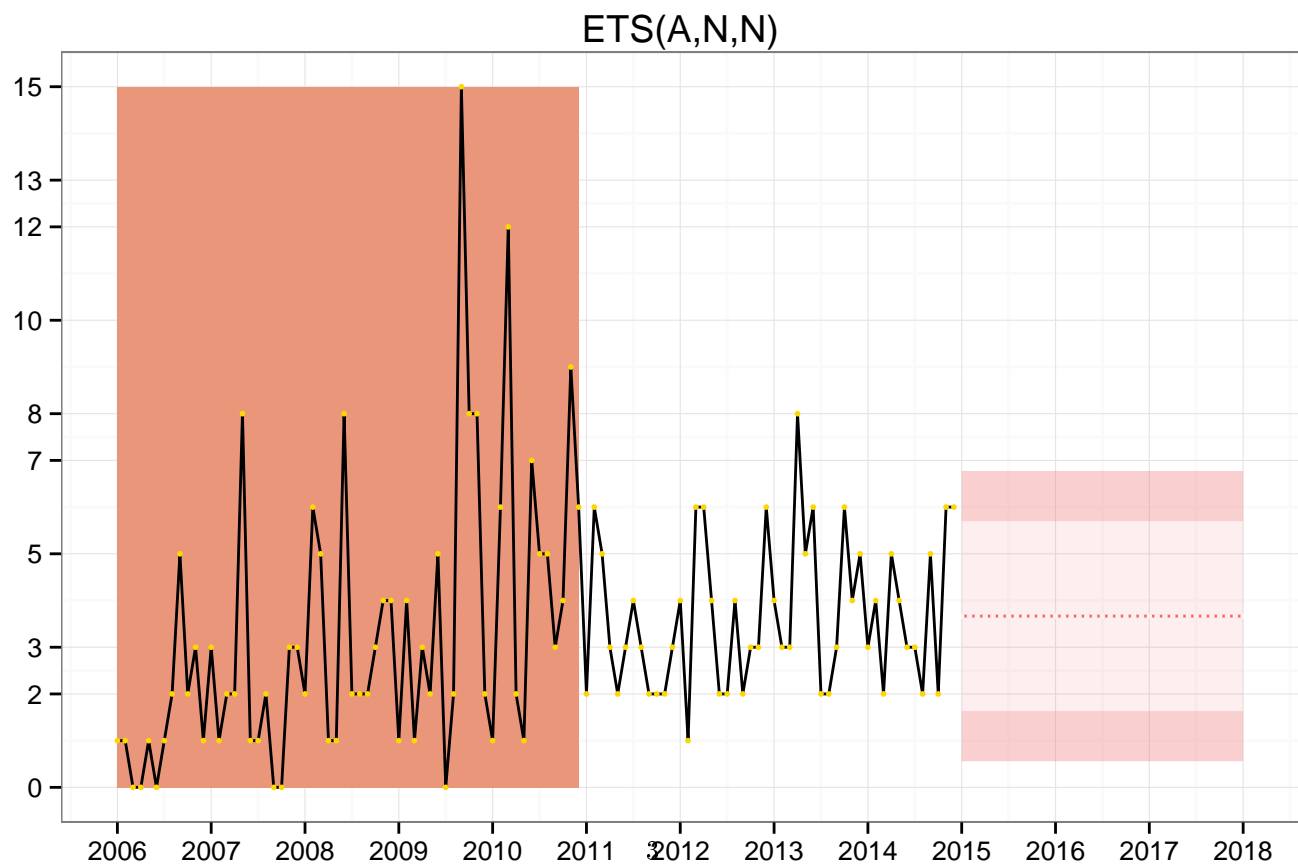# Table des matières

1 DEP_EQUIP_CAP

2 Results for automatic ets and ARIMA on Cat products

2.1 BHL_CAT_1

2.1.1 plots for BHL_CAT_1

ETS(A,N,N)

ETS(A,N,N)

NNAR(4,1)

ARIMAX(2,0,2)(2,1,1)12
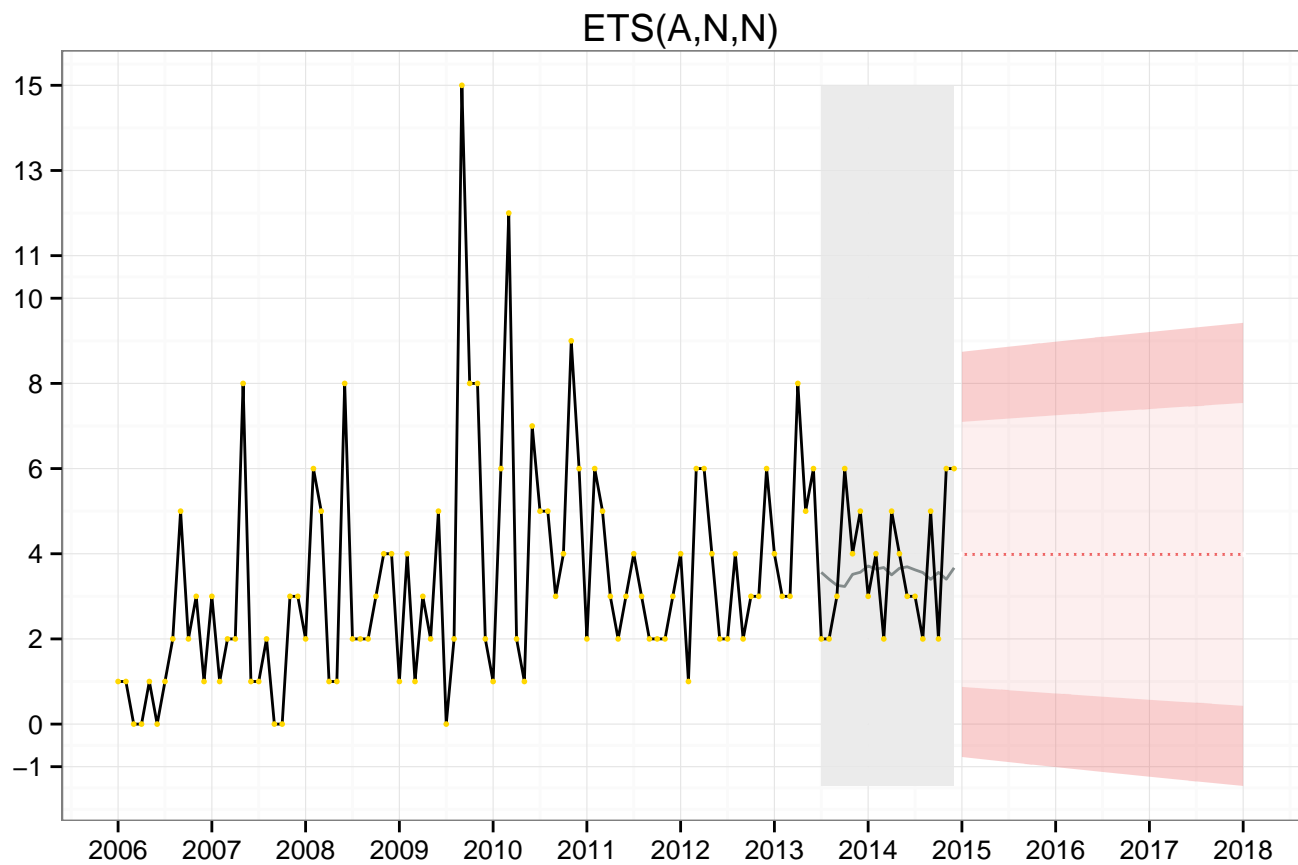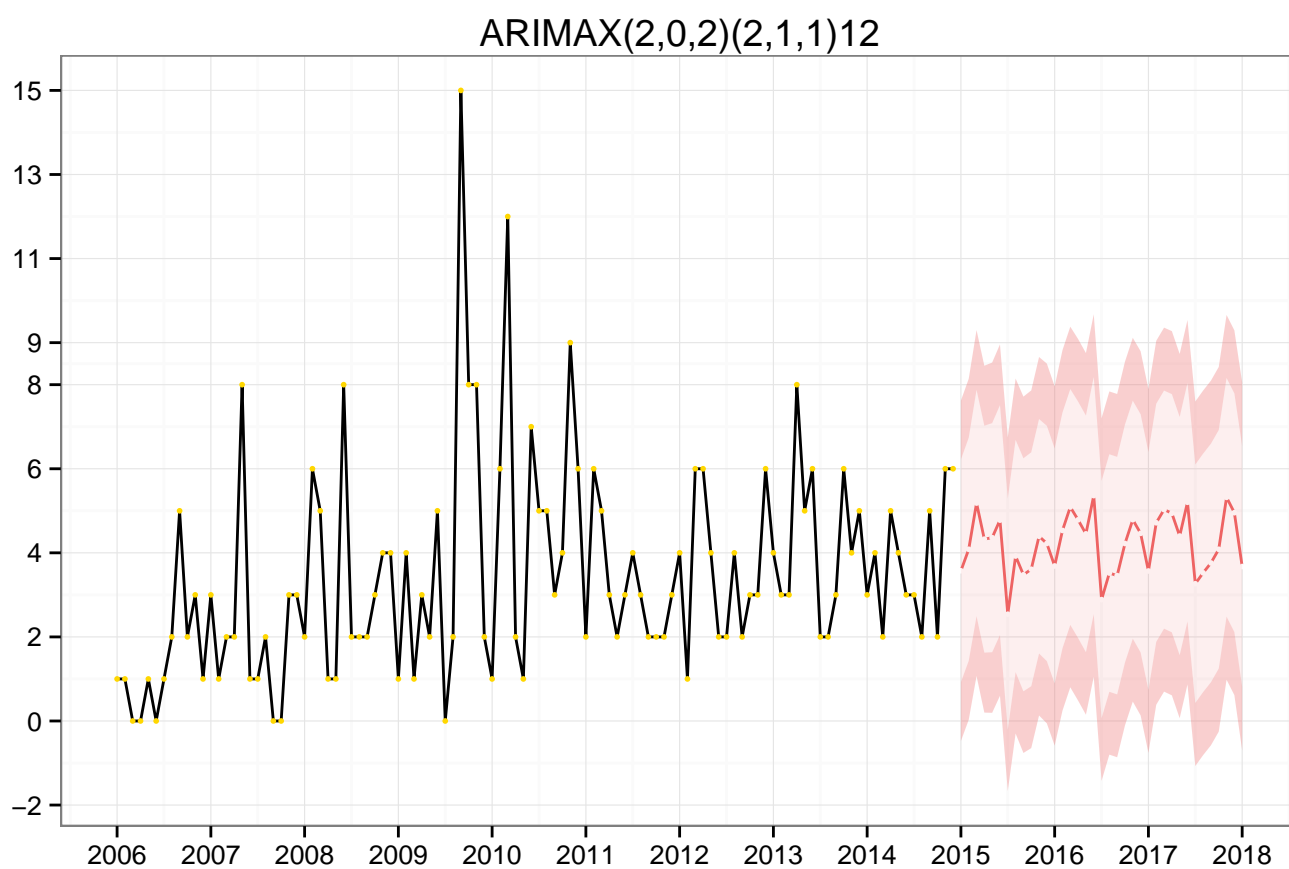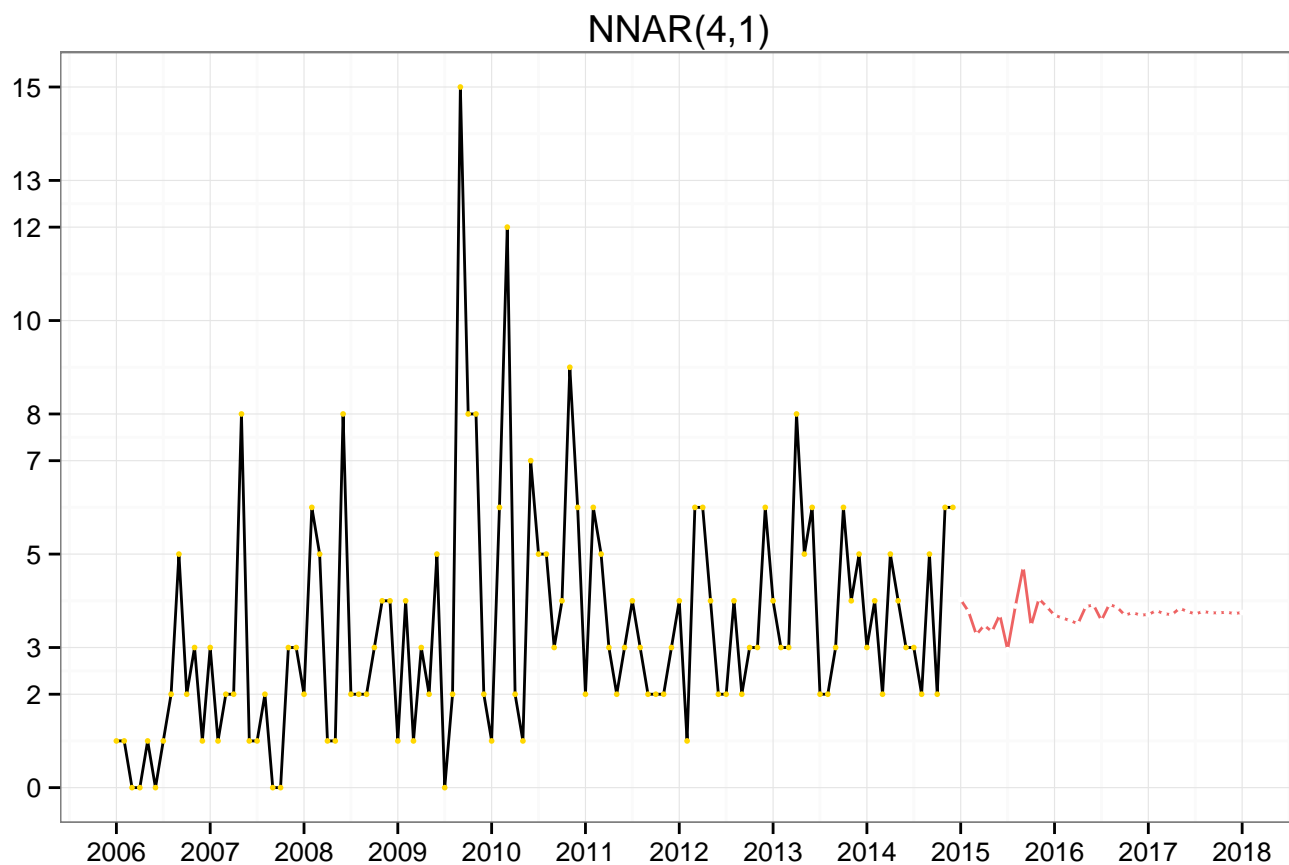
2.1.2 Outputs for BHL_CAT_1

