a2011	0.0405
a2012	0.0459
a2013	0.0513
a2014	0.0486
a2015	0.0594
a2016	0.1044
a2017	0.1098
a2018	0.1197
a2019	0.1296
a2020	0.2538
a2021	0.2538

Annual summer Landsat image chips



FID 32

High-res validation

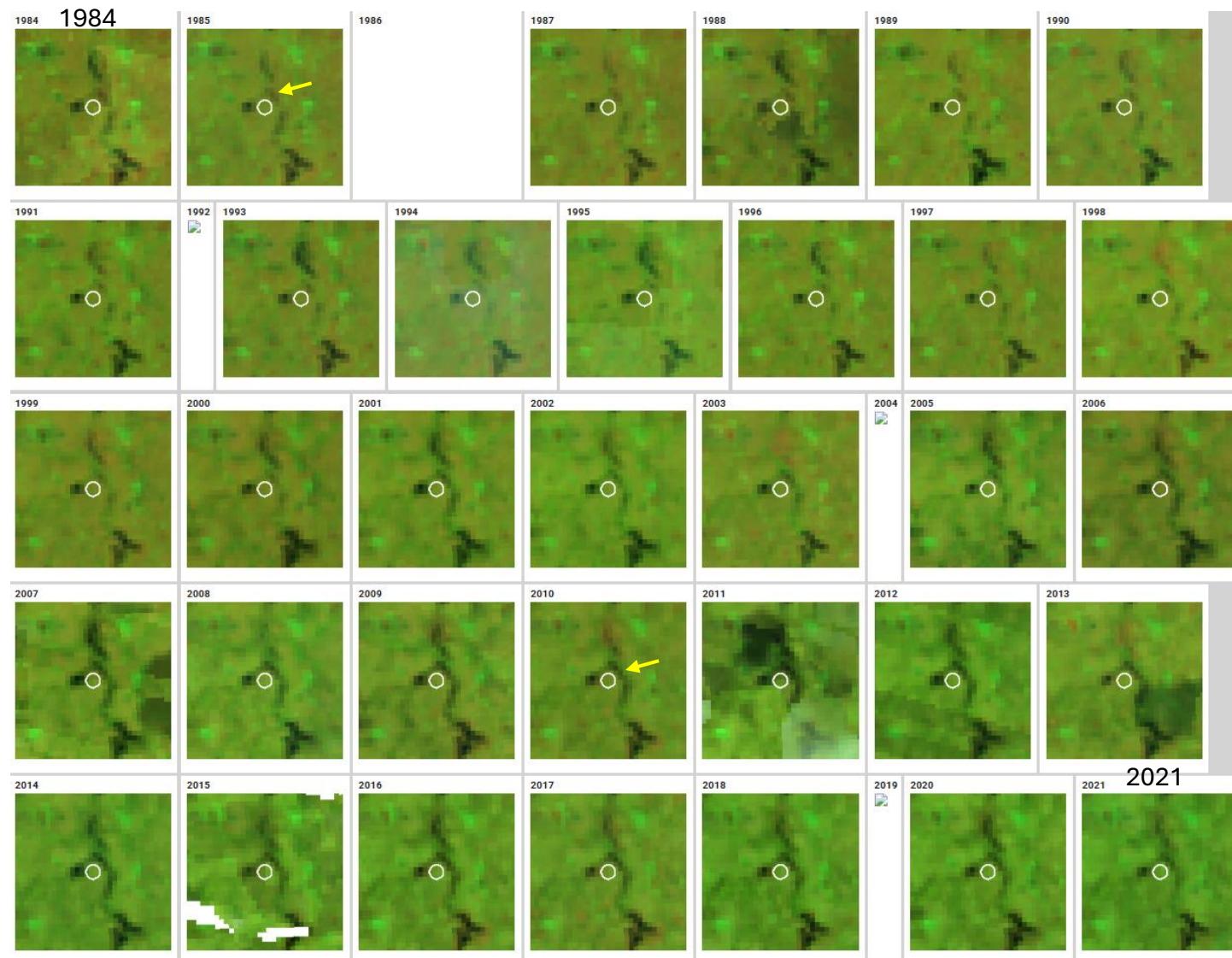


94.4229068°W 57.4352408°N

Annual area (ha)

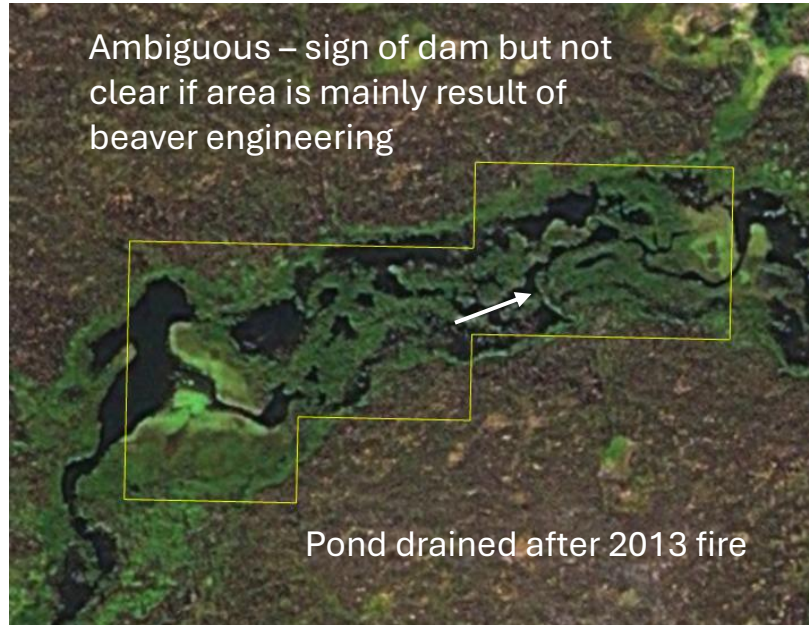
a1985	0
a1986	0
a1987	0
a1988	0.0261
a1989	0
a1990	0
a1991	0
a1992	0
a1993	0
a1994	0
a1995	0
a1996	0
a1997	0
a1998	0
a1999	0
a2000	0
a2001	0
a2002	0.0306
a2003	0.0288
a2004	0.0279
a2005	0.0729
a2006	0.0873
a2007	0.0873
a2008	0.0927
a2009	0.1143
a2010	0.1584
a2011	0.1431
a2012	0.1782
a2013	0.1296
a2014	0.1278
a2015	0.1818
a2016	0.1989
a2017	0.2016
a2018	0.1683
a2019	0.1224
a2020	0.0576
a2021	0.0747

Annual summer Landsat image chips



FID 33

High-res validation

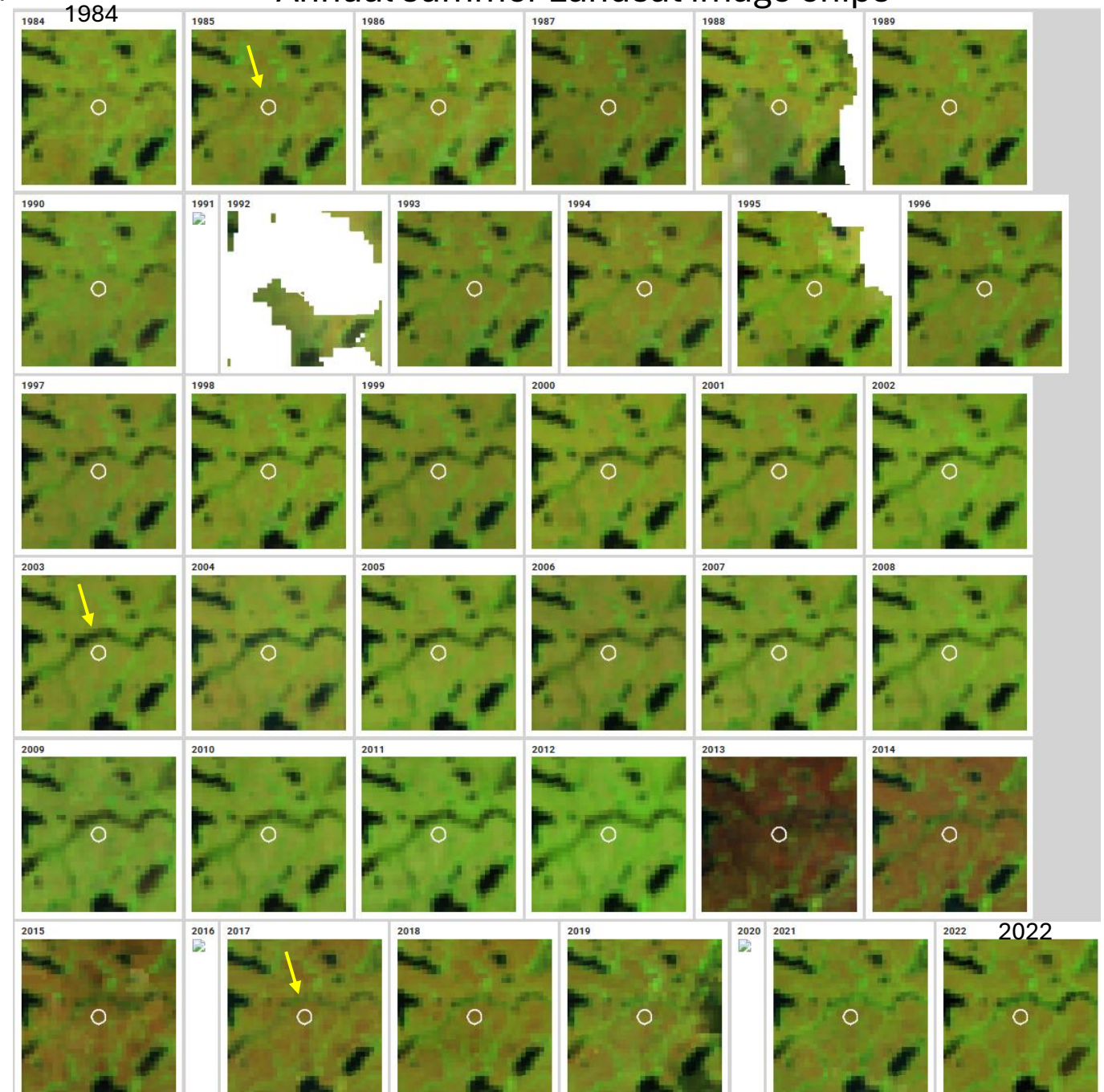


93.9168023°W 57.3197863°N

Annual area (ha)

a1985	0.0279
a1986	0.0297
a1987	0.036
a1988	0.0234
a1989	0.0306
a1990	0.0396
a1991	0.0459
a1992	0.0531
a1993	0.1143
a1994	0.0837
a1995	0.2682
a1996	0.3456
a1997	0.3996
a1998	0.5328
a1999	0.4824
a2000	0.5337
a2001	0.4824
a2002	0.5607
a2003	0.5454
a2004	0.5085
a2005	0.4365
a2006	0.4698
a2007	0.4761
a2008	0.6444
a2009	0.6138
a2010	0.4239
a2011	0.3348
a2012	0.4248
a2013	0.1017
a2014	0.0891
a2015	0.0603
a2016	0.0225
a2017	0.0225
a2018	0.027
a2019	0.0324
a2020	0.0387
a2021	0.0441

Annual summer Landsat image chips



FID 34

High-res validation

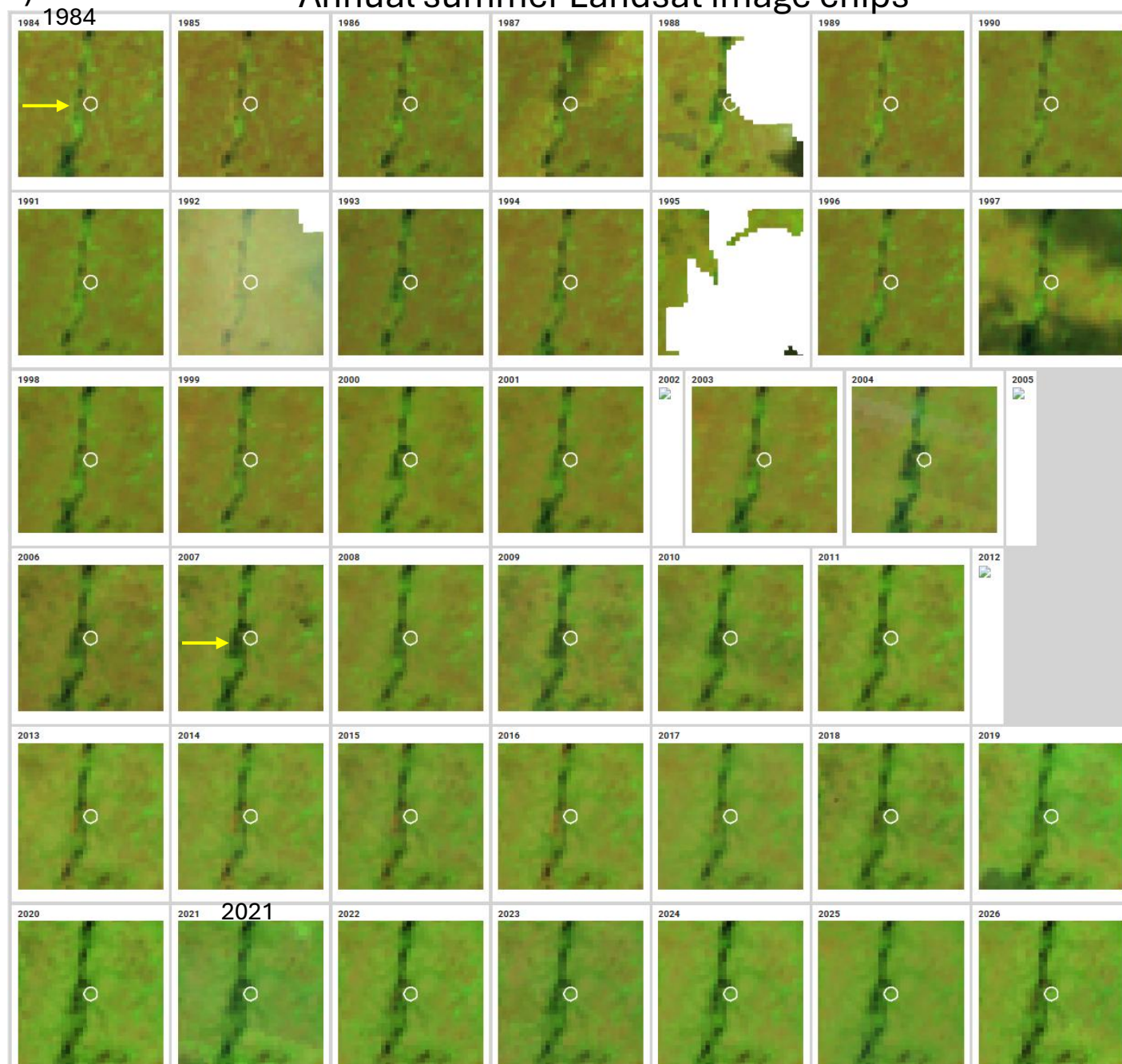


93.4620640°W 57.2198041°N

Annual area (ha)

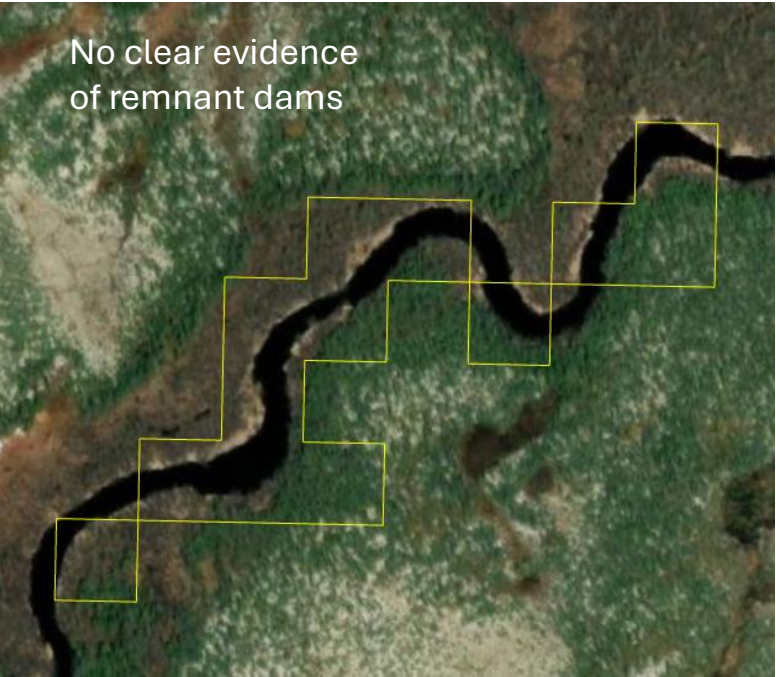
a1985	0.0306
a1986	0.0783
a1987	0.1647
a1988	0.0594
a1989	0.0639
a1990	0
a1991	0.0396
a1992	0.1314
a1993	0.1431
a1994	0.09
a1995	0.0333
a1996	0.0315
a1997	0.0891
a1998	0.0603
a1999	0.0621
a2000	0.0621
a2001	0.0954
a2002	0.0621
a2003	0.0873
a2004	0.2205
a2005	0.2322
a2006	0.306
a2007	0.3708
a2008	0.4527
a2009	0.4608
a2010	0.3843
a2011	0.3276
a2012	0.2439
a2013	0.1521
a2014	0.108
a2015	0.1053
a2016	0.1026
a2017	0.1053
a2018	0.126
a2019	0.1854
a2020	0.2313
a2021	0.1827

Annual summer Landsat image chips



FID 35

High-res validation



93.0105572°W 57.5370783°N

Annual area (ha)

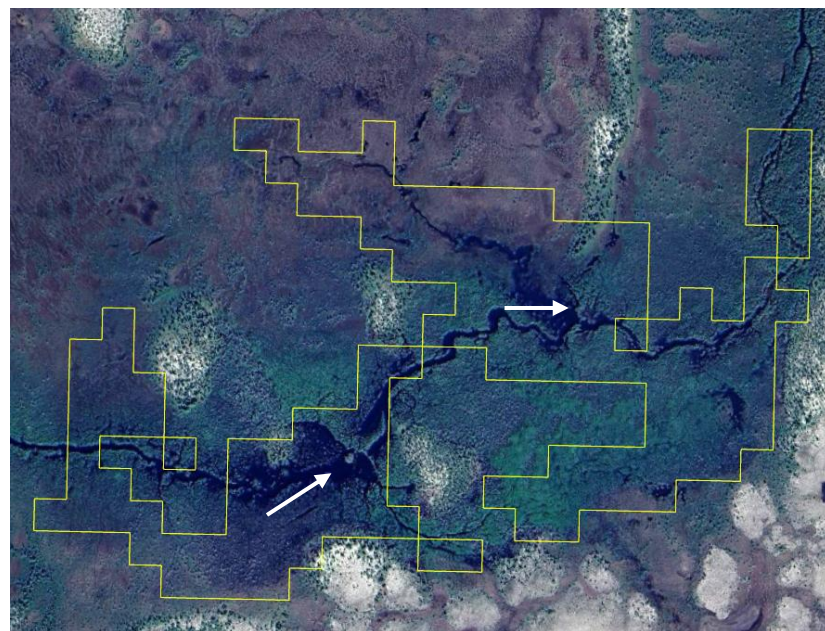
a1985	0
a1986	0
a1987	0.0243
a1988	0
a1989	0
a1990	0
a1991	0.1251
a1992	0.0252
a1993	0
a1994	0
a1995	0
a1996	0
a1997	0
a1998	0
a1999	0
a2000	0
a2001	0
a2002	0
a2003	0
a2004	0
a2005	0
a2006	0
a2007	0.0171
a2008	0.1251
a2009	0.0153
a2010	0.099
a2011	0.0135
a2012	0.0684
a2013	0
a2014	0
a2015	0.0495
a2016	0.0558
a2017	0.0414
a2018	0.0423
a2019	0.045
a2020	0.0576
a2021	0.0765

Annual summer Landsat image chips



FID 36

High-res validation

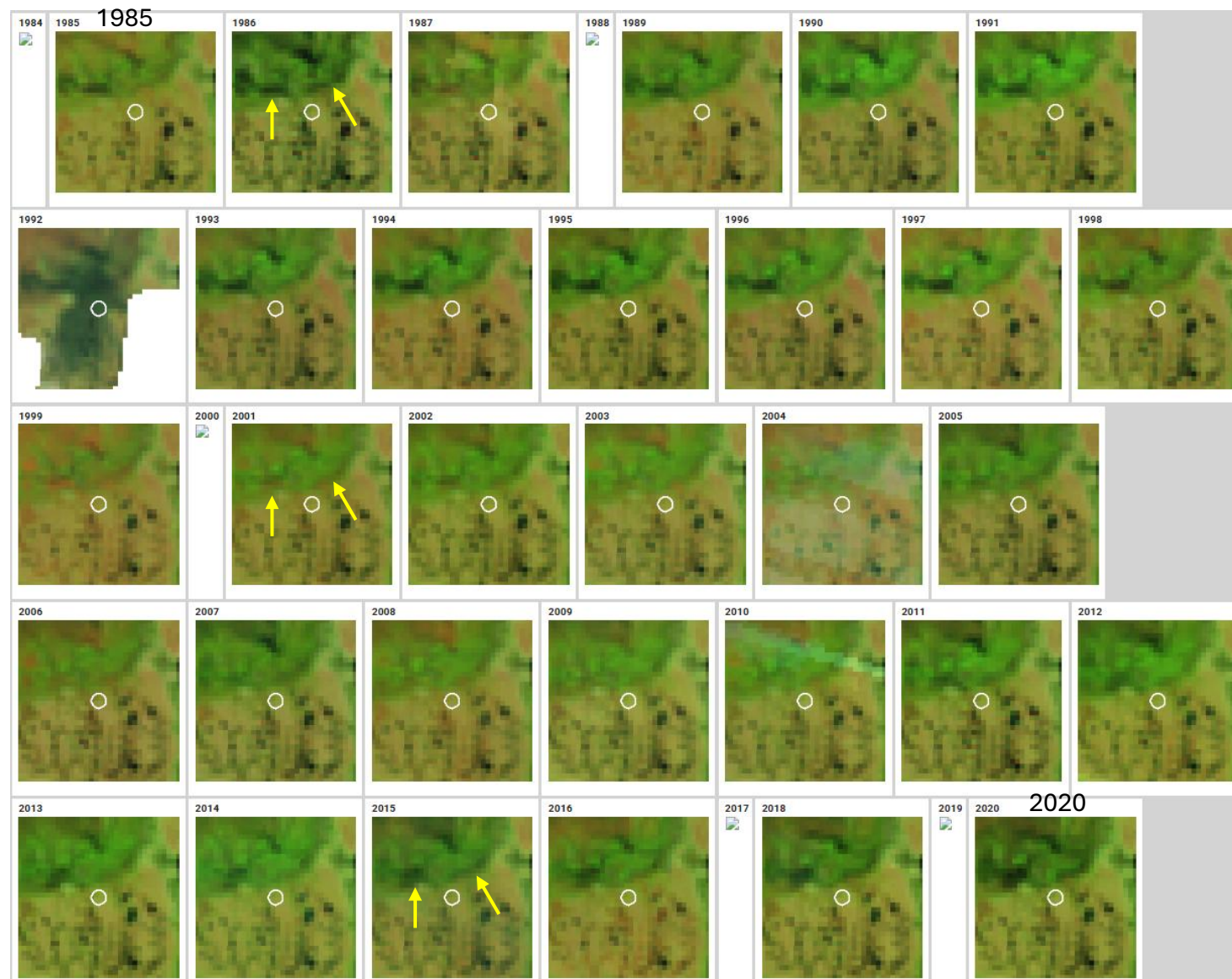


92.7897358°W 57.4172305°N

Annual area (ha)

a1985	0.2961
a1986	0.2826
a1987	1.4814
a1988	1.17
a1989	1.1241
a1990	0.9603
a1991	1.6983
a1992	1.8954
a1993	1.1907
a1994	0.6165
a1995	0.5229
a1996	0.5445
a1997	0.5904
a1998	0.4302
a1999	0.18
a2000	0
a2001	0.0207
a2002	0
a2003	0
a2004	0.0567
a2005	0.0297
a2006	0.306
a2007	0.3492
a2008	1.6434
a2009	0.3699
a2010	0.963
a2011	1.1214
a2012	0.9225
a2013	0.5805
a2014	0.8388
a2015	1.3374
a2016	1.3041
a2017	1.1646
a2018	1.1574
a2019	1.6092
a2020	1.7631
a2021	1.7118

Annual summer Landsat image chips



FID 37

High-res validation

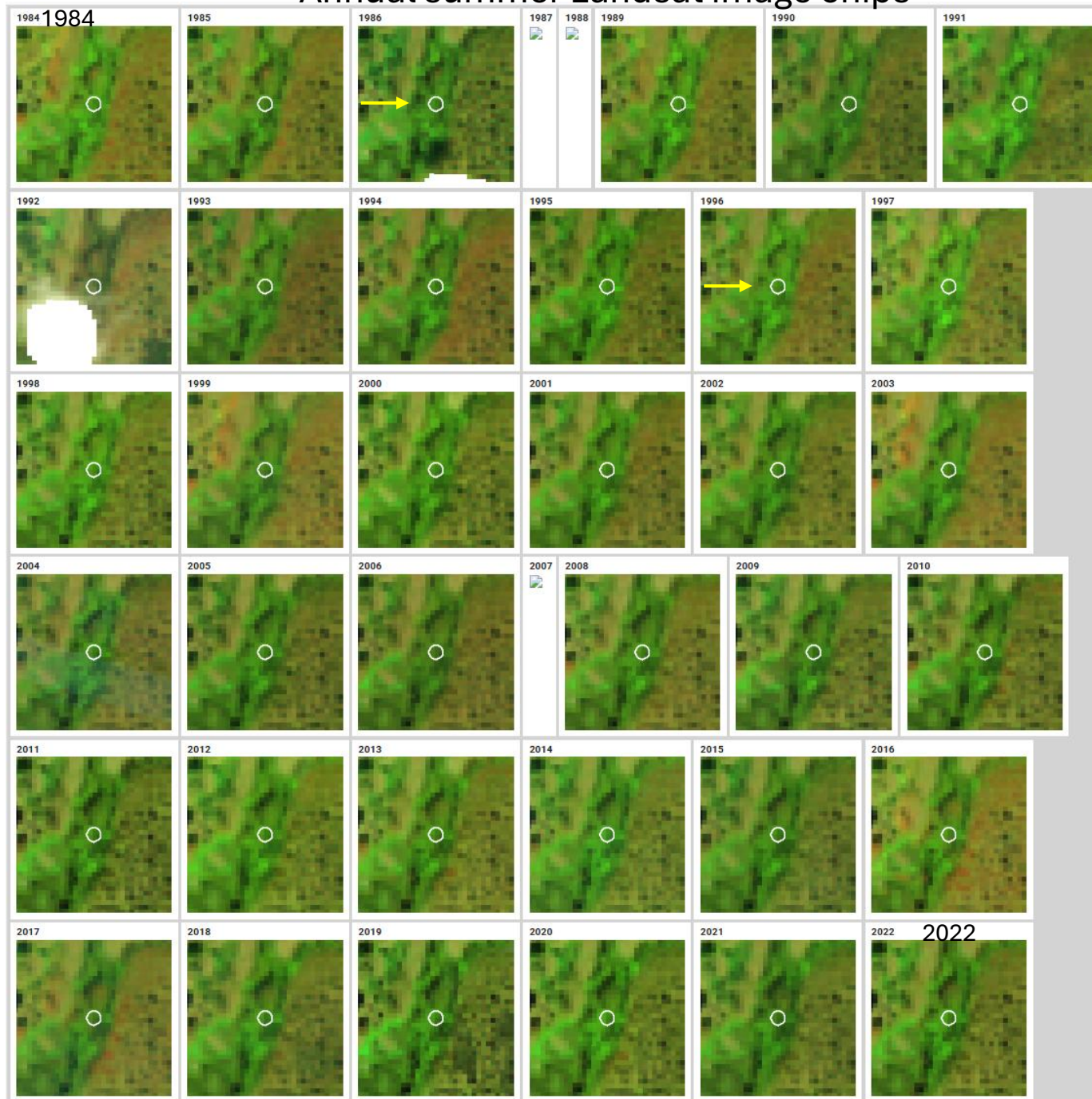


92.8392354°W 57.2356603°N

Annual area (ha)

a1985	0.0369
a1986	0.0828
a1987	0.0945
a1988	0.0324
a1989	0.0324
a1990	0.0333
a1991	0.1287
a1992	0.1359
a1993	0.0648
a1994	0.036
a1995	0.0315
a1996	0.0315
a1997	0.0315
a1998	0.0315
a1999	0.0333
a2000	0.0351
a2001	0.036
a2002	0.036
a2003	0.0369
a2004	0.036
a2005	0.0333
a2006	0.054
a2007	0.0747
a2008	0.081
a2009	0.0738
a2010	0.0909
a2011	0.0927
a2012	0.0549
a2013	0.0567
a2014	0.0333
a2015	0.0522
a2016	0.0909
a2017	0.0711
a2018	0.0738
a2019	0.0567
a2020	0.0612
a2021	0.0549

Annual summer Landsat image chips



FID 38

High-res validation

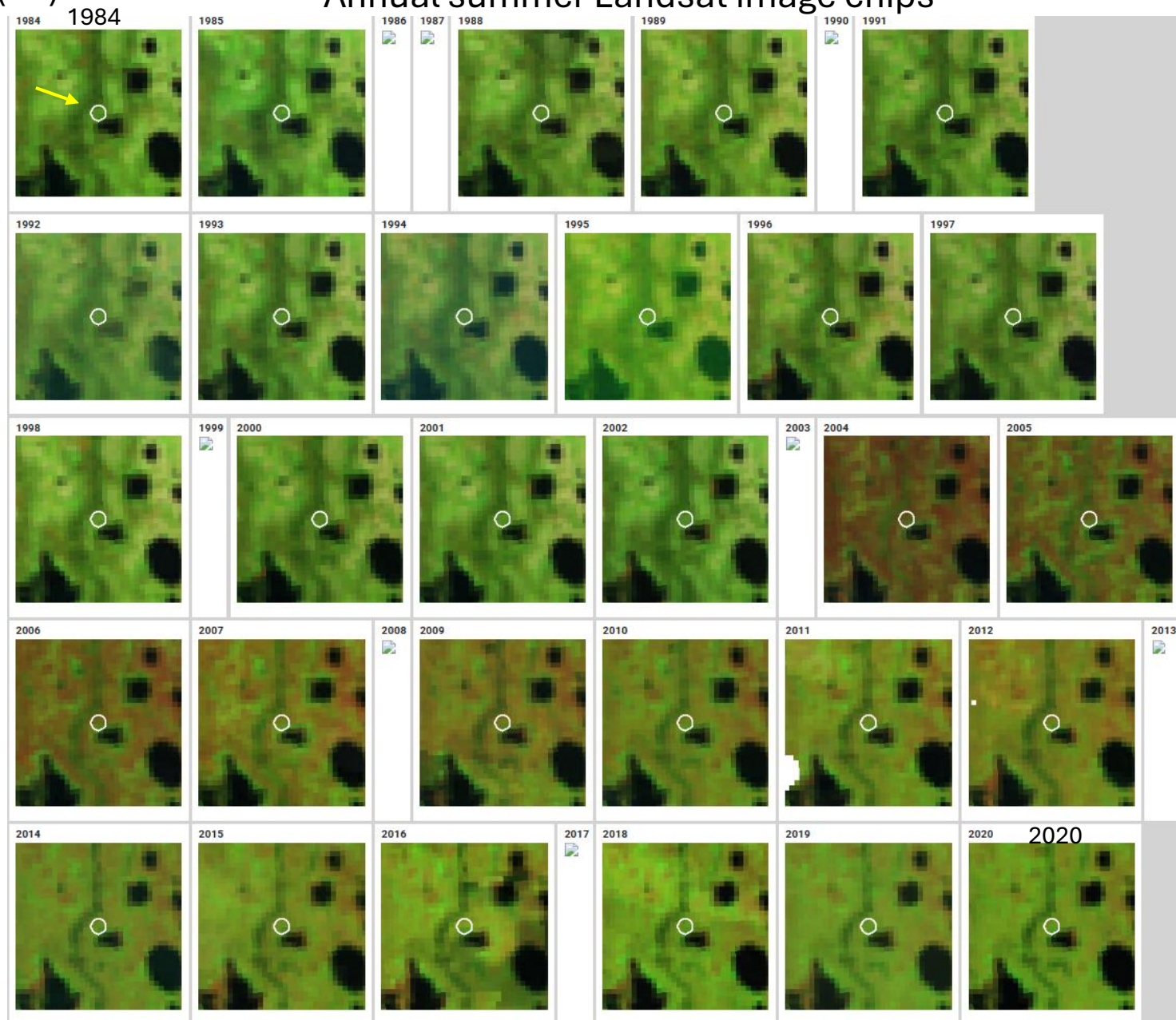


94.5355696°W 57.9971892°N

Annual area (ha)

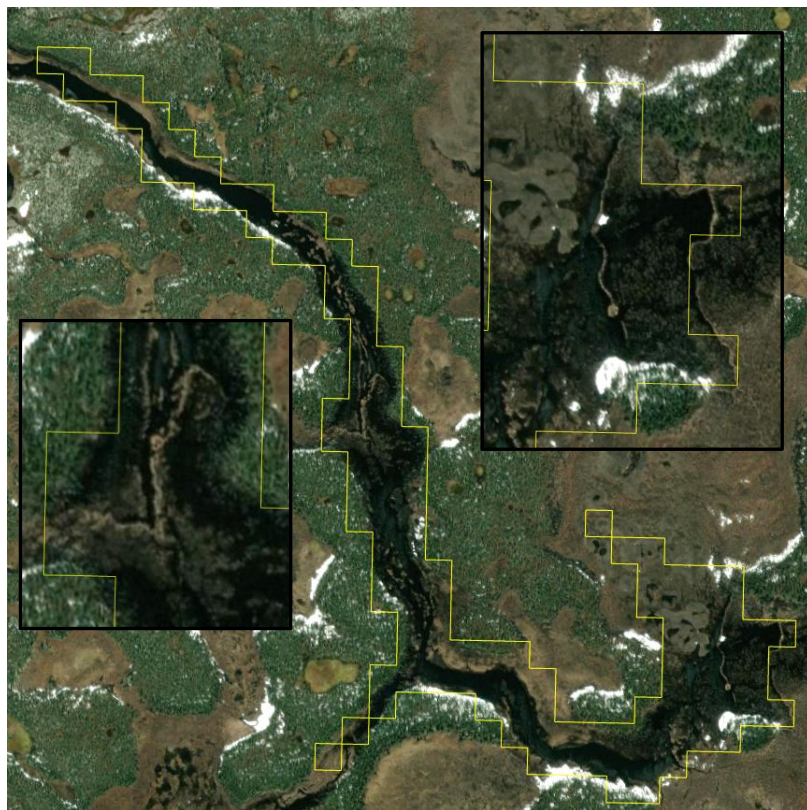
a1985	0.2637
a1986	0.3141
a1987	0.3015
a1988	0.0792
a1989	0.0855
a1990	0.0171
a1991	0.0612
a1992	0.0747
a1993	0
a1994	0
a1995	0
a1996	0
a1997	0.0162
a1998	0.0459
a1999	0.0585
a2000	0.0153
a2001	0.0189
a2002	0.0837
a2003	0.2214
a2004	0.0468
a2005	0.0513
a2006	0.0882
a2007	0.0684
a2008	0.0477
a2009	0.0774
a2010	0.1854
a2011	0.2511
a2012	0.2385
a2013	0
a2014	0
a2015	0
a2016	0.0207
a2017	0.117
a2018	0.0684
a2019	0.027
a2020	0.0252
a2021	0.0522

Annual summer Landsat image chips



FID 39

High-res validation

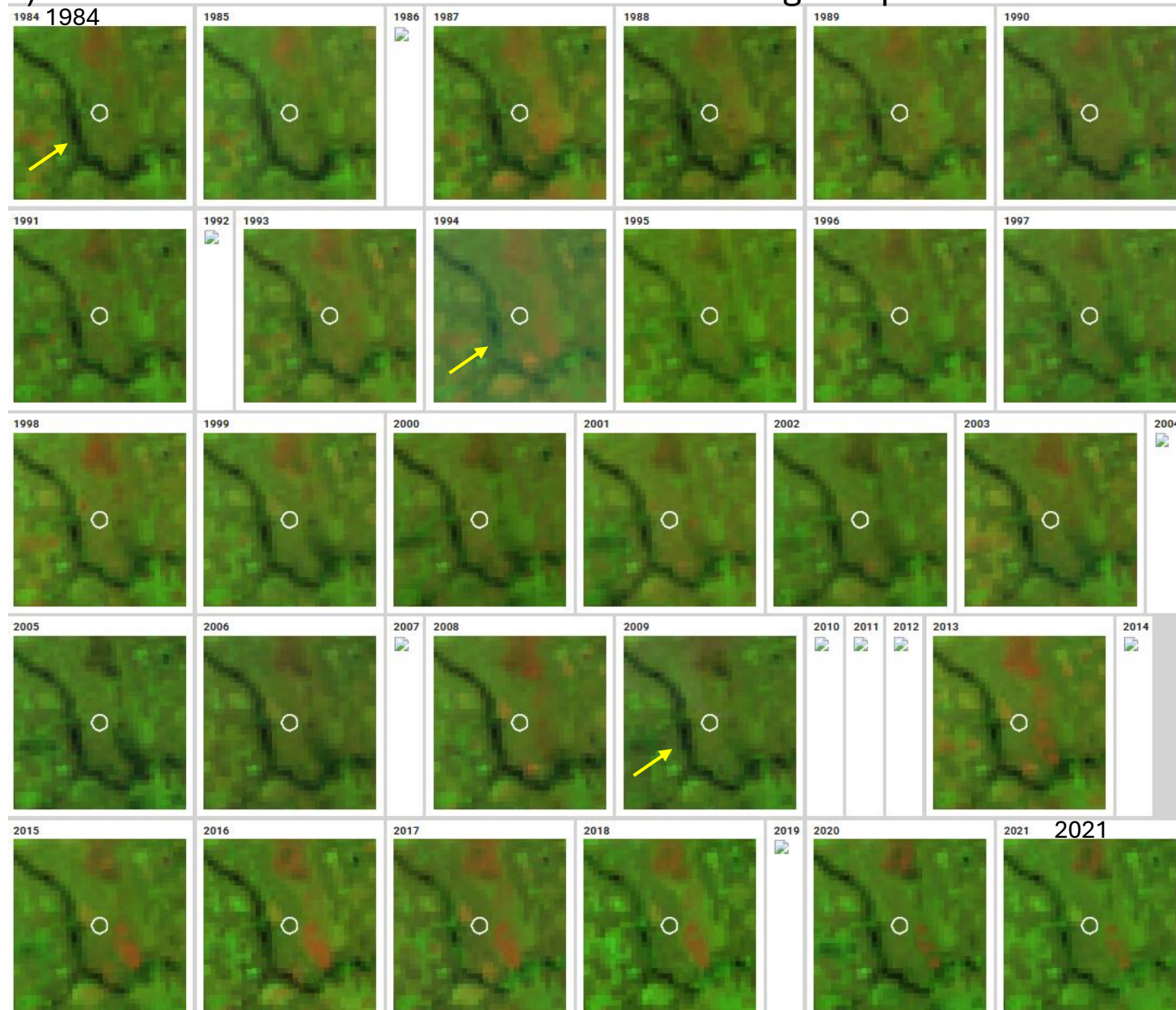


94.3355263°W 57.7836059°N

Annual area (ha)

a1985	2.9709
a1986	2.3112
a1987	2.7297
a1988	2.3229
a1989	2.4057
a1990	2.241
a1991	2.0808
a1992	2.2923
a1993	1.4436
a1994	1.4112
a1995	1.4148
a1996	1.7685
a1997	2.0151
a1998	2.349
a1999	2.3535
a2000	2.2662
a2001	2.4345
a2002	2.0196
a2003	2.2968
a2004	2.574
a2005	2.6298
a2006	2.8341
a2007	2.9223
a2008	3.2031
a2009	3.1752
a2010	3.0942
a2011	3.0069
a2012	2.6118
a2013	2.2284
a2014	2.0934
a2015	2.2653
a2016	2.0619
a2017	1.9539
a2018	1.7829
a2019	2.1348
a2020	1.9791
a2021	1.8468