$ETS(A, N, N)$

1. parameters :
   - alpha : 0.09222605
2. init state :
   - l : 1.646745
3. informations critereas :
   - loglik : -348.612
   - aic : 701.2241
   - bic : 706.5883
   - aicc : 701.3383
   - mse : 5.892304
   - amse : 5.94095
   - sigma2 : 5.892304
4. accuracy :
   - ME : 0.186974
   - RMSE : 1.504051
   - MAE : 1.303554
   - MPE : -11.98795
   - MAPE : 39.60657
   - MASE : 0.7914434
   - ACF1 : -0.05905615

$ARIMAX(2, 0, 2)(2, 1, 1)_{12}$

1. informations critereas :
   - loglik : -179.3546
   - aic : 402.5925
   - bic : 430.8003
   - aicc : 405.7353
   - sigma2 : 4.18904

2. coefficients :
   - ar1 : 0.1233935
   - ar2 : -0.8921281
   - ma1 : -0.06113772
   - ma2 : 0.7135861
   - sar1 : -0.1979725
   - sar2 : -0.1499642
   - sma1 : -0.8405916
   - drift : 0.01272453
   - xreg.My$_{ArimaX}$: 0.009673871 xreg.My$_{SDummy}$: 12.73687

time	ETS	lo 80	up 80	lo 95	up 95	ARIMAX	lo 80	up 80	lo 95	up 95
2015.00	3.98	0.87	7.10	-0.77	8.74	3.57	0.92	6.22	-0.48	7.62
2015.08	3.98	0.86	7.11	-0.79	8.76	4.08	1.43	6.74	0.03	8.14
2015.17	3.98	0.85	7.12	-0.81	8.78	5.18	2.49	7.88	1.07	9.30
2015.25	3.98	0.83	7.14	-0.83	8.80	4.33	1.63	7.02	0.20	8.45
2015.33	3.98	0.82	7.15	-0.85	8.82	4.36	1.64	7.08	0.19	8.53
2015.42	3.98	0.81	7.16	-0.87	8.84	4.78	2.05	7.51	0.60	8.96
2015.50	3.98	0.80	7.17	-0.89	8.86	2.54	-0.21	5.29	-1.67	6.75
2015.58	3.98	0.78	7.19	-0.91	8.88	3.92	1.16	6.68	-0.30	8.15
2015.67	3.98	0.77	7.20	-0.93	8.90	3.48	0.71	6.25	-0.76	7.72
2015.75	3.98	0.76	7.21	-0.95	8.92	3.61	0.83	6.39	-0.65	7.86
2015.83	3.98	0.74	7.23	-0.97	8.94	4.39	1.61	7.18	0.13	8.66
2015.92	3.98	0.73	7.24	-0.99	8.96	4.22	1.42	7.02	-0.06	8.50
2016.00	3.98	0.72	7.25	-1.01	8.98	3.69	0.89	6.48	-0.59	7.96
2016.08	3.98	0.71	7.26	-1.03	9.00	4.53	1.73	7.34	0.25	8.82
2016.17	3.98	0.69	7.28	-1.05	9.02	5.09	2.29	7.89	0.80	9.38
2016.25	3.98	0.68	7.29	-1.07	9.04	4.78	1.97	7.60	0.48	9.09
2016.33	3.98	0.67	7.30	-1.09	9.06	4.45	1.64	7.26	0.15	8.75
2016.42	3.98	0.66	7.31	-1.11	9.07	5.36	2.54	8.18	1.05	9.67
2016.50	3.98	0.64	7.33	-1.12	9.09	2.89	0.07	5.71	-1.43	7.20
2016.58	3.98	0.63	7.34	-1.14	9.11	3.52	0.69	6.34	-0.80	7.84
2016.67	3.98	0.62	7.35	-1.16	9.13	3.46	0.63	6.28	-0.86	7.78
2016.75	3.98	0.61	7.36	-1.18	9.15	4.22	1.39	7.05	-0.10	8.55
2016.83	3.98	0.60	7.37	-1.20	9.17	4.79	1.96	7.62	0.46	9.12
2016.92	3.98	0.58	7.39	-1.22	9.19	4.46	1.63	7.30	0.13	8.80
2017.00	3.98	0.57	7.40	-1.24	9.21	3.57	0.74	6.40	-0.76	7.89
2017.08	3.98	0.56	7.41	-1.25	9.22	4.71	1.88	7.55	0.39	9.04
2017.17	3.98	0.55	7.42	-1.27	9.24	5.03	2.20	7.86	0.70	9.36
2017.25	3.98	0.54	7.43	-1.29	9.26	4.94	2.11	7.77	0.61	9.27
2017.33	3.98	0.52	7.45	-1.31	9.28	4.40	1.57	7.23	0.07	8.73
2017.42	3.98	0.51	7.46	-1.33	9.30	5.20	2.37	8.04	0.87	9.54

2.2 BHL_CAT_2

2.2.1 plots for BHL_CAT_2
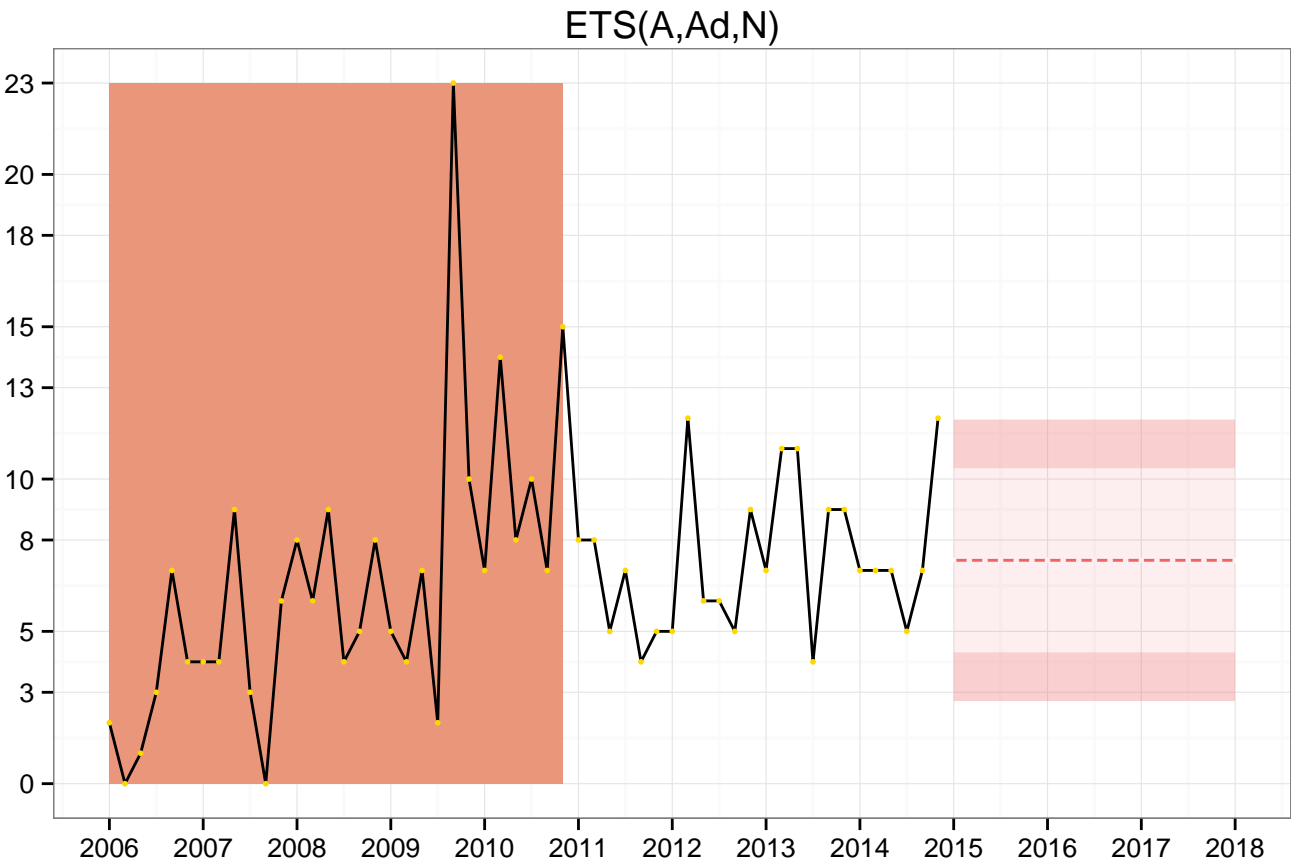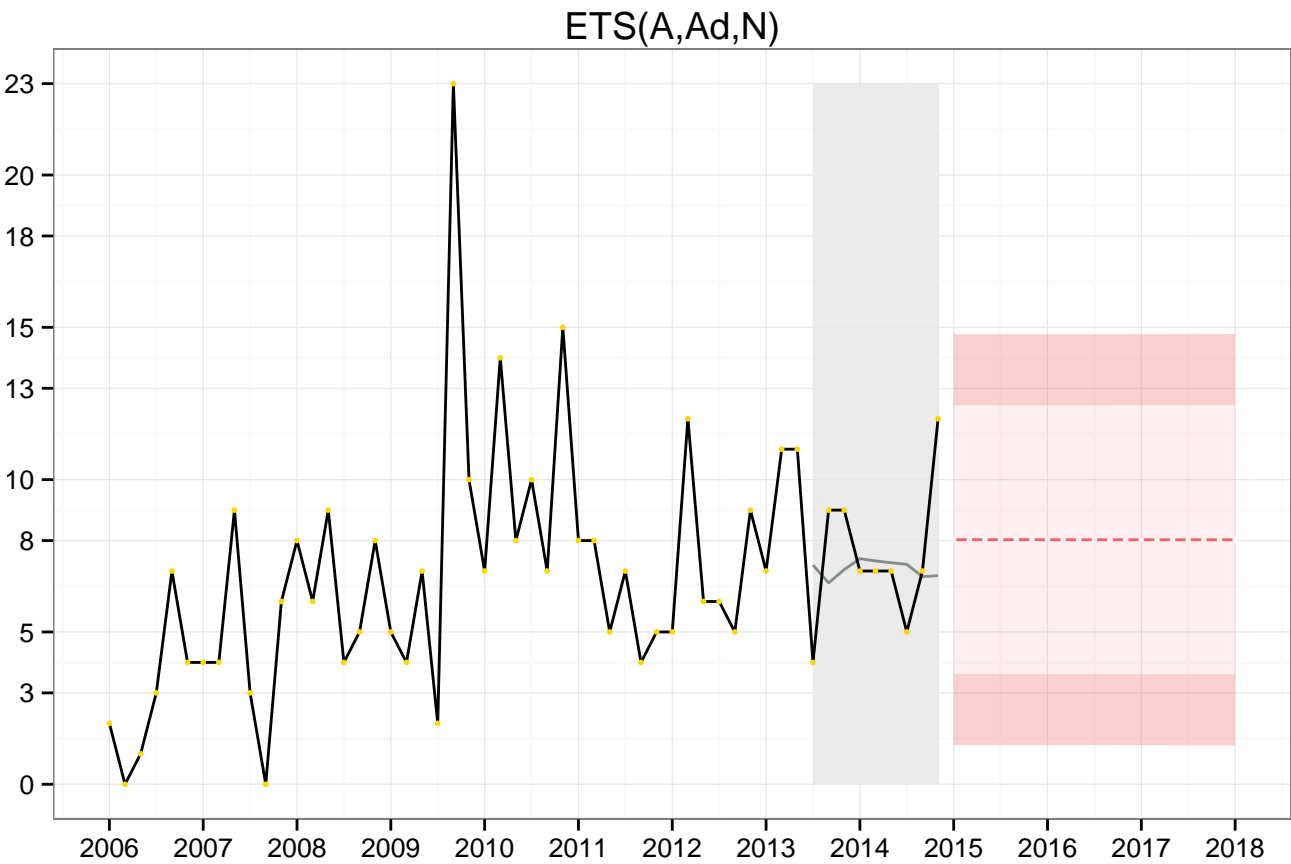
ETS(A,Ad,N)

ETS(A,Ad,N)
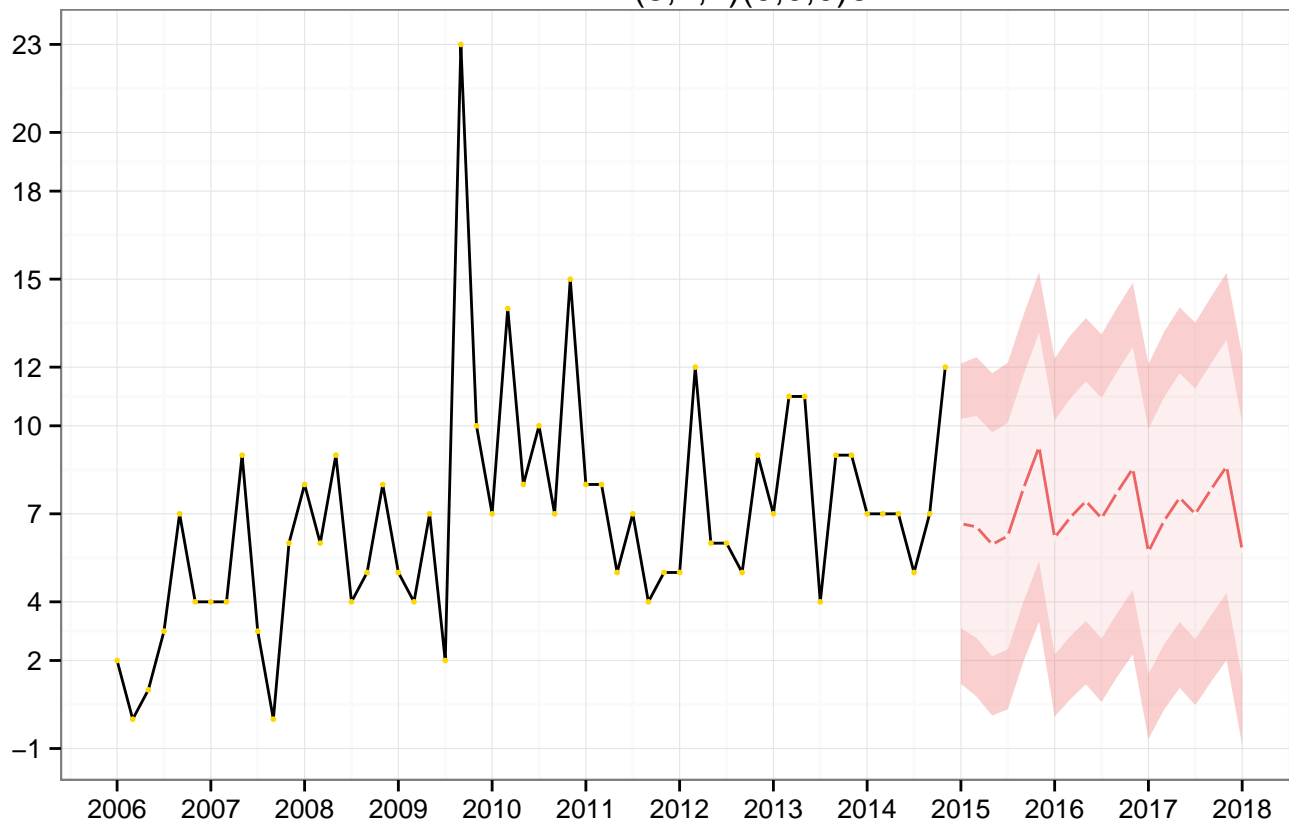
NNAR(1,1)
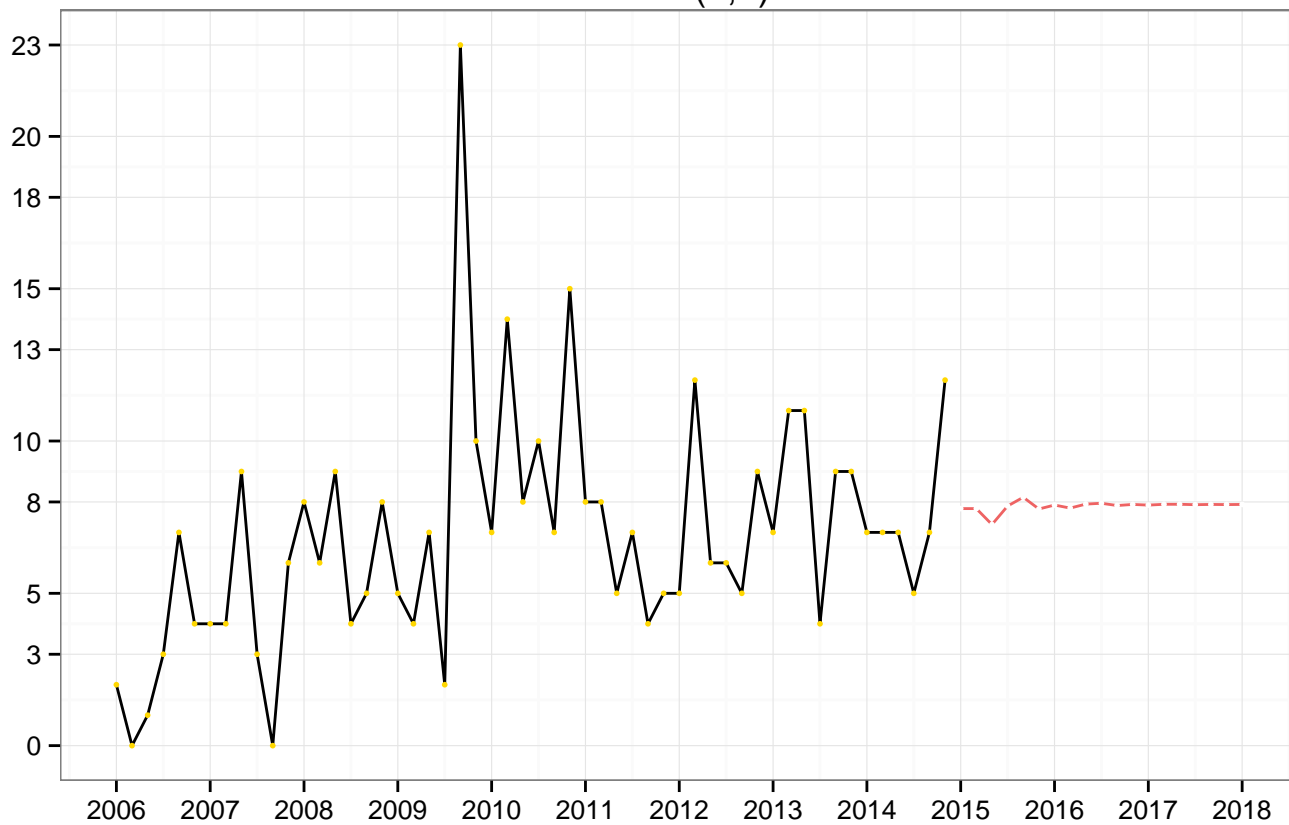
ARIMAX(3,1,1)(0,0,0)6

2.2.2 Outputs for BHL_CAT_2

$ETS(A, Ad, N)$

1. parameters :
   - alpha : 0.001707628
   - beta : 0.001707599
   - phi : 0.8977721
2. init state :
   - l : 1.400526
   - b : 0.7648558
3. informations critereas :
   - loglik : -174.4294
   - aic : 358.8588
   - bic : 368.8038
   - aicc : 360.1088
   - mse : 11.8386
   - amse : 11.80293
   - sigma2 : 11.8386
4. accuracy :
   - ME : 0.3615647
   - RMSE : 2.39411
   - MAE : 1.789183
   - MPE : -4.987956
   - MAPE : 25.83608
   - MASE : 0.8945917
   - ACF1 : -0.0594125

$ARIMAX(3, 1, 1)(0, 0, 0)_6$

1. informations critereas :
   - loglik : -127.4365
   - aic : 268.873
   - bic : 282.6651
   - aicc : 271.3619
   - sigma2 : 7.756287
2. coefficients :
   - ar1 : 0.1824696
   - ar2 : -0.08732735
   - ar3 : -0.3284321
   - ma1 : -0.8321503
   - DEP_EQUIP_CAP_2 : 0.01803109
   - $My_{SD}ummy$: 17.49321

time	ETS	lo 80	up 80	lo 95	up 95	ARIMAX	lo 80	up 80	lo 95	up 95
2015.00	8.03	3.62	12.44	1.29	14.77	6.67	3.10	10.24	1.21	12.12
2015.17	8.03	3.62	12.44	1.29	14.77	6.55	2.77	10.34	0.77	12.34
2015.33	8.03	3.62	12.44	1.29	14.77	5.96	2.14	9.77	0.12	11.80
2015.50	8.03	3.62	12.44	1.28	14.77	6.24	2.38	10.10	0.33	12.15
2015.67	8.03	3.62	12.44	1.28	14.77	7.86	4.00	11.72	1.96	13.77
2015.83	8.03	3.62	12.44	1.28	14.77	9.28	5.39	13.17	3.33	15.24
2016.00	8.03	3.62	12.44	1.28	14.77	6.19	2.20	10.18	0.09	12.29
2016.17	8.03	3.62	12.44	1.28	14.77	6.88	2.83	10.93	0.68	13.07
2016.33	8.03	3.62	12.44	1.28	14.77	7.43	3.35	11.51	1.19	13.67
2016.50	8.03	3.62	12.44	1.28	14.77	6.85	2.75	10.95	0.59	13.11
2016.67	8.03	3.62	12.44	1.28	14.77	7.73	3.62	11.85	1.44	14.03
2016.83	8.03	3.62	12.44	1.28	14.77	8.54	4.40	12.69	2.21	14.88
2017.00	8.03	3.61	12.44	1.28	14.77	5.71	1.53	9.89	-0.68	12.10
2017.17	8.03	3.61	12.44	1.28	14.78	6.76	2.55	10.97	0.32	13.20
2017.33	8.03	3.61	12.44	1.28	14.78	7.55	3.31	11.79	1.07	14.03
2017.50	8.03	3.61	12.44	1.28	14.78	7.00	2.73	11.26	0.47	13.52
2017.67	8.03	3.61	12.44	1.28	14.78	7.83	3.54	12.12	1.27	14.39
2017.83	8.03	3.61	12.44	1.28	14.78	8.61	4.30	12.93	2.01	15.22
2018.00	8.03	3.61	12.44	1.27	14.78	5.76	1.42	10.11	-0.88	12.41

2.3 BHL_CAT_3

2.3.1 plots for BHL_CAT_3

ETS(A,Ad,N)

ETS(A,Ad,N)

NNAR(1,1)