Annual summer Landsat image chips



FID 40

High-res validation



One early period
of ponding

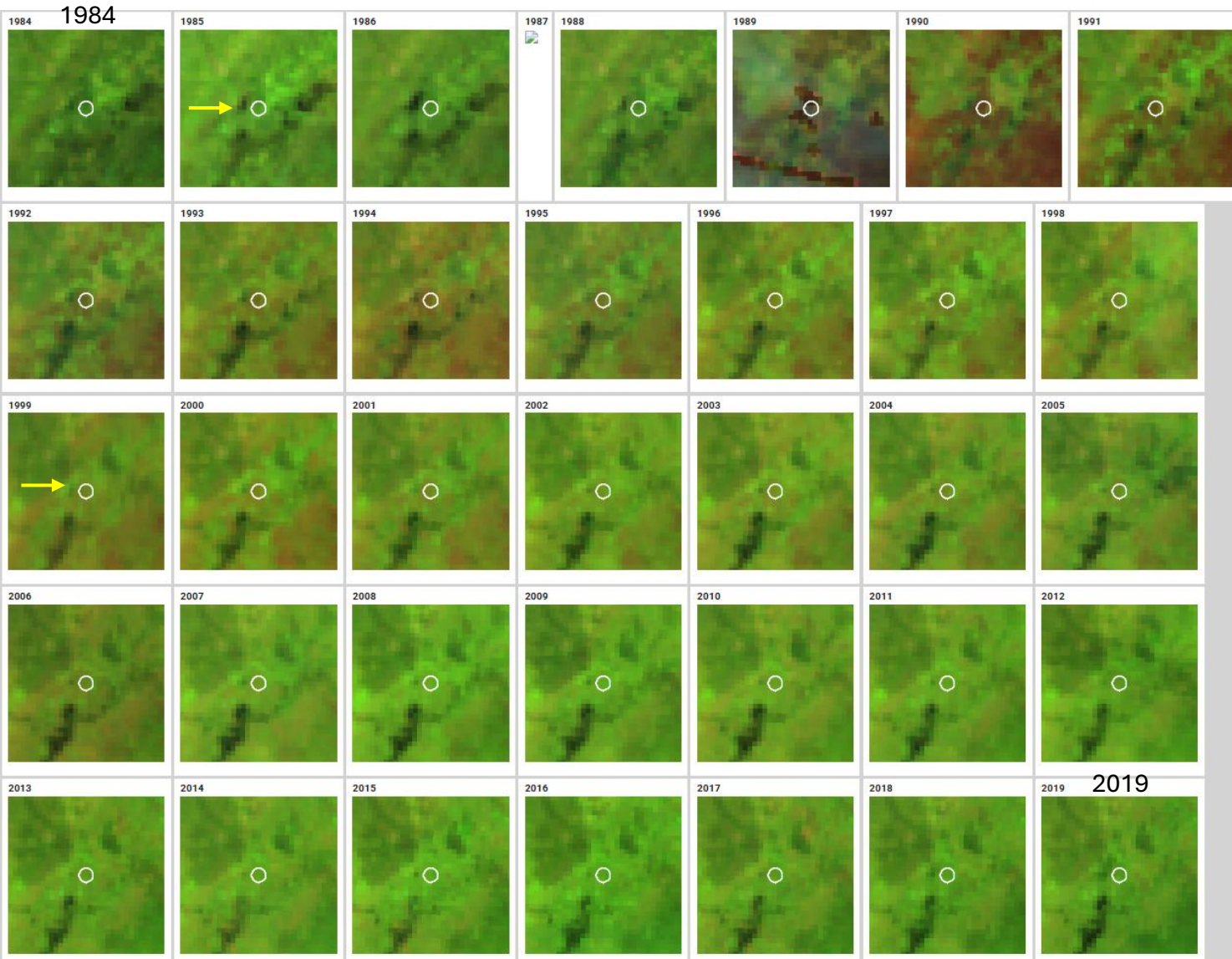


91.5707943°W 55.9817423°N

Annual area (ha)

a1985	0.063
a1986	0.1962
a1987	0.189
a1988	0.1728
a1989	0.054
a1990	0.0189
a1991	0.0243
a1992	0.0414
a1993	0.027
a1994	0.0234
a1995	0.0234
a1996	0.0162
a1997	0
a1998	0
a1999	0
a2000	0
a2001	0
a2002	0
a2003	0
a2004	0
a2005	0
a2006	0
a2007	0
a2008	0
a2009	0
a2010	0
a2011	0
a2012	0
a2013	0
a2014	0
a2015	0
a2016	0
a2017	0
a2018	0
a2019	0
a2020	0
a2021	0.0666

Annual summer Landsat image chips



FID 41

High-res validation

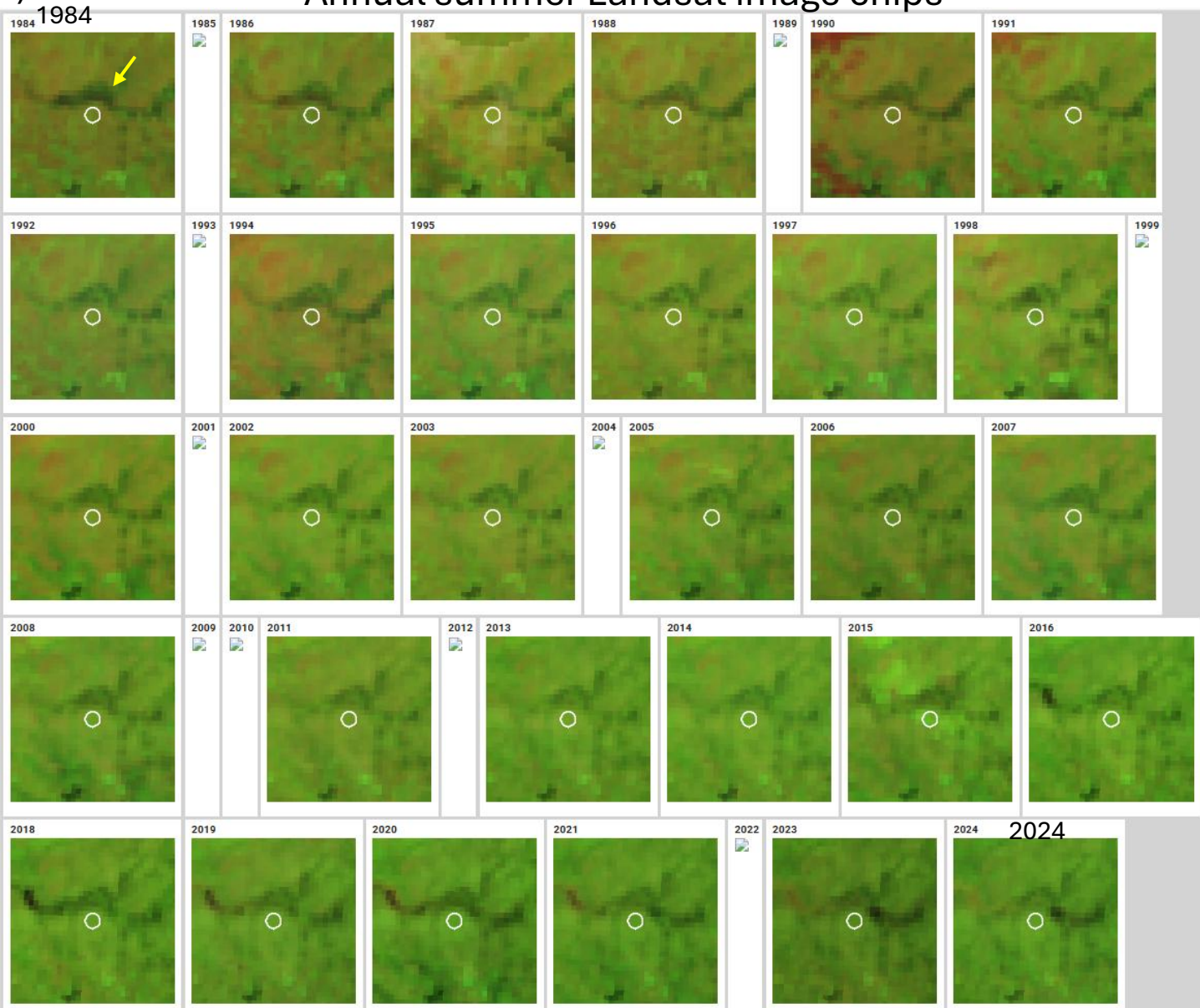


91.3622997°W 55.8689671°N

Annual area (ha)

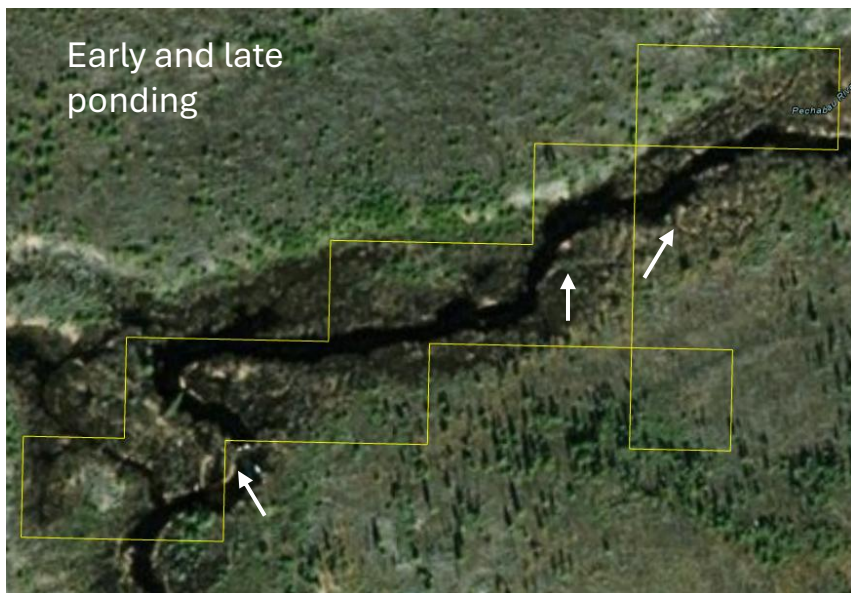
a1985	0.2475
a1986	0.2025
a1987	0.1539
a1988	0.0531
a1989	0
a1990	0
a1991	0.0207
a1992	0.0342
a1993	0.0558
a1994	0.0558
a1995	0
a1996	0
a1997	0
a1998	0.0153
a1999	0
a2000	0
a2001	0
a2002	0
a2003	0
a2004	0
a2005	0
a2006	0
a2007	0
a2008	0
a2009	0
a2010	0
a2011	0
a2012	0
a2013	0
a2014	0
a2015	0
a2016	0
a2017	0
a2018	0
a2019	0.0378
a2020	0.0666
a2021	0.1287

Annual summer Landsat image chips



FID 42

High-res validation

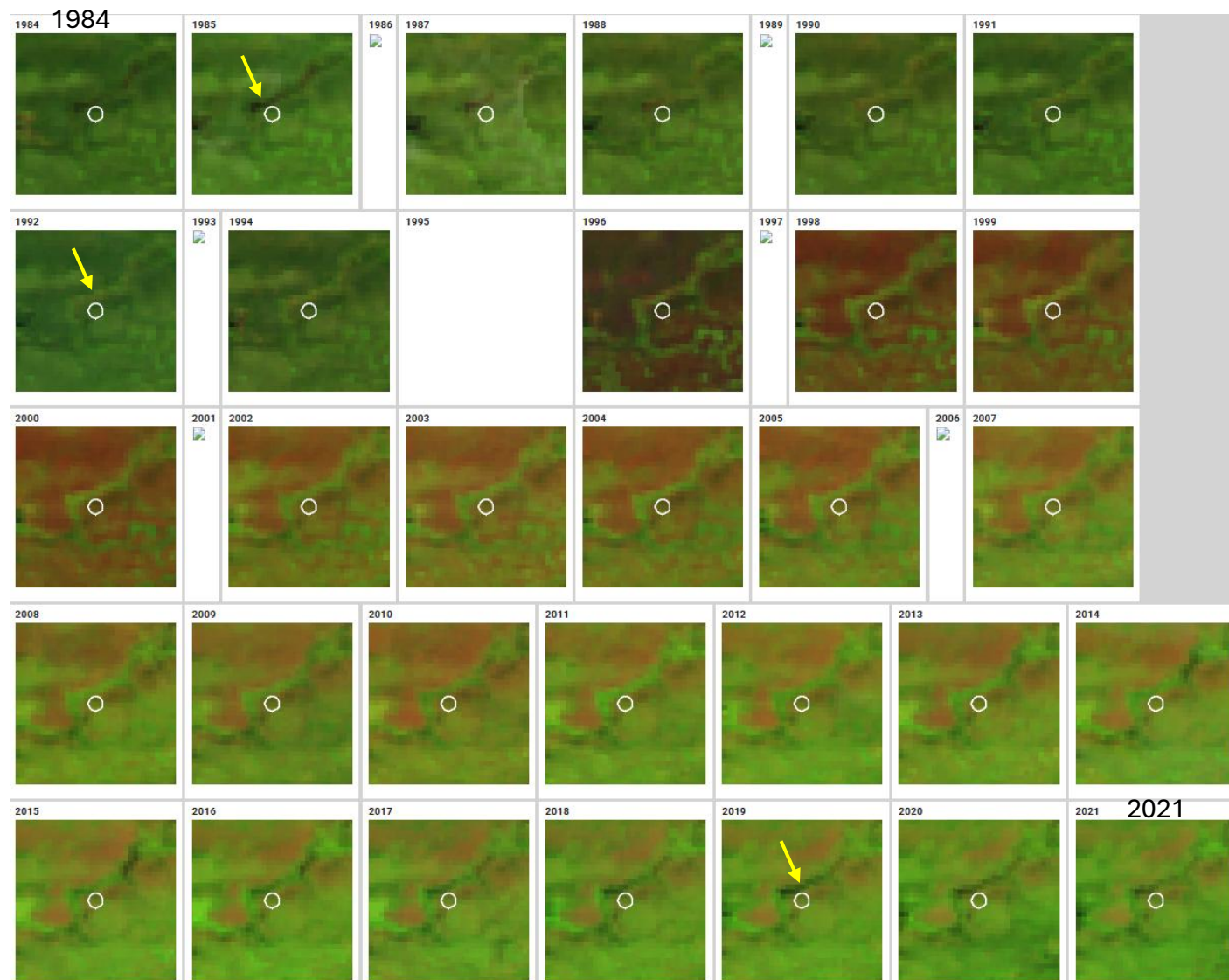


91.3934232°W 55.6172573°N

Annual area (ha)

a1985	0.2727
a1986	0.2889
a1987	0.2142
a1988	0.1539
a1989	0.036
a1990	0
a1991	0.0126
a1992	0.0144
a1993	0.0189
a1994	0.0126
a1995	0.0198
a1996	0.0144
a1997	0
a1998	0
a1999	0
a2000	0
a2001	0
a2002	0.0108
a2003	0
a2004	0
a2005	0
a2006	0
a2007	0
a2008	0
a2009	0
a2010	0
a2011	0
a2012	0
a2013	0
a2014	0
a2015	0
a2016	0
a2017	0.0729
a2018	0.1116
a2019	0.153
a2020	0.1242
a2021	0.1026

Annual summer Landsat image chips



FID 43

High-res validation



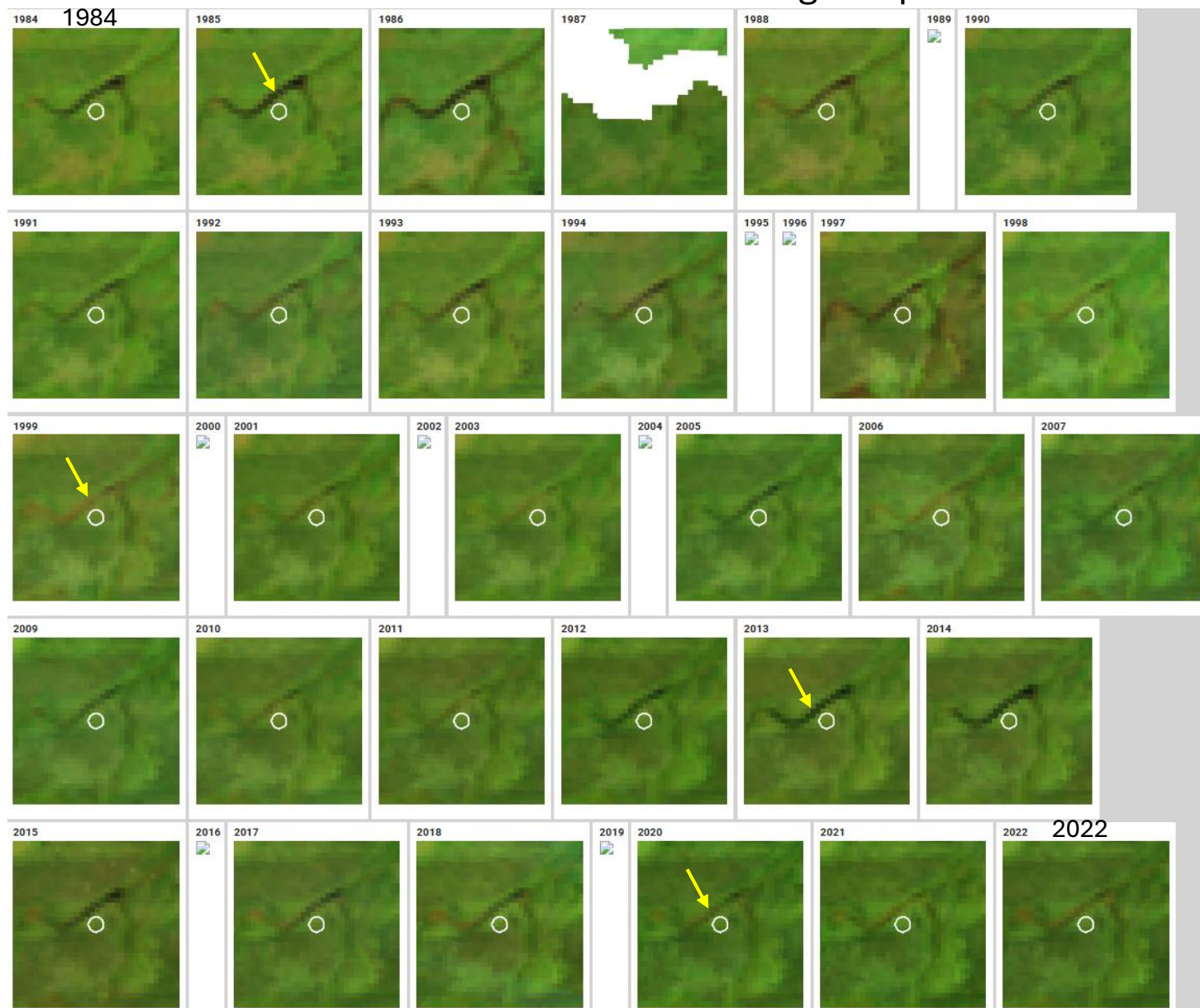
Early and late
ponding

91.8190930°W 56.4299784°N

Annual area (ha)

a1985	1.1745
a1986	0.9603
a1987	0.6795
a1988	0.5103
a1989	0.4752
a1990	0.3726
a1991	0.4221
a1992	0.4014
a1993	0.3465
a1994	0.252
a1995	0.1629
a1996	0.1458
a1997	0.0639
a1998	0.2133
a1999	0.0324
a2000	0.0315
a2001	0.0324
a2002	0.027
a2003	0.0261
a2004	0.0315
a2005	0.0351
a2006	0.0621
a2007	0.0315
a2008	0.1269
a2009	0.027
a2010	0.027
a2011	0.0684
a2012	0.6102
a2013	0.9954
a2014	1.1016
a2015	0.882
a2016	0.6075
a2017	0.5022
a2018	0.3474
a2019	0.1611
a2020	0.1413
a2021	0.1647

Annual summer Landsat image chips



FID 44

High-res validation

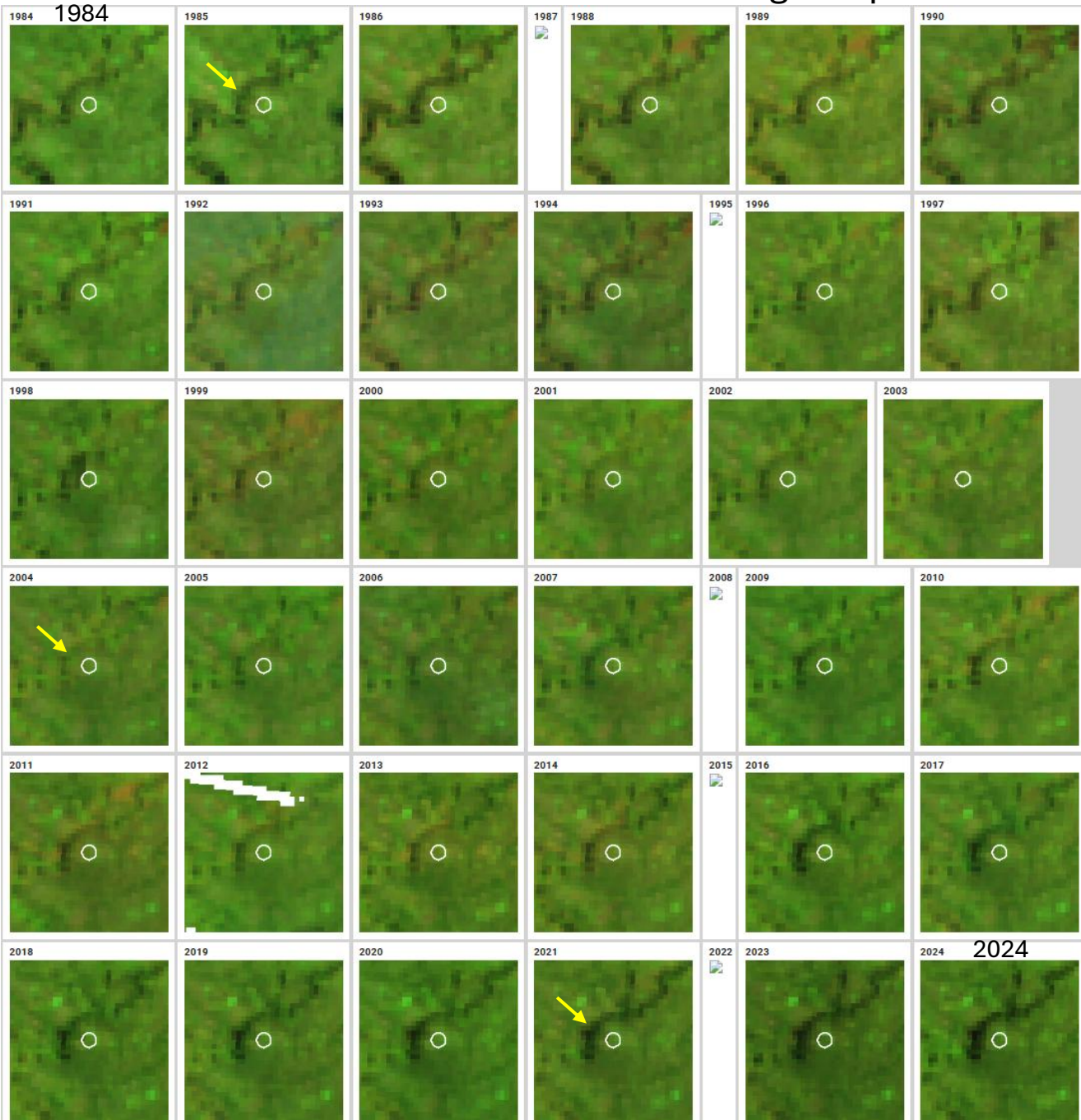


90.9555848°W 56.2342755°N

Annual area (ha)

a1985	0.4743
a1986	0.6291
a1987	0.6111
a1988	0.5922
a1989	0.4887
a1990	0.4374
a1991	0.567
a1992	0.441
a1993	0.5112
a1994	0.5166
a1995	0.3258
a1996	0.5211
a1997	0.3141
a1998	0.3771
a1999	0.3519
a2000	0.2853
a2001	0.2988
a2002	0.1368
a2003	0.1422
a2004	0.1134
a2005	0.1737
a2006	0.2943
a2007	0.5193
a2008	0.5589
a2009	0.6048
a2010	0.4914
a2011	0.4554
a2012	0.3384
a2013	0.2268
a2014	0.2007
a2015	0.3465
a2016	0.6579
a2017	0.738
a2018	0.7344
a2019	0.7731
a2020	0.8145
a2021	1.0071

Annual summer Landsat image chips



FID 45

High-res validation

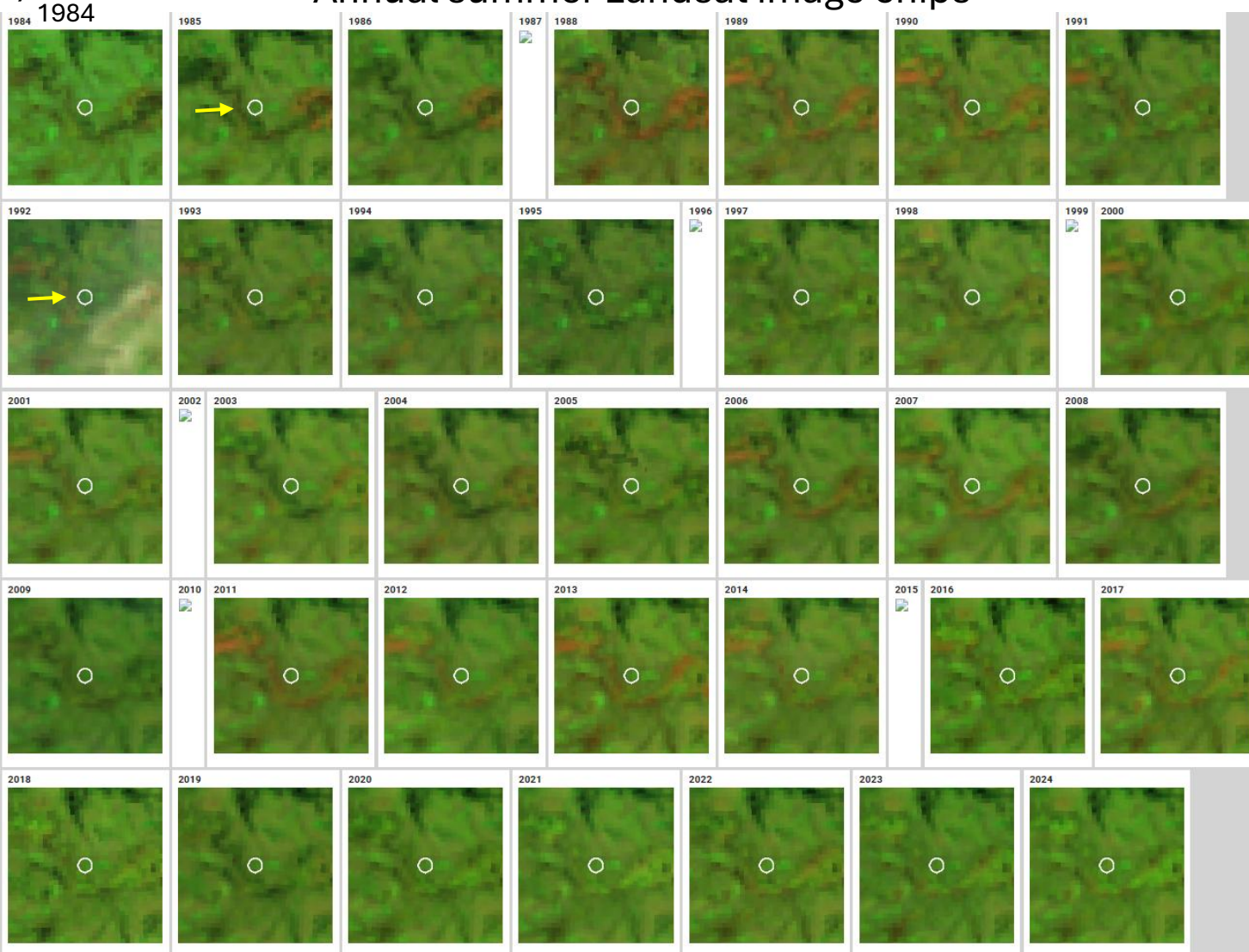


89.2578141°W 55.3441069°N

Annual area (ha)

a1985	0.1602
a1986	0.1872
a1987	0.1719
a1988	0.1044
a1989	0.0603
a1990	0.0324
a1991	0.0486
a1992	0.0837
a1993	0.0225
a1994	0
a1995	0.0288
a1996	0.027
a1997	0.0126
a1998	0.0414
a1999	0.0297
a2000	0.018
a2001	0
a2002	0.0153
a2003	0.0378
a2004	0.0288
a2005	0.0306
a2006	0
a2007	0.0261
a2008	0
a2009	0.0135
a2010	0
a2011	0
a2012	0
a2013	0
a2014	0
a2015	0
a2016	0
a2017	0
a2018	0.0117
a2019	0.0396
a2020	0
a2021	0

Annual summer Landsat image chips



2025

FID 46

High-res validation

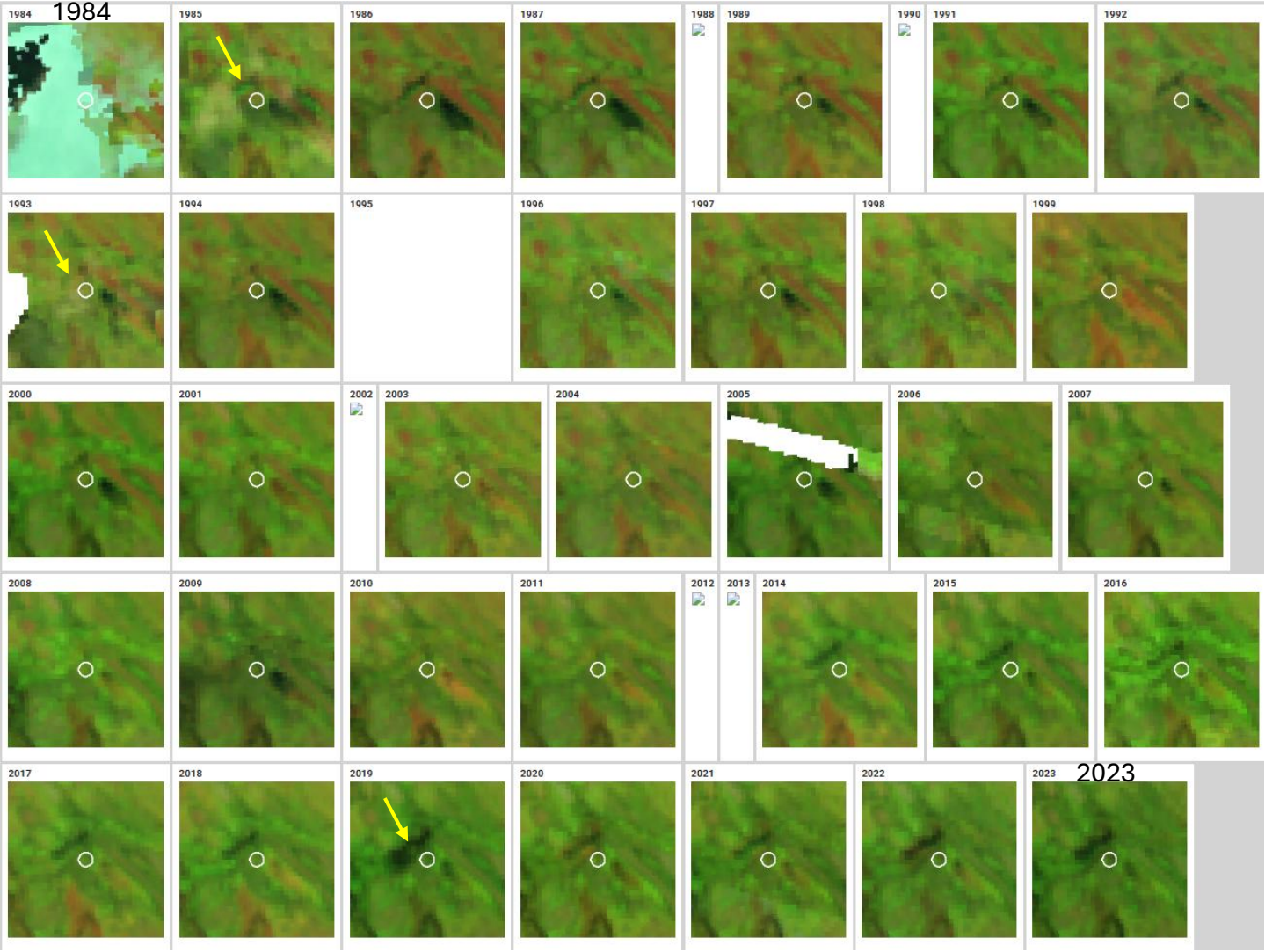


89.3380893°W 56.5684748°N

Annual area (ha)

a1985	0.2124
a1986	0.2268
a1987	0.2043
a1988	0.1665
a1989	0.1575
a1990	0.126
a1991	0.1737
a1992	0.09
a1993	0.0459
a1994	0
a1995	0
a1996	0
a1997	0.018
a1998	0
a1999	0
a2000	0
a2001	0.0495
a2002	0.0468
a2003	0.1296
a2004	0.0432
a2005	0.018
a2006	0
a2007	0
a2008	0.0216
a2009	0.0225
a2010	0
a2011	0
a2012	0
a2013	0.0459
a2014	0.1719
a2015	0.2367
a2016	0.2853
a2017	0.351
a2018	0.5706
a2019	0.8109
a2020	0.8199
a2021	0.6975

Annual summer Landsat image chips



FID 47

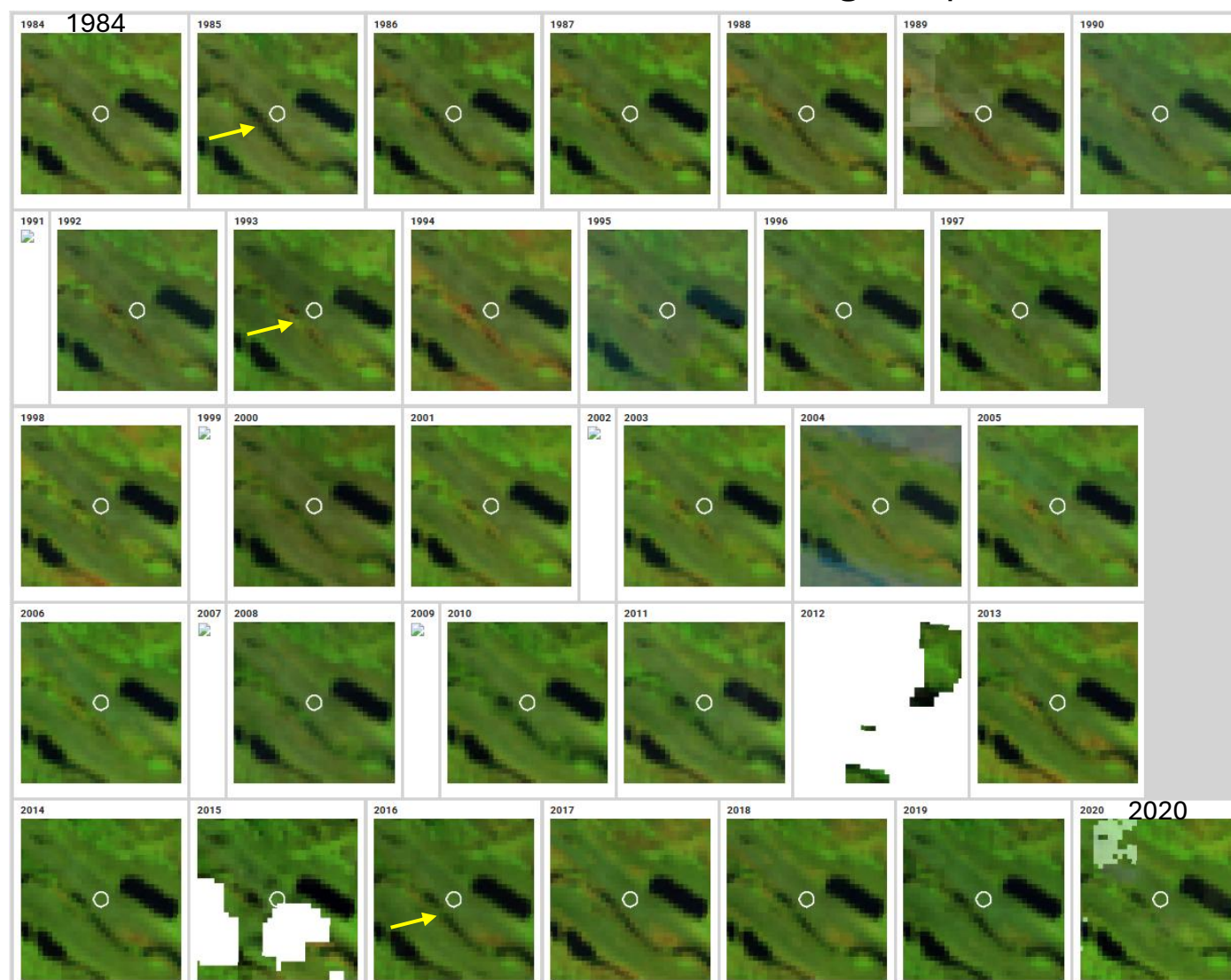
High-res validation



Annual area (ha)

Annual summer Landsat image chips

a1985	1.1457
a1986	1.0026
a1987	0.9396
a1988	0.7443
a1989	0.6579
a1990	0.2421
a1991	0.3384
a1992	0.2997
a1993	0.2772
a1994	0.3618
a1995	0.3132
a1996	0.2673
a1997	0.2268
a1998	0.2178
a1999	0.2088
a2000	0.1908
a2001	0.4284
a2002	0.3591
a2003	0.4437
a2004	0.2394
a2005	0.2637
a2006	0.3024
a2007	0.387
a2008	0.531
a2009	0.7641
a2010	0.9009
a2011	1.1727
a2012	0.9801
a2013	1.062
a2014	1.0323
a2015	0.9594
a2016	0.9063
a2017	0.8586
a2018	0.9495
a2019	0.9342
a2020	0.8595
a2021	0.7722



86.4052180°W 55.6295737°N

FID 48

High-res validation



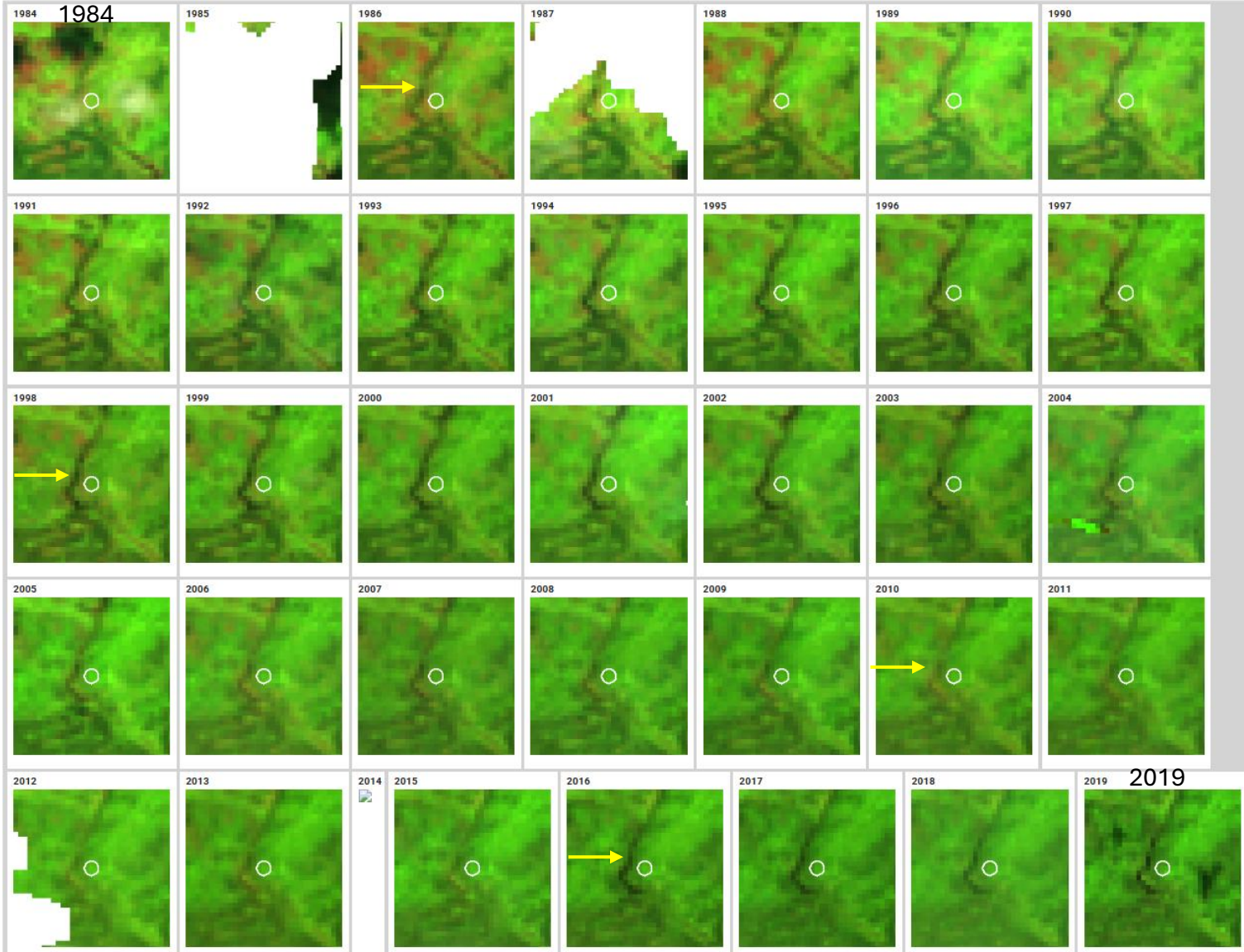
86.9607217°W 49.8311918°N



Annual area (ha)

a1985	0.0324
a1986	0.0828
a1987	0.0819
a1988	0.0648
a1989	0
a1990	0
a1991	0.1953
a1992	0.2529
a1993	0.3267
a1994	0.3123
a1995	0.5274
a1996	0.4842
a1997	0.5868
a1998	0.6363
a1999	0.6381
a2000	0.666
a2001	0.6174
a2002	0.6165
a2003	0.5652
a2004	0.3078
a2005	0.3006
a2006	0.2592
a2007	0.1575
a2008	0.0936
a2009	0.0414
a2010	0.0144
a2011	0.0468
a2012	0.0918
a2013	0.1728
a2014	0.1431
a2015	0.3051
a2016	0.4914
a2017	0.6246
a2018	0.6624
a2019	0.5544
a2020	0.5148
a2021	0.396