ARIMAX(0,1,1)(0,0,0)4
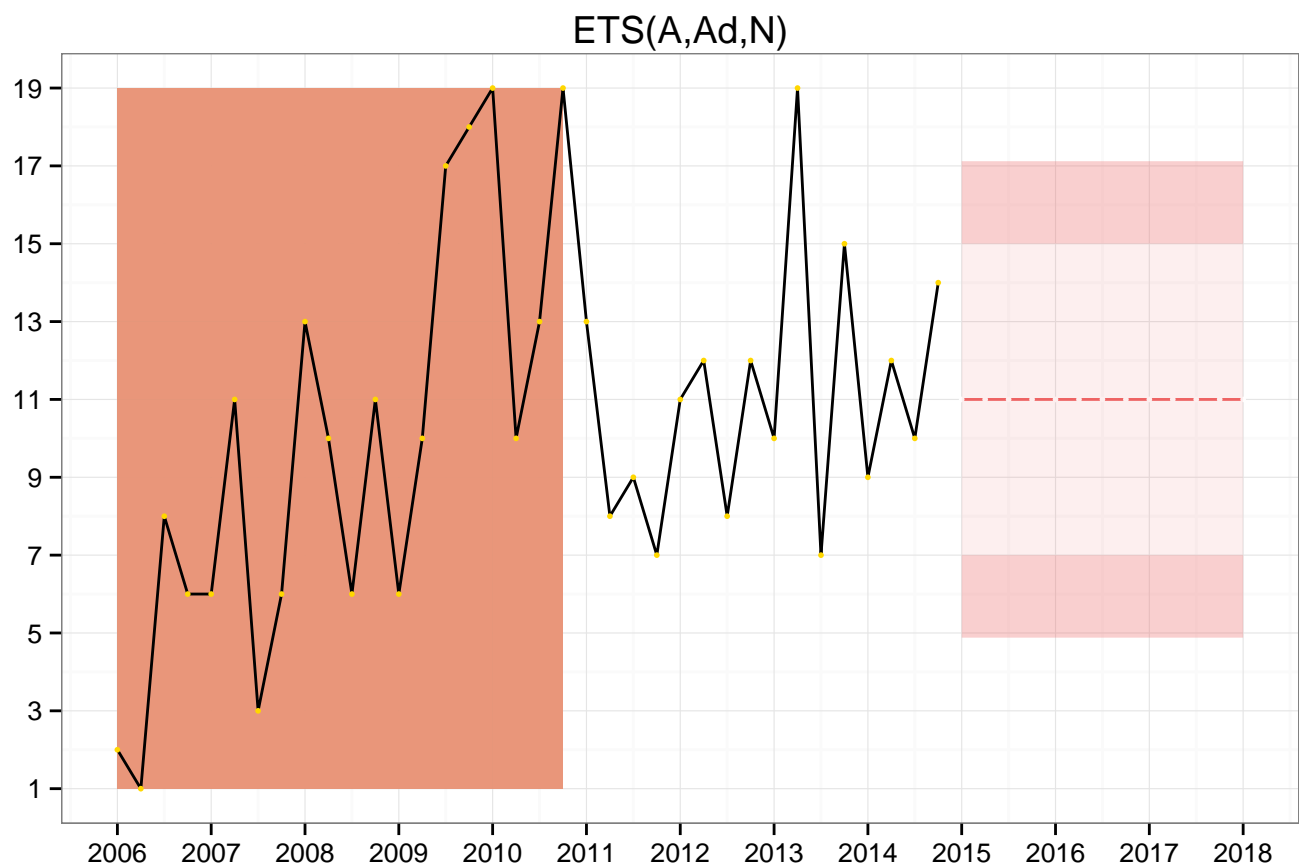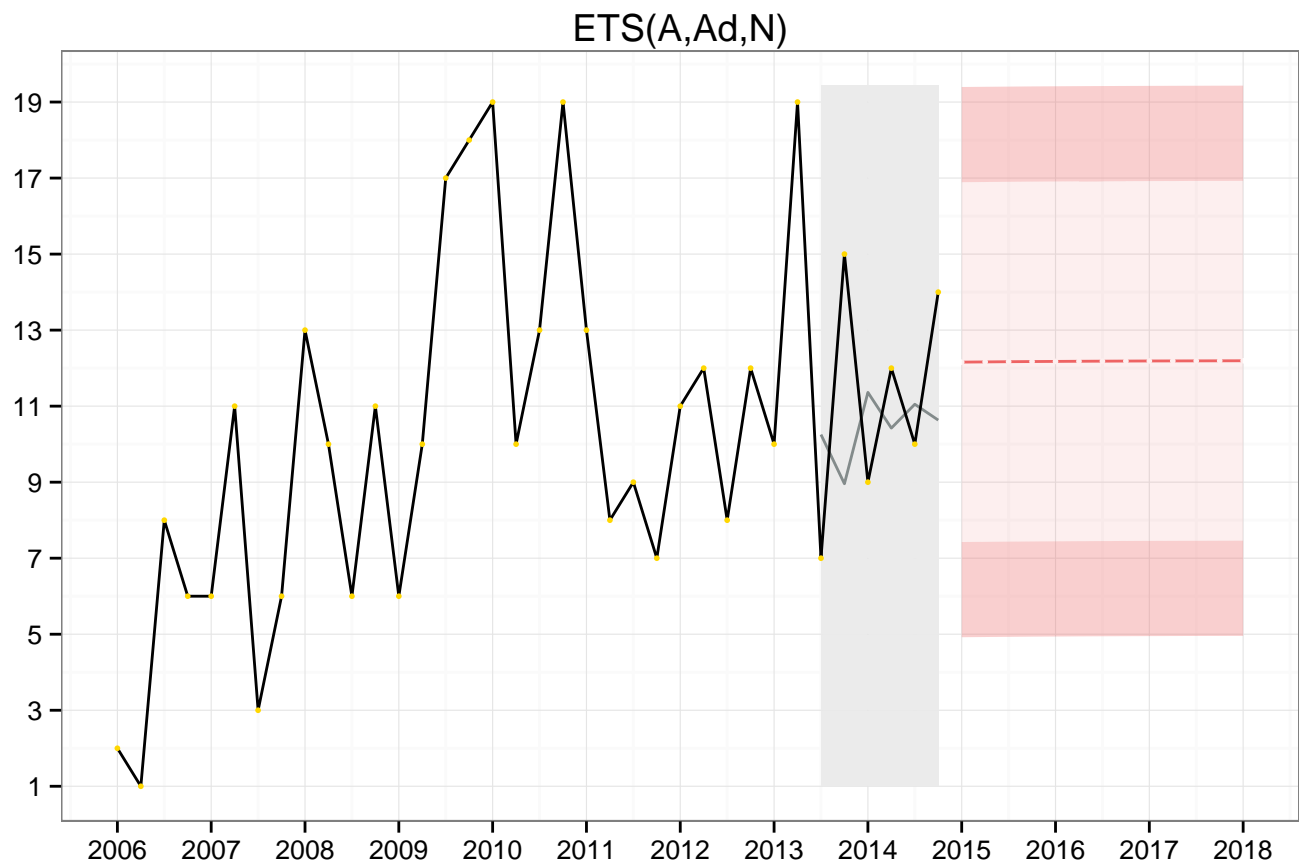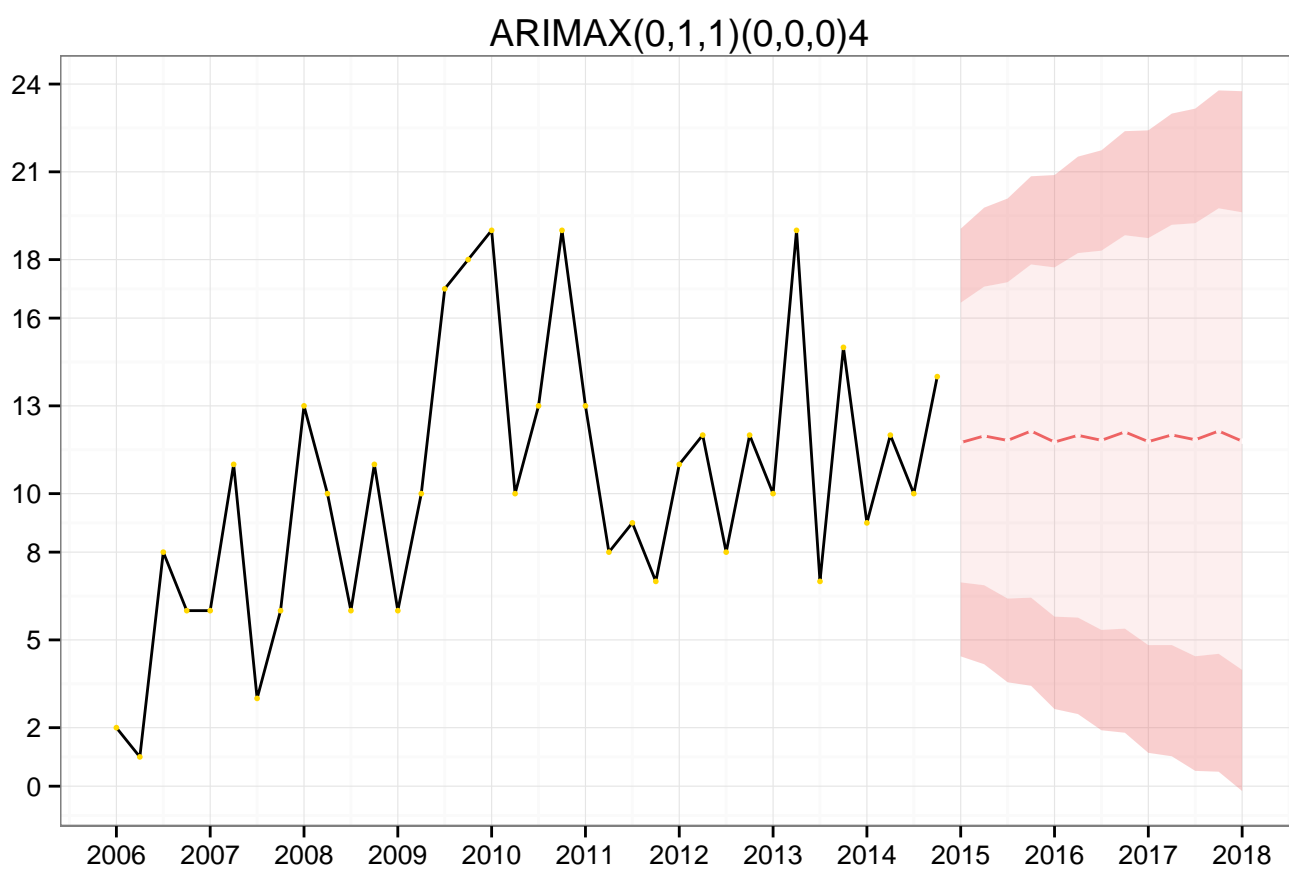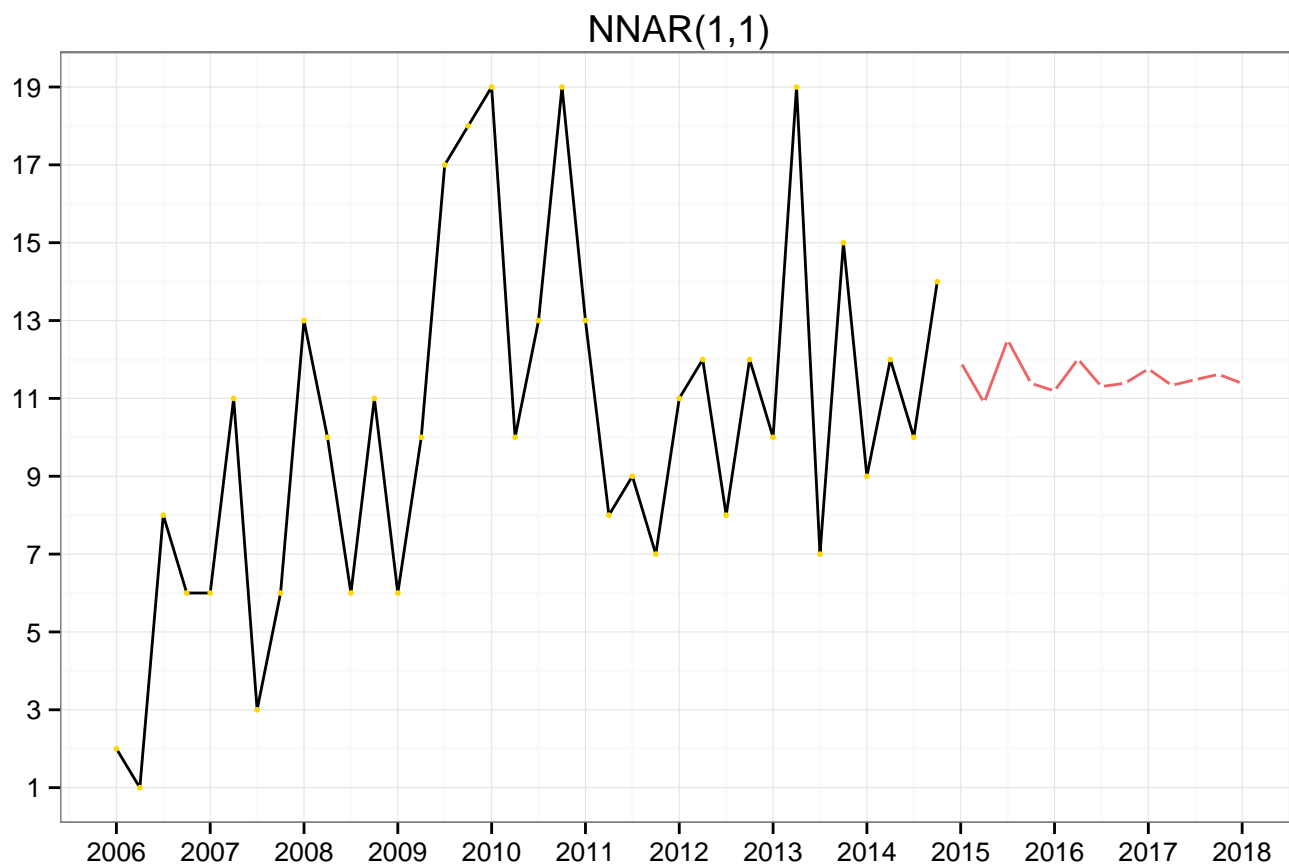
2.3.2 Outputs for BHL_CAT_3

$ETS(A, Ad, N)$

1. parameters :
   – alpha : 0.001008939
   – beta : 0.0001042115
   – phi : 0.8629533

2. init state :
   – l : 1.817976
   – b : 1.649842

3. informations critereas :
   – loglik : -111.533
   – aic : 233.066
   – bic : 240.9836
   – aicc : 235.066
   – mse : 13.63661
   – amse : 13.50983
   – sigma2 : 13.63661

$ARIMAX(0, 1, 1)(0, 0, 0)_4$
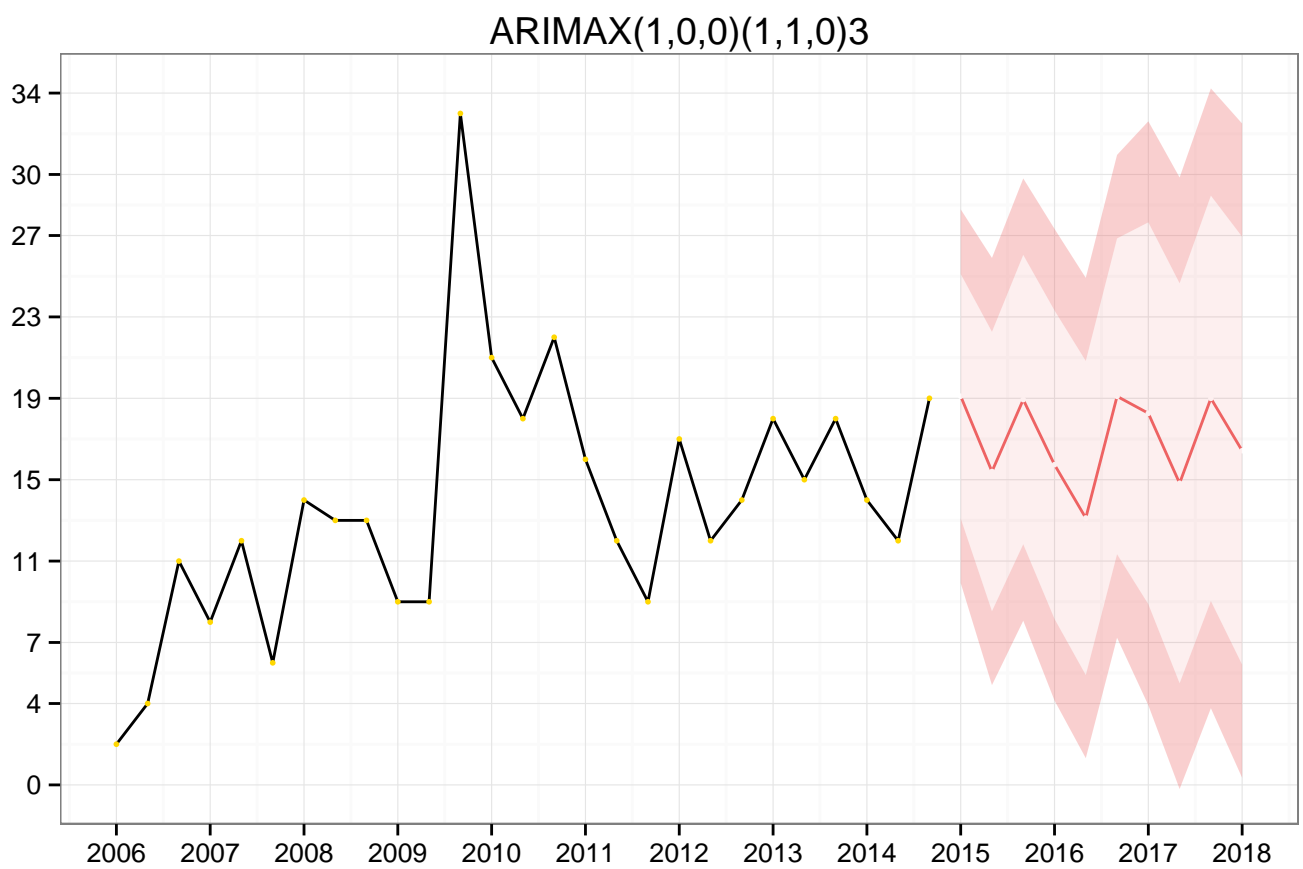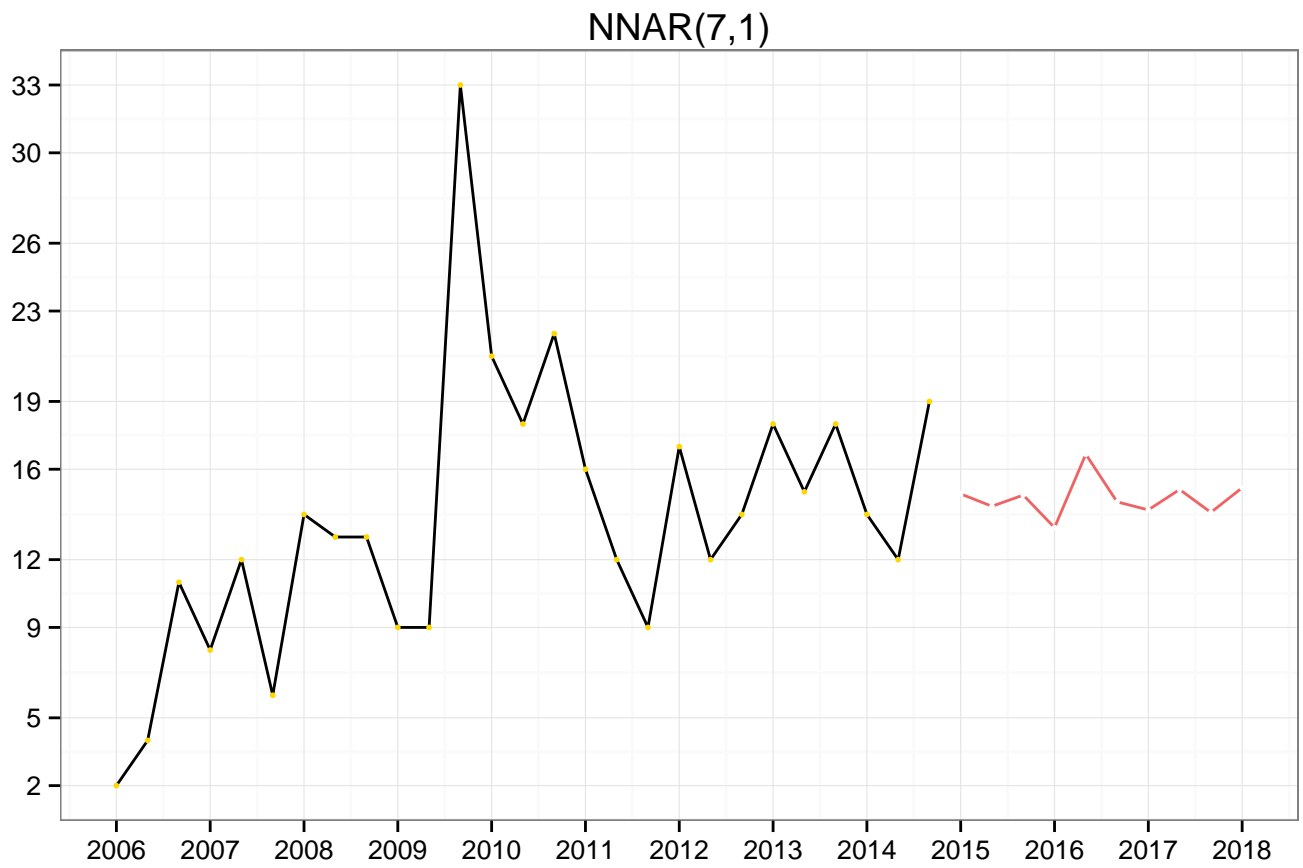
1. informations critereas :
   – loglik : -92.74284
   – aic : 193.4857
   – bic : 199.7071
   – aicc : 194.819
   – sigma2 : 13.90653

2. coefficients :
   – ma1 : -0.6260444
   – DEP_EQUIP_CAP_3 : 0.002601371
– My$_{SD}ummy$: 7.270153

time	ETS	lo 80	up 80	lo 95	up 95	ARIMAX	lo 80	up 80	lo 95	up 95
2015.00	12.16	7.43	16.89	4.92	19.40	11.75	6.97	16.52	4.44	19.05
2015.25	12.16	7.43	16.90	4.93	19.40	11.97	6.87	17.07	4.17	19.77
2015.50	12.17	7.44	16.90	4.93	19.41	11.82	6.41	17.23	3.55	20.09
2015.75	12.17	7.44	16.91	4.94	19.41	12.14	6.45	17.83	3.43	20.85
2016.00	12.18	7.44	16.91	4.94	19.42	11.76	5.80	17.73	2.64	20.89
2016.25	12.18	7.45	16.91	4.94	19.42	11.99	5.76	18.22	2.47	21.52
2016.50	12.18	7.45	16.92	4.95	19.42	11.82	5.34	18.30	1.91	21.73
2016.75	12.19	7.45	16.92	4.95	19.42	12.11	5.39	18.83	1.83	22.39
2017.00	12.19	7.46	16.92	4.95	19.43	11.78	4.82	18.74	1.14	22.42
2017.25	12.19	7.46	16.92	4.95	19.43	12.01	4.82	19.19	1.02	22.99
2017.50	12.19	7.46	16.92	4.95	19.43	11.84	4.44	19.24	0.52	23.16
2017.75	12.19	7.46	16.93	4.95	19.43	12.14	4.52	19.75	0.49	23.78
2018.00	12.19	7.46	16.93	4.96	19.43	11.79	3.97	19.62	-0.17	23.76

2.4 BHL_CAT_4

2.4.1 plots for BHL_CAT_4

ETS(M,A,A)

ETS(M,A,A)

NNAR(7,1)