Annual summer Landsat image chips



FID 49

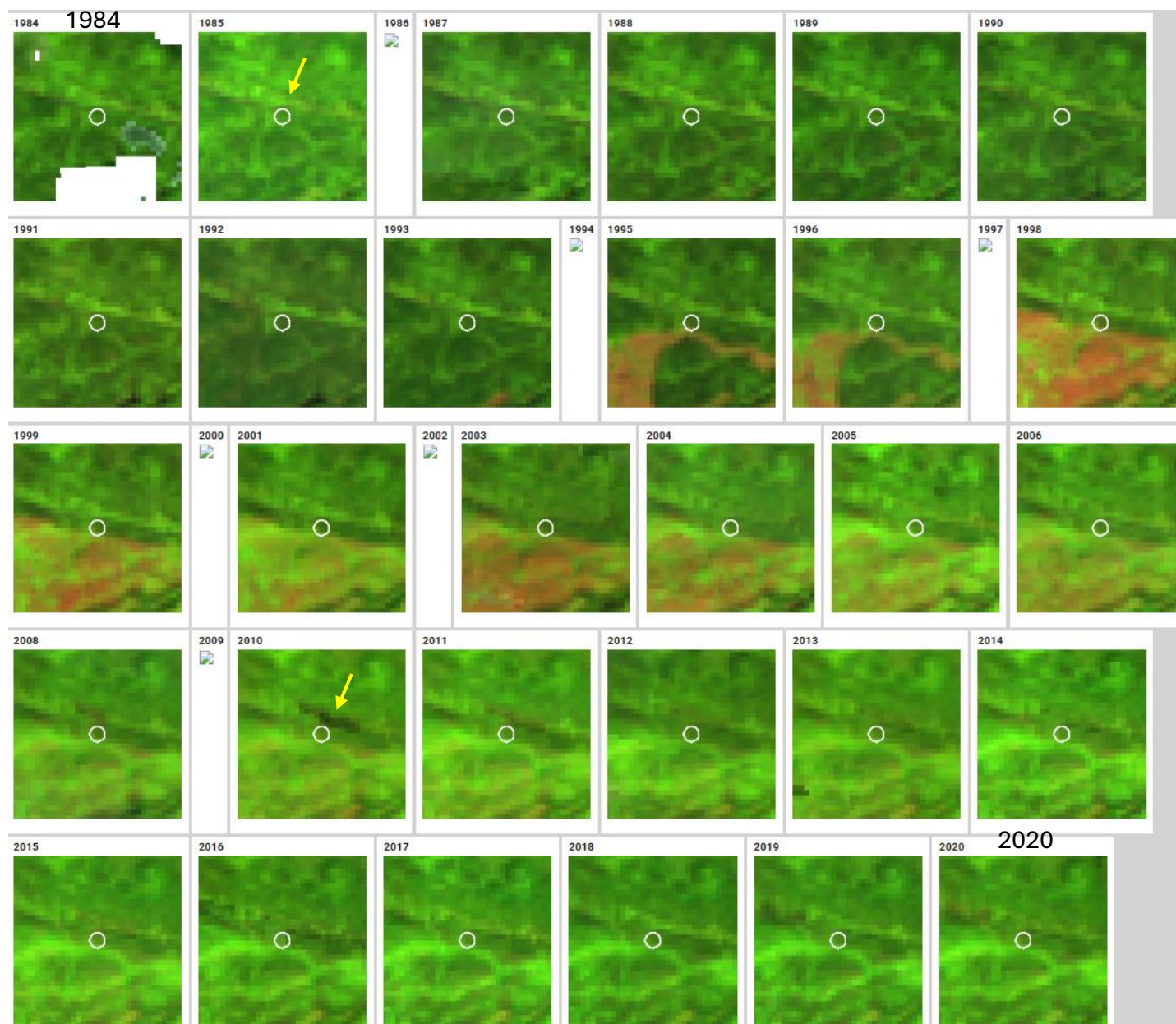
High-res validation



Annual area (ha)

a1985	0
a1986	0
a1987	0
a1988	0
a1989	0
a1990	0
a1991	0
a1992	0
a1993	0
a1994	0
a1995	0
a1996	0
a1997	0
a1998	0
a1999	0
a2000	0
a2001	0
a2002	0
a2003	0
a2004	0
a2005	0
a2006	0
a2007	0
a2008	0
a2009	0.216
a2010	0.2295
a2011	0.2376
a2012	0
a2013	0
a2014	0
a2015	0
a2016	0
a2017	0
a2018	0
a2019	0
a2020	0
a2021	0

Annual summer Landsat image chips



FID 50

High-res validation

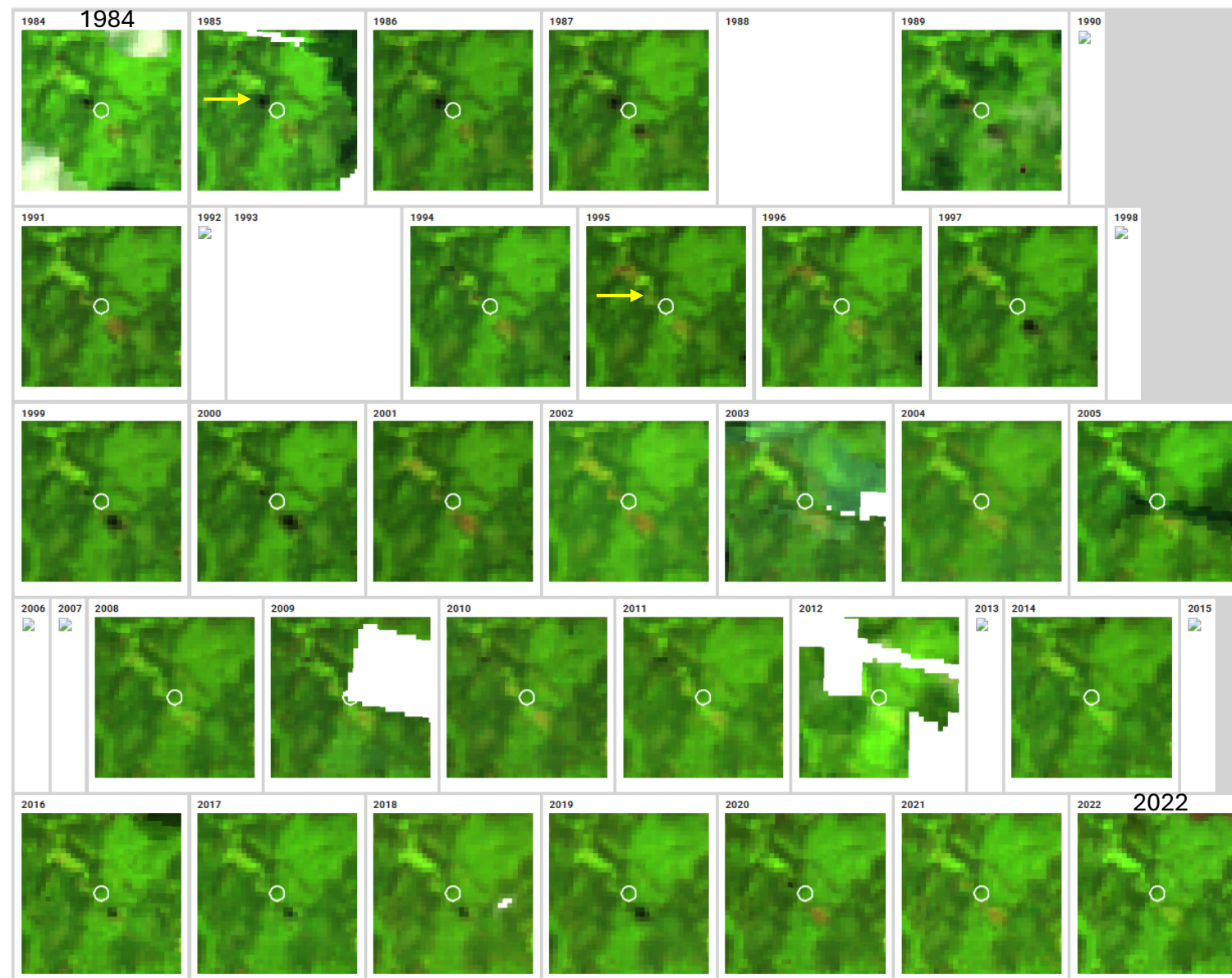


85.5973176°W 49.6236174°N

Annual area (ha)

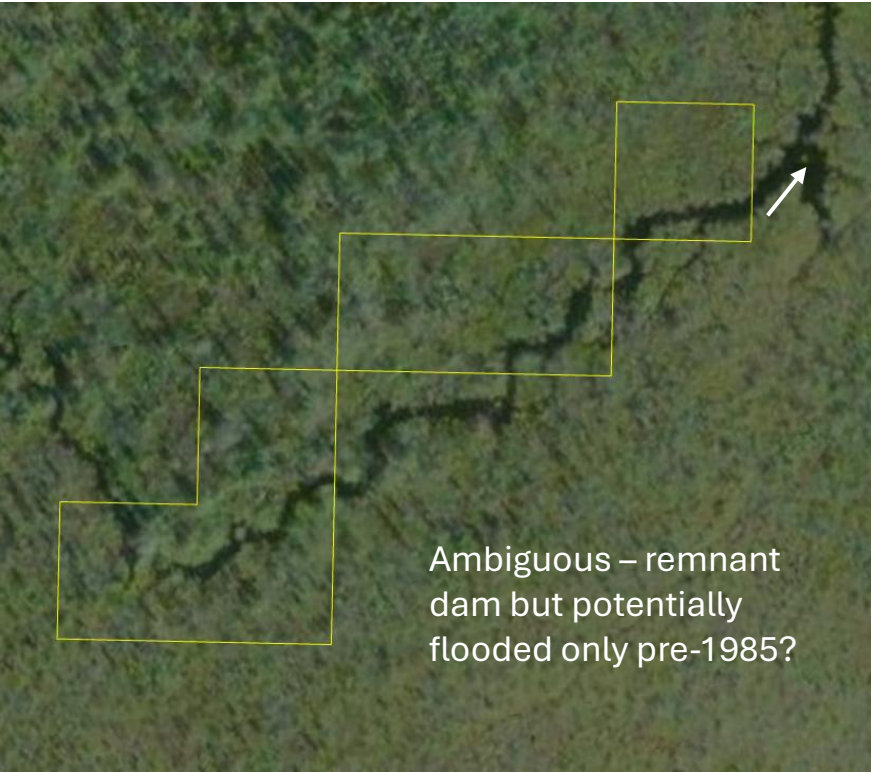
a1985	0.2619
a1986	0.3177
a1987	0.2997
a1988	0.2205
a1989	0.0513
a1990	0.0477
a1991	0.0378
a1992	0.0351
a1993	0
a1994	0
a1995	0
a1996	0
a1997	0
a1998	0
a1999	0.0819
a2000	0.0756
a2001	0.0693
a2002	0.0261
a2003	0
a2004	0
a2005	0
a2006	0
a2007	0
a2008	0
a2009	0
a2010	0
a2011	0
a2012	0
a2013	0
a2014	0
a2015	0
a2016	0
a2017	0
a2018	0
a2019	0
a2020	0
a2021	0

Annual summer Landsat image chips



FID 51

High-res validation

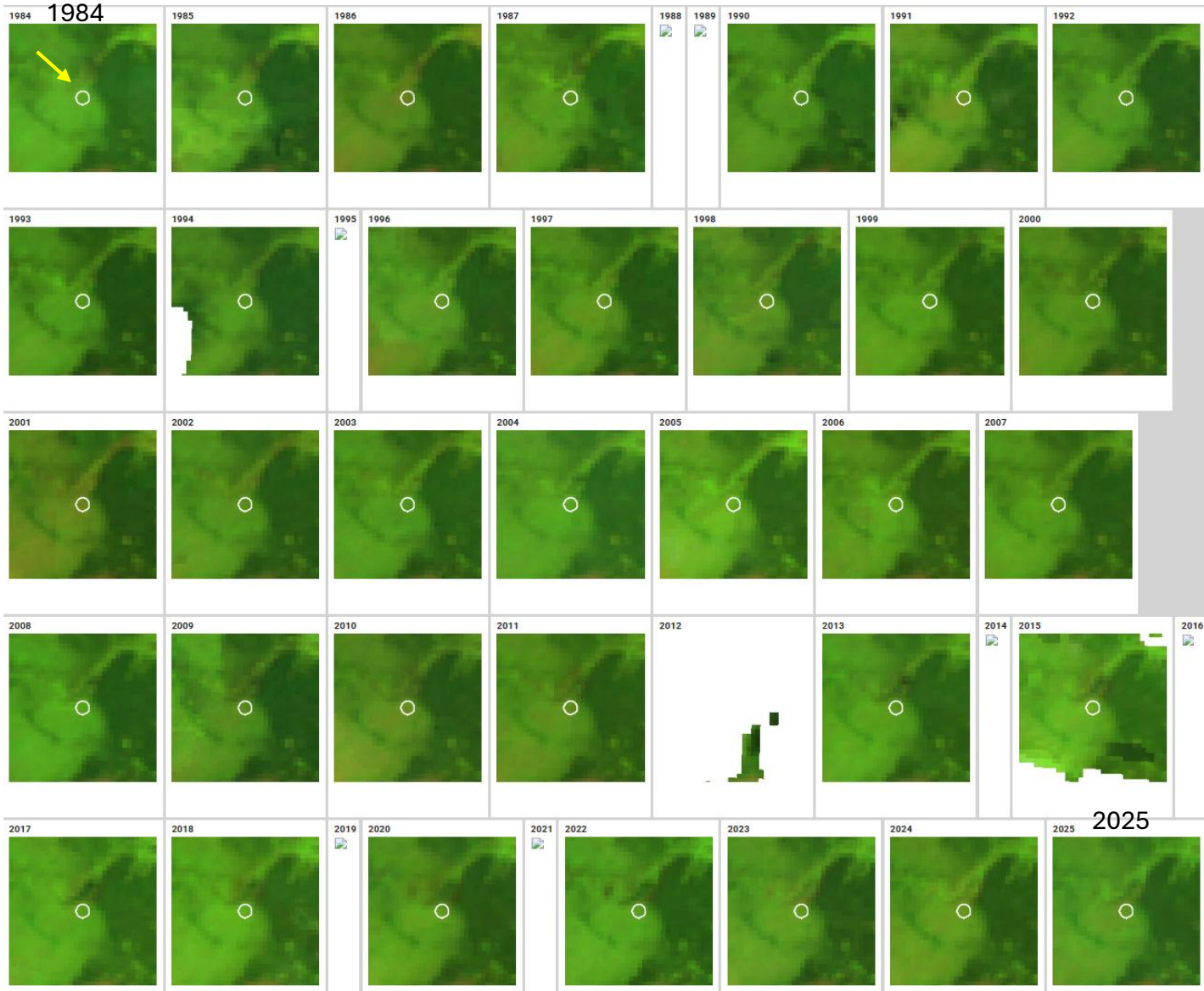


84.8732374°W 49.5026216°N

Annual area (ha)

a1985	0
a1986	0
a1987	0
a1988	0
a1989	0
a1990	0
a1991	0
a1992	0
a1993	0
a1994	0
a1995	0
a1996	0
a1997	0
a1998	0
a1999	0
a2000	0
a2001	0
a2002	0
a2003	0
a2004	0
a2005	0
a2006	0
a2007	0
a2008	0
a2009	0
a2010	0.009
a2011	0.0081
a2012	0
a2013	0.0279
a2014	0.0243
a2015	0.0324
a2016	0.0297
a2017	0.0288
a2018	0.1017
a2019	0.0738
a2020	0.0297
a2021	0.0189

Annual summer Landsat image chips



FID 52

High-res validation



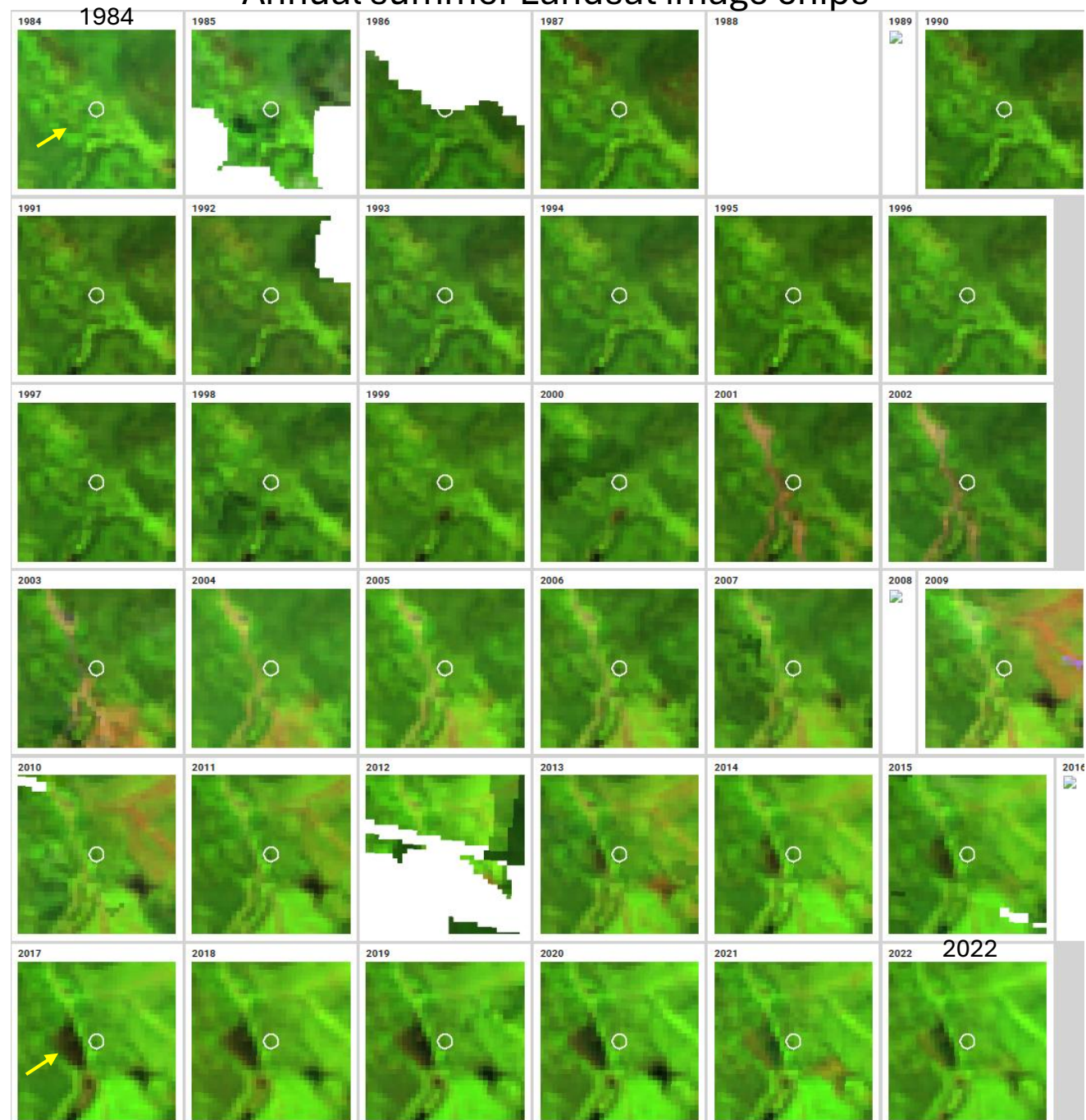
Used 2001 logging road
to help form dam –
ponding starts in 2012

85.4577513°W 49.9146497°N

Annual area (ha)

a1985	0.0738
a1986	0
a1987	0
a1988	0
a1989	0
a1990	0.0252
a1991	0.0216
a1992	0
a1993	0
a1994	0
a1995	0
a1996	0
a1997	0.0207
a1998	0.0207
a1999	0
a2000	0
a2001	0.018
a2002	0
a2003	0
a2004	0
a2005	0
a2006	0
a2007	0
a2008	0
a2009	0
a2010	0
a2011	0
a2012	0.1998
a2013	0.5535
a2014	0.7335
a2015	1.0521
a2016	1.44
a2017	1.5993
a2018	1.7937
a2019	1.7352
a2020	1.3869
a2021	0.882

Annual summer Landsat image chips



FID 53

High-res validation



Only one short period of
ponding 2011-2012

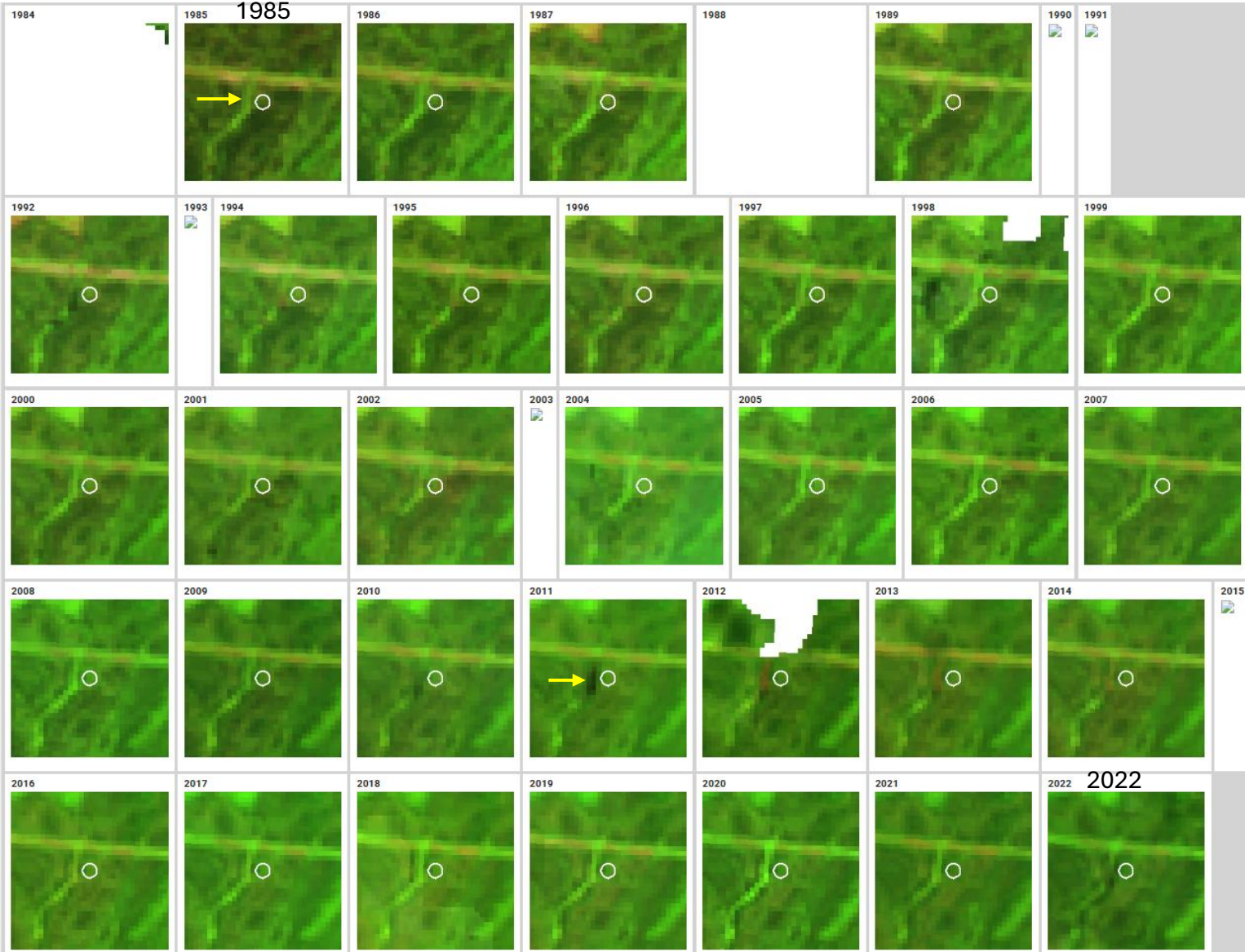


85.4607195°W 49.7611357°N

Annual area (ha)

a1985	0.0171
a1986	0.0171
a1987	0.0198
a1988	0.0171
a1989	0.0162
a1990	0.0207
a1991	0.0234
a1992	0.0873
a1993	0.0513
a1994	0.0189
a1995	0.0306
a1996	0.0252
a1997	0.0252
a1998	0
a1999	0
a2000	0.0162
a2001	0.0063
a2002	0
a2003	0
a2004	0
a2005	0
a2006	0
a2007	0
a2008	0
a2009	0
a2010	0.0351
a2011	0.189
a2012	0.1809
a2013	0.0396
a2014	0.0117
a2015	0
a2016	0
a2017	0
a2018	0
a2019	0
a2020	0
a2021	0

Annual summer Landsat image chips



FID 54

High-res validation

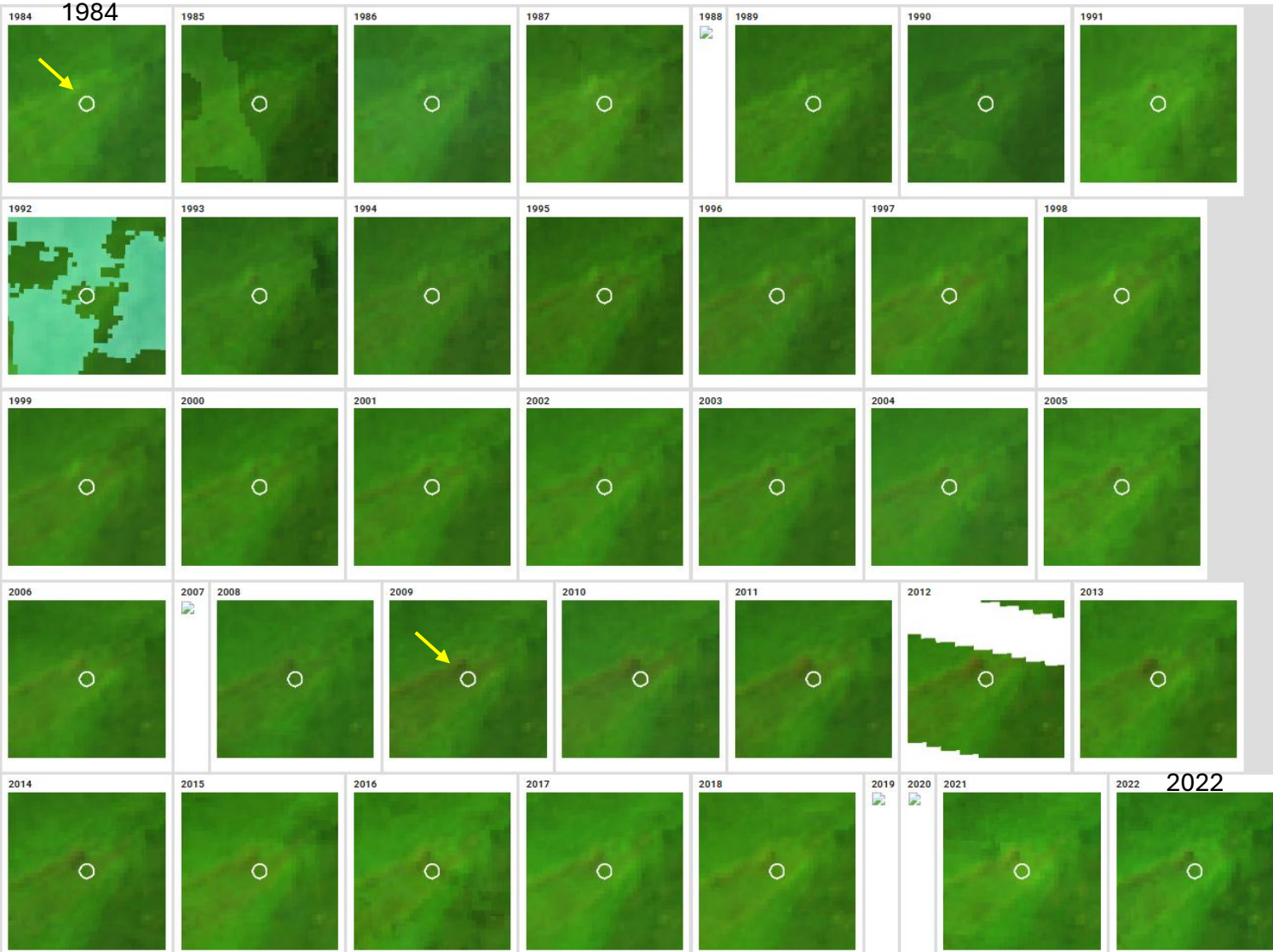


84.4751237°W 50.4077283°N

Annual area (ha)

a1985	0
a1986	0
a1987	0
a1988	0
a1989	0
a1990	0
a1991	0
a1992	0
a1993	0
a1994	0
a1995	0
a1996	0
a1997	0
a1998	0
a1999	0
a2000	0
a2001	0
a2002	0
a2003	0
a2004	0
a2005	0
a2006	0
a2007	0
a2008	0.0189
a2009	0.0585
a2010	0.0747
a2011	0.072
a2012	0.1053
a2013	0.1179
a2014	0.1044
a2015	0.0135
a2016	0
a2017	0
a2018	0
a2019	0.018
a2020	0
a2021	0

Annual summer Landsat image chips



FID 55

High-res validation



One period of flooding
2016-2019 after 1997 fire

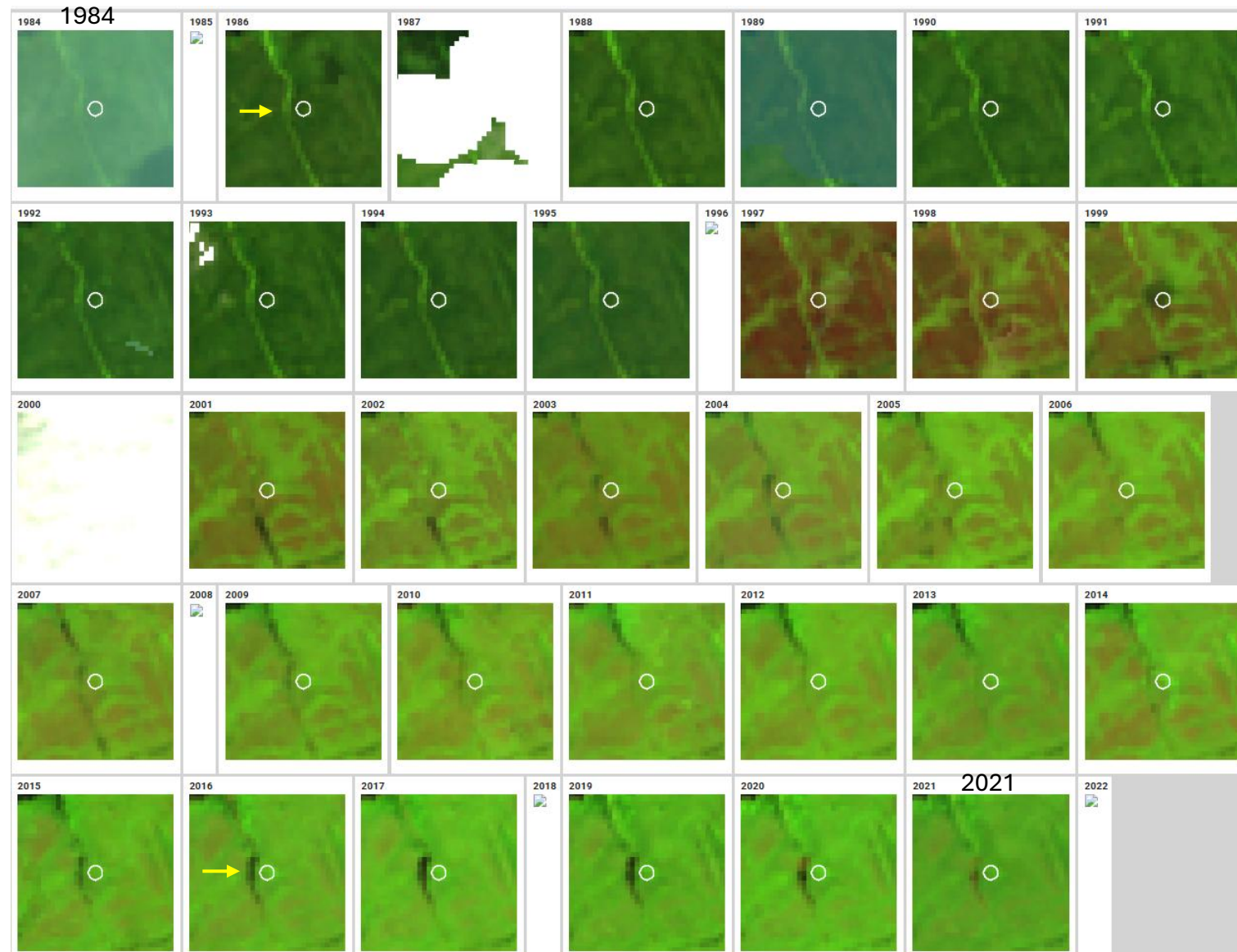


86.3497965°W 51.1148258°N

Annual area (ha)

a1985	0.0171
a1986	0.0081
a1987	0.0081
a1988	0.009
a1989	0.0108
a1990	0.0117
a1991	0.0108
a1992	0.0099
a1993	0.0081
a1994	0.0063
a1995	0.0027
a1996	0
a1997	0
a1998	0
a1999	0
a2000	0
a2001	0
a2002	0
a2003	0
a2004	0
a2005	0
a2006	0
a2007	0
a2008	0
a2009	0
a2010	0
a2011	0
a2012	0
a2013	0
a2014	0
a2015	0.0639
a2016	0.2043
a2017	0.3915
a2018	0.45
a2019	0.2889
a2020	0.1305
a2021	0.072

Annual summer Landsat image chips



FID 56

High-res validation

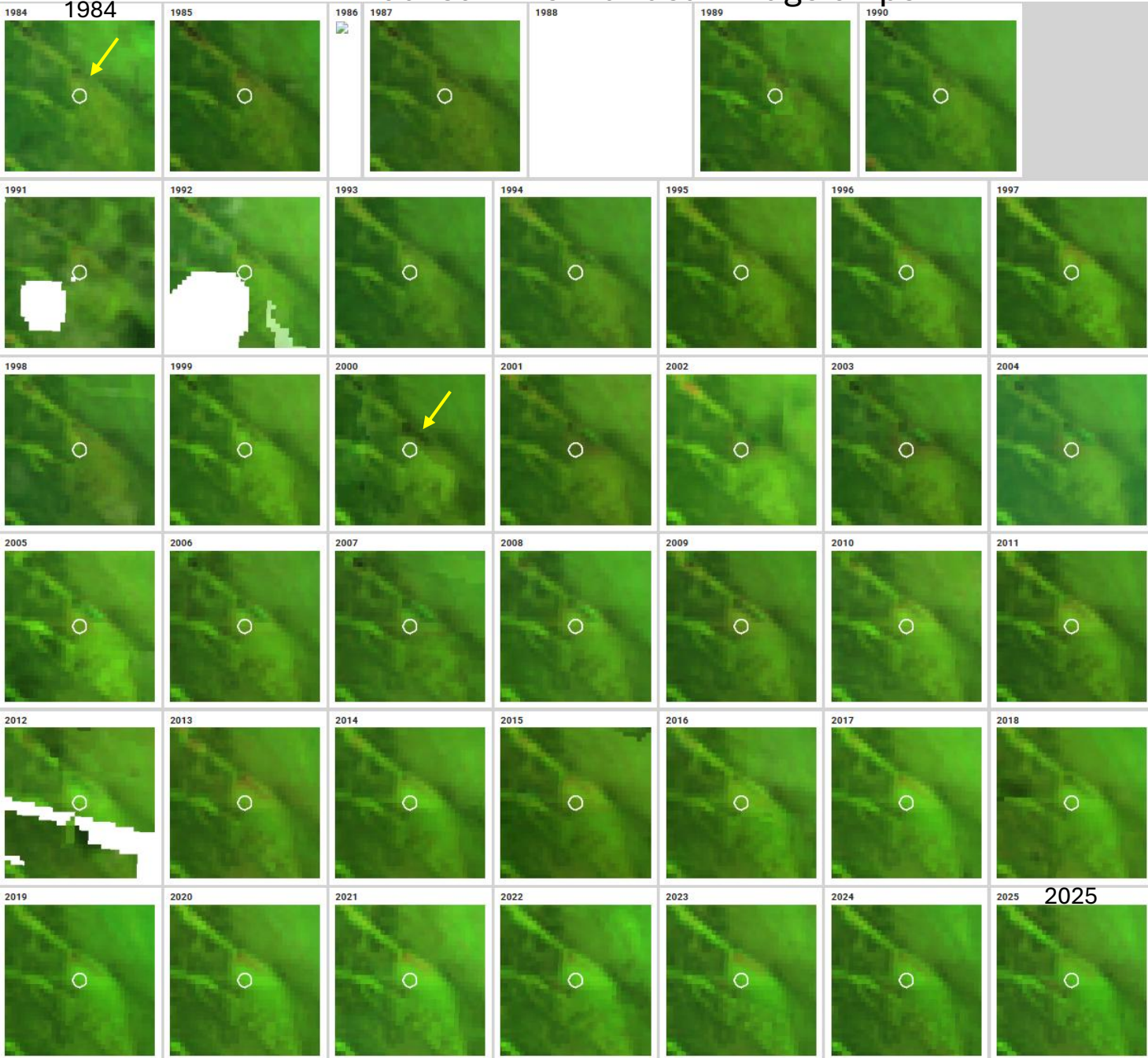


85.1029401°W 50.6885808°N

Annual area (ha)

a1985	0
a1986	0.0396
a1987	0.1305
a1988	0.117
a1989	0.0252
a1990	0.0216
a1991	0
a1992	0
a1993	0
a1994	0
a1995	0
a1996	0
a1997	0
a1998	0
a1999	0
a2000	0.018
a2001	0.2943
a2002	0.1755
a2003	0.1899
a2004	0.0603
a2005	0
a2006	0.0207
a2007	0
a2008	0
a2009	0
a2010	0
a2011	0
a2012	0
a2013	0
a2014	0
a2015	0
a2016	0
a2017	0
a2018	0
a2019	0
a2020	0
a2021	0