ARIMAX(1,0,0)(1,1,0)3
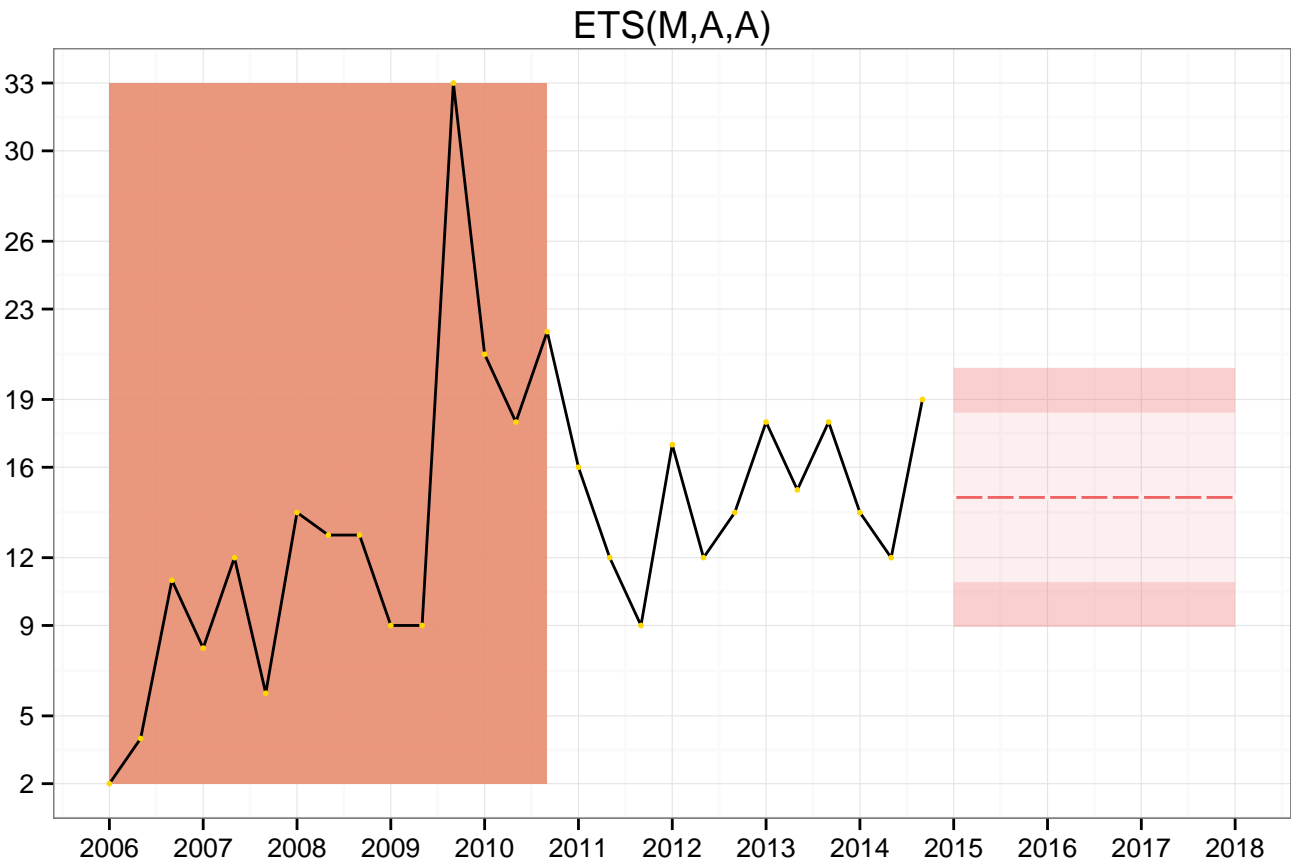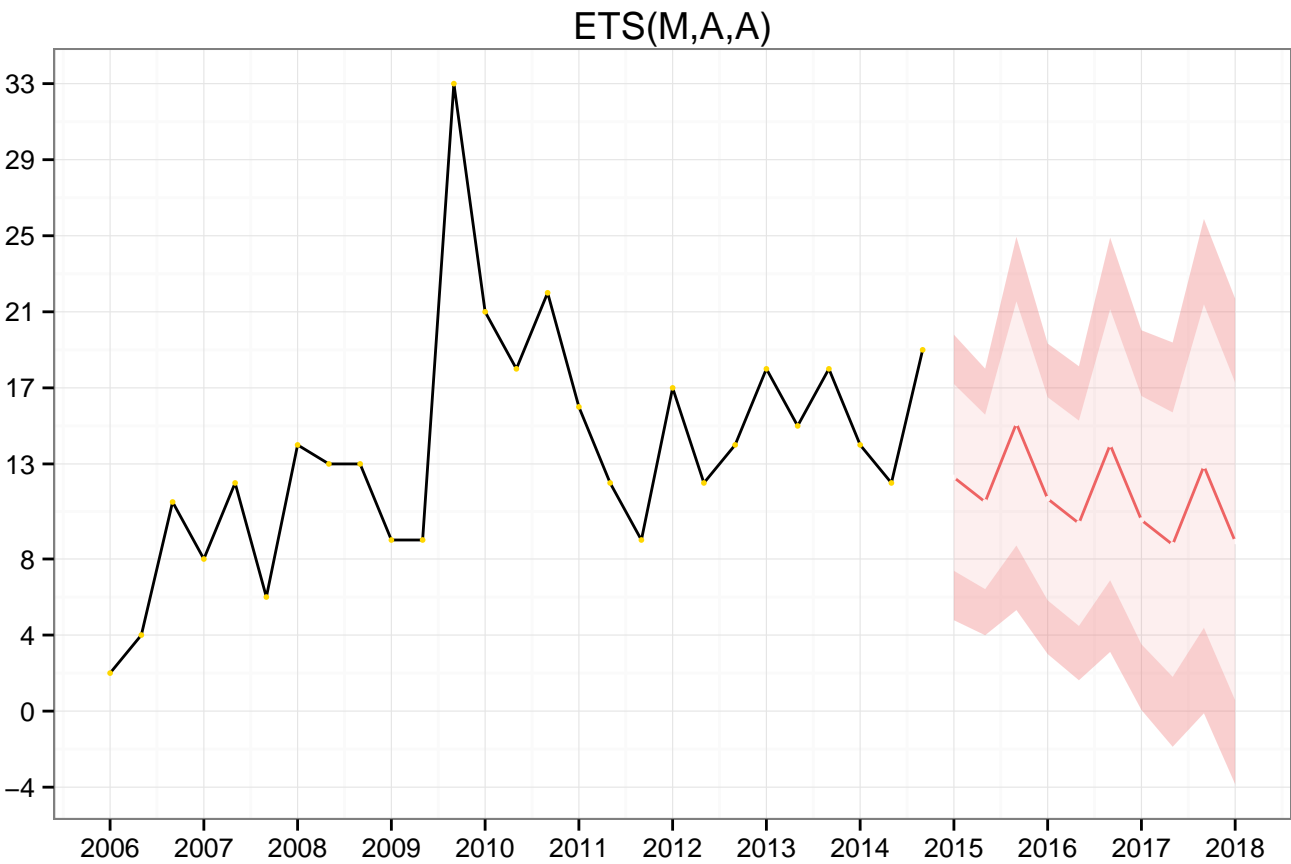
2.4.2 Outputs for BHL_CAT_4

$ETS(M, A, A)$

1. parameters :
   - alpha : 0.1512083
   - beta : 0.05112943
   - gamma : 0.04770924

2. init state :
   - l : 1.51766
   - b : 1.843631
   - s1 : 3.106917
   - s2 : -1.663044
   - s3 : -1.443873

3. informations critereas :
   - loglik : -83.80703
   - aic : 181.6141
   - bic : 190.6849
   - aicc : 187.5088
   - mse : 35.01868
   - amse : 40.08574
   - sigma2 : 0.09718068

$ARIMAX(1, 0, 0)(1, 1, 0)_3$

1. informations critereas :
   - loglik : -61.89288
   - aic : 133.7858
   - bic : 139.676
   - aicc : 137.1191
   - sigma2 : 21.94877

2. coefficients :
   - ar1 : 0.554084
   - sar1 : -0.7321728
   - DEP_EQUIP_CAP_4 : -8.797603e-06
   - $My_{SD}ummy$: 23.56681

time	ETS	lo 80	up 80	lo 95	up 95	ARIMAX	lo 80	up 80	lo 95	up 95
2015.00	12.29	7.38	17.20	4.78	19.80	19.10	13.10	25.11	9.92	28.29
2015.33	11.00	6.42	15.59	3.99	18.01	15.40	8.54	22.27	4.90	25.90
2015.67	15.13	8.71	21.55	5.31	24.95	18.94	11.83	26.04	8.07	29.81
2016.00	11.17	5.83	16.51	3.00	19.33	15.74	8.16	23.31	4.15	27.33
2016.33	9.88	4.48	15.28	1.62	18.13	13.12	5.40	20.83	1.31	24.92
2016.67	14.01	6.88	21.13	3.11	24.90	19.10	11.34	26.86	7.23	30.96
2017.00	10.05	3.52	16.57	0.06	20.03	18.26	8.88	27.65	3.92	32.61
2017.33	8.76	1.80	15.71	-1.88	19.39	14.82	5.00	24.65	-0.20	29.85
2017.67	12.89	4.39	21.38	-0.11	25.88	19.00	9.04	28.96	3.77	34.23
2018.00	8.92	0.57	17.27	-3.85	21.69	16.42	5.91	26.94	0.35	32.50

2.5 BHL_CAT_6

2.5.1 plots for BHL_CAT_6

ETS(A,N,N)

ETS(A,N,N)