Annual summer Landsat image chips



FID 57

High-res validation



One period of flooding 1991-2017
after forest harvesting

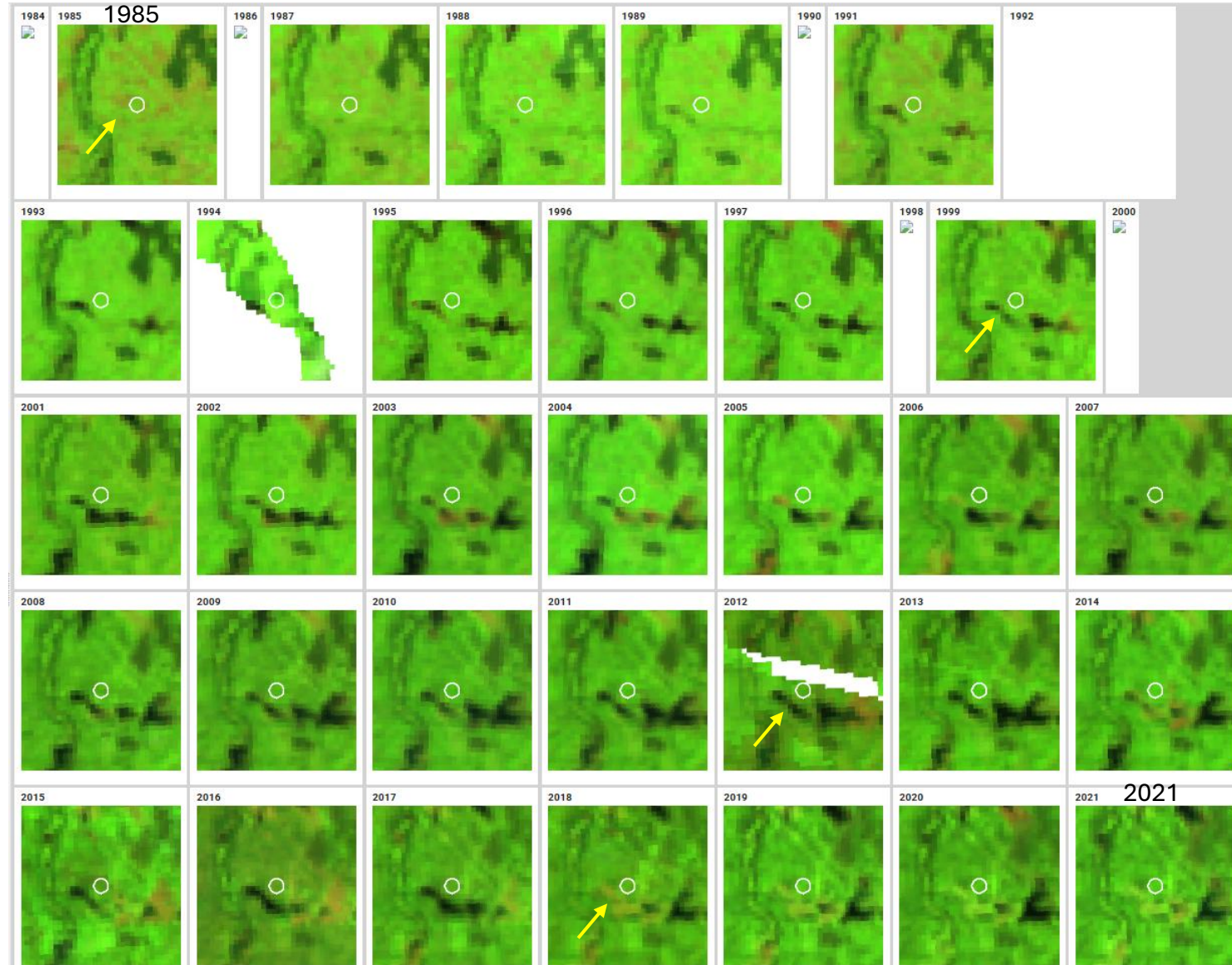


83.9483045°W 49.9909908°N

Annual area (ha)

a1985	0
a1986	0
a1987	0
a1988	0
a1989	0
a1990	0
a1991	0.1539
a1992	0.153
a1993	0.2961
a1994	0.279
a1995	0.2592
a1996	0.1512
a1997	0.0513
a1998	0.054
a1999	0.0558
a2000	0.1467
a2001	0.6147
a2002	0.3348
a2003	0.1854
a2004	0.2268
a2005	0.4365
a2006	0.4725
a2007	0.4338
a2008	0.3888
a2009	0.4158
a2010	0.3708
a2011	0.3852
a2012	0.4716
a2013	0.3681
a2014	0.3177
a2015	0.3447
a2016	0.7866
a2017	0.6462
a2018	0
a2019	0
a2020	0
a2021	0

Annual summer Landsat image chips



FID 58

High-res validation



Two periods of flooding

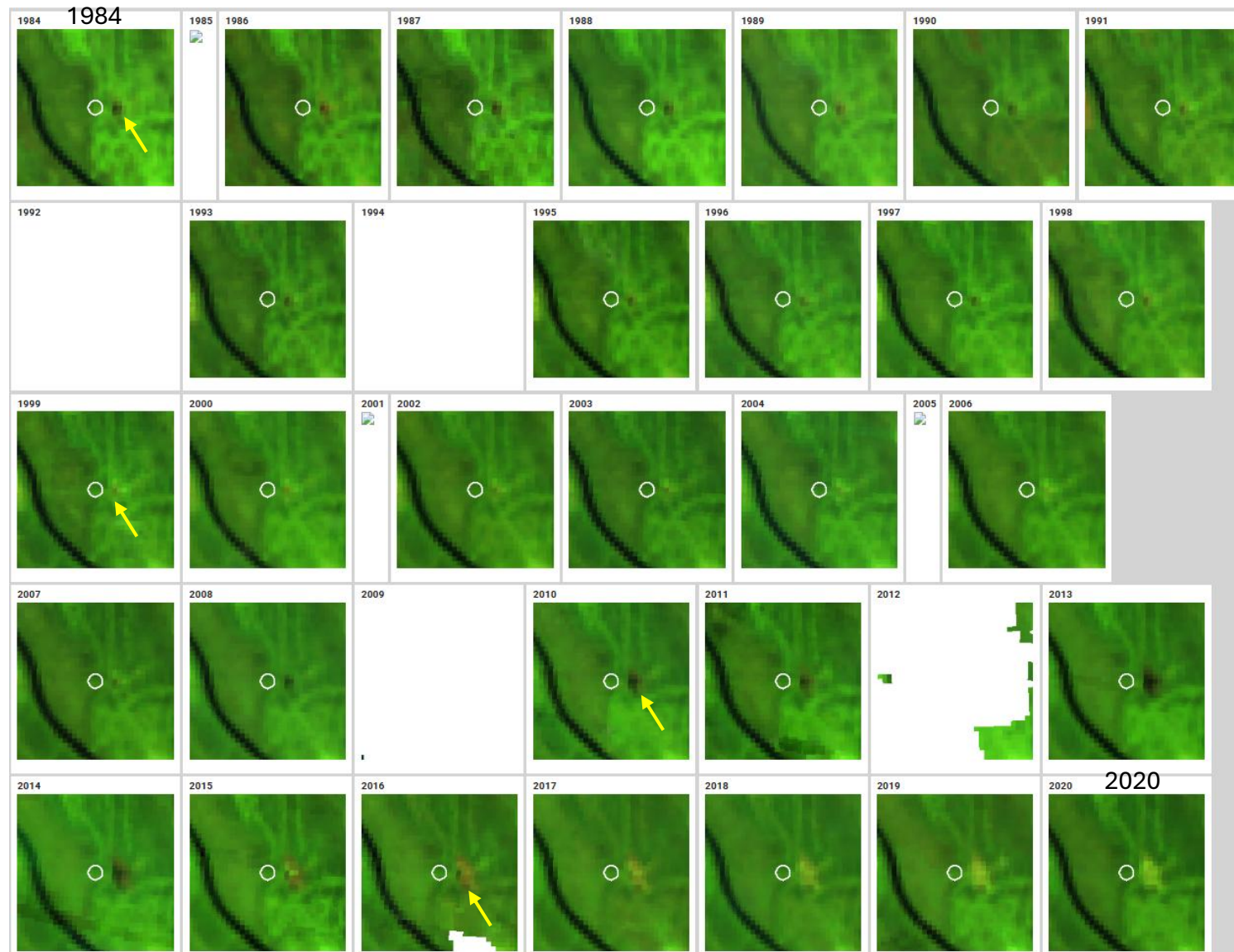


84.0522596°W 49.6318083°N

Annual area (ha)

a1985	0.1539
a1986	0.117
a1987	0.1107
a1988	0.1125
a1989	0.0396
a1990	0.0351
a1991	0.036
a1992	0.0378
a1993	0.0405
a1994	0.0378
a1995	0.0342
a1996	0.036
a1997	0.0315
a1998	0
a1999	0
a2000	0
a2001	0
a2002	0
a2003	0
a2004	0
a2005	0
a2006	0
a2007	0
a2008	0.135
a2009	0.2601
a2010	0.3051
a2011	0.3087
a2012	0.4095
a2013	0.4554
a2014	0.4194
a2015	0.144
a2016	0.0198
a2017	0
a2018	0
a2019	0
a2020	0
a2021	0

Annual summer Landsat image chips



FID 59

High-res validation

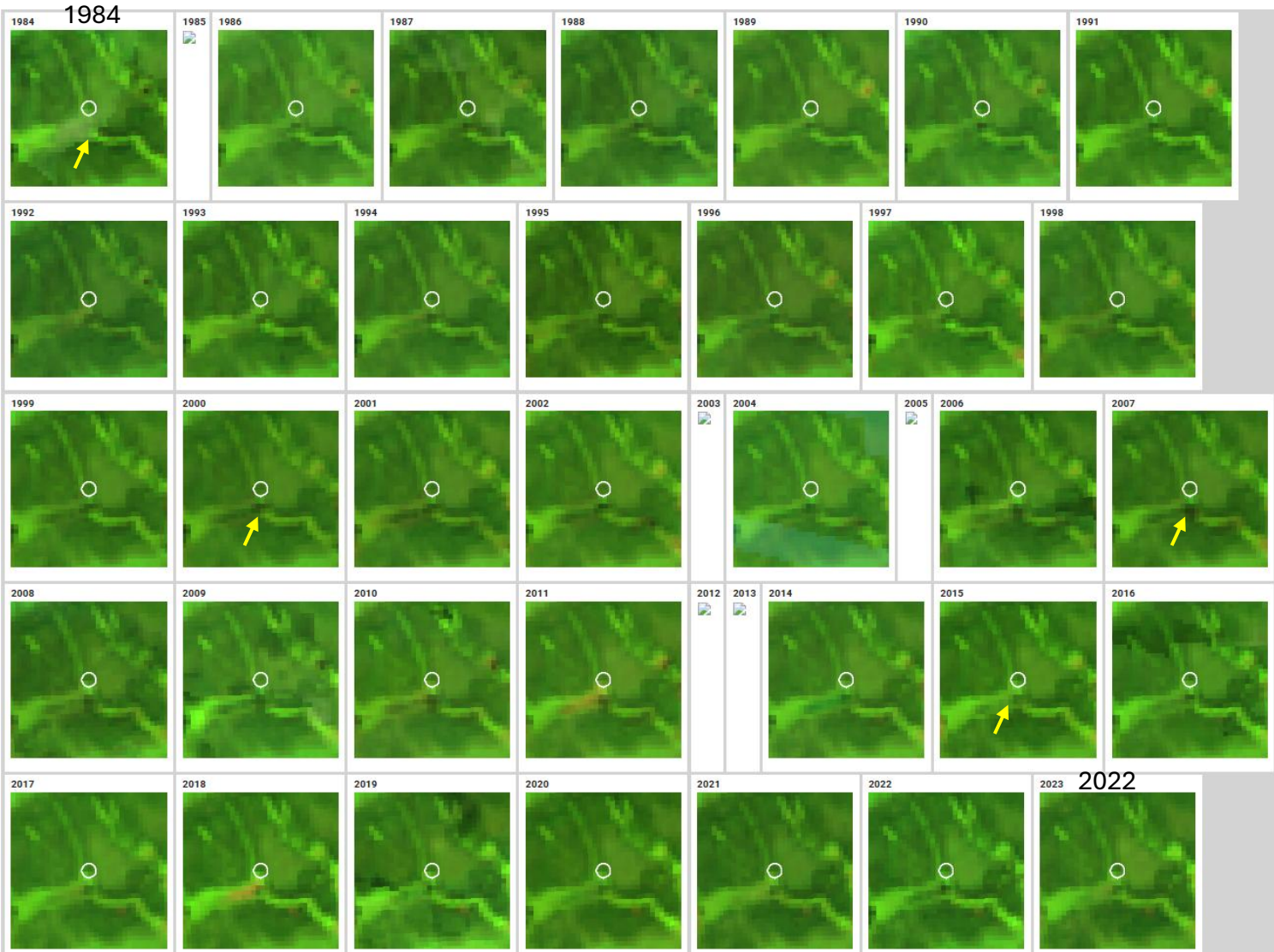


82.9899619°W 50.4075489°N

Annual area (ha)

a1985	0
a1986	0
a1987	0.027
a1988	0
a1989	0.0297
a1990	0
a1991	0.0558
a1992	0
a1993	0
a1994	0
a1995	0
a1996	0
a1997	0
a1998	0.0279
a1999	0.0288
a2000	0.0756
a2001	0.0792
a2002	0.0945
a2003	0.0882
a2004	0.0711
a2005	0.081
a2006	0.1467
a2007	0.1539
a2008	0.135
a2009	0.0738
a2010	0.0459
a2011	0.0711
a2012	0.0576
a2013	0.0756
a2014	0.0288
a2015	0
a2016	0
a2017	0
a2018	0
a2019	0
a2020	0
a2021	0

Annual summer Landsat image chips



FID 60

High-res validation

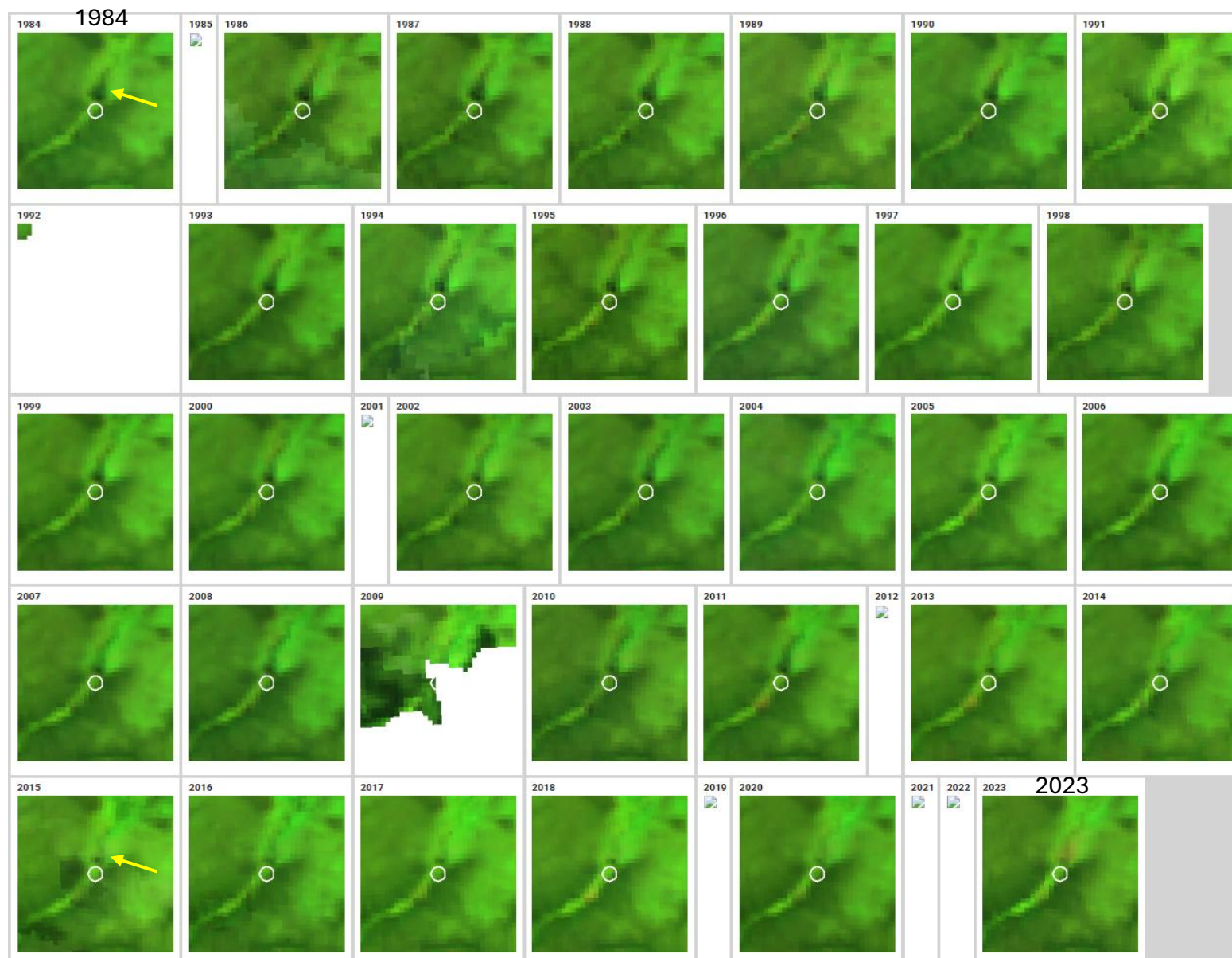


83.7932659°W 50.4874855°N

Annual area (ha)

a1985	0.1467
a1986	0.1503
a1987	0.1773
a1988	0.1296
a1989	0.1224
a1990	0.0729
a1991	0.126
a1992	0.0837
a1993	0.1188
a1994	0.0846
a1995	0.0396
a1996	0.0783
a1997	0.0855
a1998	0.0837
a1999	0.0819
a2000	0.081
a2001	0.0783
a2002	0.0774
a2003	0.0747
a2004	0.036
a2005	0.0342
a2006	0.0333
a2007	0.0675
a2008	0
a2009	0
a2010	0.0351
a2011	0.0648
a2012	0.0855
a2013	0
a2014	0
a2015	0
a2016	0
a2017	0
a2018	0
a2019	0
a2020	0
a2021	0

Annual summer Landsat image chips



FID 61

High-res validation



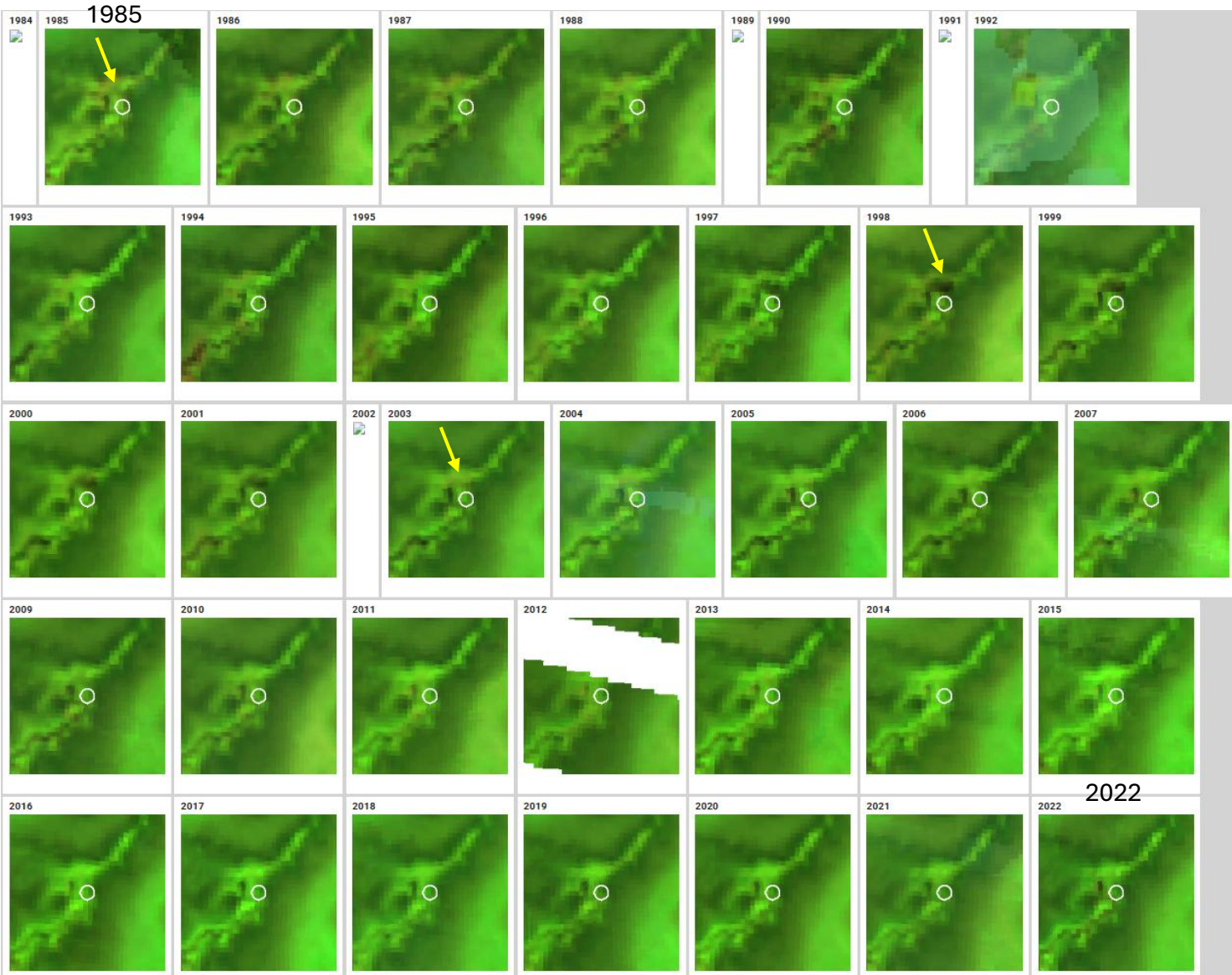
Ambiguous – some signs of remnant dams and ponding from 1998-2001

83.5552098°W 51.3793466°N

Annual area (ha)

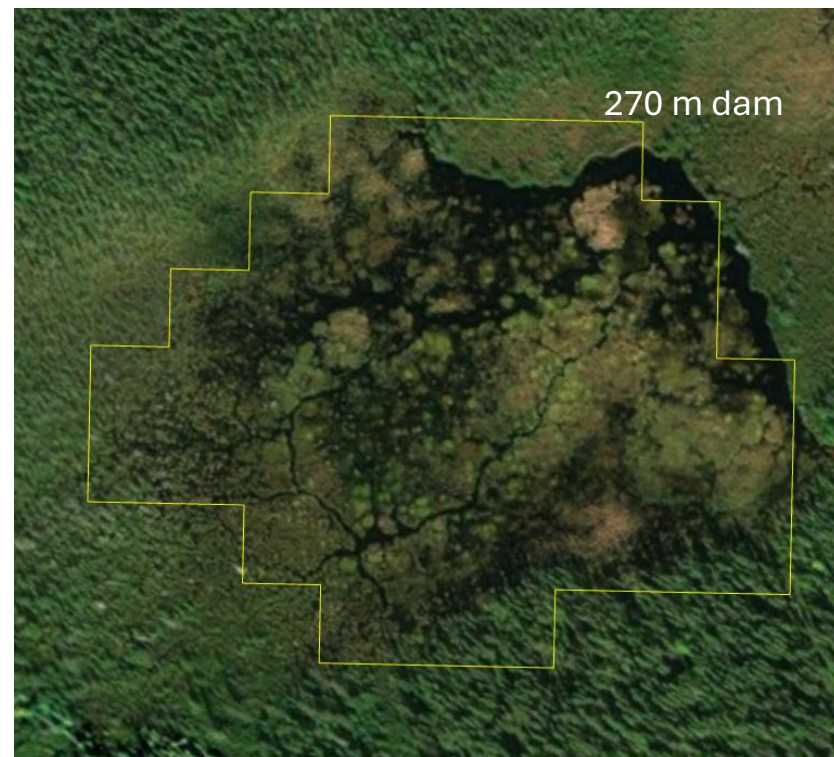
a1985	0
a1986	0
a1987	0
a1988	0
a1989	0
a1990	0
a1991	0
a1992	0
a1993	0
a1994	0
a1995	0
a1996	0
a1997	0.0288
a1998	0.1818
a1999	0.1845
a2000	0.1026
a2001	0.0828
a2002	0.0522
a2003	0
a2004	0
a2005	0
a2006	0
a2007	0
a2008	0
a2009	0
a2010	0
a2011	0
a2012	0
a2013	0
a2014	0
a2015	0
a2016	0
a2017	0
a2018	0
a2019	0
a2020	0
a2021	0

Annual summer Landsat image chips



FID 62

High-res validation

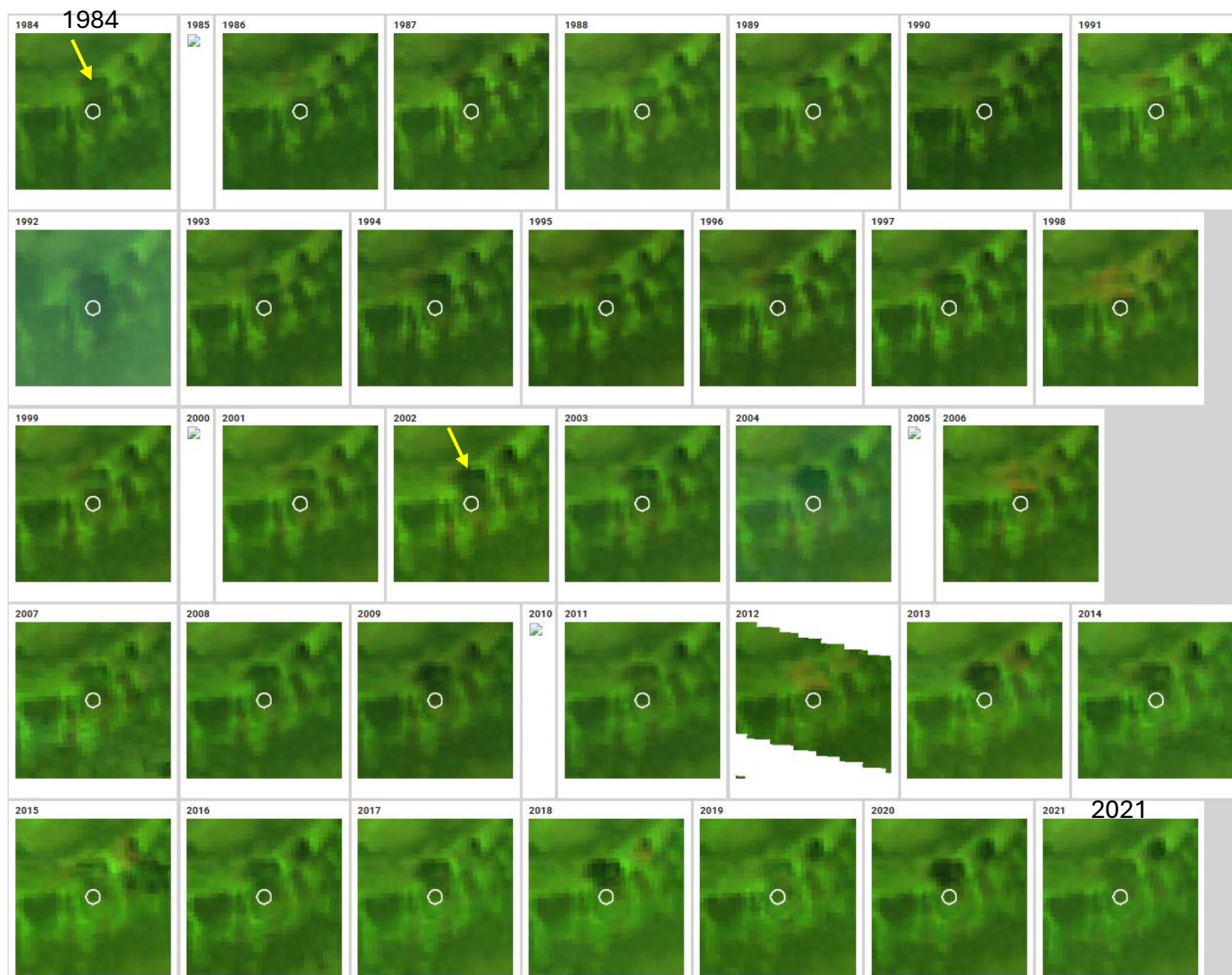


83.8191906°W 51.3183117°N

Annual area (ha)

a1985	0.2214
a1986	0.3924
a1987	0.3492
a1988	0.5418
a1989	0.459
a1990	0.2961
a1991	0.3429
a1992	0.3609
a1993	0.8694
a1994	0.6687
a1995	0.5373
a1996	0.5085
a1997	0.5013
a1998	0.3393
a1999	0.1989
a2000	0.3897
a2001	0.5094
a2002	0.8388
a2003	0.9585
a2004	0.846
a2005	0.7173
a2006	0.6183
a2007	0.5454
a2008	0.6876
a2009	0.5004
a2010	0.8721
a2011	0.6813
a2012	1.2222
a2013	1.0044
a2014	0.9603
a2015	0.6993
a2016	0.7911
a2017	0.9828
a2018	0.9423
a2019	1.1358
a2020	0.6804
a2021	0.7137

Annual summer Landsat image chips



FID 63

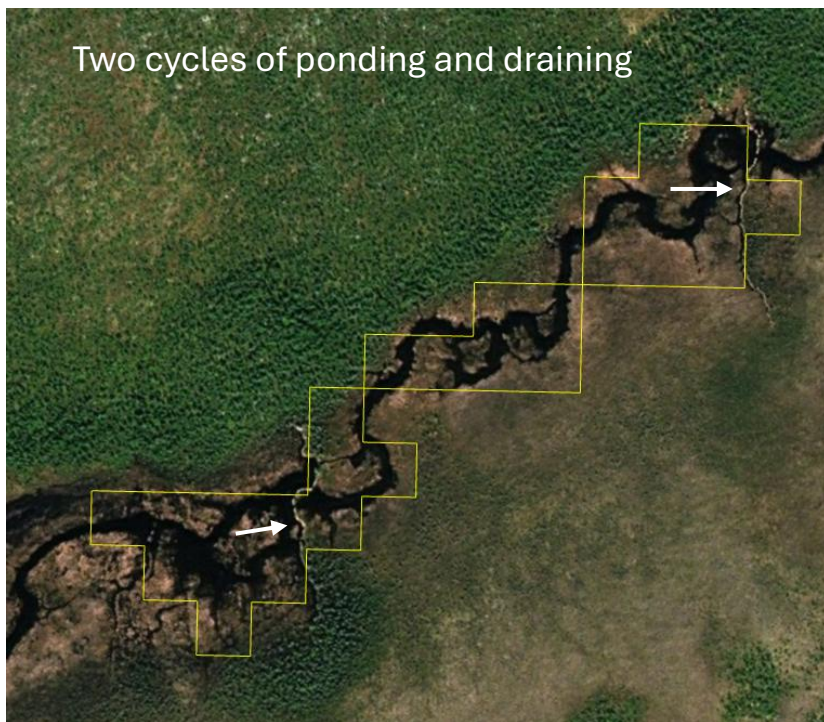
High-res validation



Annual area (ha)

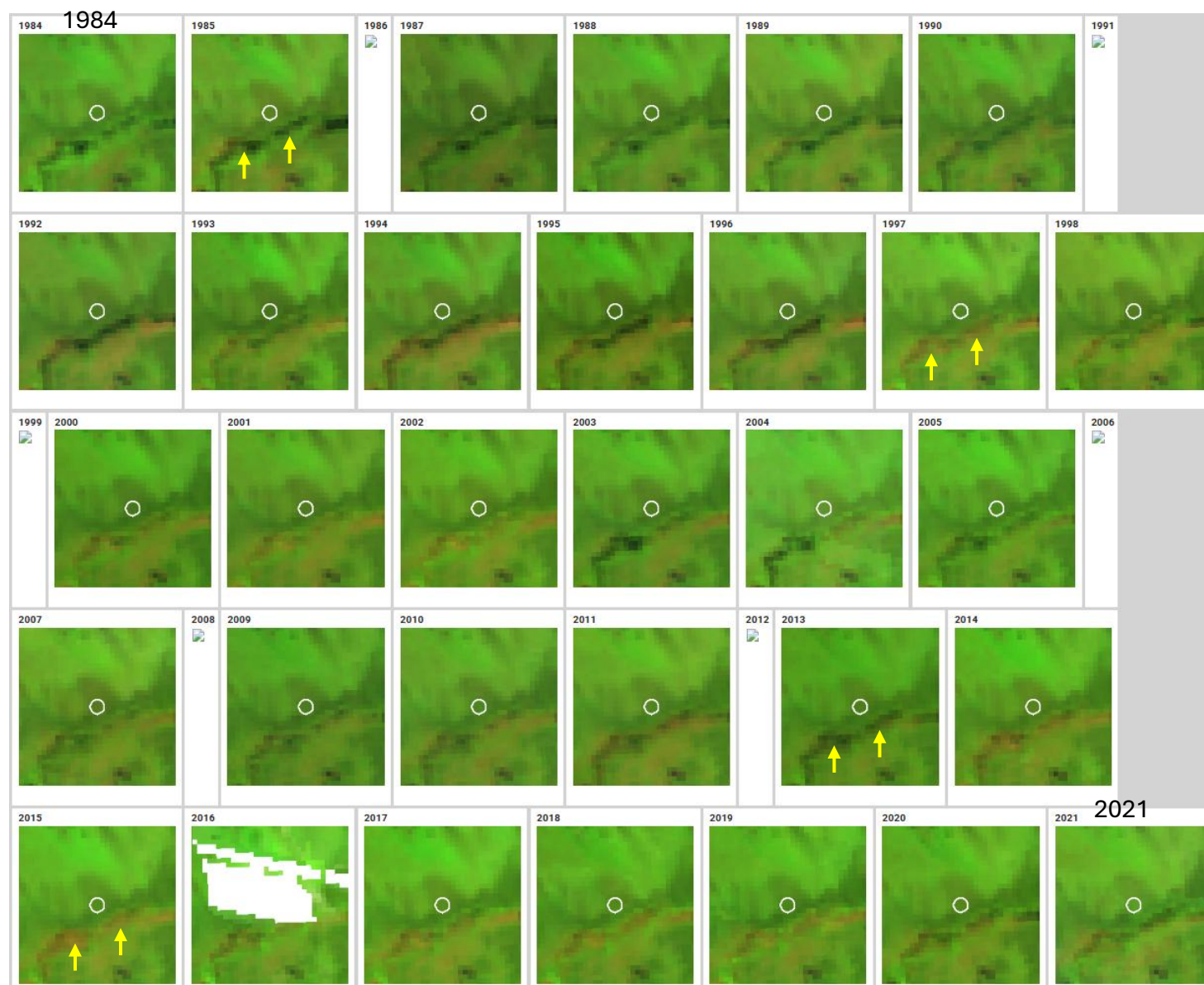
Annual summer Landsat image chips

Two cycles of ponding and draining



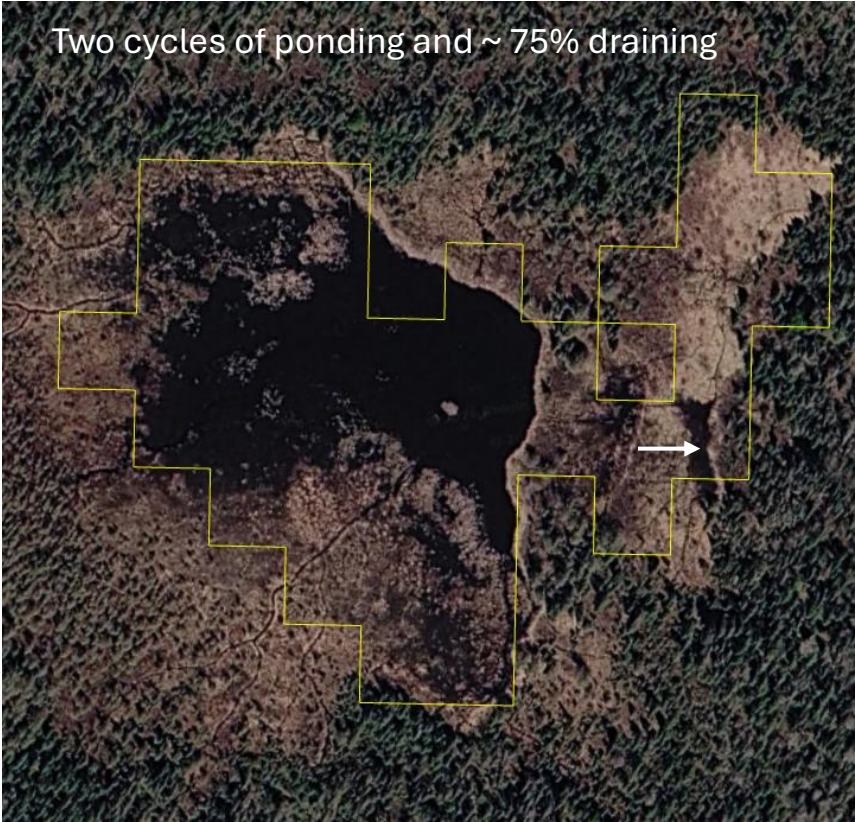
83.0135452°W 50.9204670°N

a1985	0.1692
a1986	0.3033
a1987	0.1899
a1988	0.279
a1989	0.1935
a1990	0.135
a1991	0.36
a1992	0.2574
a1993	0.369
a1994	0.4824
a1995	0.5139
a1996	0.4734
a1997	0
a1998	0
a1999	0
a2000	0
a2001	0
a2002	0
a2003	0.0594
a2004	0.1836
a2005	0.027
a2006	0.0243
a2007	0.0252
a2008	0.072
a2009	0.027
a2010	0.1449
a2011	0.2466
a2012	0.4518
a2013	0.2772
a2014	0.1881
a2015	0.0729
a2016	0
a2017	0
a2018	0
a2019	0
a2020	0.0243
a2021	0.0513



FID 64

High-res validation

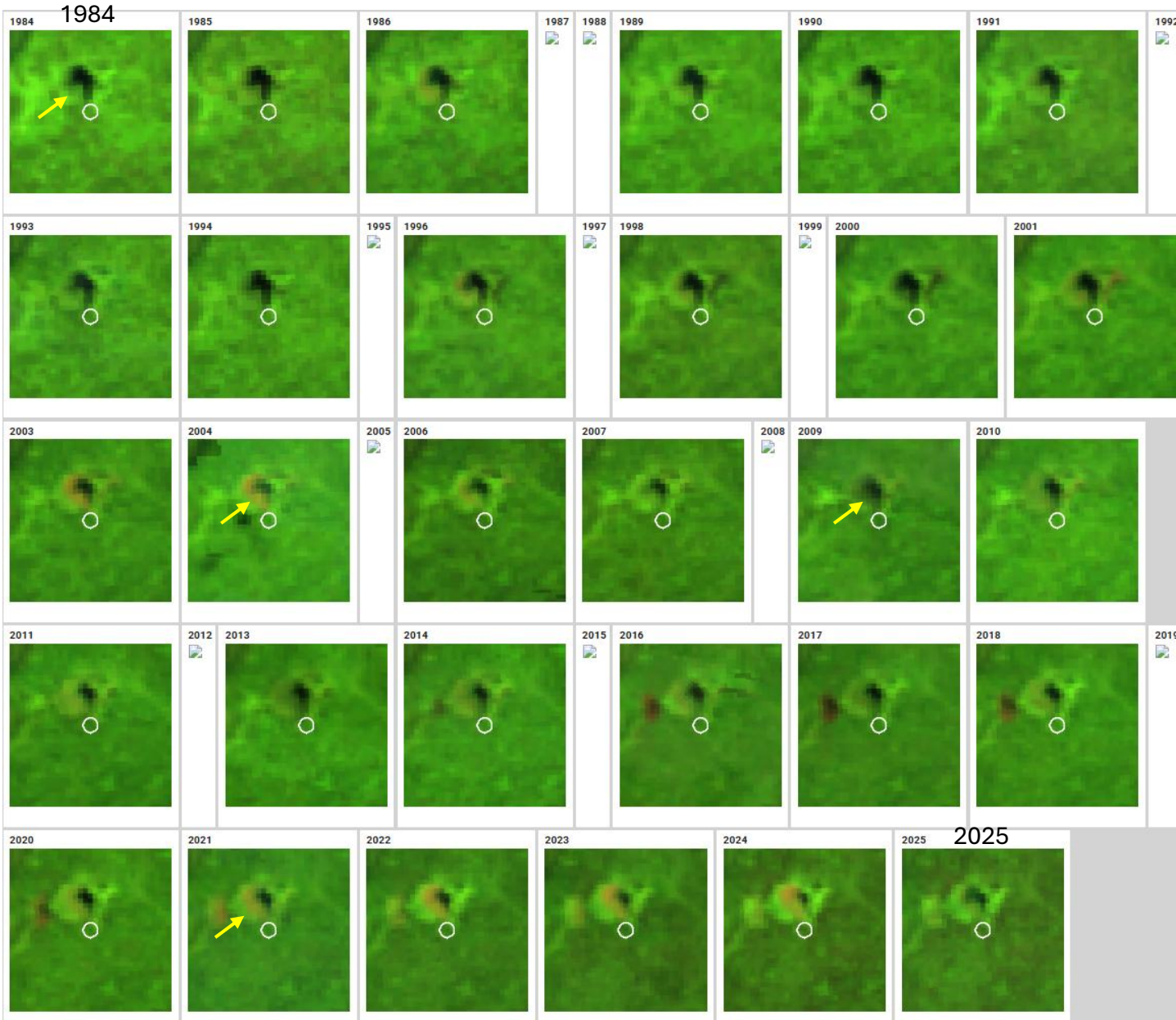


82.7530519°W 49.4785948°N

Annual area (ha)

a1985	1.0746
a1986	1.1727
a1987	1.3599
a1988	1.3554
a1989	1.2888
a1990	0.9855
a1991	0.9909
a1992	1.0395
a1993	1.1241
a1994	1.1232
a1995	1.2681
a1996	0.9162
a1997	1.0881
a1998	1.1439
a1999	1.3833
a2000	1.4526
a2001	1.4769
a2002	0.9378
a2003	0.8298
a2004	0.4806
a2005	0.324
a2006	0.3645
a2007	0.5373
a2008	0.7326
a2009	0.7065
a2010	0.5211
a2011	0.5103
a2012	0.7047
a2013	0.765
a2014	0.684
a2015	0.5004
a2016	0.5643
a2017	0.603
a2018	0.6021
a2019	0.6012
a2020	0.5823
a2021	0.3591