NNAR(1,1)
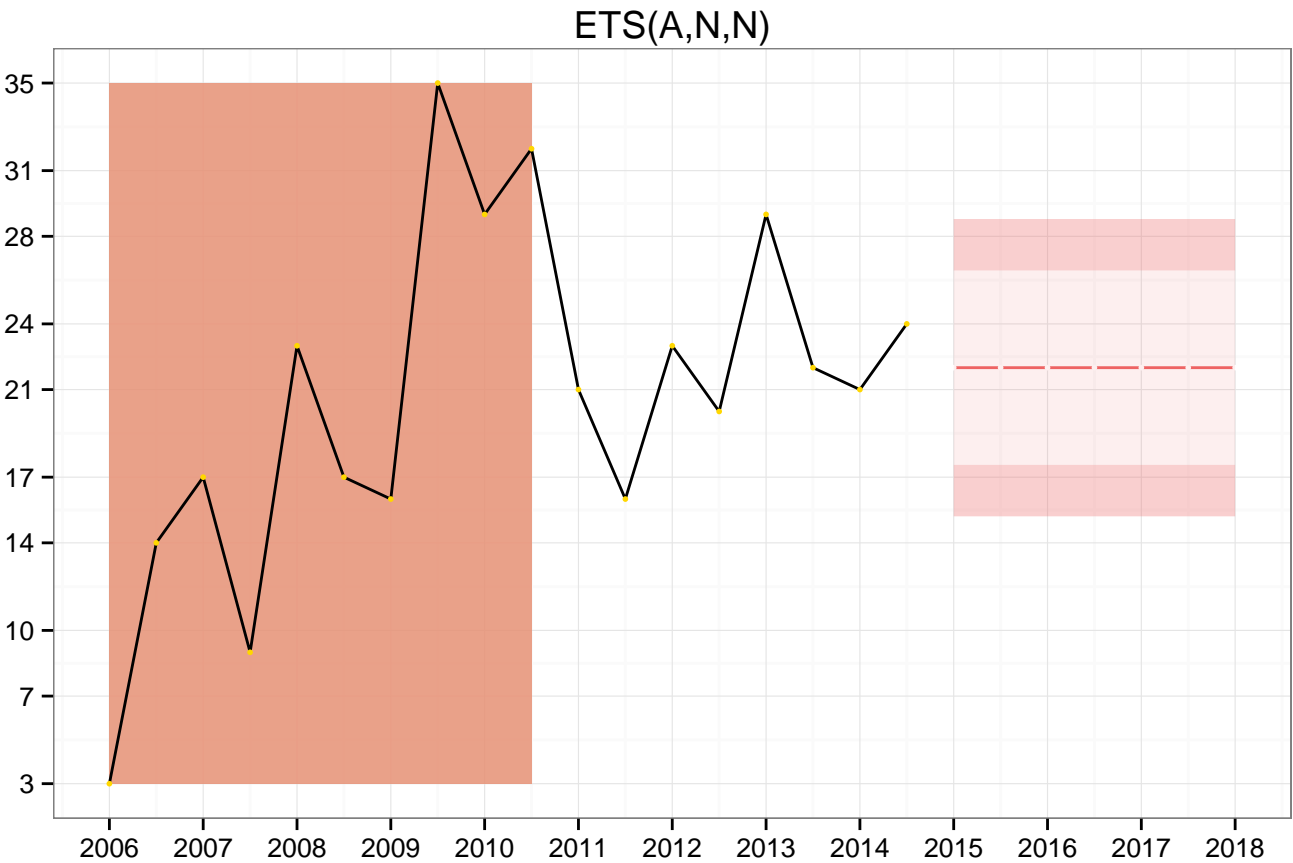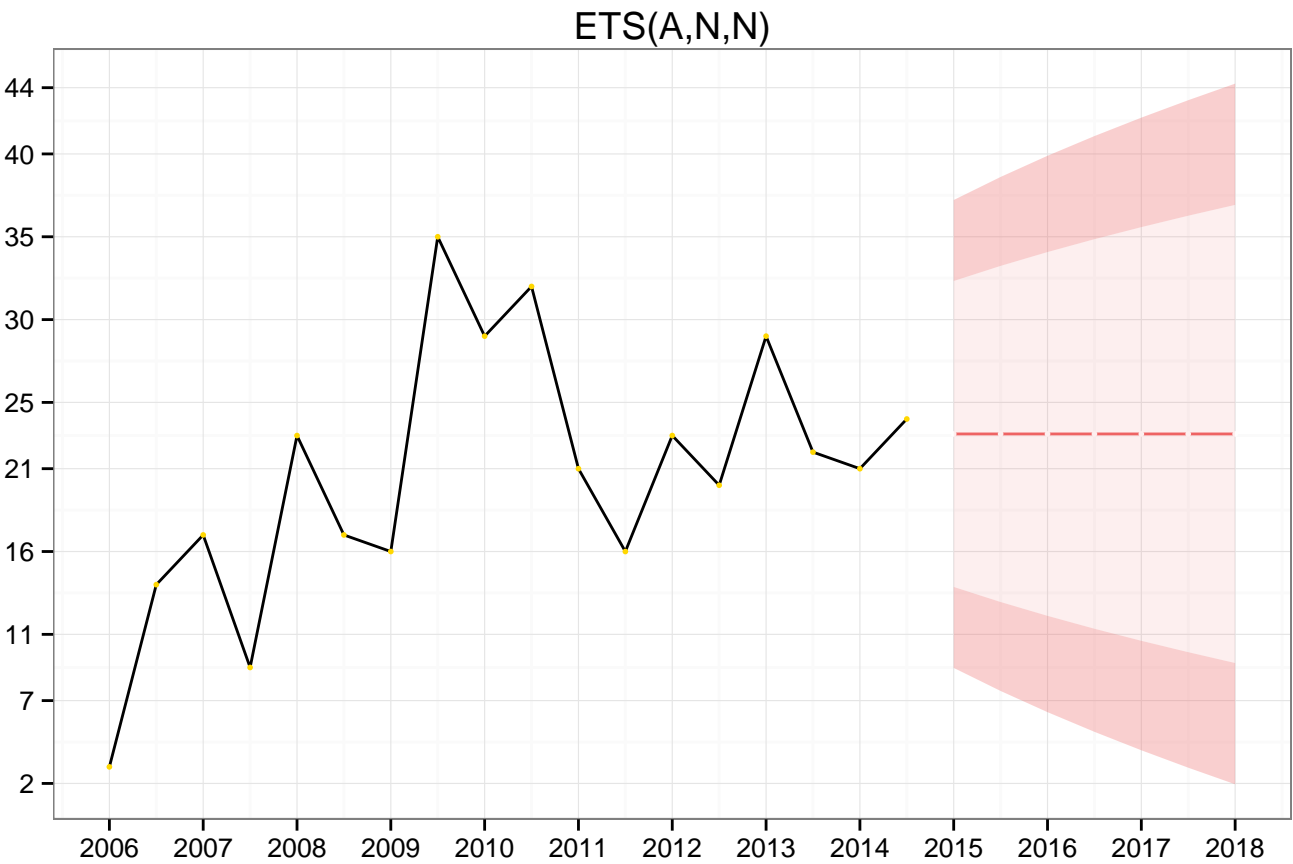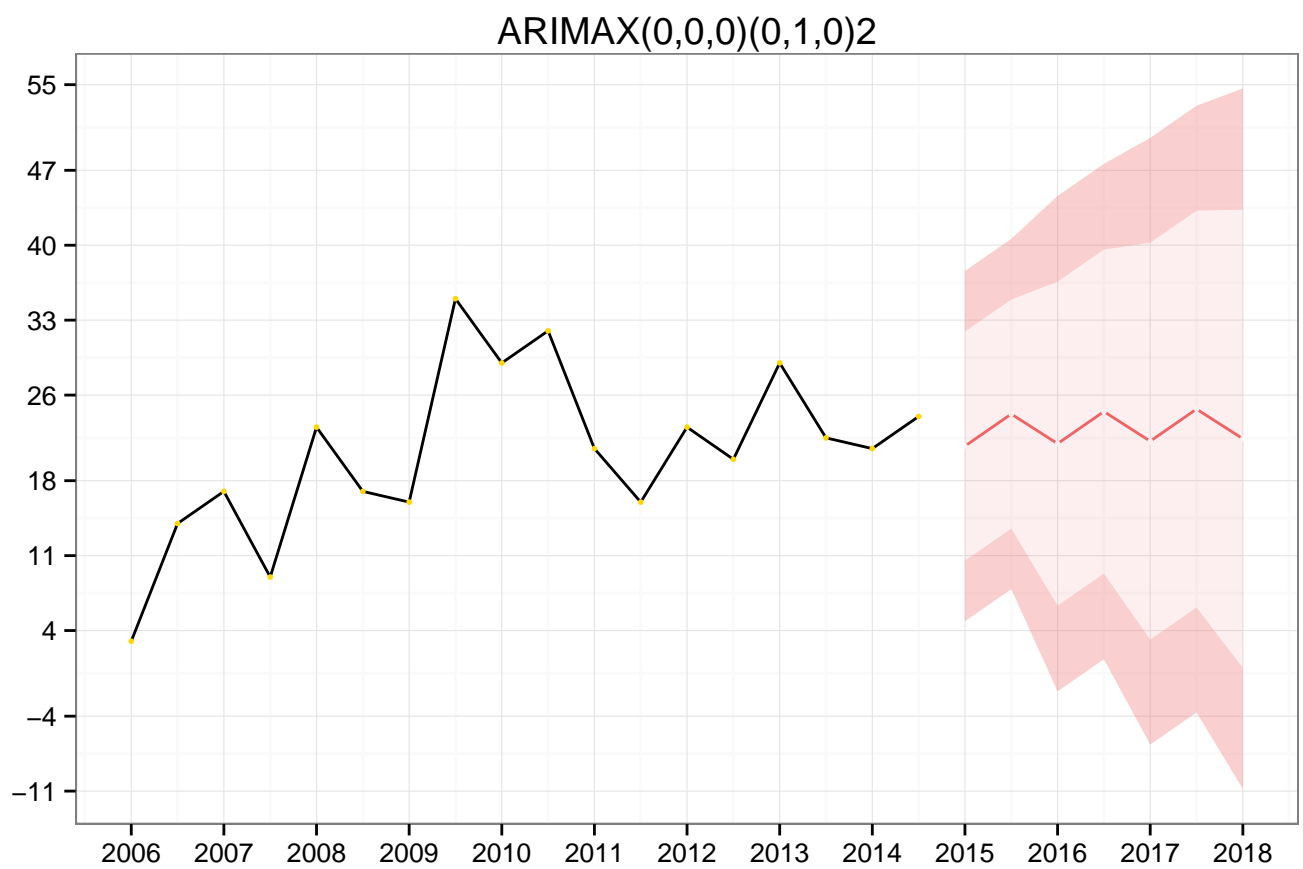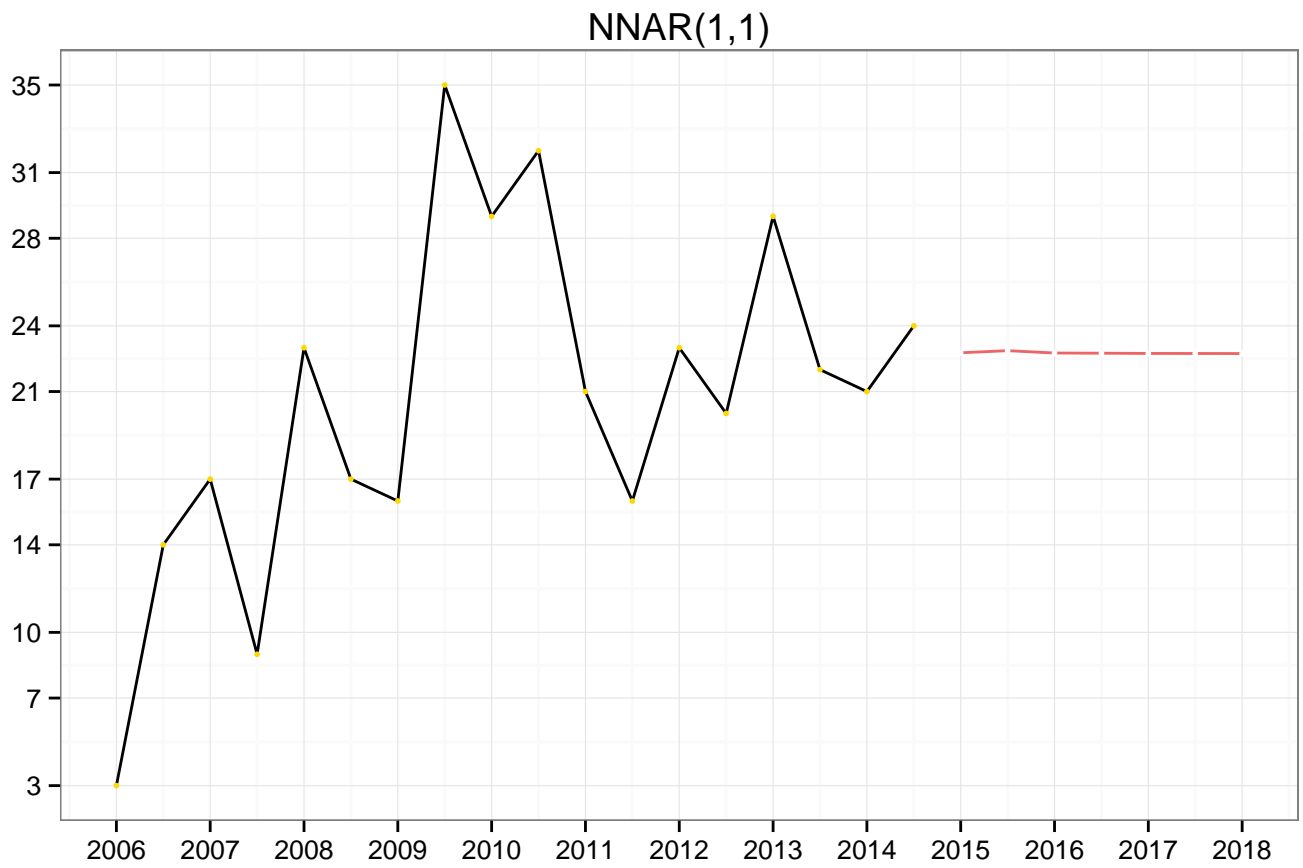
ARIMAX(0,0,0)(0,1,0)2

2.5.2 Outputs for BHL_CAT_6

$ETS(A, N, N)$

1. parameters :
   − alpha : 0.4550858
2. init state :
   − l : 9.723708
3. informations critereas :
   − loglik : -61.55892
   − aic : 127.1178
   − bic : 128.8986
   − aicc : 127.9178
   − mse : 51.90985
   − amse : 60.39
   − sigma2 : 51.90985
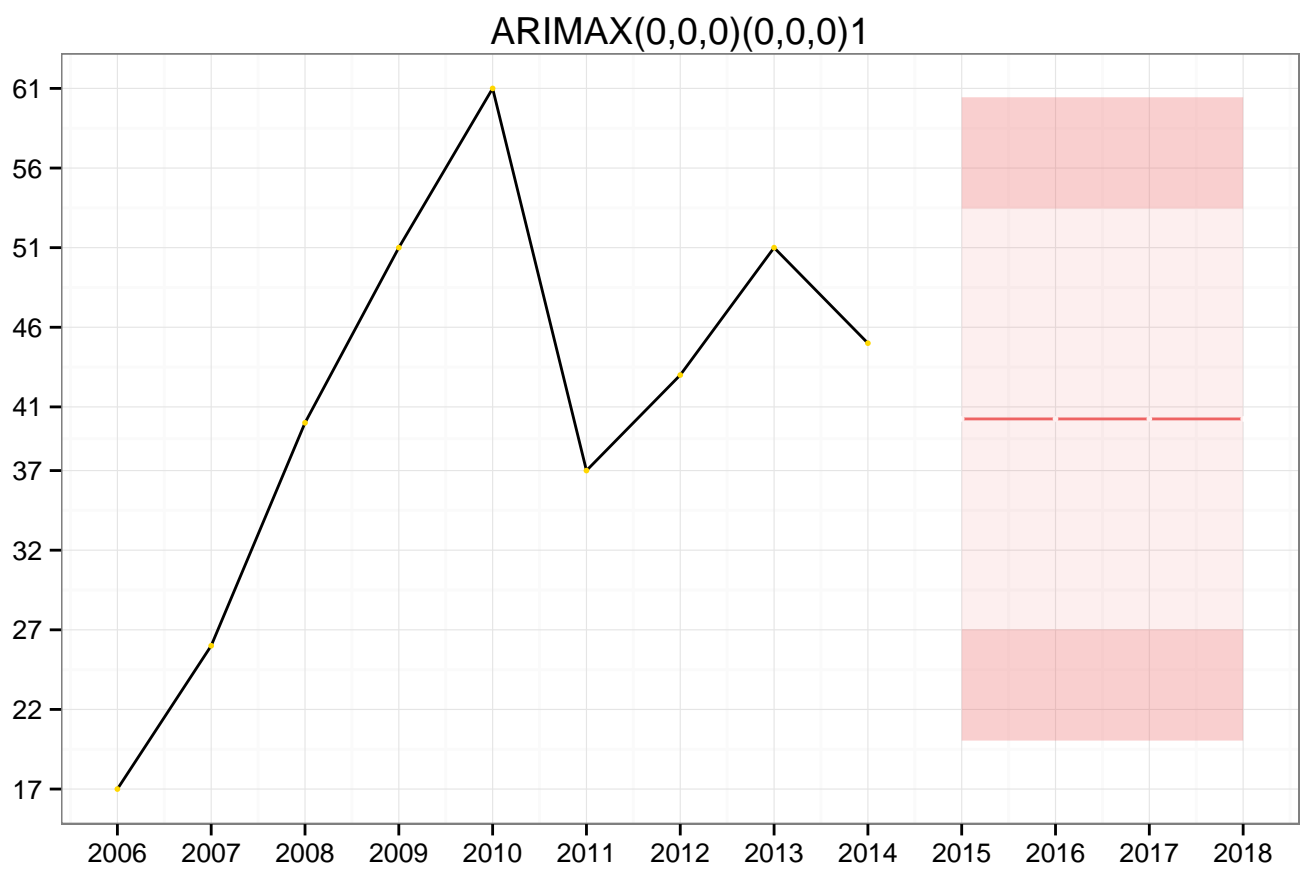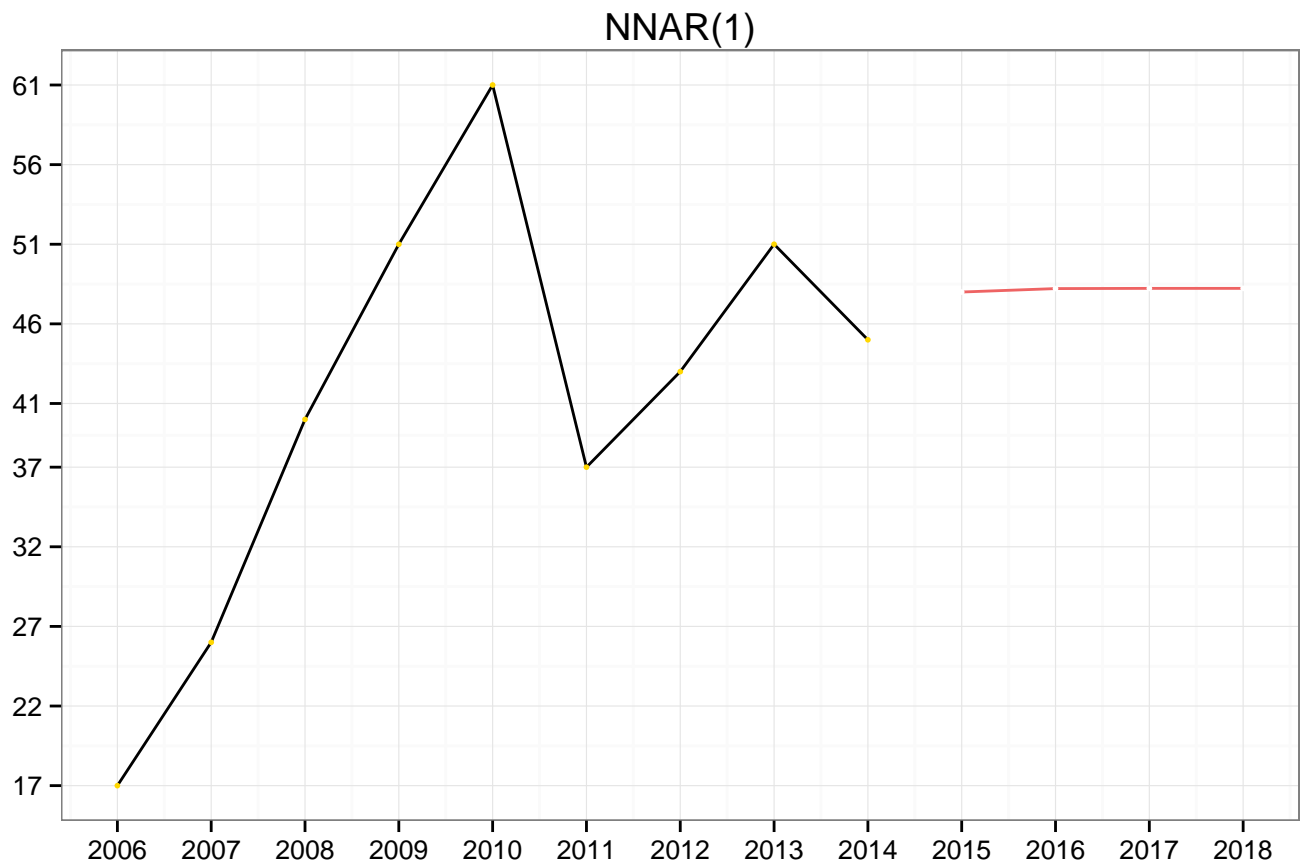
$ARIMAX(0, 0, 0)(0, 1, 0)_2$