Annual summer Landsat image chips



FID 65

High-res validation

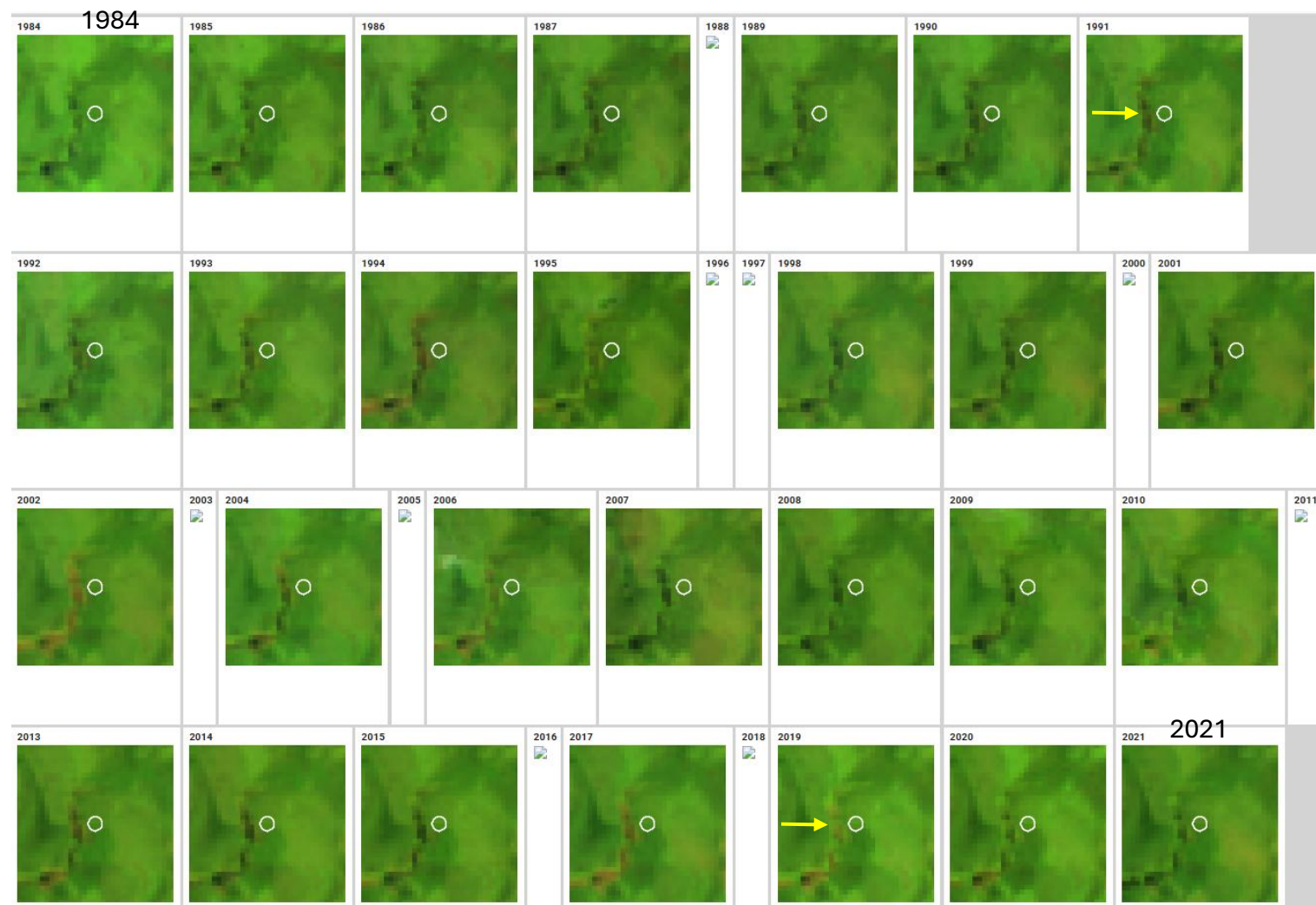


81.2084552°W 50.4015683°N

Annual area (ha)

a1985	0.0324
a1986	0.1053
a1987	0.0792
a1988	0.1098
a1989	0.1647
a1990	0.1908
a1991	0.2079
a1992	0.1422
a1993	0.1746
a1994	0.1377
a1995	0.1152
a1996	0.0684
a1997	0.1926
a1998	0.2475
a1999	0.2637
a2000	0.2961
a2001	0.2547
a2002	0.2673
a2003	0.1935
a2004	0.3159
a2005	0.1278
a2006	0.2106
a2007	0.2664
a2008	0.2574
a2009	0.2079
a2010	0.2727
a2011	0.3078
a2012	0.3105
a2013	0.3078
a2014	0.3231
a2015	0.3366
a2016	0.2466
a2017	0.135
a2018	0.1323
a2019	0.1161
a2020	0.1449
a2021	0.2133

Annual summer Landsat image chips



FID 66

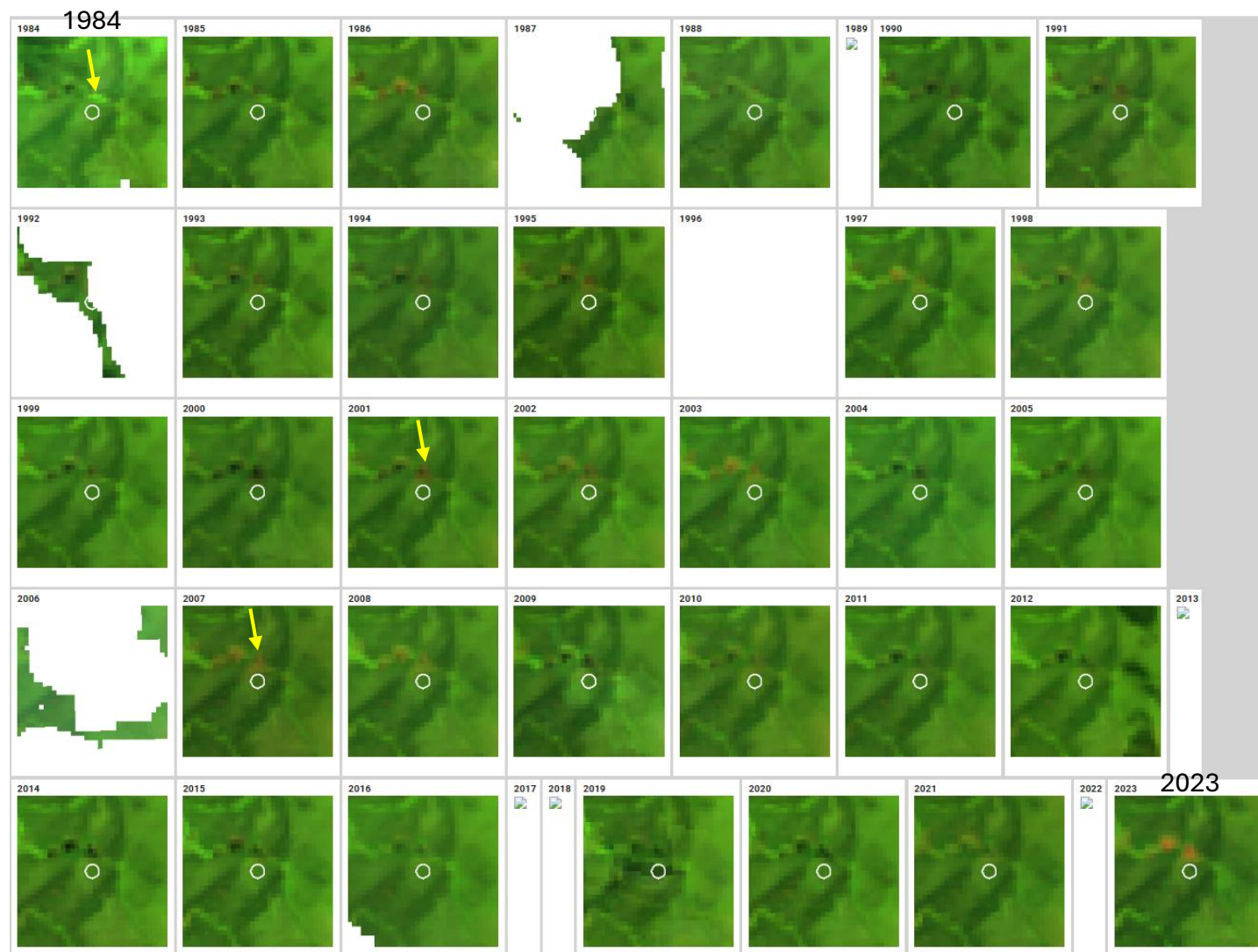
High-res validation



Annual area (ha)

a1985	0.0423
a1986	0.0432
a1987	0
a1988	0
a1989	0.018
a1990	0.0675
a1991	0.0747
a1992	0.045
a1993	0.0189
a1994	0.0207
a1995	0
a1996	0.0576
a1997	0
a1998	0
a1999	0
a2000	0.0684
a2001	0.1557
a2002	0.0855
a2003	0
a2004	0.0189
a2005	0.1728
a2006	0.1188
a2007	0
a2008	0
a2009	0
a2010	0
a2011	0
a2012	0.027
a2013	0.1404
a2014	0.0423
a2015	0.0423
a2016	0.0747
a2017	0.0954
a2018	0.0927
a2019	0.1359
a2020	0.1107
a2021	0.1089

Annual summer Landsat image chips



82.0146083°W 50.2497279°N

FID 67

High-res validation

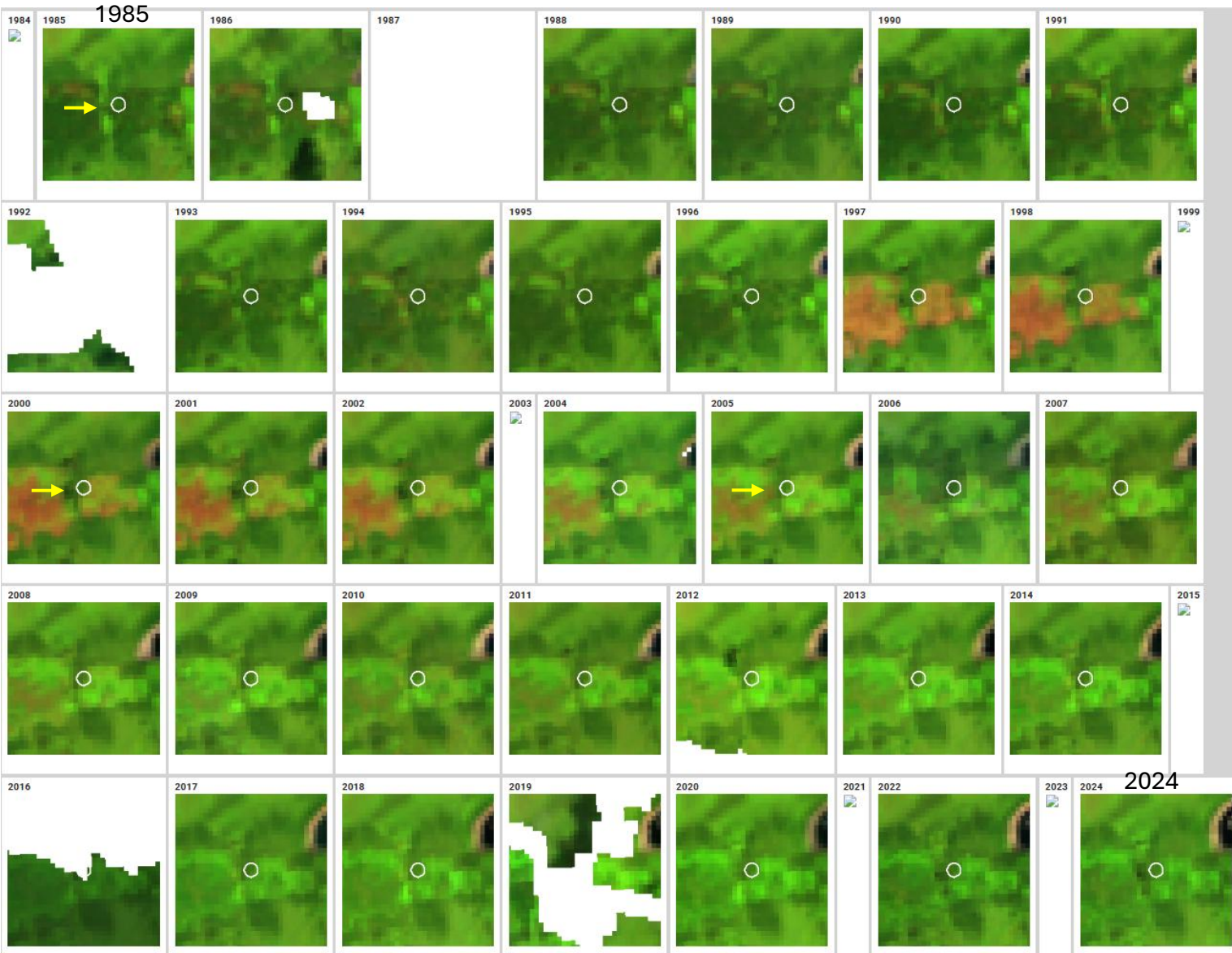


82.0957646°W 50.1404504°N

Annual area (ha)

a1985	0
a1986	0
a1987	0
a1988	0.0342
a1989	0.0387
a1990	0.0108
a1991	0.0144
a1992	0.0351
a1993	0.0144
a1994	0
a1995	0.0171
a1996	0.0153
a1997	0.0405
a1998	0.0414
a1999	0.0945
a2000	0.1152
a2001	0.1449
a2002	0.1422
a2003	0.1377
a2004	0
a2005	0
a2006	0
a2007	0
a2008	0
a2009	0
a2010	0
a2011	0
a2012	0
a2013	0
a2014	0
a2015	0
a2016	0
a2017	0
a2018	0
a2019	0
a2020	0
a2021	0

Annual summer Landsat image chips



FID 68

High-res validation

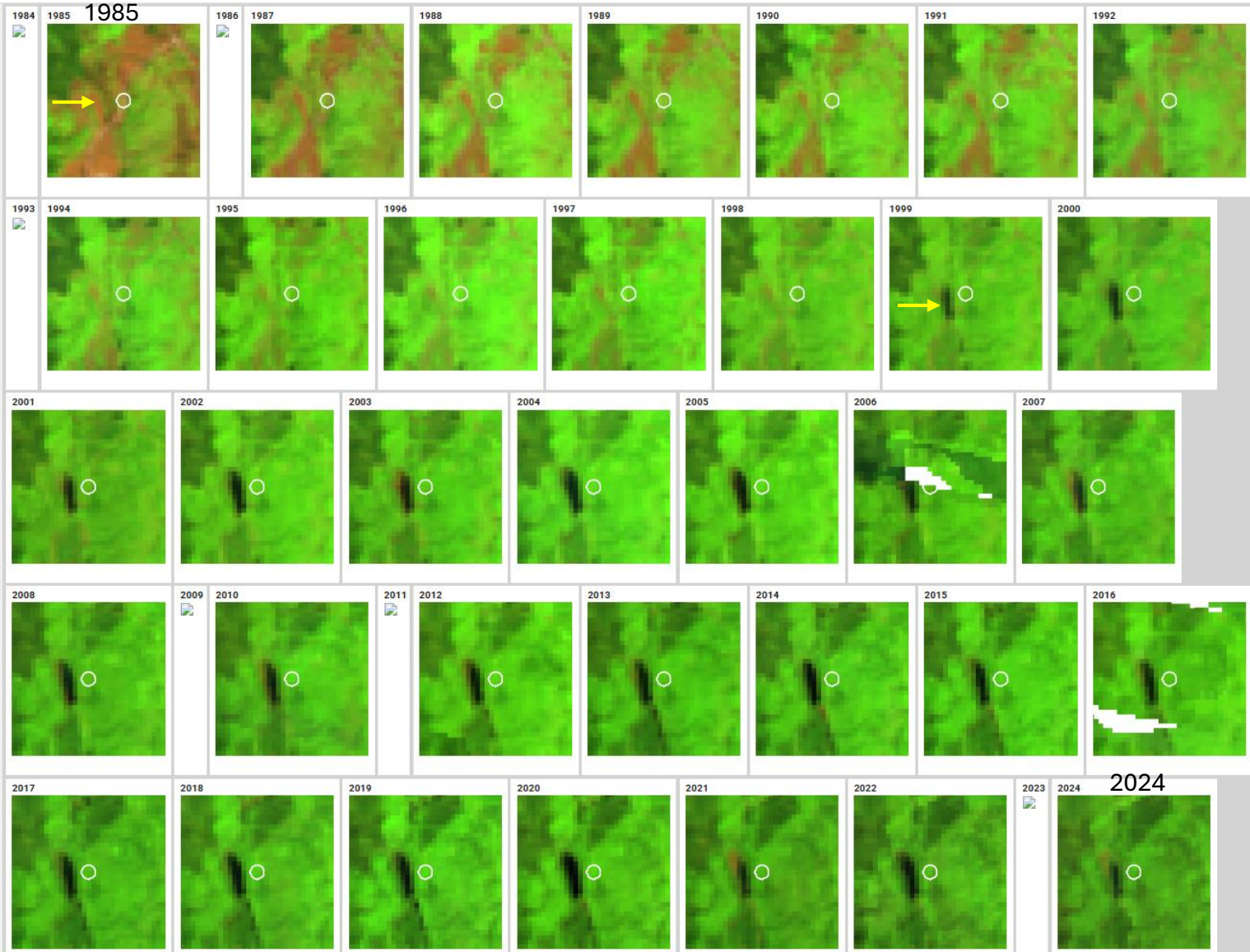


81.5579659°W 50.0485048°N

Annual area (ha)

a1985	0
a1986	0
a1987	0
a1988	0
a1989	0
a1990	0
a1991	0
a1992	0
a1993	0
a1994	0
a1995	0
a1996	0
a1997	0
a1998	0
a1999	0.2673
a2000	0.6075
a2001	0.8559
a2002	0.9216
a2003	1.161
a2004	1.2402
a2005	1.2402
a2006	1.1241
a2007	1.1097
a2008	1.3815
a2009	1.35
a2010	1.3824
a2011	1.152
a2012	1.332
a2013	1.4832
a2014	1.4652
a2015	1.4364
a2016	1.3365
a2017	1.3509
a2018	1.3032
a2019	1.593
a2020	1.4058
a2021	1.4247

Annual summer Landsat image chips



FID 69

High-res validation



81.5143064°W 51.4203068°N

Annual area (ha)

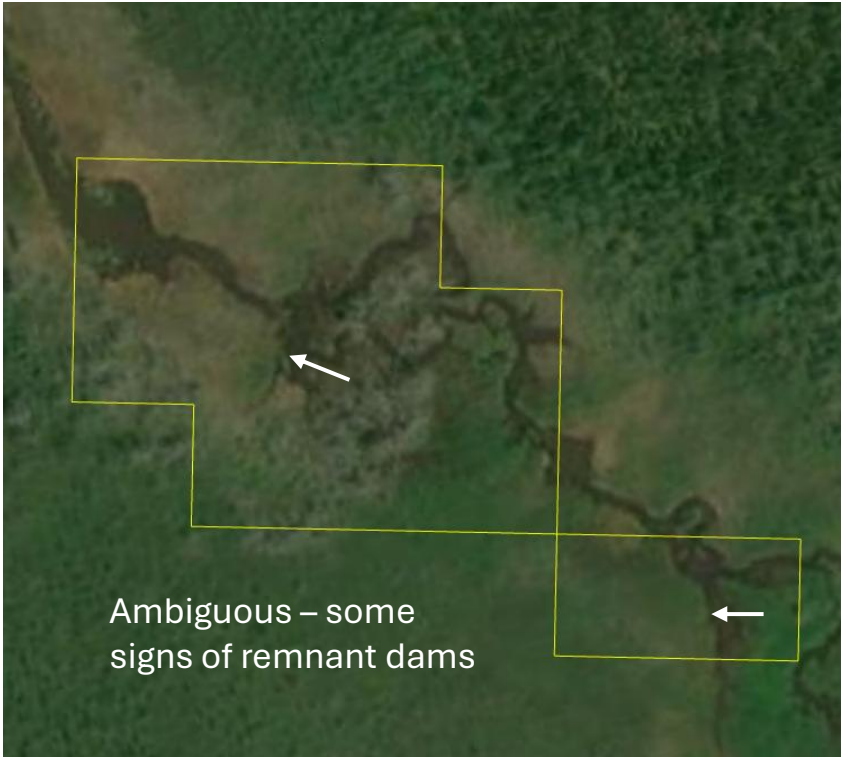
a1985	0.0144
a1986	0.0144
a1987	0.0153
a1988	0.018
a1989	0.0171
a1990	0
a1991	0.0153
a1992	0.0207
a1993	0.0162
a1994	0.0171
a1995	0.0162
a1996	0
a1997	0.0153
a1998	0.0135
a1999	0.0774
a2000	0.1773
a2001	0.1926
a2002	0.1926
a2003	0.1476
a2004	0.0684
a2005	0.0207
a2006	0.0198
a2007	0.0162
a2008	0.018
a2009	0
a2010	0.0153
a2011	0.0153
a2012	0
a2013	0
a2014	0
a2015	0
a2016	0
a2017	0
a2018	0
a2019	0
a2020	0
a2021	0

Annual summer Landsat image chips



FID 70

High-res validation



Ambiguous – some signs of remnant dams

80.2304075°W 51.1170581°N

Annual area (ha)

a1985	0
a1986	0
a1987	0.0198
a1988	0
a1989	0
a1990	0
a1991	0
a1992	0.027
a1993	0.0234
a1994	0.0189
a1995	0
a1996	0
a1997	0
a1998	0
a1999	0
a2000	0.0216
a2001	0.0675
a2002	0.0657
a2003	0.0981
a2004	0.1341
a2005	0.1161
a2006	0.1494
a2007	0.135
a2008	0.1575
a2009	0.1431
a2010	0.2124
a2011	0.2052
a2012	0.2079
a2013	0.1134
a2014	0.1683
a2015	0.1431
a2016	0.1656
a2017	0.1521
a2018	0.1656
a2019	0.1467
a2020	0.0666
a2021	0.0936

Annual summer Landsat image chips



FID 71

High-res validation

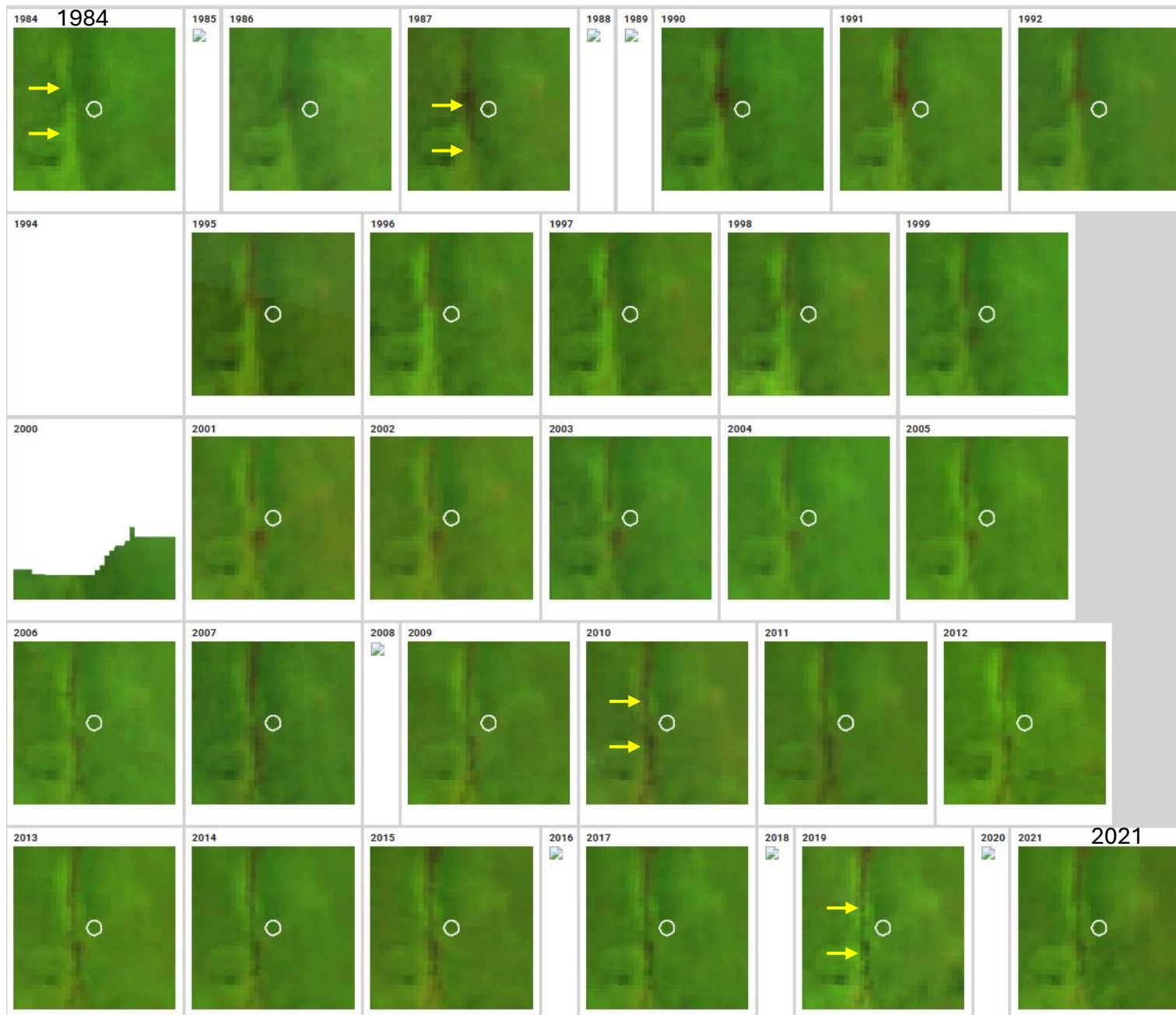


80.3204029°W 51.1003538°N

Annual area (ha)

a1985	0
a1986	0.1107
a1987	0.3591
a1988	0.3087
a1989	0.2979
a1990	0.2232
a1991	0.1377
a1992	0.1035
a1993	0.0945
a1994	0.0387
a1995	0
a1996	0
a1997	0
a1998	0.0162
a1999	0.1143
a2000	0.1413
a2001	0.1242
a2002	0.1269
a2003	0.1152
a2004	0.0729
a2005	0.0189
a2006	0.0792
a2007	0.1521
a2008	0.1557
a2009	0.1935
a2010	0.2016
a2011	0.1845
a2012	0.135
a2013	0.072
a2014	0.1512
a2015	0.1458
a2016	0.2331
a2017	0.1881
a2018	0.2115
a2019	0.1161
a2020	0.0243
a2021	0.0711

Annual summer Landsat image chips



FID 72

High-res validation



Annual area (ha)

Annual summer Landsat image chips

a1985	0.0198
a1986	0
a1987	0
a1988	0
a1989	0.0747
a1990	0.0963
a1991	0.1044
a1992	0.0972
a1993	0.171
a1994	0.1593
a1995	0.1179
a1996	0.1161
a1997	0.0765
a1998	0.0711
a1999	0.045
a2000	0.0459
a2001	0.0477
a2002	0.0405
a2003	0.0747
a2004	0.0225
a2005	0
a2006	0
a2007	0
a2008	0
a2009	0.0198
a2010	0.0684
a2011	0.09
a2012	0.0774
a2013	0.0954
a2014	0.0747
a2015	0.0612
a2016	0.0189
a2017	0.0207
a2018	0.0207
a2019	0.0207
a2020	0.0369
a2021	0.0396



79.1297533°W 51.0579326°N

FID 73

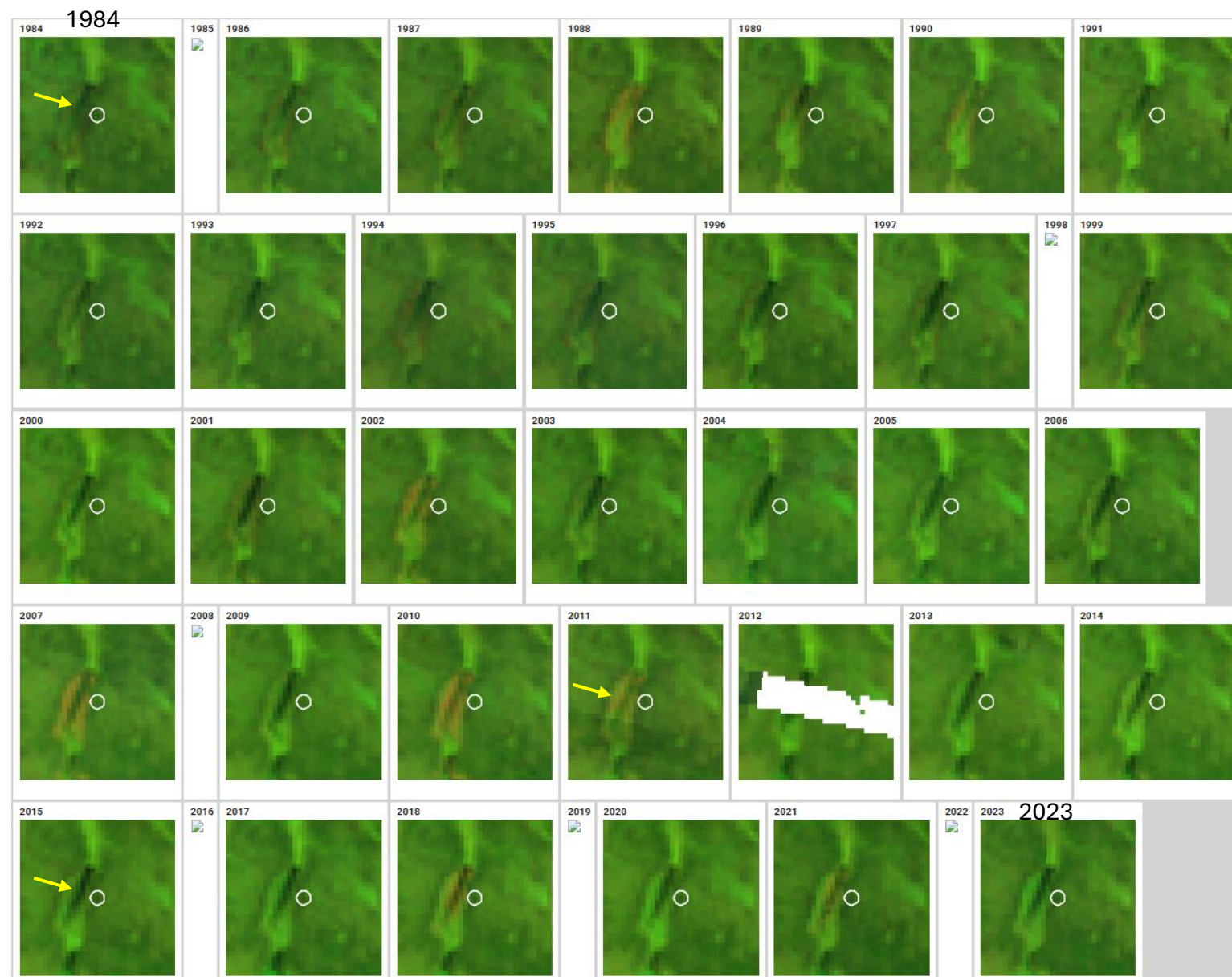
High-res validation



Annual area (ha)

a1985	0.297
a1986	0.2151
a1987	0.1413
a1988	0.0882
a1989	0
a1990	0.1971
a1991	0.1935
a1992	0.2232
a1993	0.3519
a1994	0.4986
a1995	0.4095
a1996	0.4266
a1997	0.5715
a1998	0.4689
a1999	0.3006
a2000	0.5877
a2001	0.6651
a2002	0.6777
a2003	0.4896
a2004	0.5094
a2005	0.5769
a2006	0.5274
a2007	0.2232
a2008	0.0387
a2009	0.027
a2010	0.1035
a2011	0
a2012	0.2772
a2013	0.4959
a2014	0.5121
a2015	0.5022
a2016	0.5139
a2017	0.4716
a2018	0.432
a2019	0.4716
a2020	0.3852
a2021	0.1071

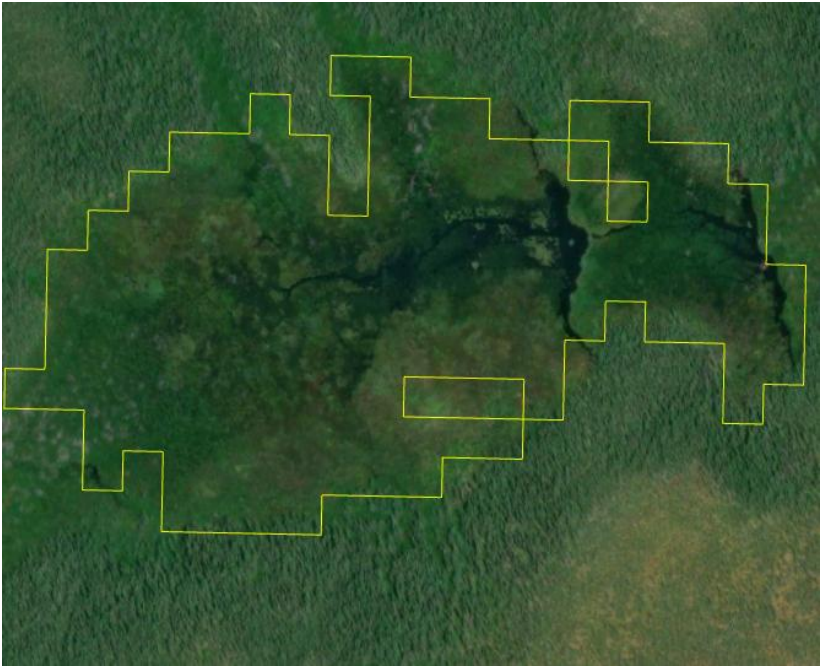
Annual summer Landsat image chips



86.3348790°W 52.4617101°N

FID 74

High-res validation

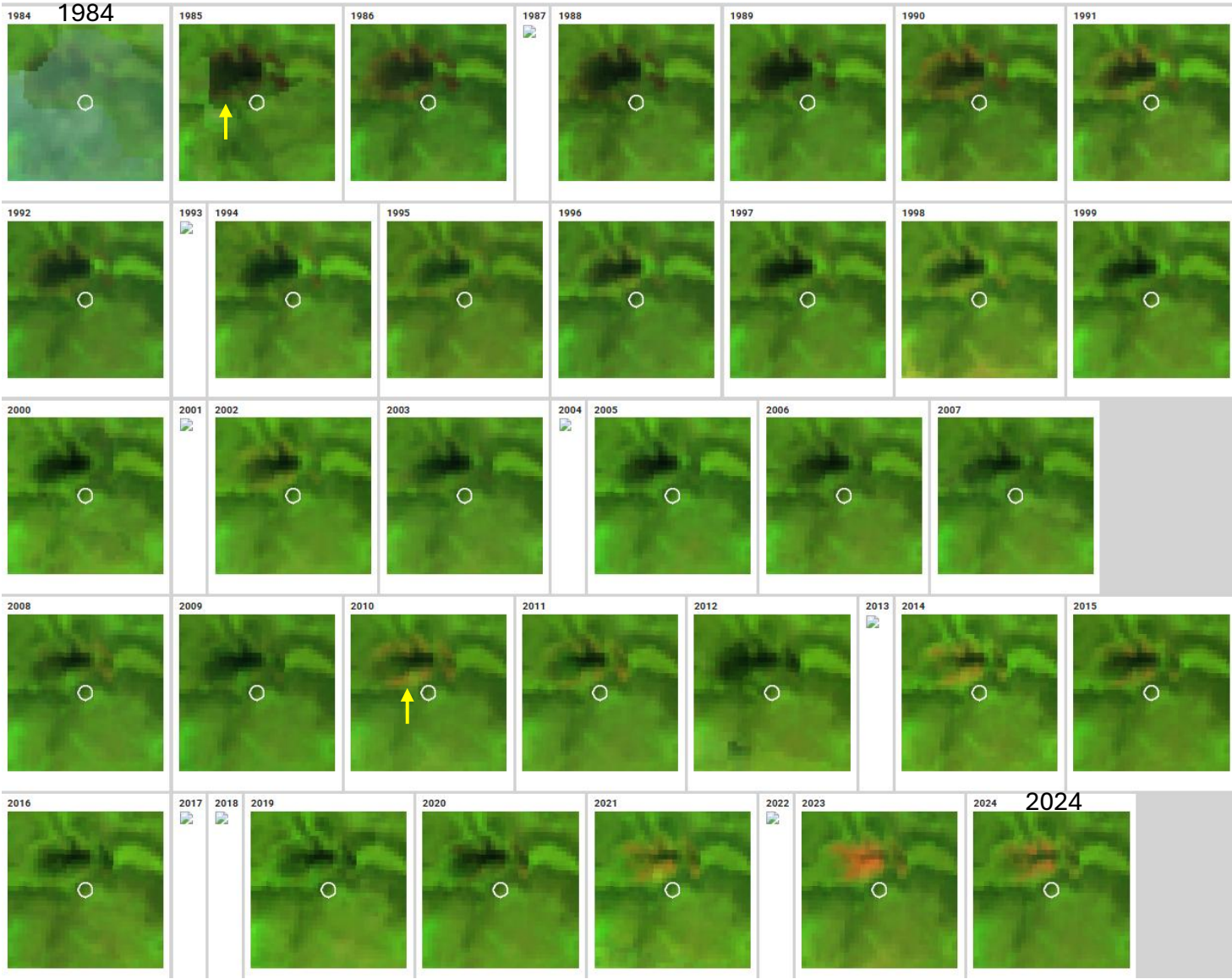


85.5246233°W 51.9540084°N

Annual area (ha)

a1985	4.1994
a1986	4.6062
a1987	4.8276
a1988	4.959
a1989	4.0518
a1990	3.3282
a1991	2.6838
a1992	2.6802
a1993	3.132
a1994	2.7189
a1995	2.439
a1996	2.1537
a1997	2.3949
a1998	2.5443
a1999	2.5272
a2000	3.2661
a2001	3.4119
a2002	3.2391
a2003	2.9241
a2004	3.1932
a2005	3.1644
a2006	3.0087
a2007	2.4327
a2008	2.358
a2009	2.349
a2010	2.718
a2011	2.6847
a2012	3.1104
a2013	2.9502
a2014	2.727
a2015	2.5002
a2016	2.3949
a2017	2.2365
a2018	2.16
a2019	2.2563
a2020	1.8783
a2021	1.9989

Annual summer Landsat image chips



FID 75

High-res validation

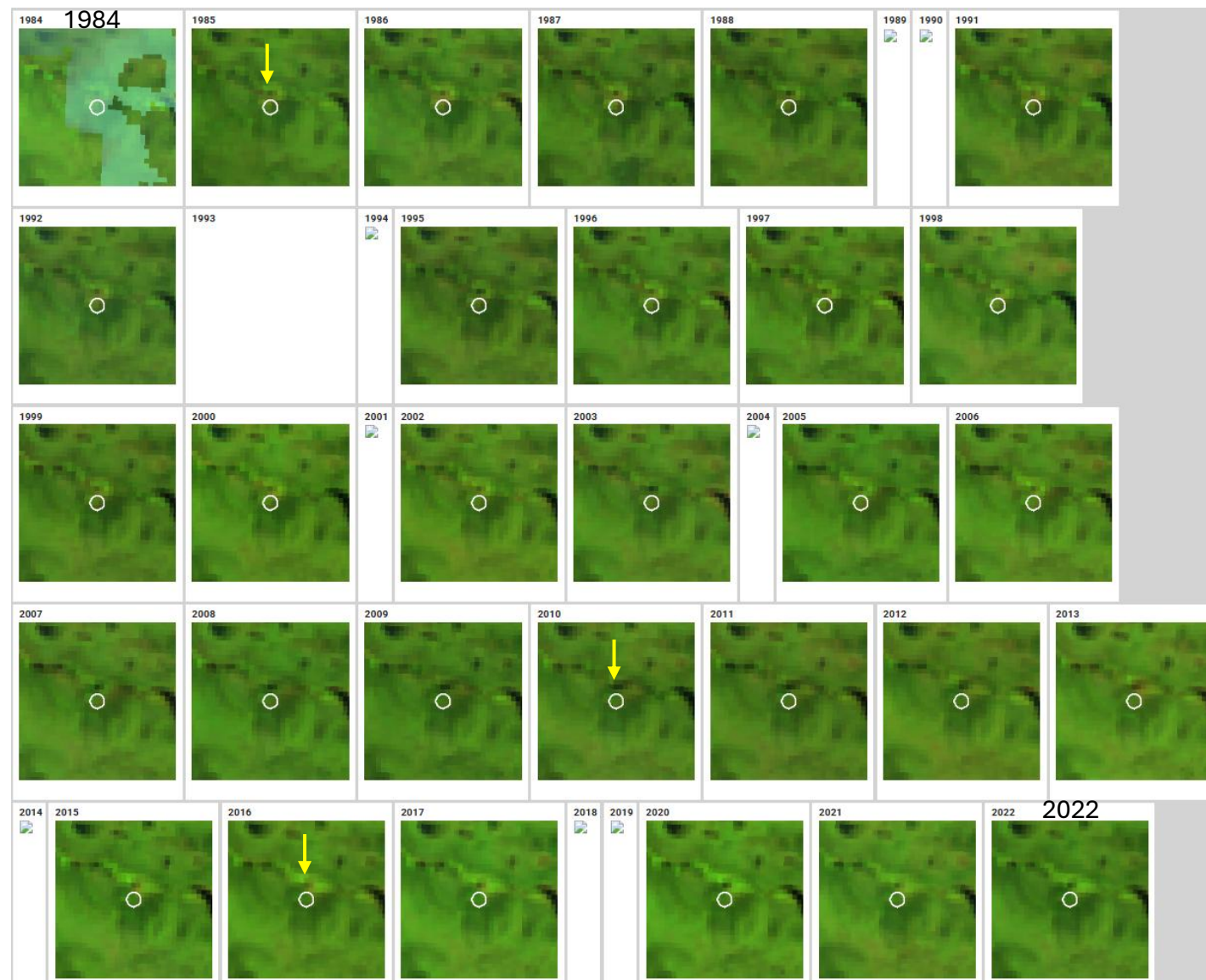


84.6789666°W 52.3358989°N

Annual area (ha)

a1985	0
a1986	0
a1987	0.0297
a1988	0.0297
a1989	0.0297
a1990	0
a1991	0
a1992	0
a1993	0.0261
a1994	0.0387
a1995	0.0351
a1996	0.0288
a1997	0
a1998	0.0261
a1999	0.0243
a2000	0.0234
a2001	0.0261
a2002	0.0369
a2003	0.0387
a2004	0.0324
a2005	0
a2006	0.0306
a2007	0.0405
a2008	0.0981
a2009	0.1809
a2010	0.2007
a2011	0.2124
a2012	0.1728
a2013	0.0621
a2014	0.0351
a2015	0.0288
a2016	0
a2017	0.0252
a2018	0.0333
a2019	0.0414
a2020	0.0369
a2021	0.0378

Annual summer Landsat image chips



FID 76

High-res validation



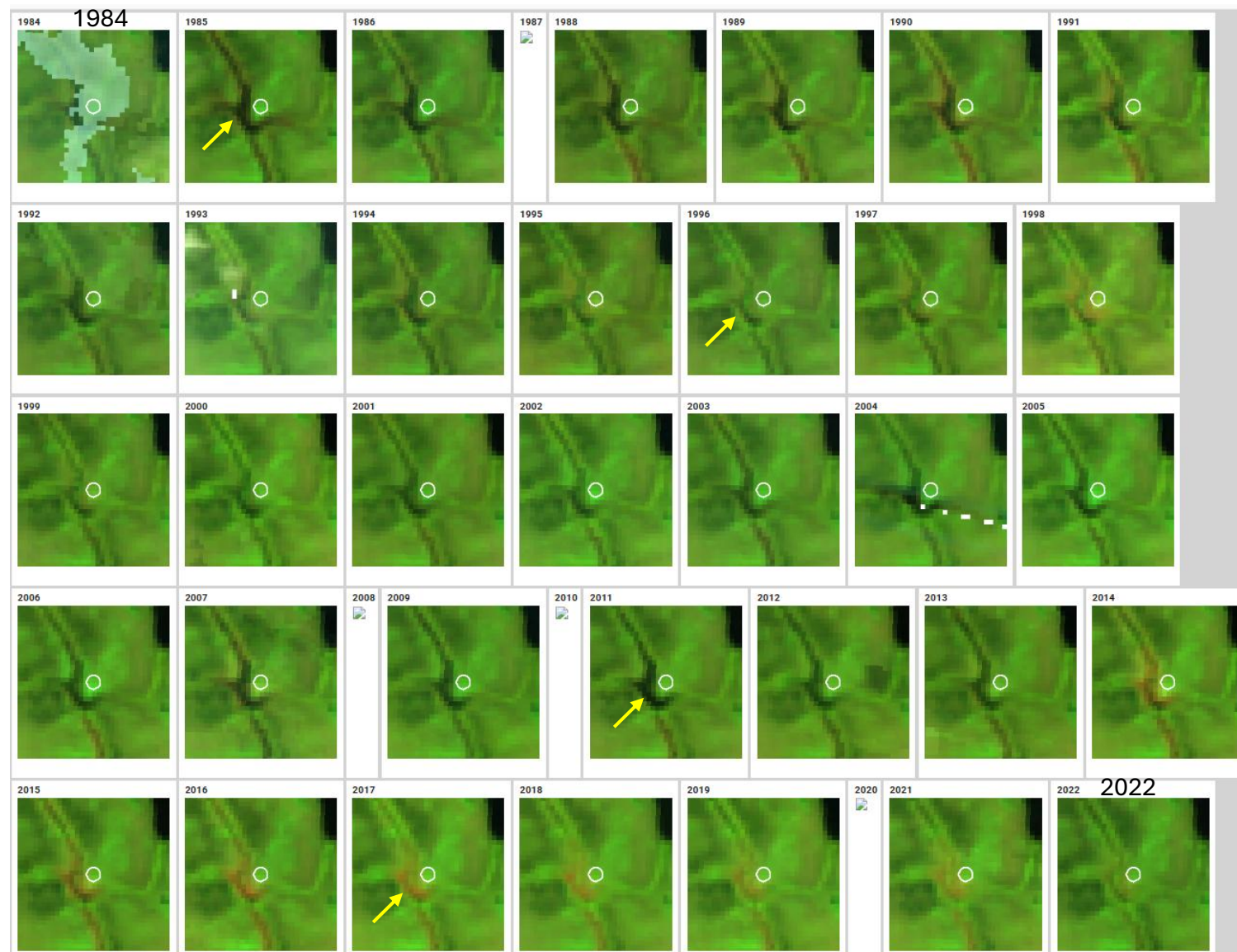
Two cycles of ponding
and draining

85.4110402°W 52.0483668°N

Annual area (ha)

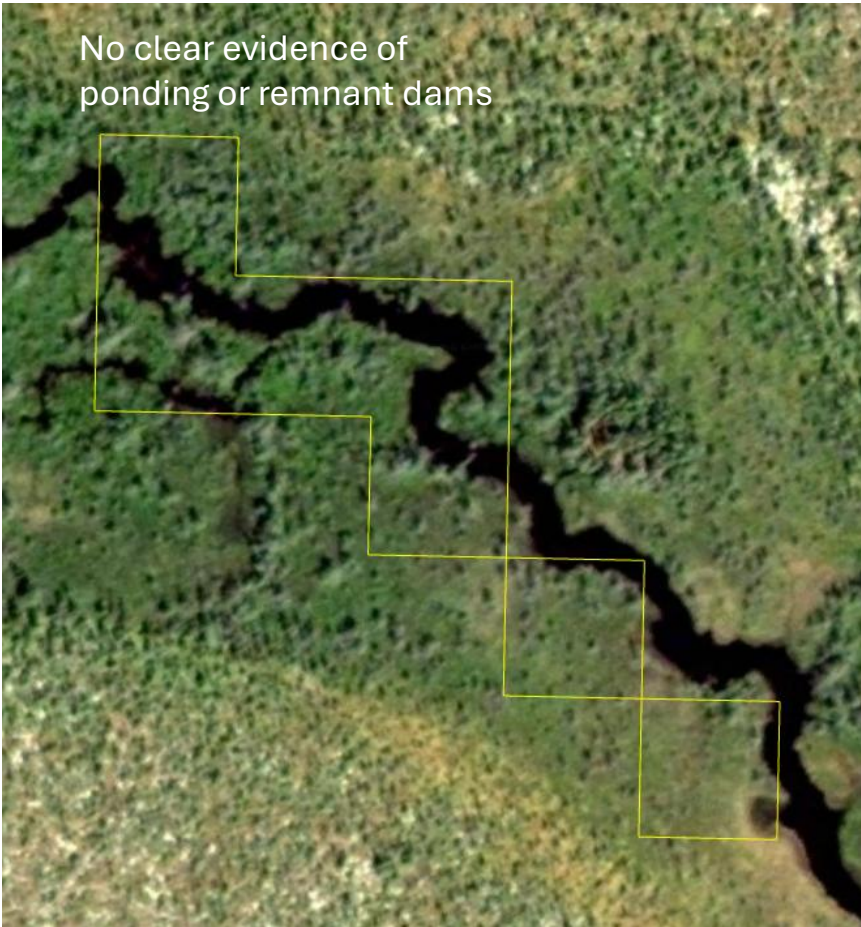
a1985	1.6362
a1986	1.5201
a1987	1.386
a1988	1.2933
a1989	1.2816
a1990	1.1025
a1991	0.6156
a1992	0.4716
a1993	0.4698
a1994	0.2718
a1995	0.0909
a1996	0.0432
a1997	0.0423
a1998	0.1188
a1999	0.1278
a2000	0.684
a2001	0.774
a2002	0.6444
a2003	0.5796
a2004	0.6372
a2005	0.9261
a2006	0.9369
a2007	0.5688
a2008	0.558
a2009	0.4716
a2010	1.1529
a2011	1.1556
a2012	1.3833
a2013	0.9225
a2014	0.7722
a2015	0.2412
a2016	0.0324
a2017	0
a2018	0
a2019	0
a2020	0
a2021	0

Annual summer Landsat image chips



FID 77

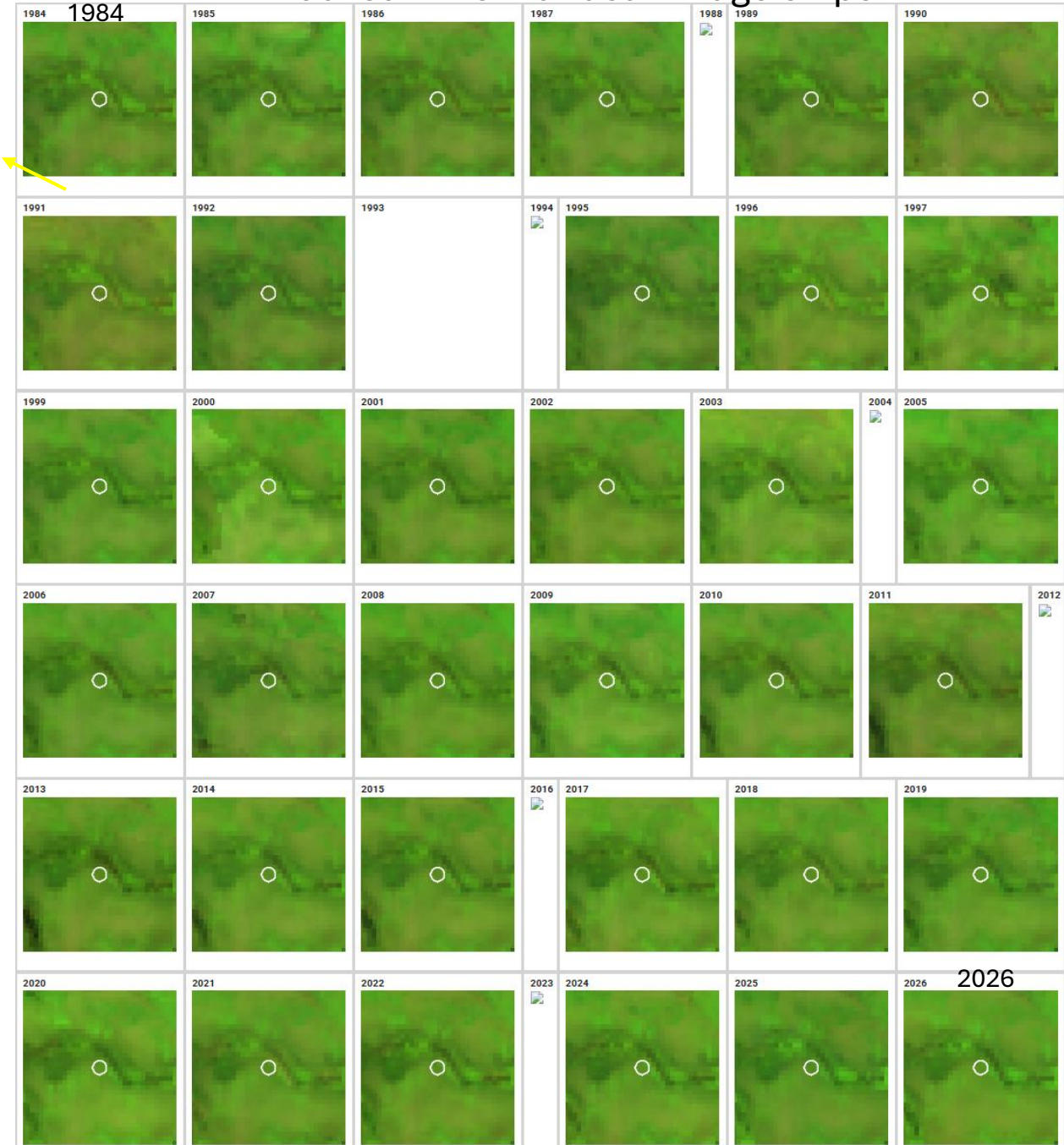
High-res validation



Annual area (ha)

a1985	0
a1986	0
a1987	0
a1988	0
a1989	0
a1990	0
a1991	0
a1992	0
a1993	0.0189
a1994	0
a1995	0
a1996	0
a1997	0
a1998	0
a1999	0
a2000	0
a2001	0
a2002	0
a2003	0
a2004	0
a2005	0
a2006	0.0207
a2007	0
a2008	0.0261
a2009	0
a2010	0.0198
a2011	0.0198
a2012	0.1377
a2013	0.1188
a2014	0.0765
a2015	0.0189
a2016	0
a2017	0.0171
a2018	0.0369
a2019	0
a2020	0
a2021	0

Annual summer Landsat image chips

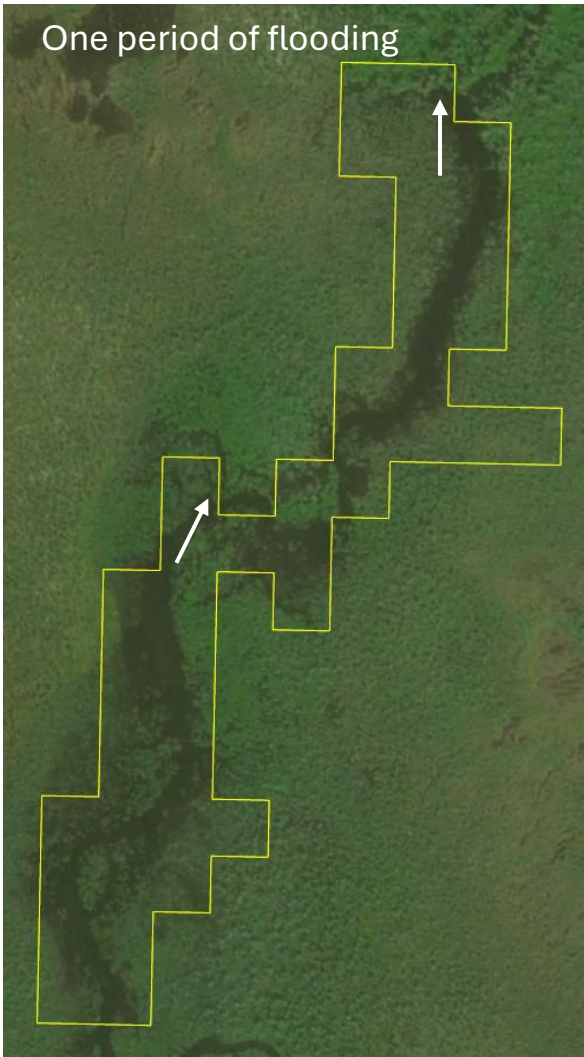


FID 78

High-res validation



One period of flooding

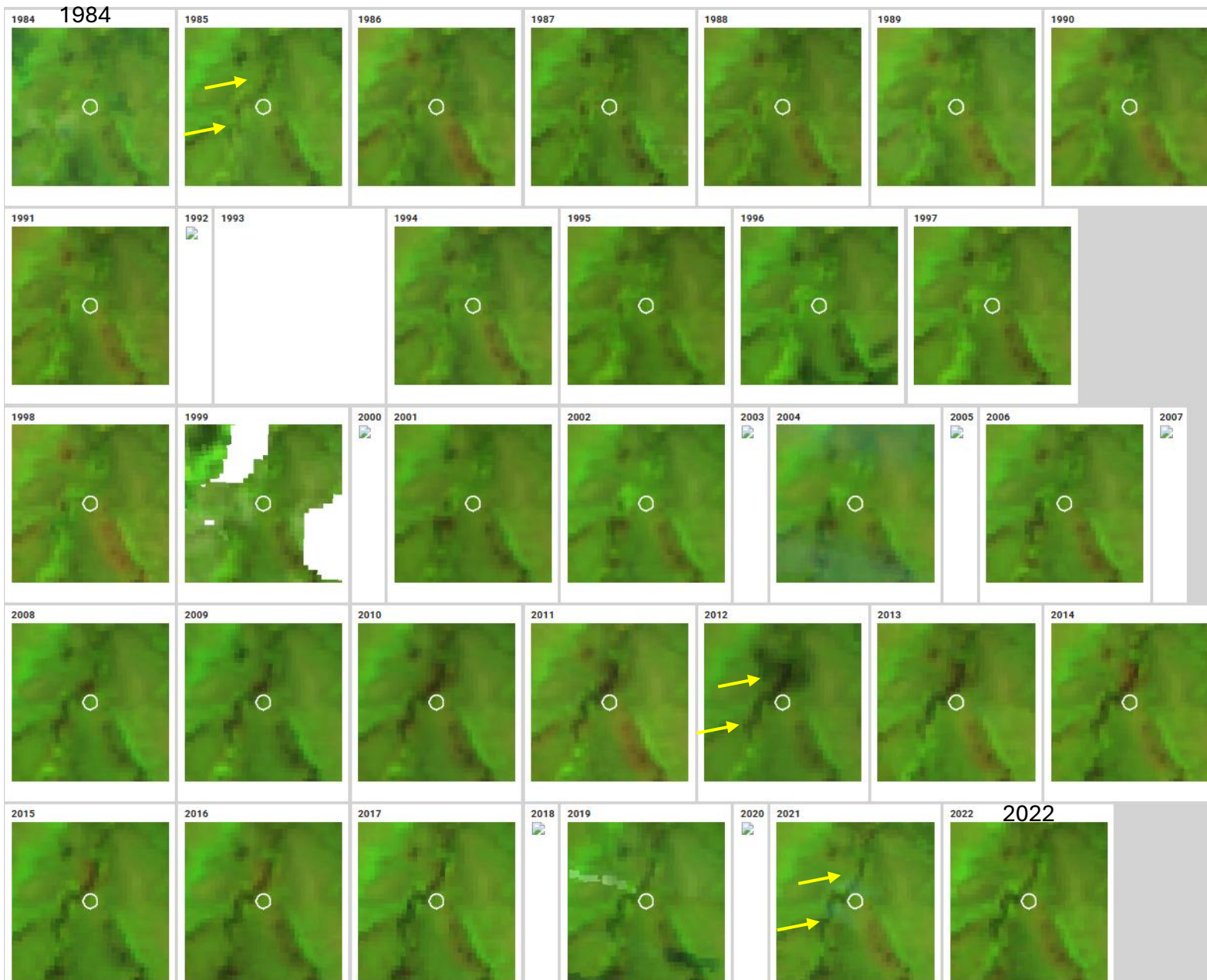


85.4413366°W 52.8720038°N

Annual area (ha)

a1985	0
a1986	0
a1987	0
a1988	0
a1989	0
a1990	0
a1991	0
a1992	0
a1993	0
a1994	0
a1995	0
a1996	0
a1997	0
a1998	0
a1999	0.0414
a2000	0.1485
a2001	0.144
a2002	0.1917
a2003	0.1215
a2004	0.1692
a2005	0.171
a2006	0.2097
a2007	0.3195
a2008	0.4311
a2009	0.5337
a2010	0.6318
a2011	0.6795
a2012	0.7353
a2013	0.6597
a2014	0.6723
a2015	0.5553
a2016	0.5715
a2017	0.4428
a2018	0.5148
a2019	0.3726
a2020	0.4086
a2021	0.1467

Annual summer Landsat image chips



FID 79

High-res validation



One pixel width – near detection limit

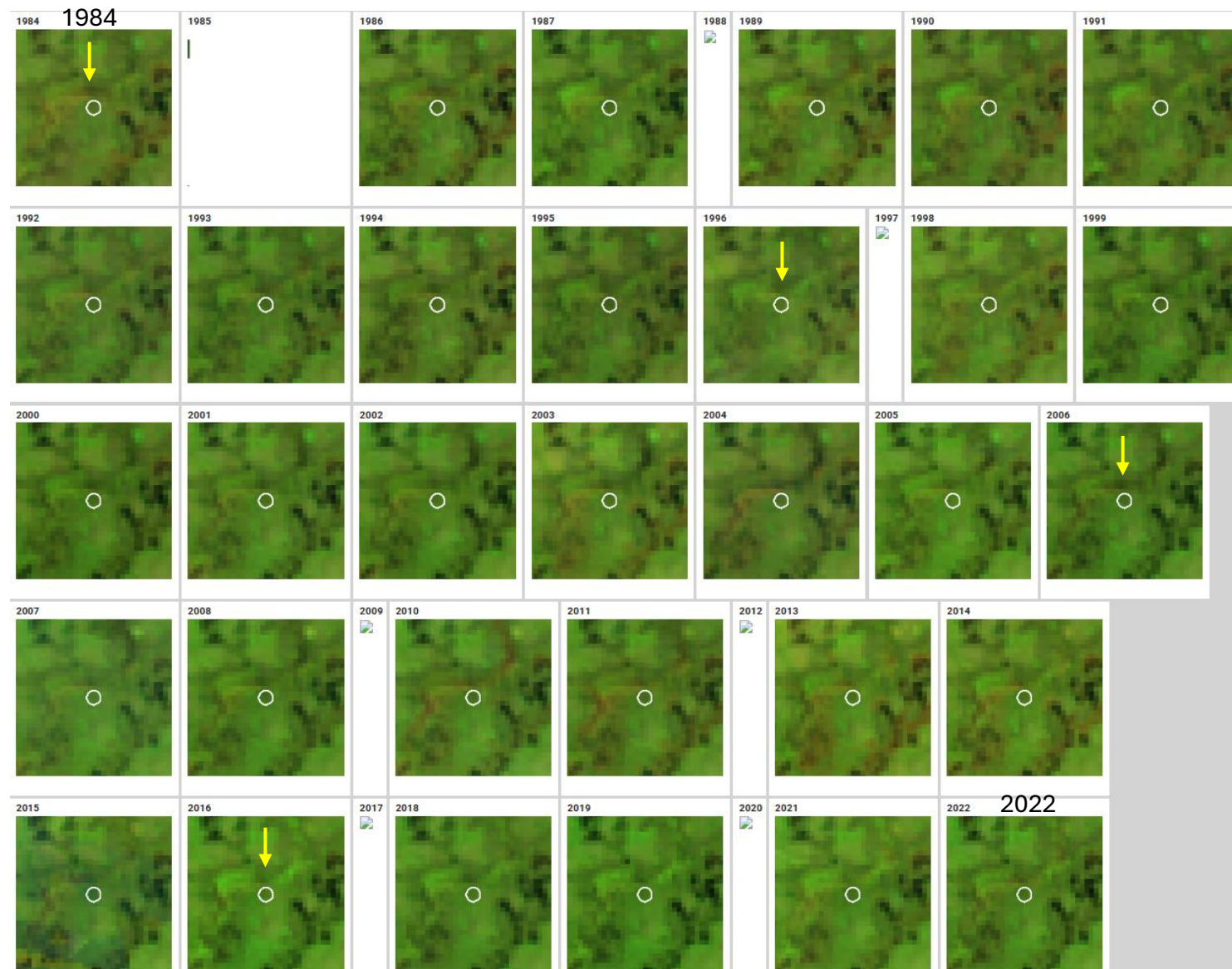


86.5875558°W 54.2936345°N

Annual area (ha)

a1985	0.1269
a1986	0.0972
a1987	0.0378
a1988	0.045
a1989	0.0954
a1990	0.0585
a1991	0.0495
a1992	0.0549
a1993	0.0972
a1994	0.09
a1995	0.1251
a1996	0.0261
a1997	0.0531
a1998	0.0738
a1999	0.108
a2000	0.1251
a2001	0.1314
a2002	0.1044
a2003	0.0882
a2004	0.1071
a2005	0.2025
a2006	0.2232
a2007	0.1251
a2008	0.1107
a2009	0.1035
a2010	0.1602
a2011	0.1287
a2012	0.1242
a2013	0.1089
a2014	0.1035
a2015	0.0378
a2016	0
a2017	0.018
a2018	0.0207
a2019	0.0216
a2020	0.0189
a2021	0.0171

Annual summer Landsat image chips



FID 80

High-res validation



One period of flooding

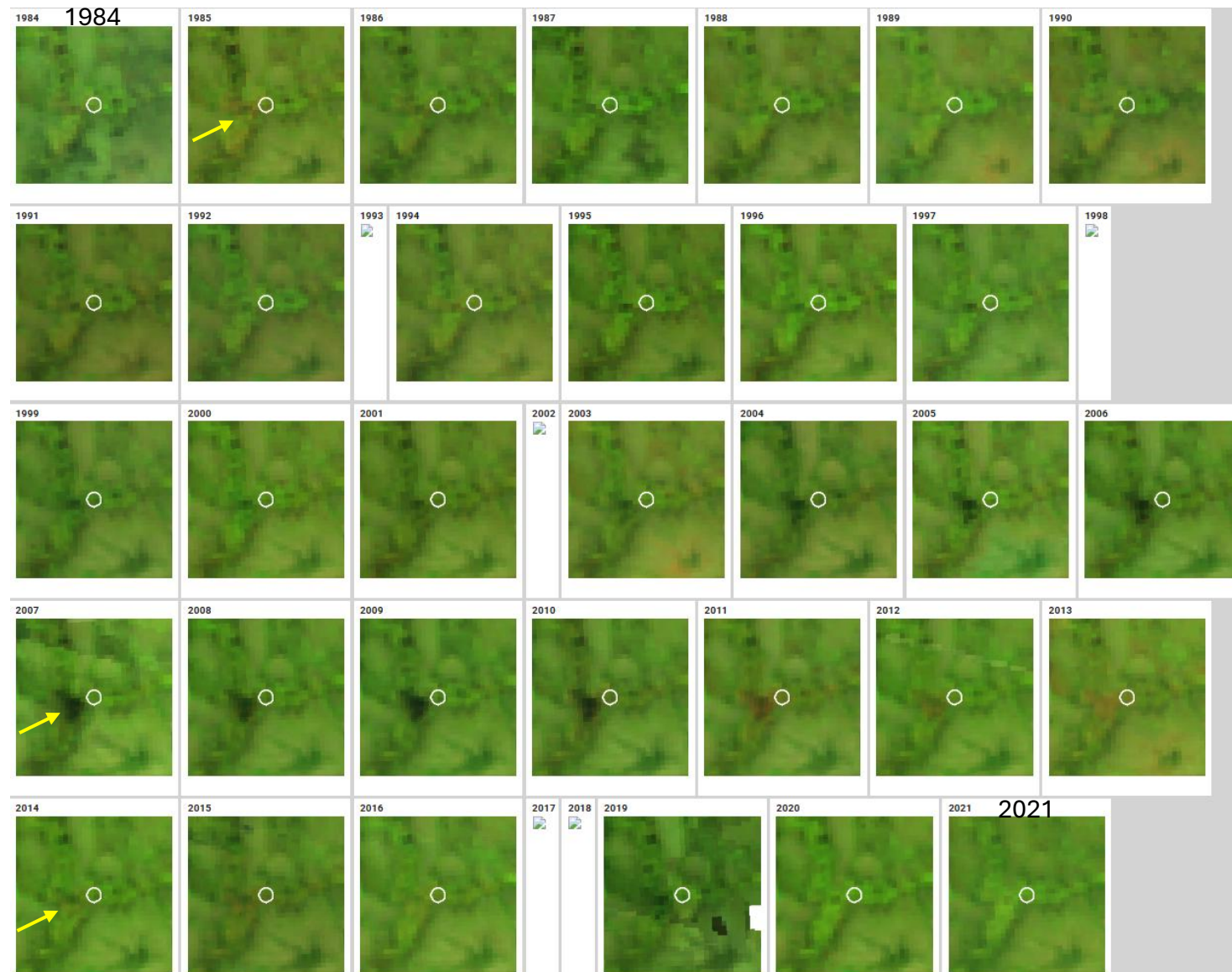


84.3456094°W 53.9457487°N

Annual area (ha)

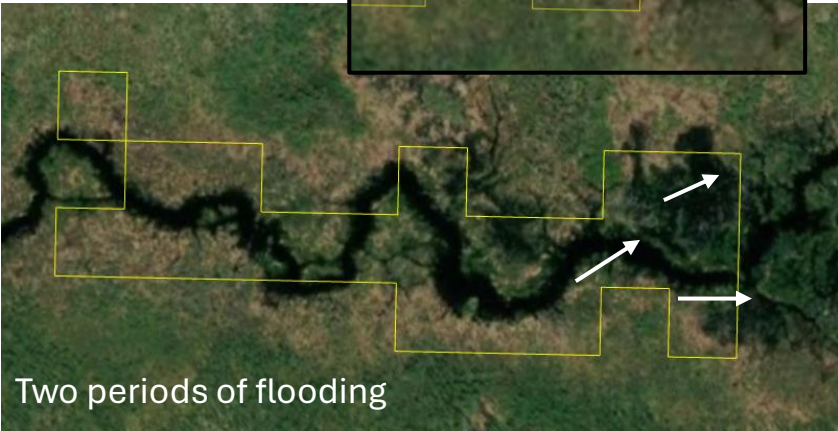
a1985	0.0171
a1986	0.1008
a1987	0.0189
a1988	0.0171
a1989	0
a1990	0
a1991	0
a1992	0.018
a1993	0
a1994	0
a1995	0
a1996	0.036
a1997	0
a1998	0.0567
a1999	0.072
a2000	0.1557
a2001	0.2196
a2002	0.2736
a2003	0.4293
a2004	0.45
a2005	0.5985
a2006	0.6534
a2007	0.7119
a2008	0.7389
a2009	0.7758
a2010	0.7281
a2011	0.6597
a2012	0.1242
a2013	0.1206
a2014	0.1971
a2015	0.1737
a2016	0
a2017	0
a2018	0
a2019	0
a2020	0
a2021	0

Annual summer Landsat image chips



FID 81

High-res validation



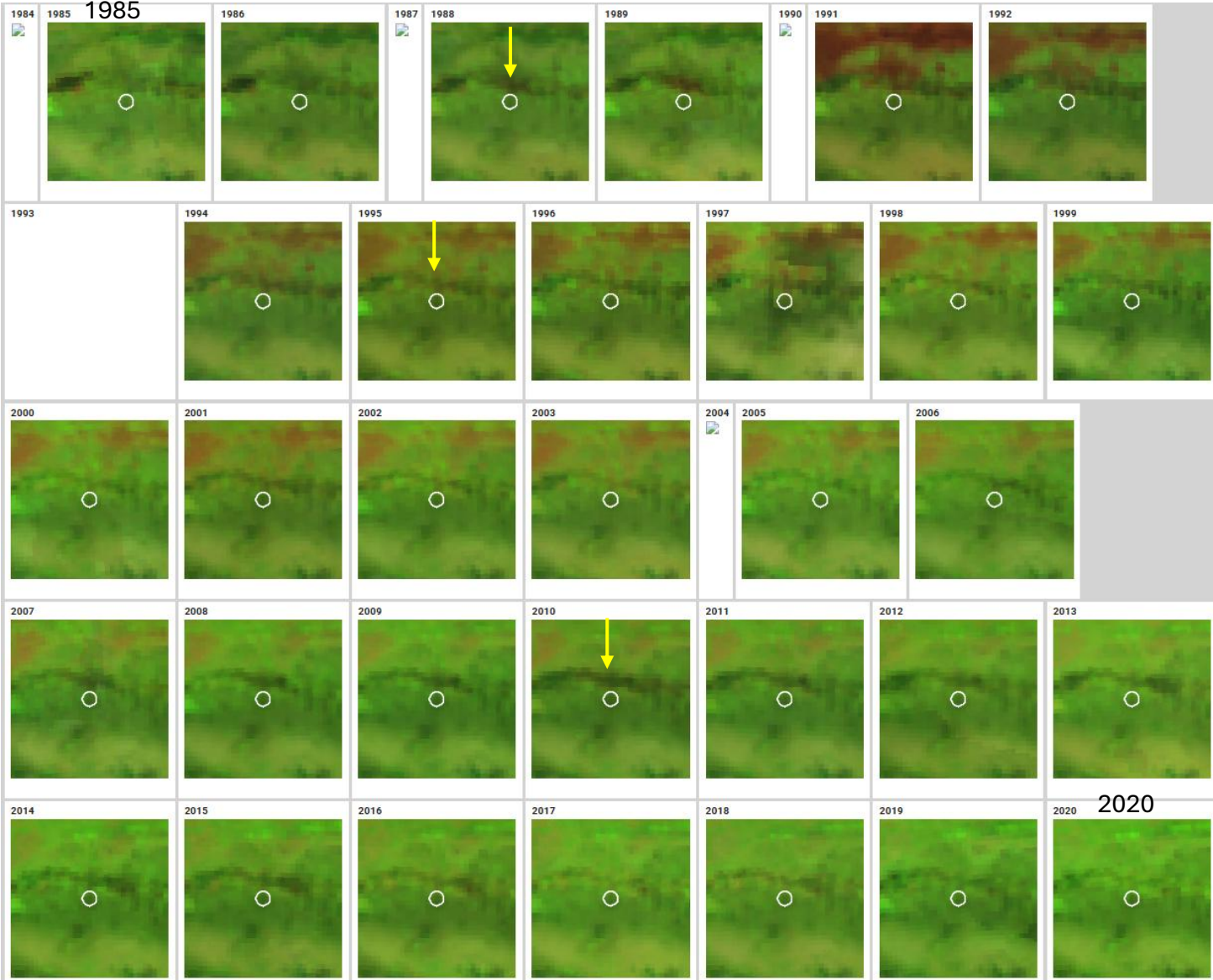
Two periods of flooding

85.0926184°W 53.5356957°N

Annual area (ha)

a1985	0
a1986	0.0477
a1987	0.1143
a1988	0.2619
a1989	0.3123
a1990	0.1467
a1991	0.1584
a1992	0.1638
a1993	0.1458
a1994	0.0387
a1995	0
a1996	0
a1997	0.0225
a1998	0.0459
a1999	0
a2000	0
a2001	0
a2002	0
a2003	0
a2004	0
a2005	0
a2006	0
a2007	0.0297
a2008	0.0288
a2009	0.1224
a2010	0.1296
a2011	0.1242
a2012	0.0477
a2013	0.0252
a2014	0.0243
a2015	0
a2016	0
a2017	0
a2018	0
a2019	0
a2020	0
a2021	0

Annual summer Landsat image chips



FID 82

High-res validation

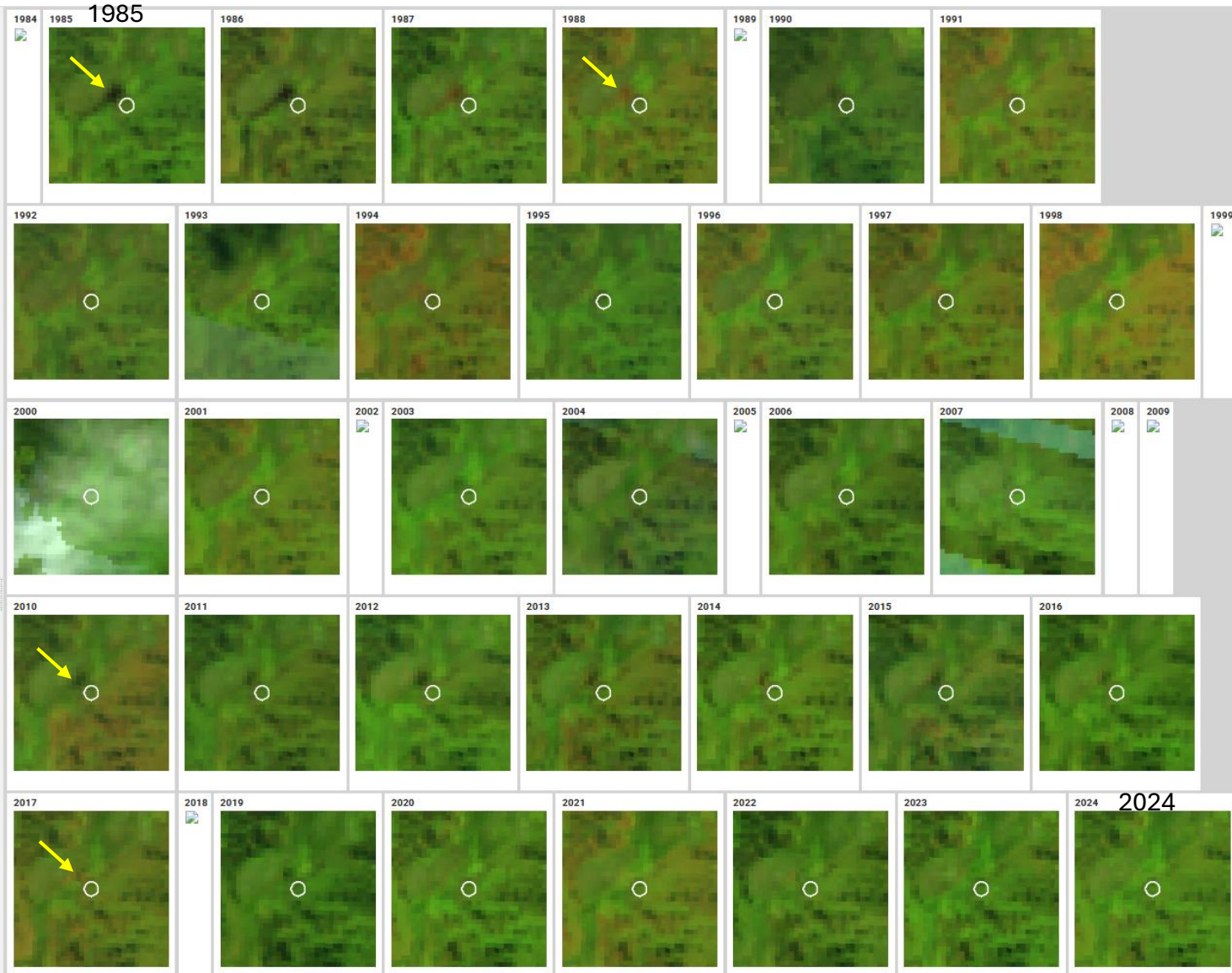


85.4879433°W 55.0728743°N

Annual area (ha)

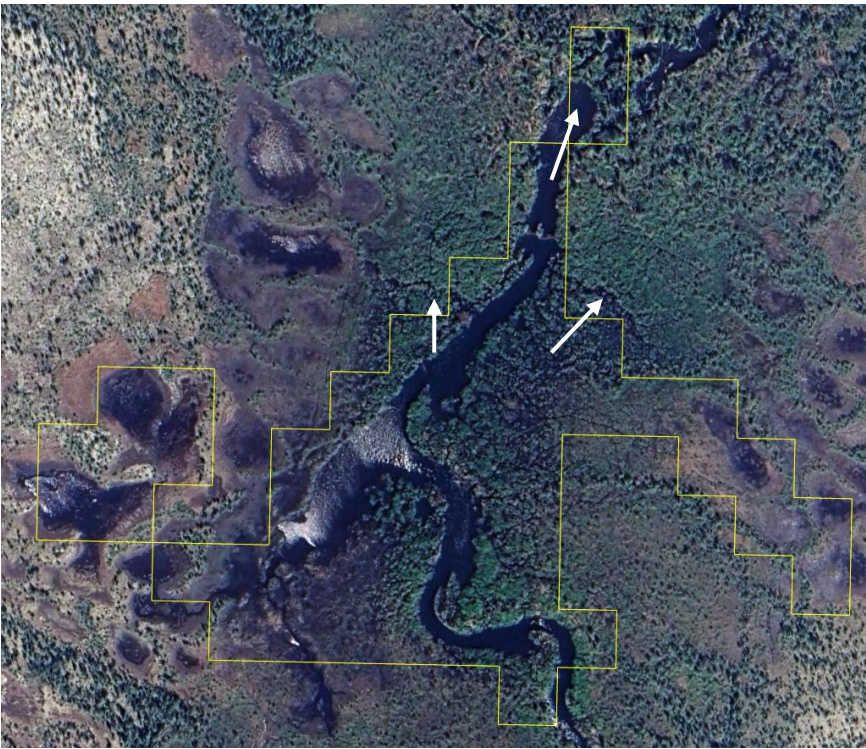
a1985	0.4212
a1986	0.3969
a1987	0.1881
a1988	0
a1989	0
a1990	0
a1991	0
a1992	0
a1993	0
a1994	0
a1995	0
a1996	0
a1997	0
a1998	0
a1999	0
a2000	0
a2001	0
a2002	0
a2003	0
a2004	0
a2005	0
a2006	0
a2007	0
a2008	0.0648
a2009	0.0891
a2010	0.1395
a2011	0.1359
a2012	0.1359
a2013	0.1071
a2014	0.1224
a2015	0.1071
a2016	0.0216
a2017	0
a2018	0
a2019	0
a2020	0
a2021	0

Annual summer Landsat image chips



FID 83

High-res validation

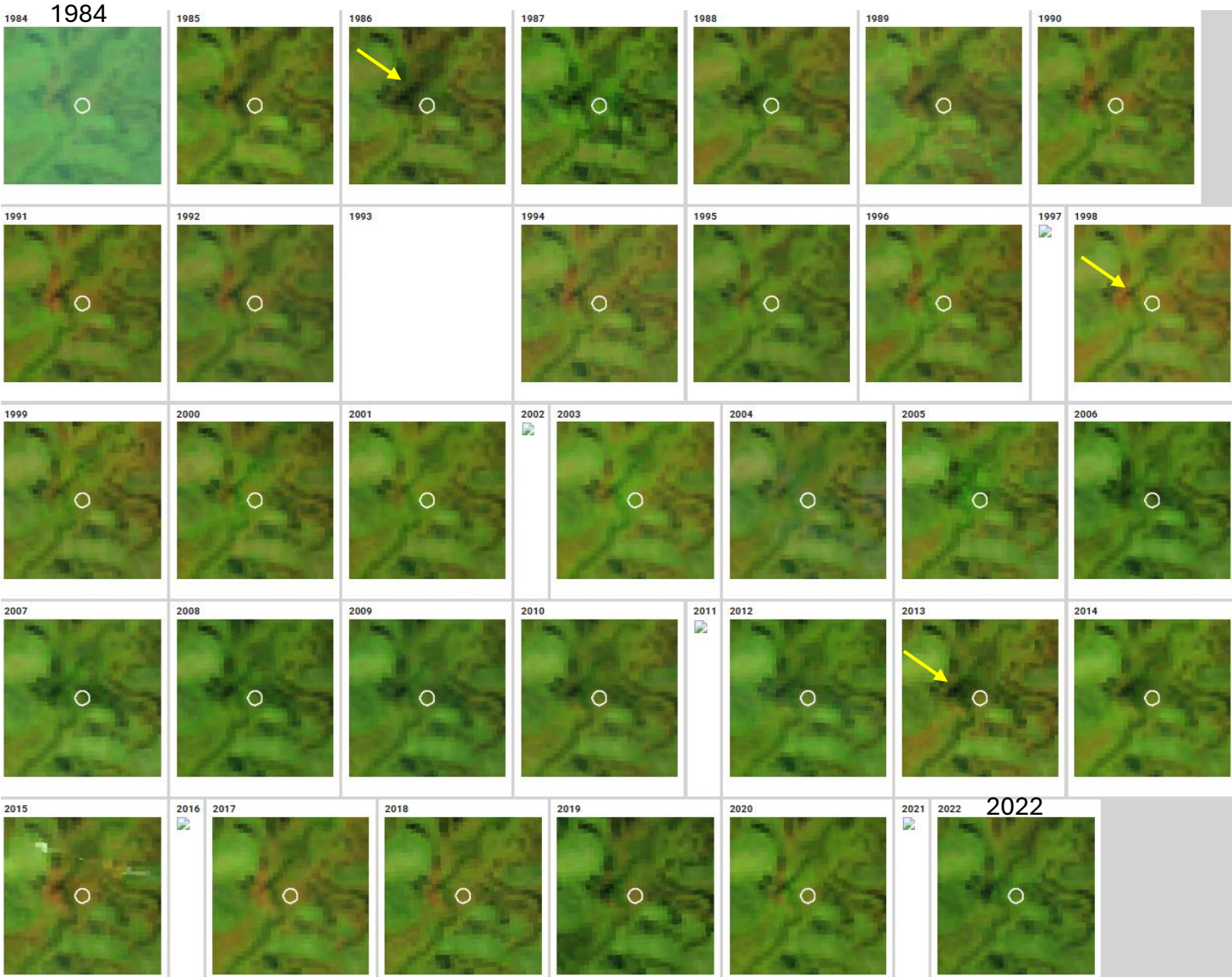


83.9639505°W 54.5879341°N

Annual area (ha)

a1985	0.711
a1986	1.0467
a1987	1.0503
a1988	0.8892
a1989	0.5625
a1990	0.3366
a1991	0.2916
a1992	0.3384
a1993	0.2547
a1994	0.1944
a1995	0.1359
a1996	0.1206
a1997	0.117
a1998	0.1602
a1999	0.1602
a2000	0.1755
a2001	0.1314
a2002	0.1458
a2003	0.144
a2004	0.1782
a2005	0.3474
a2006	0.4689
a2007	0.4518
a2008	0.3933
a2009	0.4689
a2010	0.6345
a2011	0.8019
a2012	1.0206
a2013	1.1178
a2014	1.0881
a2015	1.0422
a2016	0.4068
a2017	0.243
a2018	0.2214
a2019	0.333
a2020	0.2574
a2021	0.2079

Annual summer Landsat image chips



FID 84

High-res validation



Drained from
1988-2001

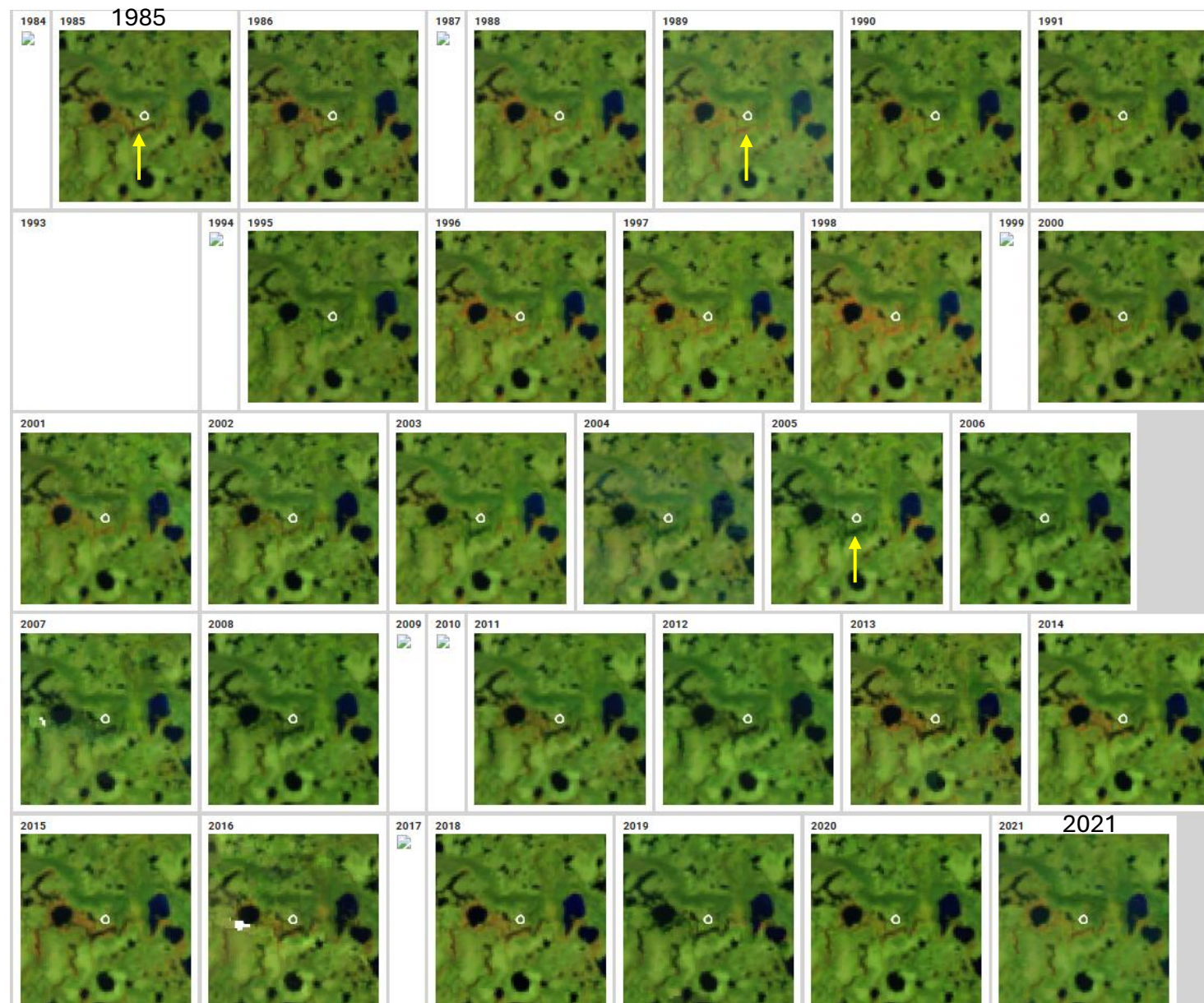


84.3595387°W 54.5935748°N

Annual area (ha)

a1985	0.4734
a1986	0.5976
a1987	0.1728
a1988	0.0522
a1989	0.0288
a1990	0.0333
a1991	0.081
a1992	0.0585
a1993	0.1611
a1994	0.4365
a1995	0.1476
a1996	0.0279
a1997	0.0279
a1998	0.027
a1999	0.054
a2000	0.0756
a2001	0.2169
a2002	0.5049
a2003	0.6669
a2004	0.6534
a2005	1.1133
a2006	1.2159
a2007	1.3698
a2008	1.4526
a2009	1.4931
a2010	1.5894
a2011	1.6821
a2012	1.8072
a2013	2.0268
a2014	2.0448
a2015	1.7505
a2016	1.2195
a2017	1.1997
a2018	1.1484
a2019	0.9756
a2020	0.7254
a2021	0.5238

Annual summer Landsat image chips



FID 85

High-res validation



Near Landsat detection limit

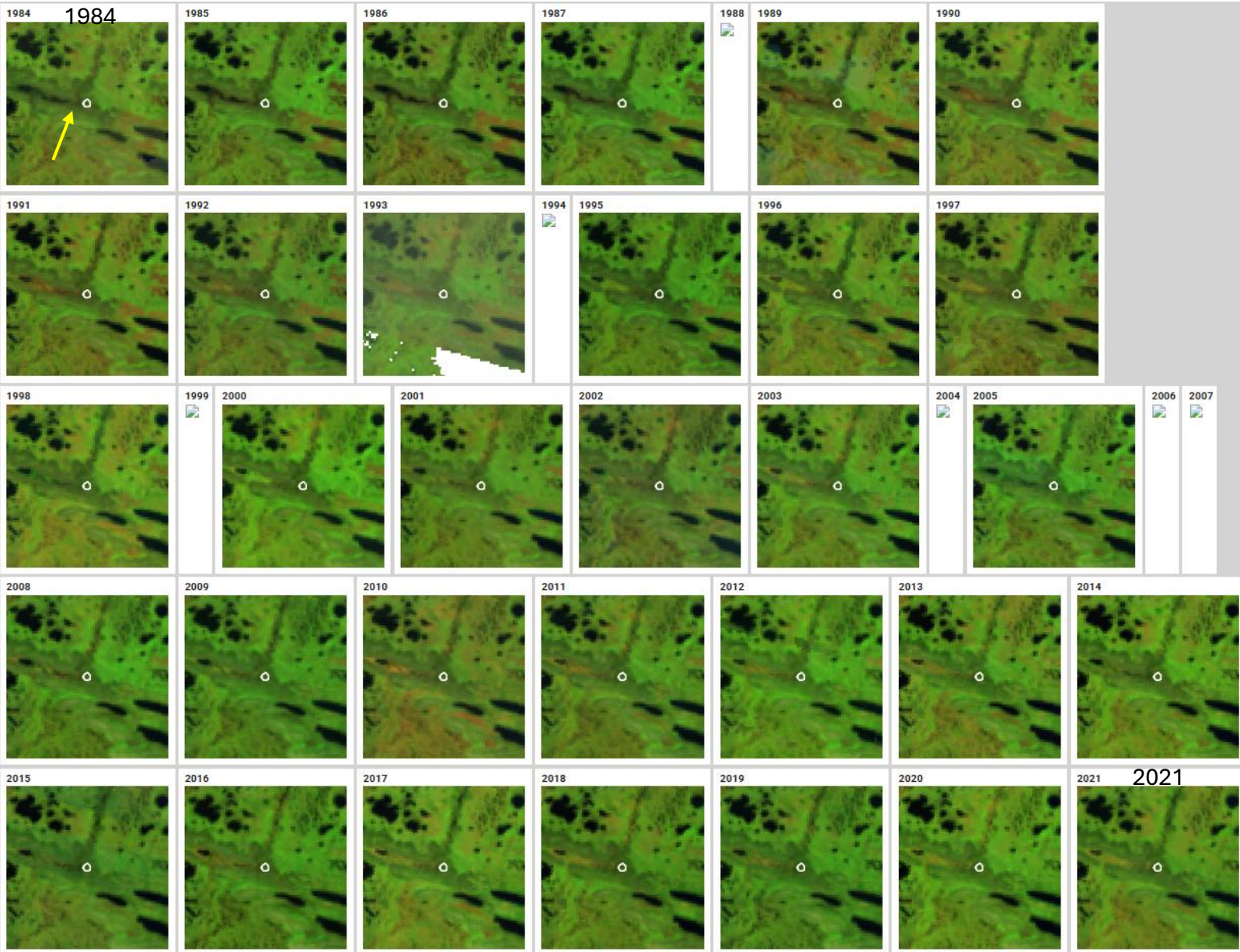


84.7908598°W 54.9555174°N

Annual area (ha)

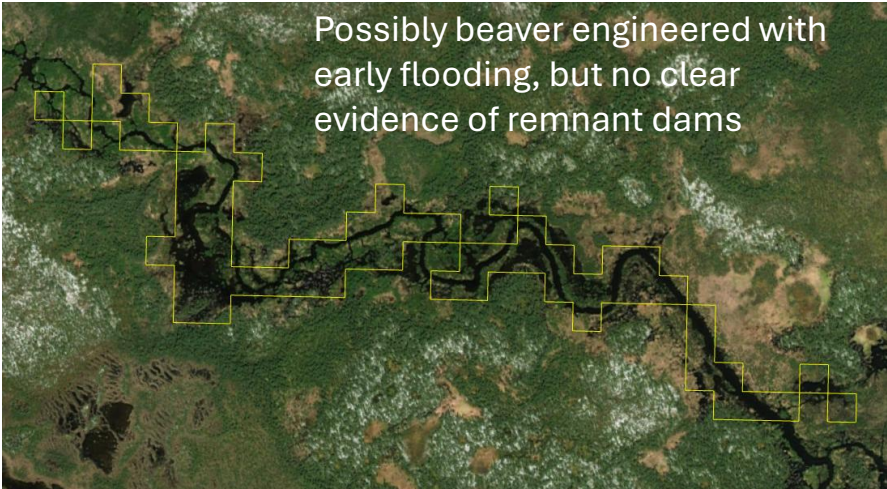
Annual summer Landsat image chips

a1985	0.1341
a1986	0.1449
a1987	0.1062
a1988	0.0855
a1989	0.0783
a1990	0.0801
a1991	0.0738
a1992	0.0648
a1993	0.0594
a1994	0.0657
a1995	0.0558
a1996	0.0594
a1997	0.0603
a1998	0.0675
a1999	0.0756
a2000	0.0702
a2001	0.0657
a2002	0.0666
a2003	0.0666
a2004	0.0774
a2005	0.0891
a2006	0.1035
a2007	0.0936
a2008	0.0234
a2009	0.0432
a2010	0.0423
a2011	0.054
a2012	0.0369
a2013	0.0855
a2014	0.0891
a2015	0.1008
a2016	0.0639
a2017	0.0486
a2018	0.0369
a2019	0.0234
a2020	0.0126
a2021	0.0135



FID 86

High-res validation

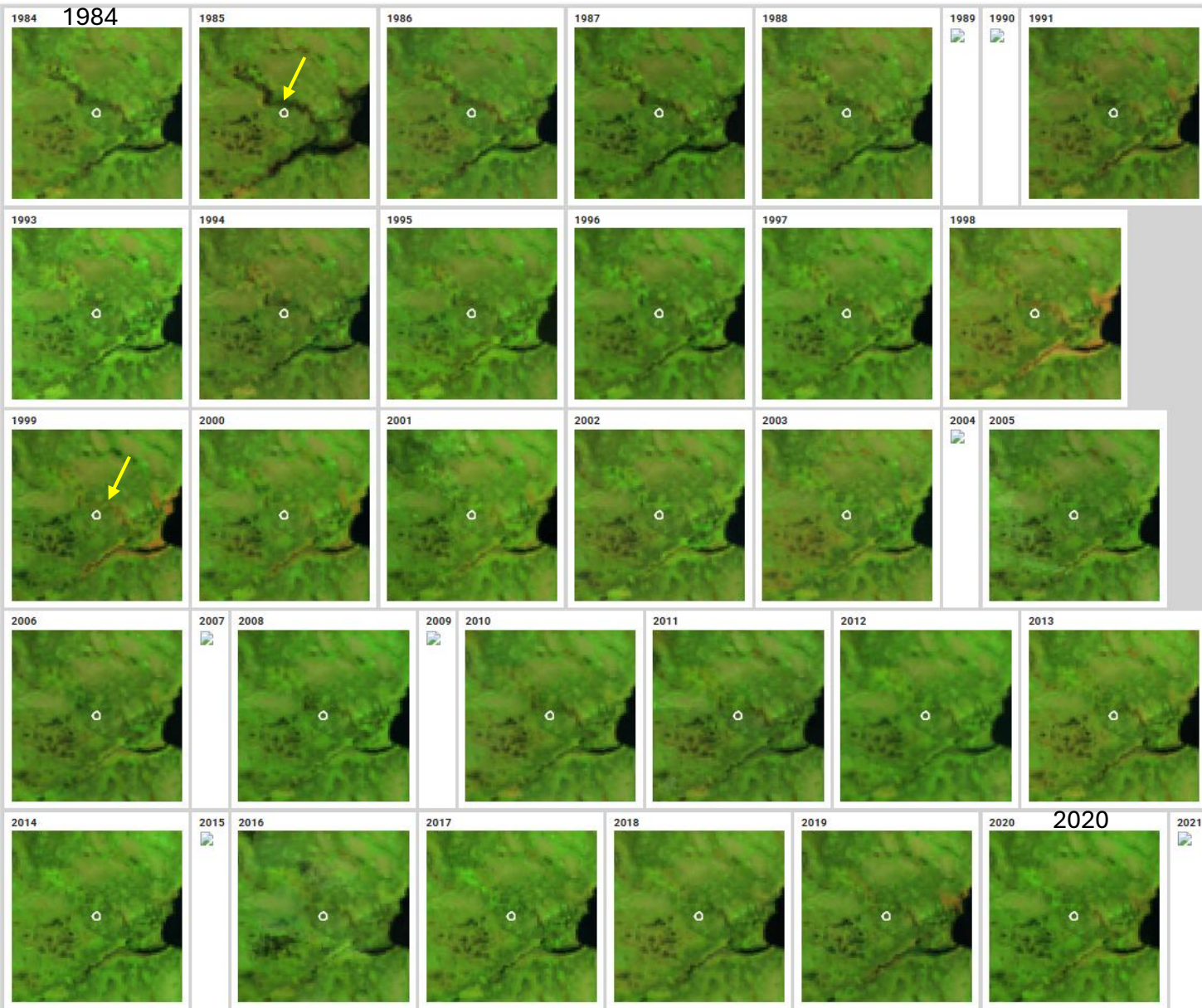


83.4934407°W 53.9176297°N

Annual area (ha)

a1985	0.8361
a1986	0.9108
a1987	0.8019
a1988	0.8442
a1989	0.702
a1990	0.6894
a1991	0.7938
a1992	0.7011
a1993	0.5796
a1994	0.4374
a1995	0.2538
a1996	0.117
a1997	0.1512
a1998	0.1368
a1999	0.0243
a2000	0
a2001	0.0225
a2002	0.0234
a2003	0
a2004	0.0513
a2005	0.0351
a2006	0.1062
a2007	0.1899
a2008	0.2304
a2009	0.2439
a2010	0.4365
a2011	0.4005
a2012	0.2025
a2013	0.324
a2014	0.3699
a2015	0.4356
a2016	0.2385
a2017	0.2574
a2018	0.1998
a2019	0.1989
a2020	0.0891
a2021	0

Annual summer Landsat image chips



FID 87

High-res validation

Early and late periods of ponding

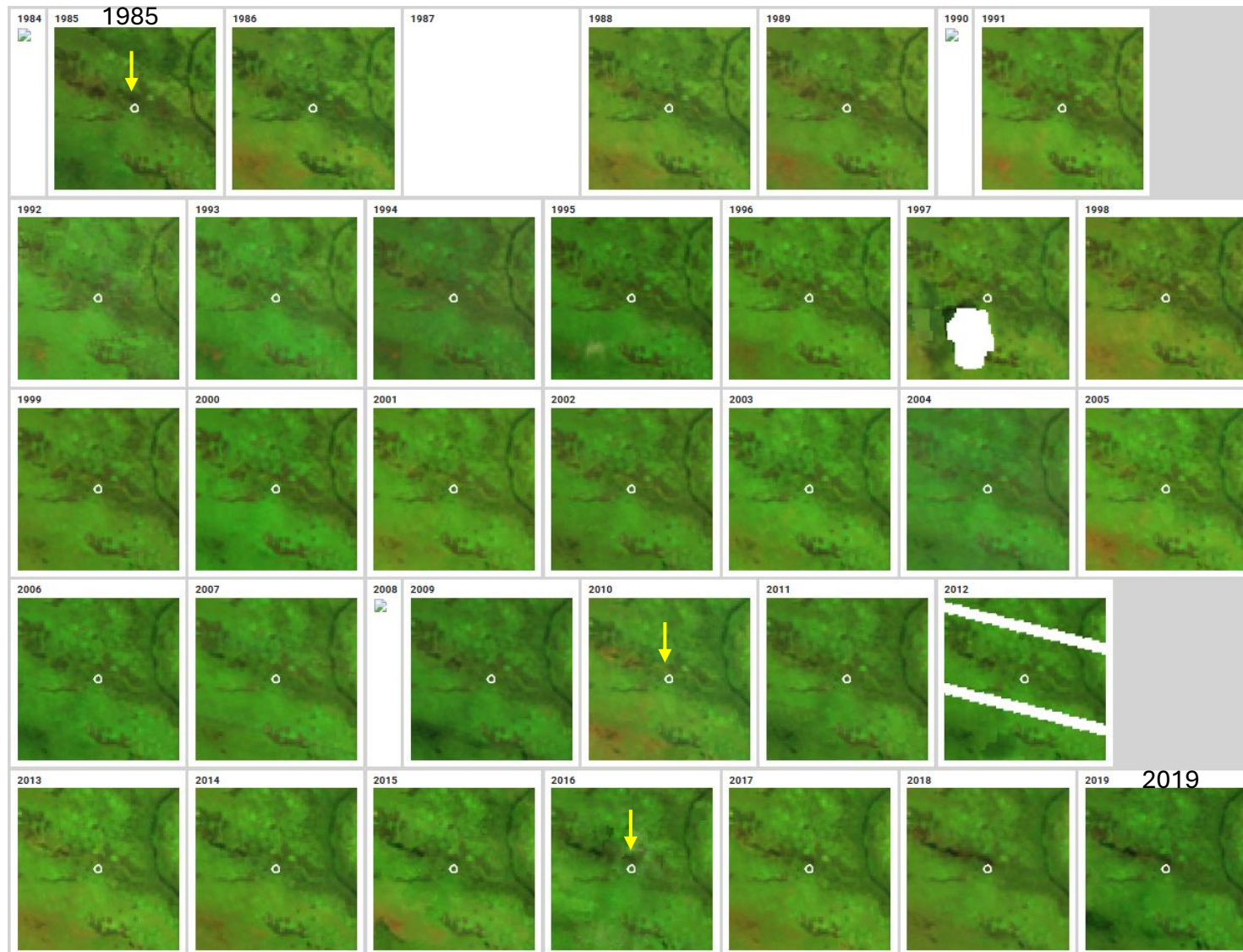
Some
“bleeding” of
water body
into dense
conifer forest

82.7170643°W 54.5228981°N

Annual area (ha)

Annual summer Landsat image chips

a1985	0.1503
a1986	0.153
a1987	0.1413
a1988	0.1539
a1989	0.1359
a1990	0.1269
a1991	0.135
a1992	0.1134
a1993	0.0441
a1994	0.0504
a1995	0.1134
a1996	0.126
a1997	0.099
a1998	0.0855
a1999	0.0891
a2000	0.0945
a2001	0.0936
a2002	0.1062
a2003	0.0801
a2004	0
a2005	0
a2006	0.0144
a2007	0.0144
a2008	0.0144
a2009	0.0135
a2010	0.0243
a2011	0.0261
a2012	0.0135
a2013	0.0126
a2014	0.0333
a2015	0.0954
a2016	0.2115
a2017	0.288
a2018	0.3087
a2019	0.2916
a2020	0.2043
a2021	0.1575



FID 88

High-res validation



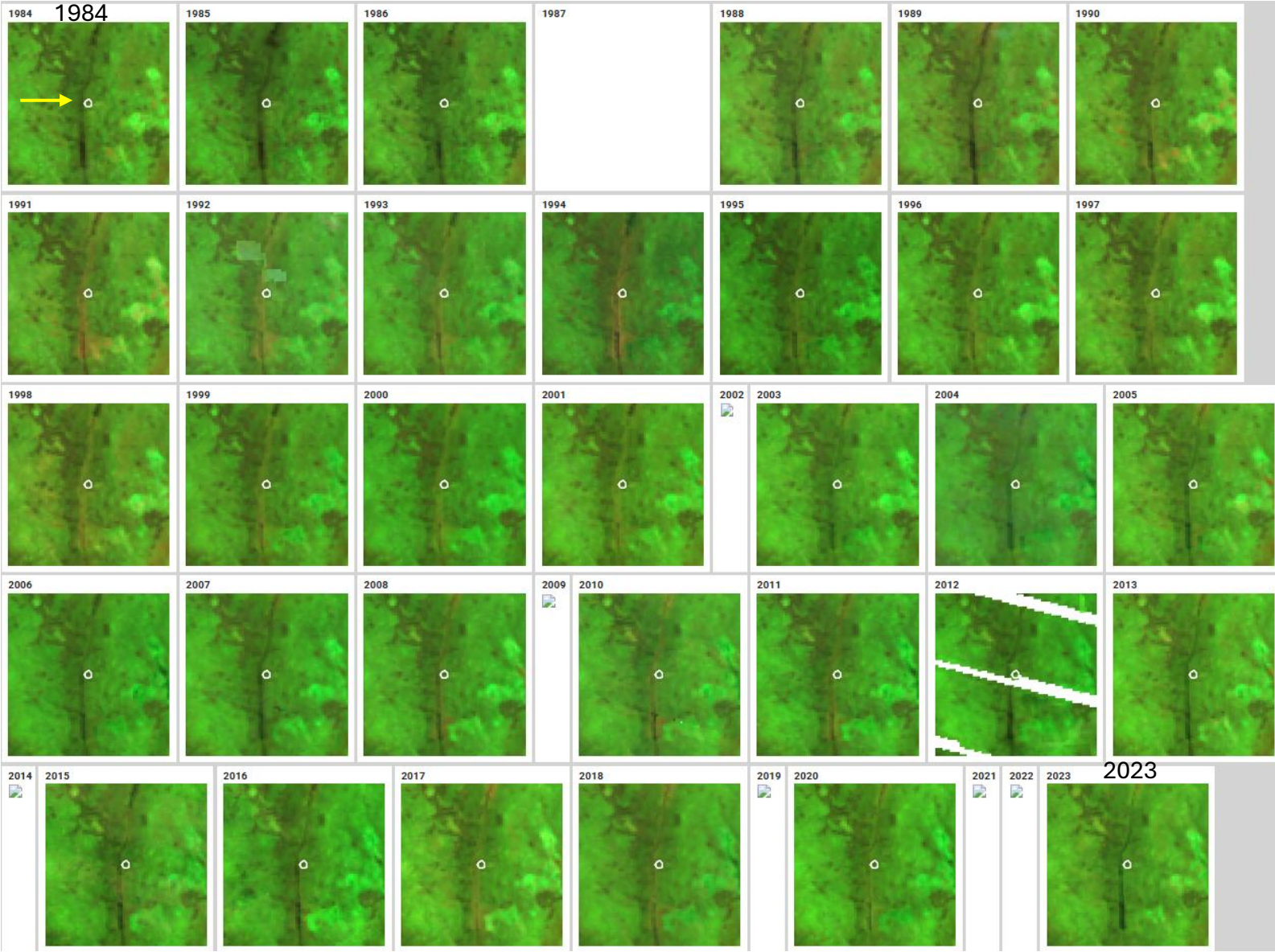
82.6930250°W 54.5519771°N



Annual area (ha)

a1985	0.0198
a1986	0.324
a1987	0.1332
a1988	0.1206
a1989	0.0207
a1990	0
a1991	0
a1992	0
a1993	0
a1994	0
a1995	0
a1996	0
a1997	0
a1998	0
a1999	0
a2000	0
a2001	0
a2002	0
a2003	0
a2004	0
a2005	0
a2006	0.0594
a2007	0.0441
a2008	0.0207
a2009	0
a2010	0
a2011	0
a2012	0.0198
a2013	0.0468
a2014	0.0648
a2015	0.1026
a2016	0.0171
a2017	0
a2018	0
a2019	0
a2020	0
a2021	0

Annual summer Landsat image chips



FID 89

High-res validation



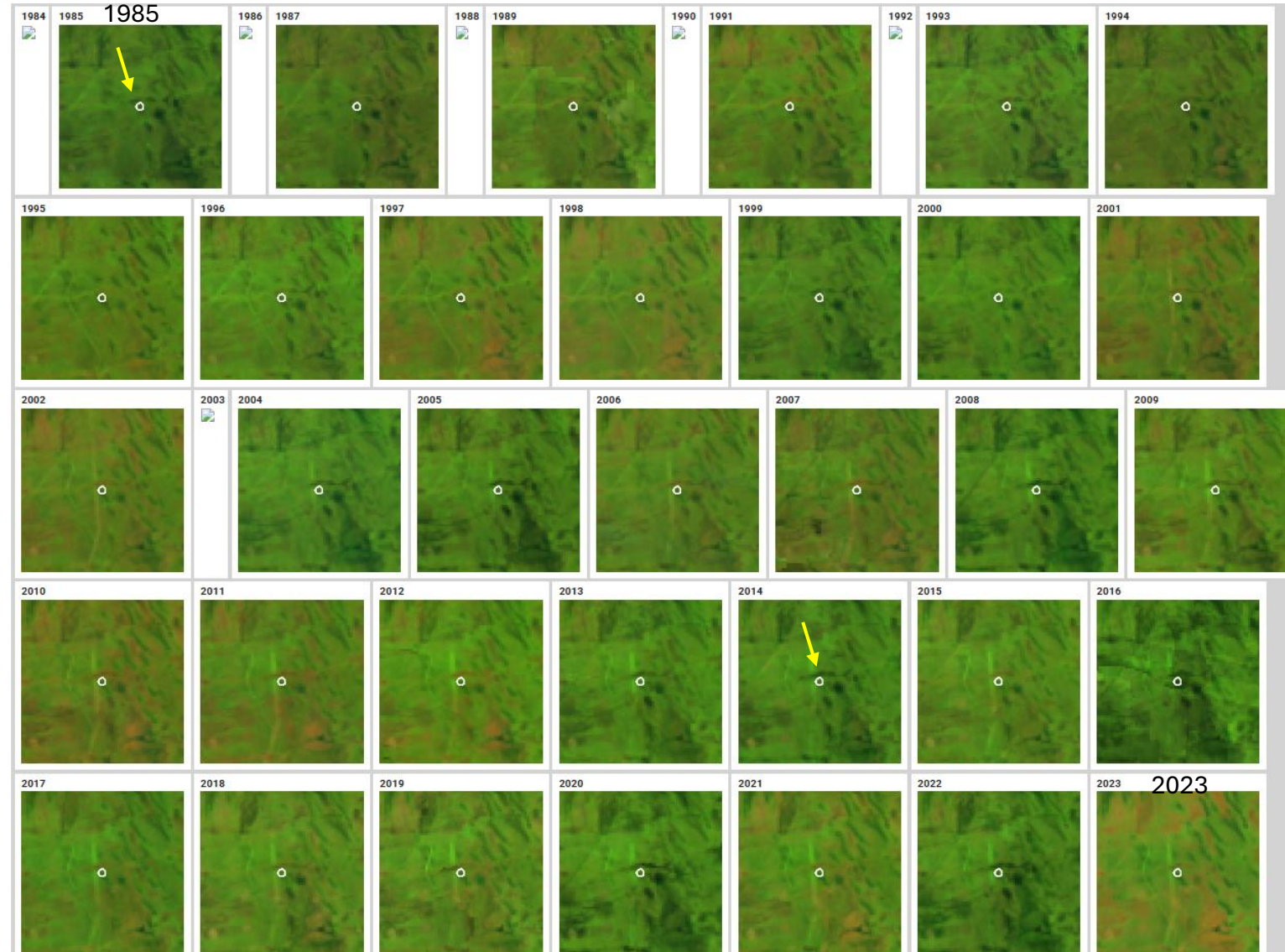
Ambiguous – some signs of remnant dam but could be a pre-1985 remnant pond

80.5763193°W 51.5899394°N

Annual area (ha)

a1985	0.0468
a1986	0.0387
a1987	0
a1988	0
a1989	0
a1990	0
a1991	0
a1992	0
a1993	0
a1994	0
a1995	0
a1996	0
a1997	0
a1998	0
a1999	0
a2000	0
a2001	0
a2002	0
a2003	0
a2004	0.0774
a2005	0
a2006	0
a2007	0
a2008	0
a2009	0
a2010	0
a2011	0
a2012	0
a2013	0
a2014	0.0387
a2015	0.1143
a2016	0.0324
a2017	0
a2018	0
a2019	0.0144
a2020	0
a2021	0.0387

Annual summer Landsat image chips



FID 90

High-res validation



Visual contrast poor with
surrounding dark conifer trees

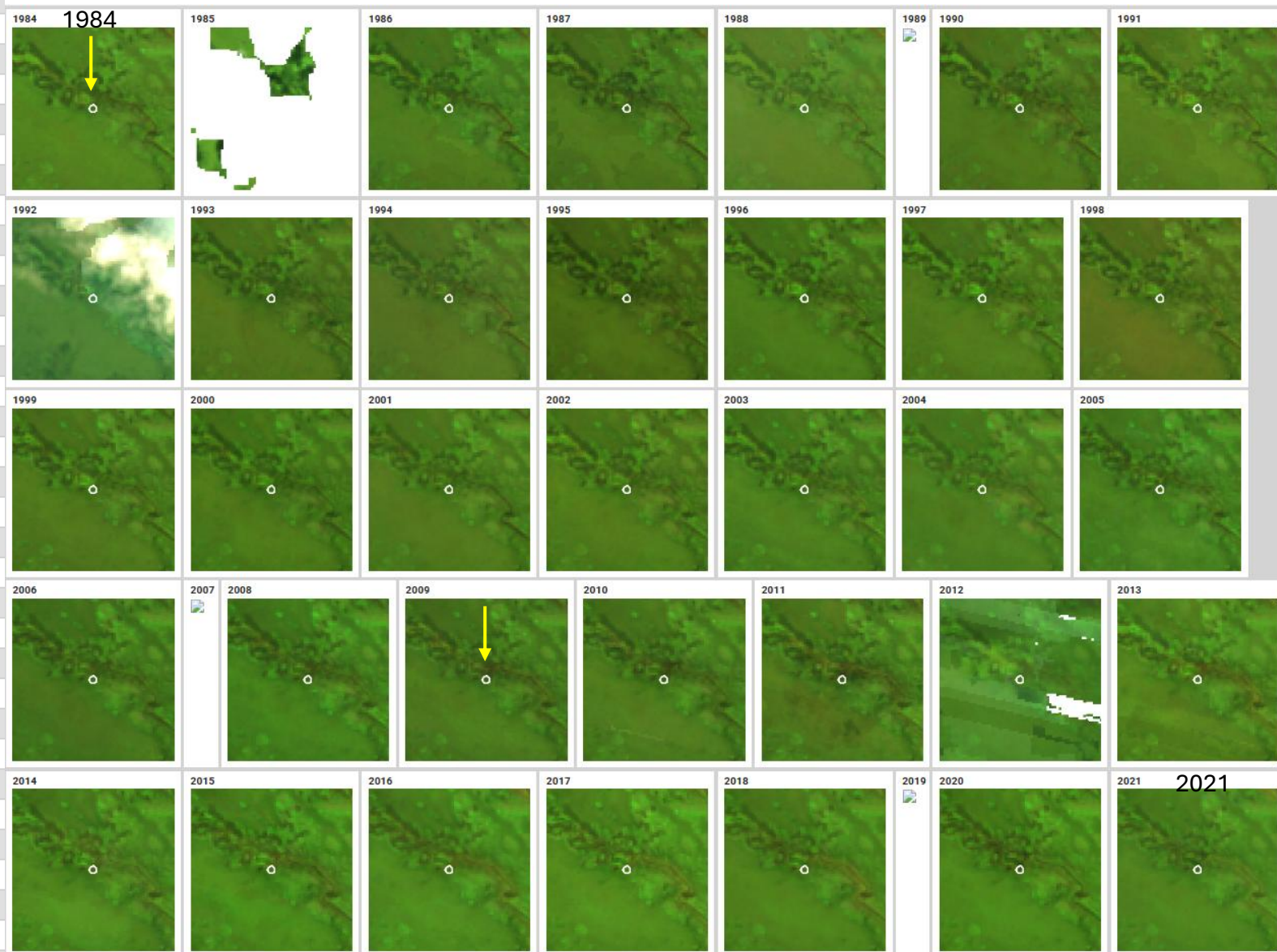


83.1183968°W 52.8402217°N

Annual area (ha)

a1985	0
a1986	0.0126
a1987	0
a1988	0
a1989	0
a1990	0
a1991	0.0198
a1992	0.018
a1993	0.0189
a1994	0.0108
a1995	0.0126
a1996	0.0153
a1997	0
a1998	0
a1999	0
a2000	0.0117
a2001	0.0243
a2002	0.0189
a2003	0.0135
a2004	0
a2005	0
a2006	0.0441
a2007	0.0495
a2008	0.0765
a2009	0.0639
a2010	0.0864
a2011	0.0927
a2012	0.072
a2013	0.0315
a2014	0.0126
a2015	0.0108
a2016	0
a2017	0
a2018	0.0108
a2019	0.0927
a2020	0.1044
a2021	0.117

Annual summer Landsat image chips



FID 91

High-res validation



Some “bleeding” of water
body into dense conifer forest

One period of ponding (1995-2000)

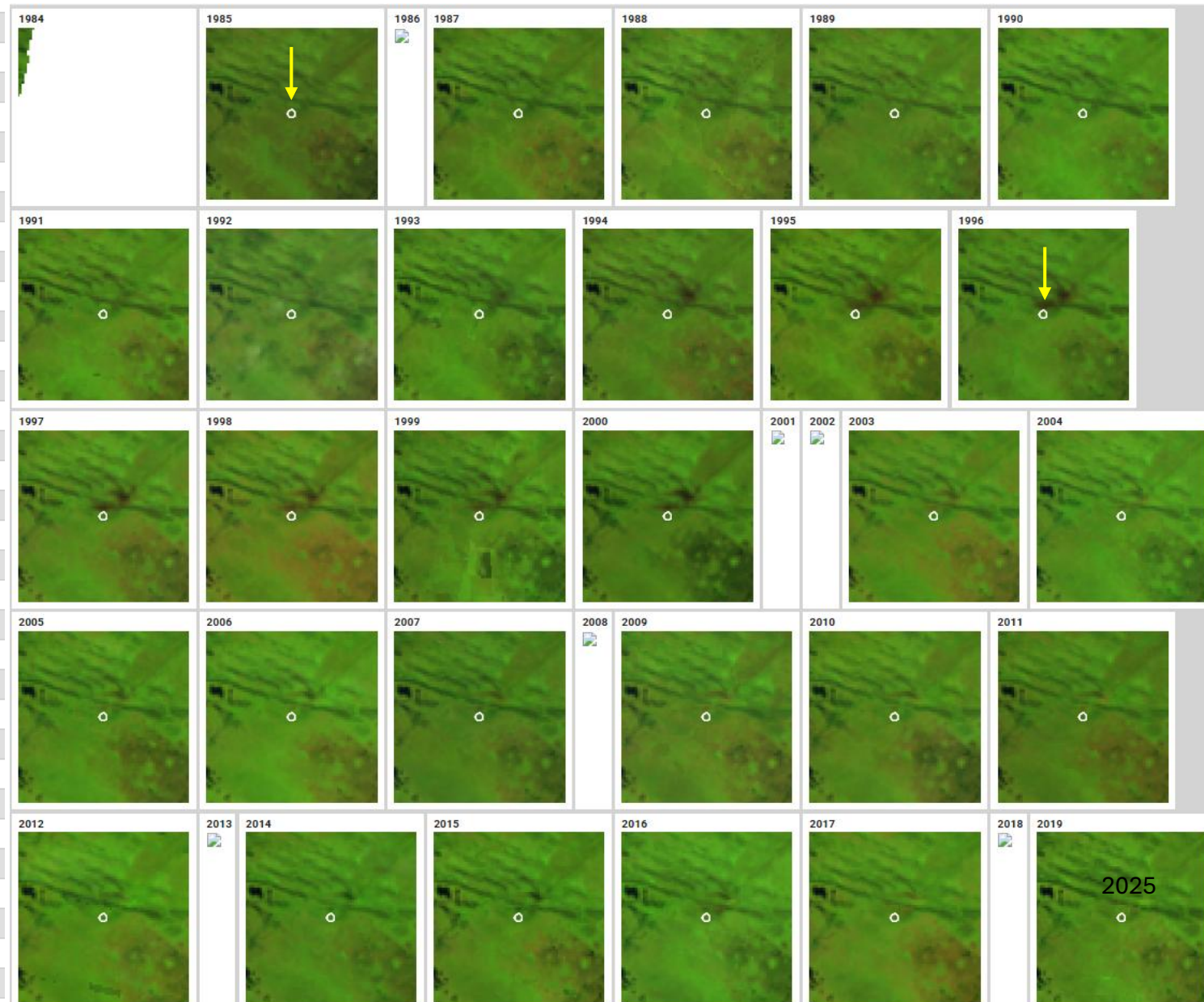
81.4443705°W 52.0541225°N

Annual area (ha)

1984

Annual summer Landsat image chips

a1985	0.0162
a1986	0
a1987	0
a1988	0.0198
a1989	0
a1990	0
a1991	0
a1992	0
a1993	0.0072
a1994	0
a1995	0.1782
a1996	0.2619
a1997	0.2871
a1998	0.2331
a1999	0.2187
a2000	0.1539
a2001	0.1404
a2002	0.0144
a2003	0
a2004	0
a2005	0
a2006	0
a2007	0
a2008	0
a2009	0
a2010	0
a2011	0
a2012	0
a2013	0
a2014	0.0198
a2015	0.0531
a2016	0.0144
a2017	0
a2018	0
a2019	0
a2020	0
a2021	0



FID 92

High-res validation

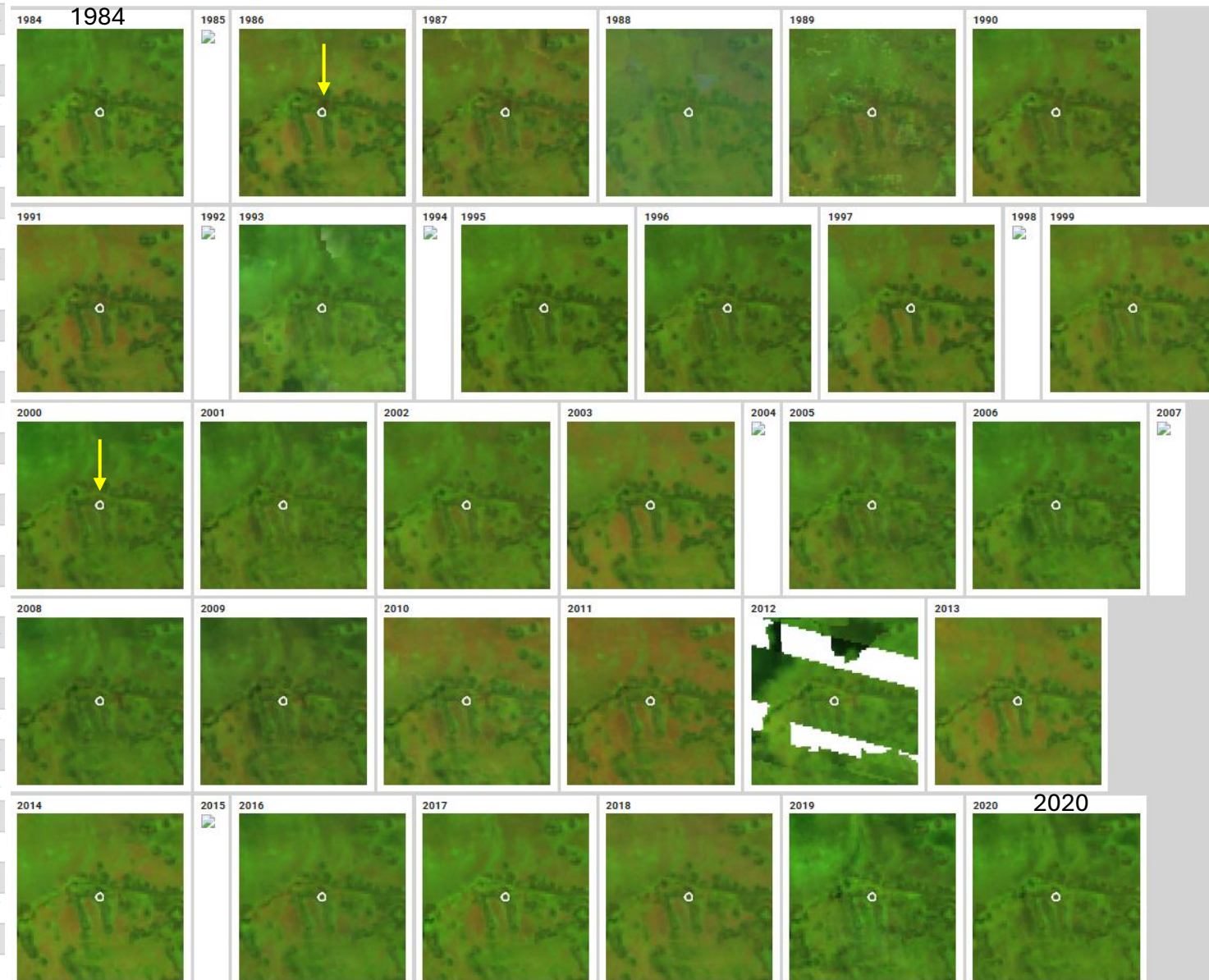


82.4461545°W 53.4968076°N

Annual area (ha)

a1985	0.1305
a1986	0.1134
a1987	0.0774
a1988	0.081
a1989	0.0918
a1990	0.0747
a1991	0.0612
a1992	0.0297
a1993	0.0351
a1994	0.0315
a1995	0.0297
a1996	0.0135
a1997	0
a1998	0
a1999	0
a2000	0
a2001	0
a2002	0.0252
a2003	0.0153
a2004	0.0162
a2005	0.0162
a2006	0.0162
a2007	0.0144
a2008	0.0171
a2009	0.018
a2010	0.0387
a2011	0.0387
a2012	0.0324
a2013	0.0612
a2014	0.0675
a2015	0.0603
a2016	0.0387
a2017	0.054
a2018	0.063
a2019	0.0594
a2020	0.0162
a2021	0

Annual summer Landsat image chips



FID 93

High-res validation

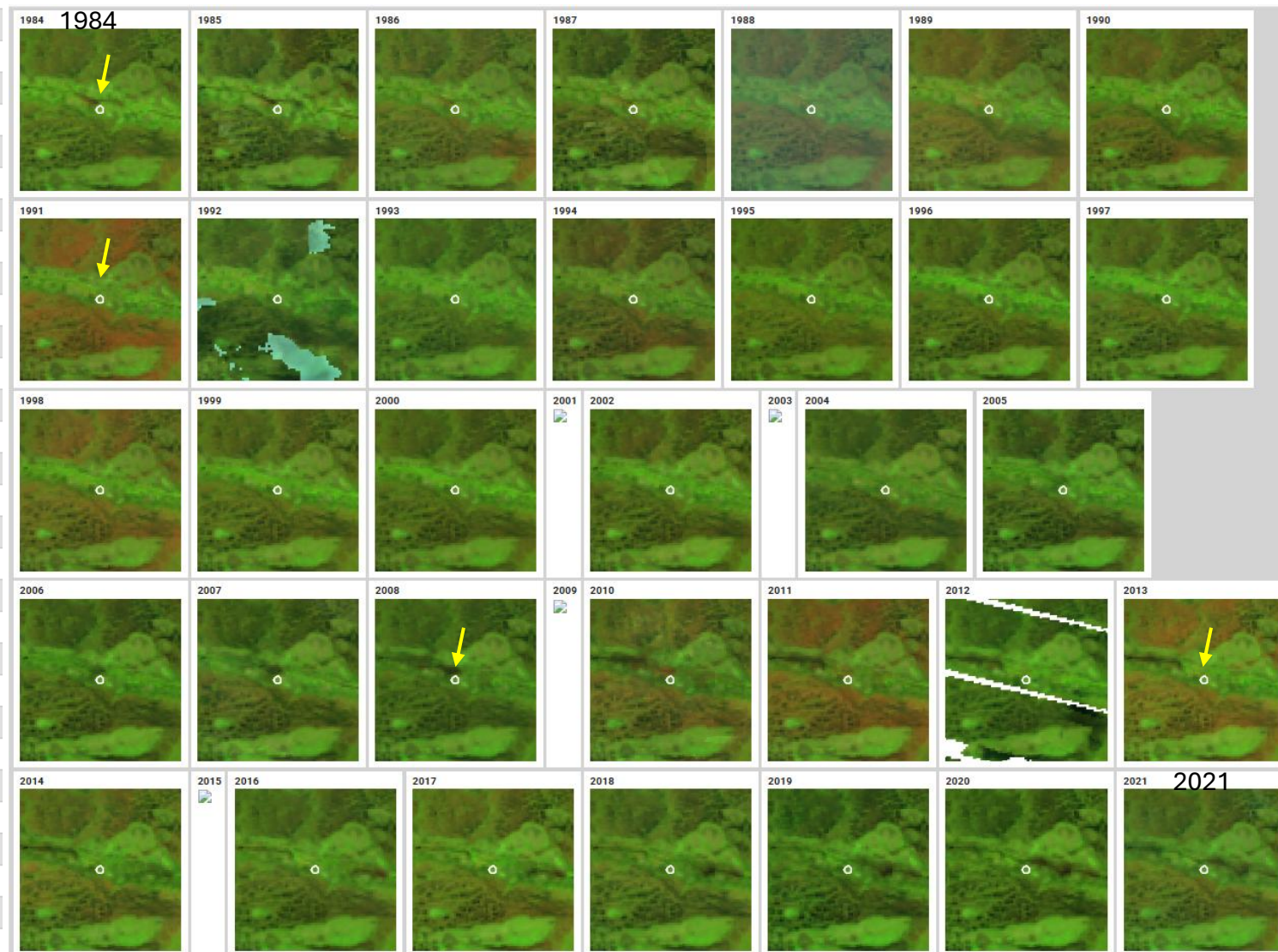


82.8907532°W 53.3369349°N

Annual area (ha)

a1985	0.207
a1986	0.0351
a1987	0
a1988	0
a1989	0
a1990	0
a1991	0
a1992	0
a1993	0
a1994	0
a1995	0
a1996	0
a1997	0
a1998	0
a1999	0
a2000	0
a2001	0
a2002	0
a2003	0
a2004	0
a2005	0
a2006	0.1197
a2007	0.4491
a2008	0.5868
a2009	0.5607
a2010	0.1746
a2011	0.0153
a2012	0
a2013	0
a2014	0
a2015	0
a2016	0
a2017	0
a2018	0
a2019	0.3348
a2020	0.4221
a2021	0.4707

Annual summer Landsat image chips



FID 94

High-res validation



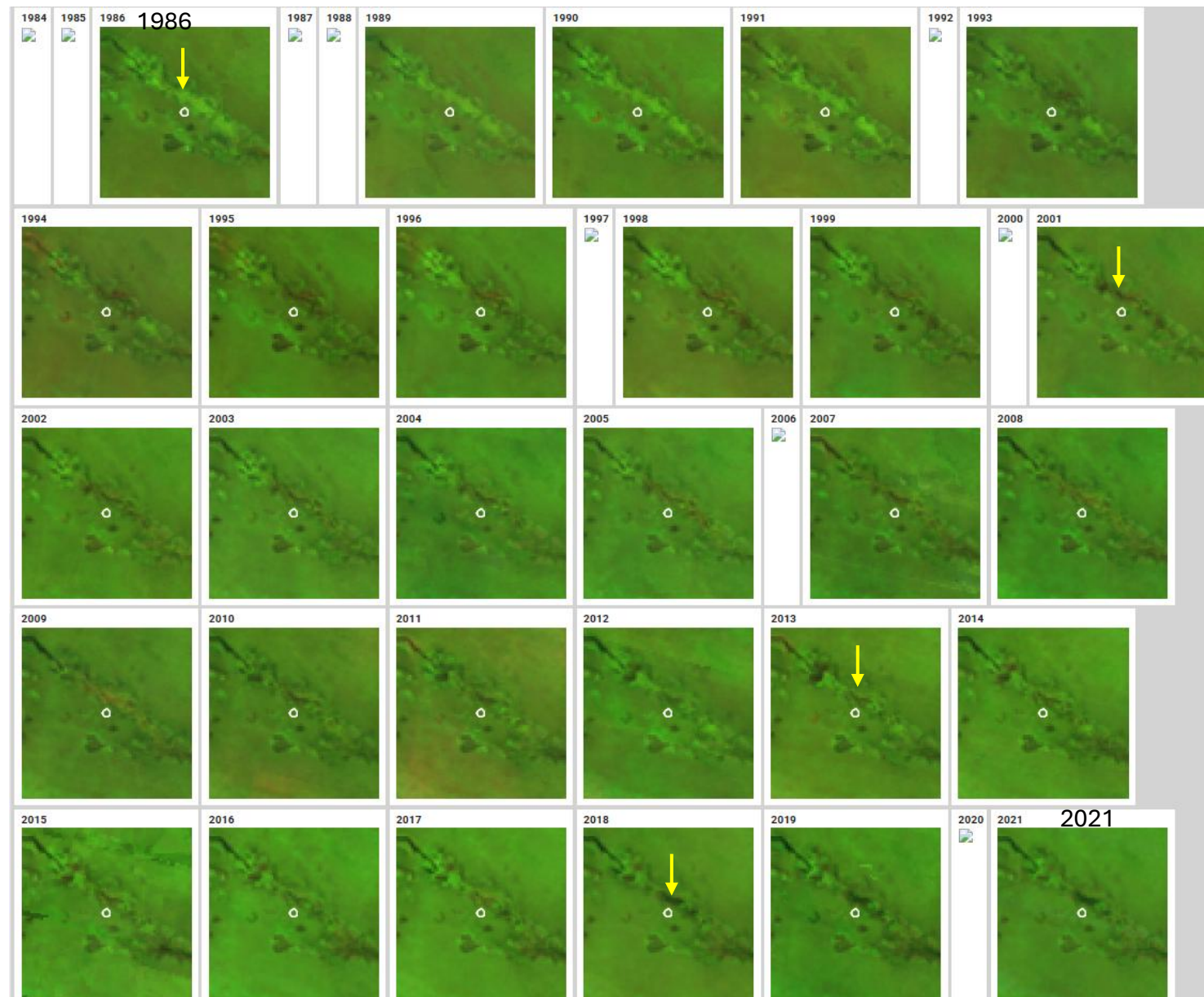
Two periods of ponding

82.8193034°W 53.0303883°N

Annual area (ha)

a1985	0
a1986	0
a1987	0
a1988	0
a1989	0
a1990	0
a1991	0
a1992	0
a1993	0.027
a1994	0.1476
a1995	0.171
a1996	0.1773
a1997	0.18
a1998	0.1998
a1999	0.1908
a2000	0.2043
a2001	0.2313
a2002	0.2187
a2003	0.1116
a2004	0.0504
a2005	0.0261
a2006	0.1107
a2007	0.0765
a2008	0.0792
a2009	0.0162
a2010	0.0549
a2011	0.0801
a2012	0.1071
a2013	0
a2014	0.0243
a2015	0.0243
a2016	0
a2017	0.243
a2018	0.3753
a2019	0.378
a2020	0.3519
a2021	0.3348

Annual summer Landsat image chips



FID 95

High-res validation

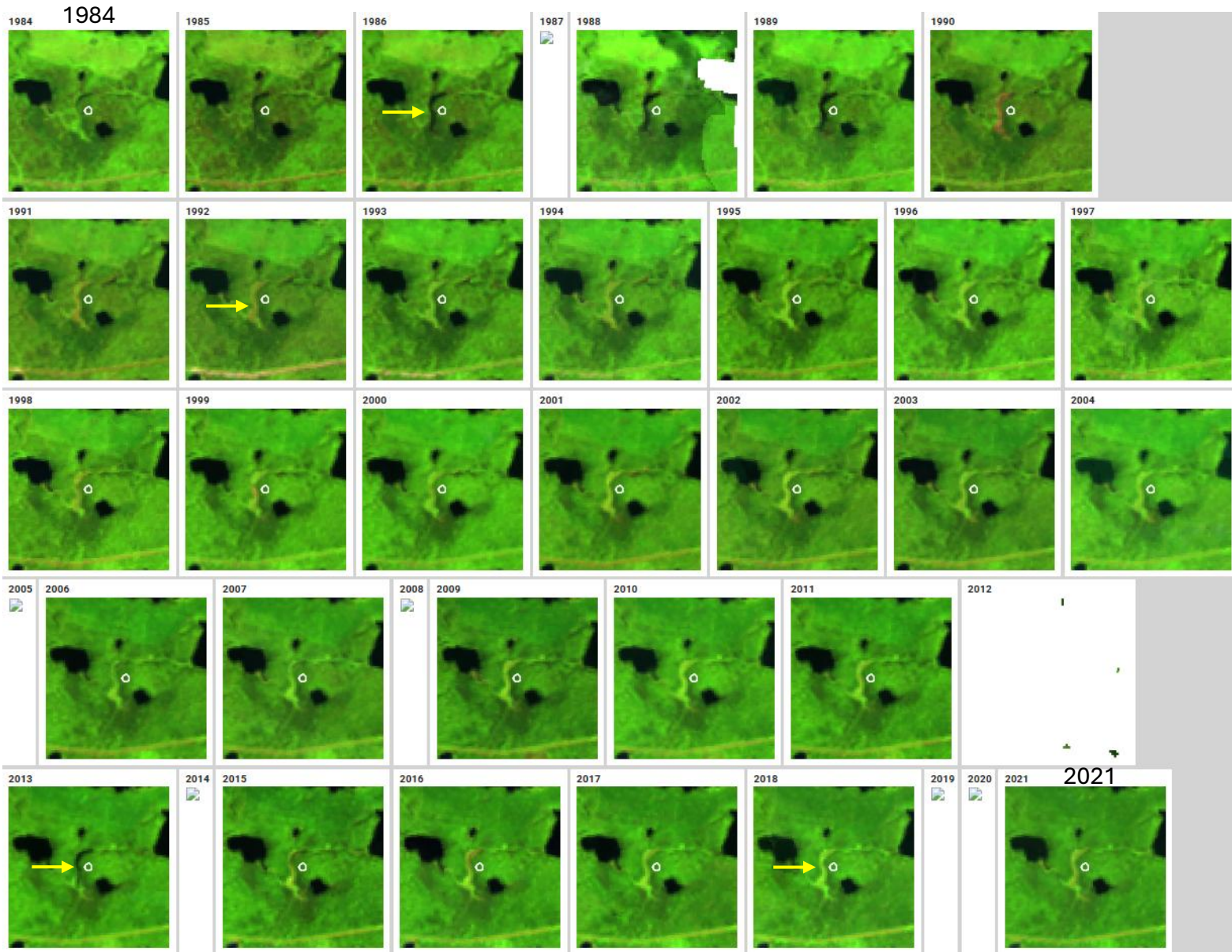


84.2731717°W 49.7561104°N

Annual area (ha)

a1985	0.9342
a1986	2.0484
a1987	2.4894
a1988	2.7108
a1989	1.4436
a1990	0.2592
a1991	0.0306
a1992	0
a1993	0
a1994	0
a1995	0
a1996	0
a1997	0
a1998	0
a1999	0
a2000	0
a2001	0
a2002	0
a2003	0
a2004	0
a2005	0
a2006	0
a2007	0.0234
a2008	0
a2009	0
a2010	0
a2011	0
a2012	0.441
a2013	1.1682
a2014	1.0062
a2015	0.243
a2016	0
a2017	0
a2018	0
a2019	0
a2020	0
a2021	0

Annual summer Landsat image chips



FID 96

High-res validation

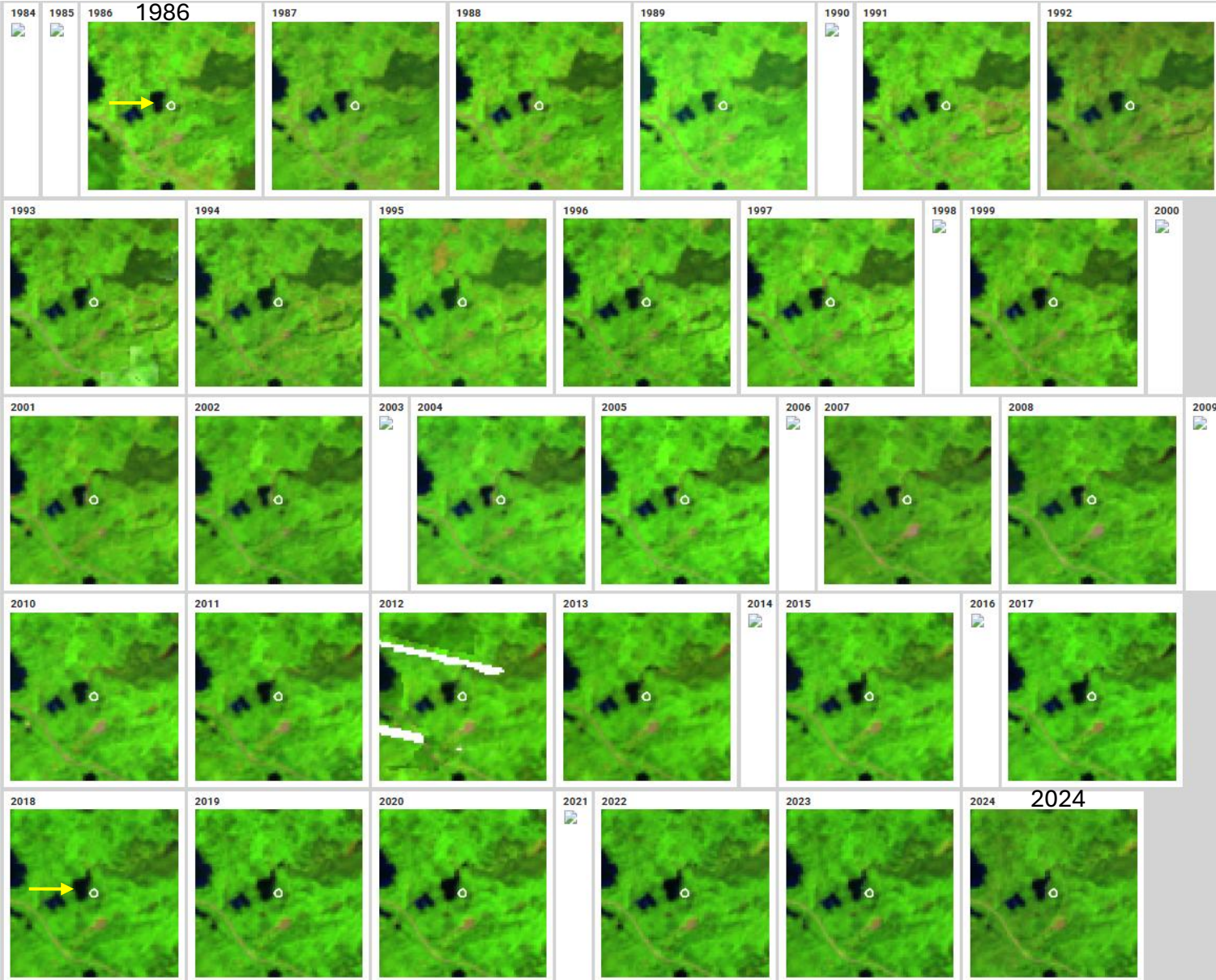


86.9089903°W 50.2688779°N

Annual area (ha)

a1985	2.8395
a1986	2.7855
a1987	2.6316
a1988	2.5686
a1989	2.6424
a1990	2.8566
a1991	2.8872
a1992	2.9556
a1993	3.0996
a1994	3.4578
a1995	3.3219
a1996	3.1554
a1997	3.1005
a1998	3.1797
a1999	3.24
a2000	3.2382
a2001	2.7297
a2002	2.6136
a2003	2.5794
a2004	2.7288
a2005	2.6694
a2006	2.6496
a2007	2.6406
a2008	2.8278
a2009	3.033
a2010	3.0798
a2011	3.0357
a2012	3.1635
a2013	3.636
a2014	3.7881
a2015	3.9231
a2016	4.0626
a2017	4.1445
a2018	4.2174
a2019	4.1148
a2020	4.0644
a2021	4.0158

Annual summer Landsat image chips



FID 97

High-res validation



Three periods of ponding

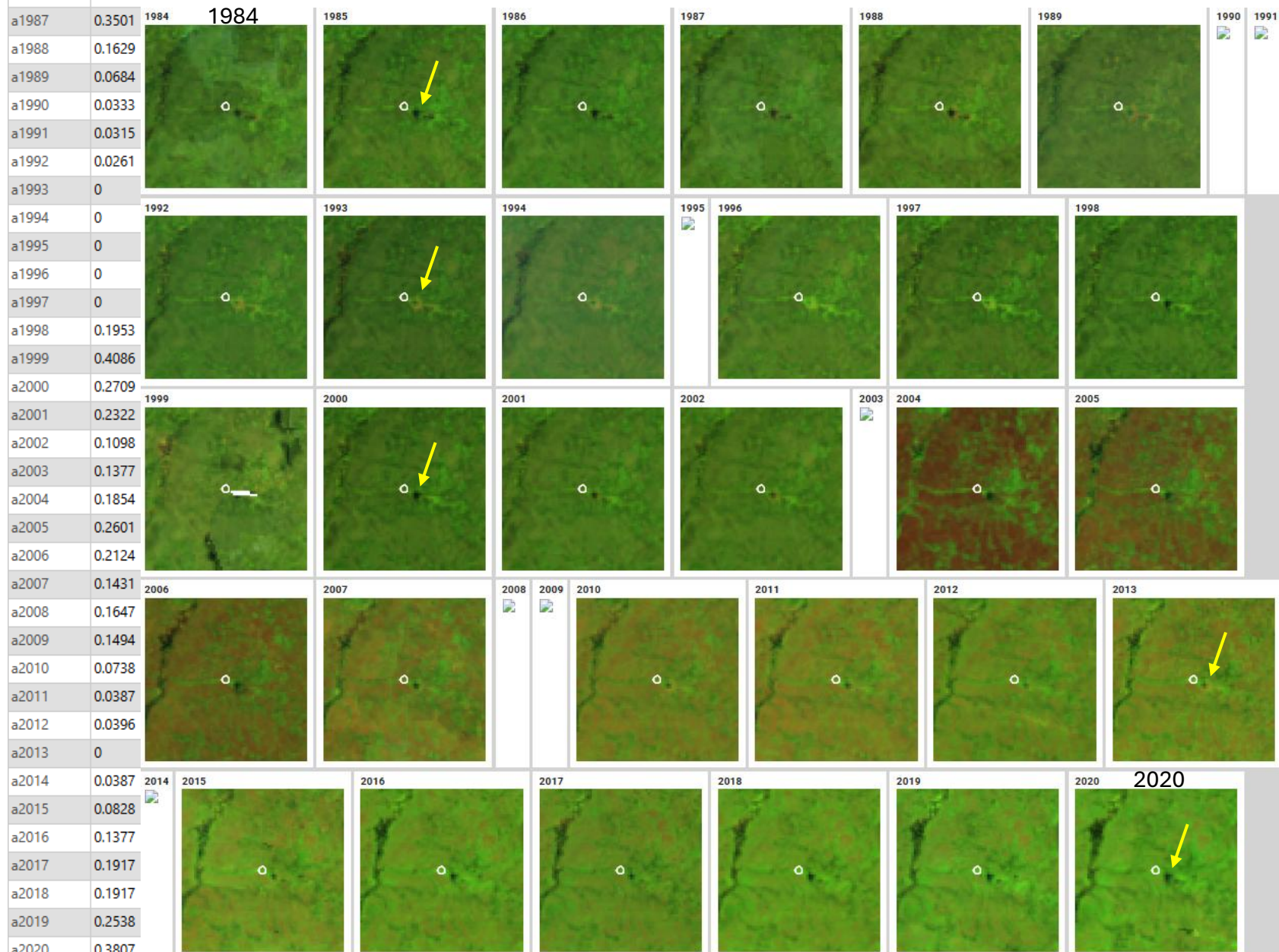


92.2482945°W 55.2433984°N

Annual area (ha)

a1985	0.4275
a1986	0.3762
a1987	0.3501
a1988	0.1629
a1989	0.0684
a1990	0.0333
a1991	0.0315
a1992	0.0261
a1993	0
a1994	0
a1995	0
a1996	0
a1997	0
a1998	0.1953
a1999	0.4086
a2000	0.2709
a2001	0.2322
a2002	0.1098
a2003	0.1377
a2004	0.1854
a2005	0.2601
a2006	0.2124
a2007	0.1431
a2008	0.1647
a2009	0.1494
a2010	0.0738
a2011	0.0387
a2012	0.0396
a2013	0
a2014	0.0387
a2015	0.0828
a2016	0.1377
a2017	0.1917
a2018	0.1917
a2019	0.2538
a2020	0.3807
a2021	0.3951

Annual summer Landsat image chips



FID 98

High-res validation



One early period of ponding

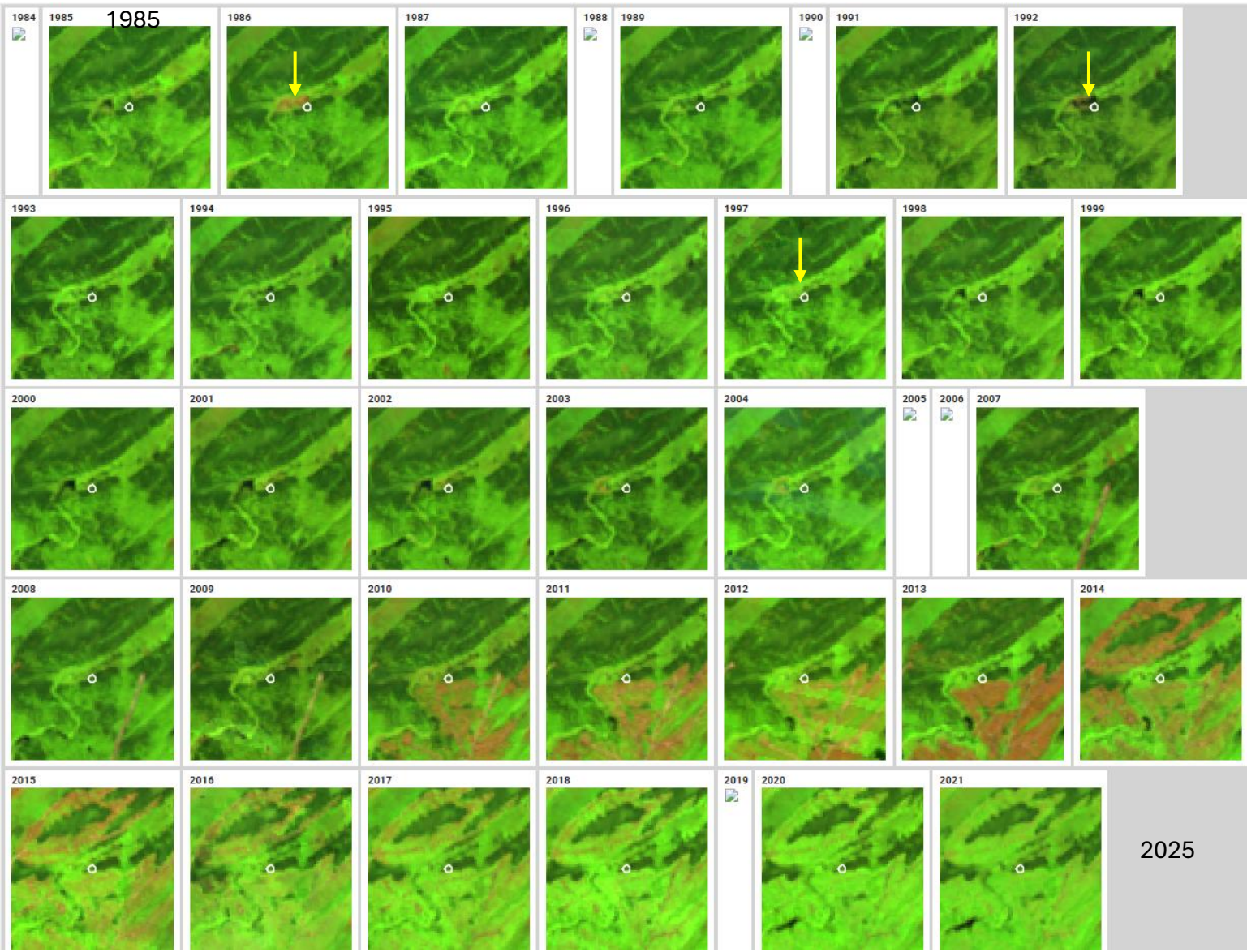


82.9283944°W 50.1139253°N

Annual area (ha)

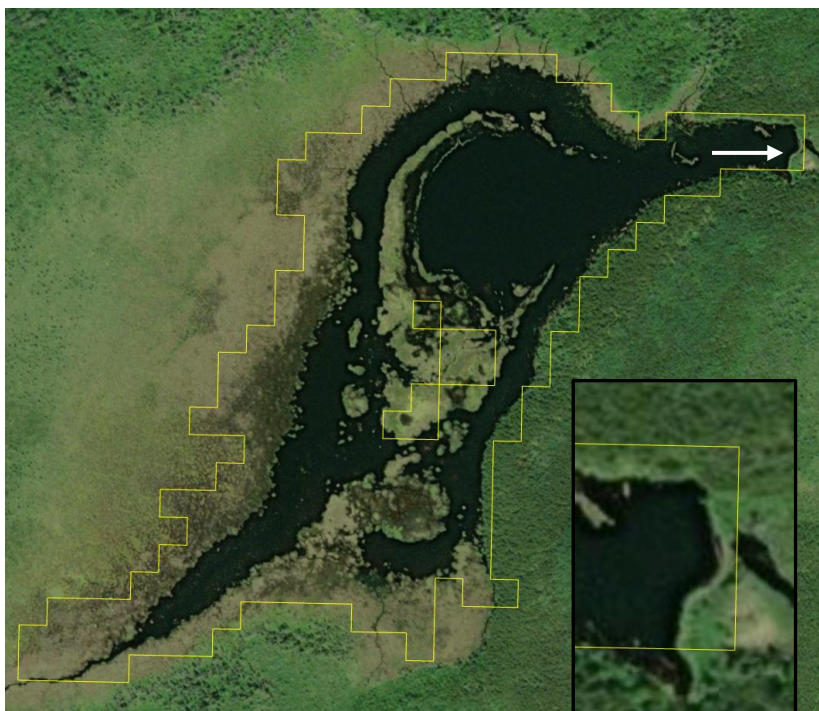
a1985	0
a1986	0
a1987	0
a1988	0
a1989	0.1548
a1990	0.2916
a1991	0.3843
a1992	0.4185
a1993	0.1521
a1994	0.126
a1995	0.0864
a1996	0
a1997	0
a1998	0
a1999	0
a2000	0
a2001	0
a2002	0
a2003	0
a2004	0
a2005	0
a2006	0
a2007	0
a2008	0
a2009	0
a2010	0
a2011	0
a2012	0
a2013	0.0504
a2014	0
a2015	0
a2016	0
a2017	0
a2018	0
a2019	0
a2020	0
a2021	0

Annual summer Landsat image chips



FID 99

High-res validation



86.5187100°W 50.9674658°N

Annual area (ha)

a1985	9.5895
a1986	9.6732
a1987	9.4707
a1988	9.5724
a1989	10.0017
a1990	9.3375
a1991	9.9702
a1992	9.7191
a1993	10.242
a1994	10.224
a1995	10.1862
a1996	8.9676
a1997	8.568
a1998	8.5068
a1999	8.3079
a2000	9.2277
a2001	9.2016
a2002	9.9342
a2003	9.6057
a2004	9.9711
a2005	9.6651
a2006	10.0629
a2007	9.7983
a2008	10.2654
a2009	10.2762
a2010	11.3337
a2011	11.5011
a2012	11.9079
a2013	12.1599
a2014	11.6541
a2015	11.6883
a2016	11.2014
a2017	11.9781
a2018	11.4174
a2019	11.1555
a2020	11.0871
a2021	10.5579

Annual summer Landsat image chips