1. informations critereas :
   − loglik : -48.64127
   − aic : 103.2825
   − bic : 105.6003
   − aicc : 105.2825
   − sigma2 : 69.71437

2. coefficients :
   − DEP_EQUIP_CAP_6 : 0.0239729
   − My$_{SD}ummy$: 12.77646

time	ETS	lo 80	up 80	lo 95	up 95	ARIMAX	lo 80	up 80	lo 95	up 95
2015.00	23.10	13.86	32.33	8.98	37.22	21.23	10.53	31.93	4.87	37.59
2015.50	23.10	12.95	33.24	7.58	38.61	24.23	13.53	34.93	7.87	40.59
2016.00	23.10	12.12	34.08	6.30	39.89	21.46	6.33	36.59	-1.68	44.60
2016.50	23.10	11.34	34.85	5.12	41.08	24.46	9.33	39.59	1.32	47.60
2017.00	23.10	10.61	35.58	4.00	42.19	21.69	3.16	40.22	-6.65	50.04
2017.50	23.10	9.92	36.27	2.95	43.24	24.69	6.16	43.22	-3.65	53.04
2018.00	23.10	9.27	36.92	1.95	44.24	21.92	0.52	43.32	-10.81	54.65

2.6 BHL_CAT_12

2.6.1 plots for BHL_CAT_12

ETS(M,N,N)

ETS(M,N,N)

NNAR(1)
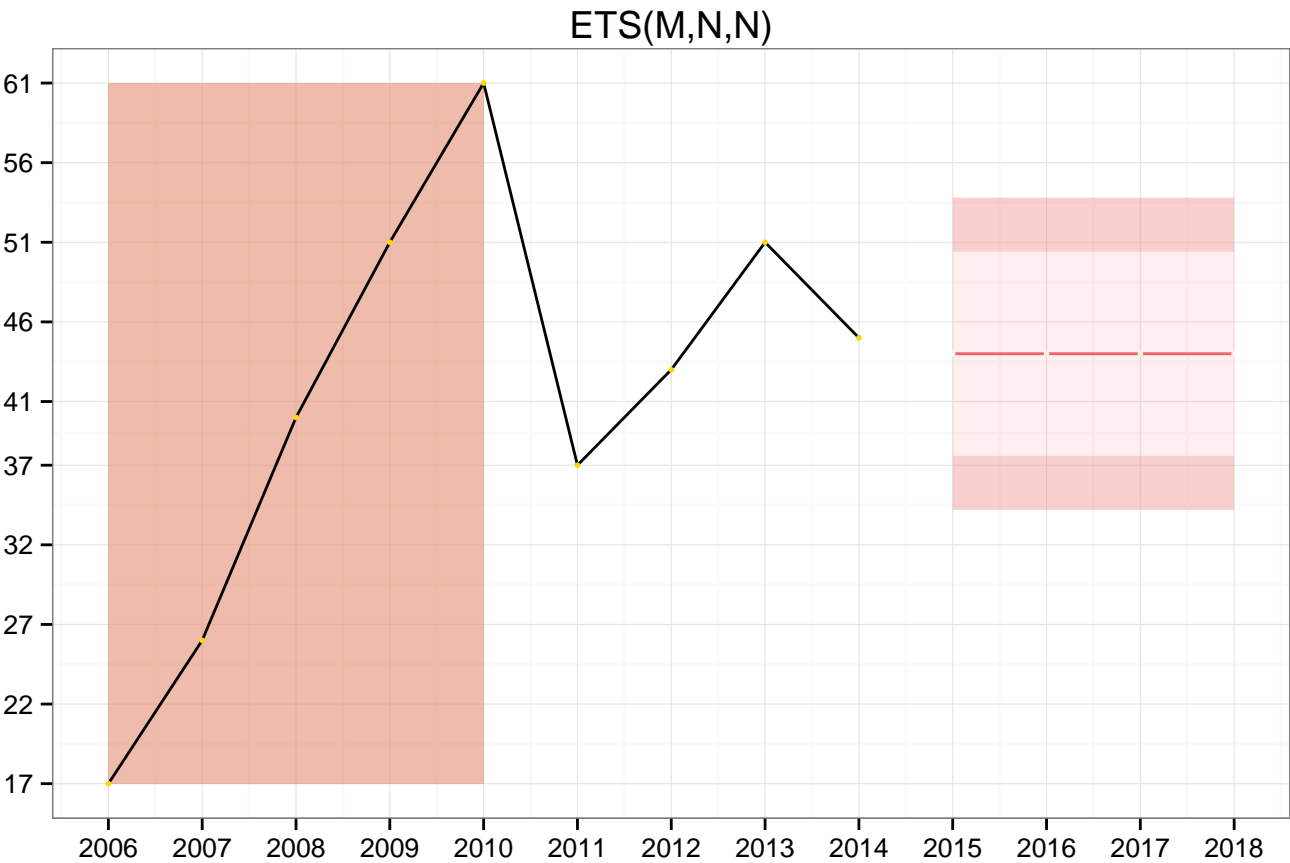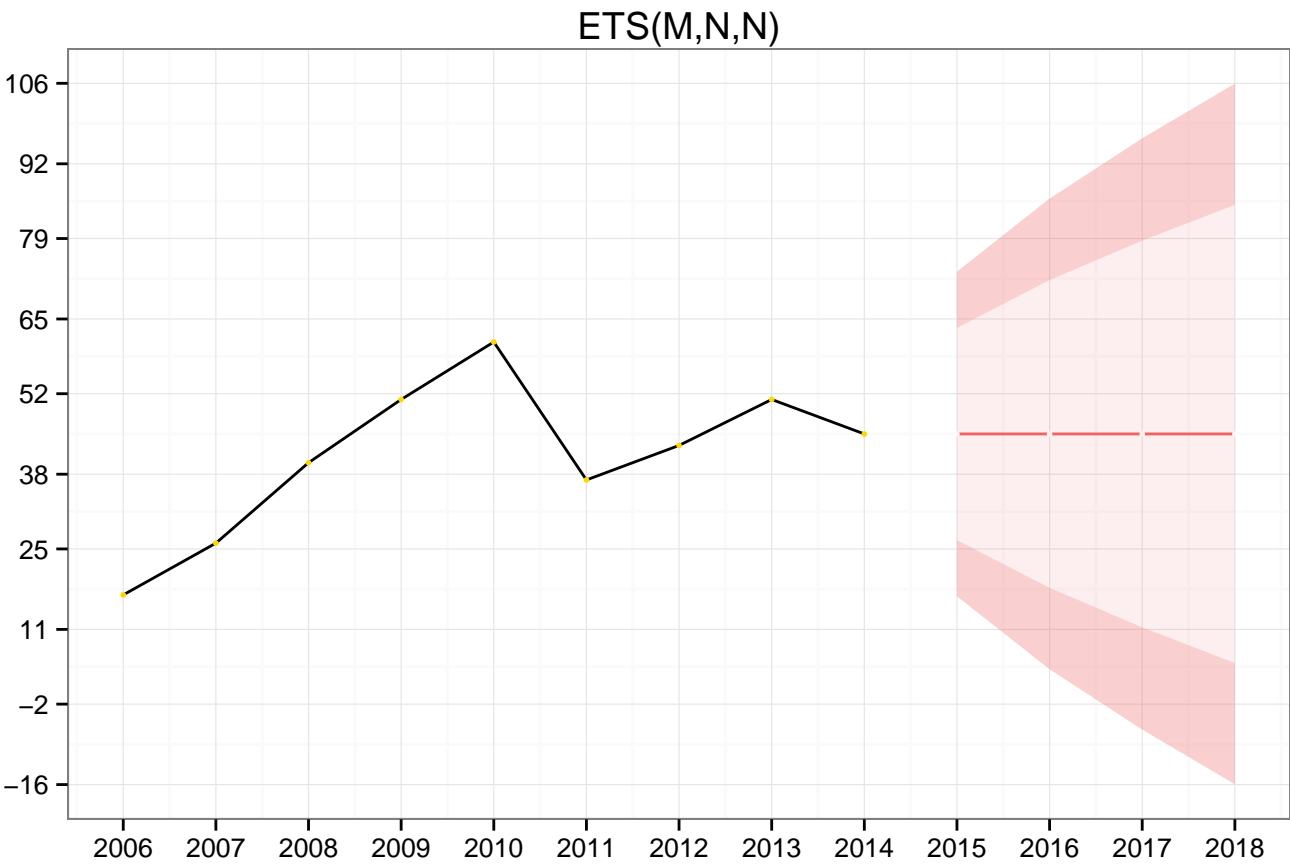
ARIMAX(0,0,0)(0,0,0)1

2.6.2 Outputs for BHL_CAT_12

$ETS(M, N, N)$

1. parameters :
   − alpha : 0.9998999
2. init state :
   − l : 15.54883
3. informations critereas :
   − loglik : -31.50834
   − aic : 67.01667
   − bic : 67.41112
   − aicc : 69.01667
   − mse : 134.6789
   − amse : 253.7839
   − sigma2 : 0.1025138

$ARIMAX(0, 0, 0)(0, 0, 0)_1$

1. informations critereas :
   − loglik : -33.76557
   − aic : 73.53114
   − bic : 74.12281
   − aicc : 78.33114
   − sigma2 : 106.2275

2. coefficients :
   − DEP_EQUIP_CAP_12 : 0.07616731
   − My$_{SD}ummy : -7.299607$

time	ETS	lo 80	up 80	lo 95	up 95	ARIMAX	lo 80	up 80	lo 95	up 95
2015.00	45.00	26.54	63.47	16.76	73.24	40.24	27.03	53.45	20.04	60.44
2016.00	45.00	18.23	71.77	4.06	85.95	40.24	27.03	53.45	20.04	60.44
2017.00	45.00	11.37	78.63	-6.44	96.44	40.24	27.03	53.45	20.04	60.44
2018.00	45.00	5.15	84.85	-15.94	105.94	40.24	27.03	53.45	20.04	60.44

2.7   BHL_1

2.7.1   plots for BHL_1

ETS(M,N,N)

ETS(M,N,N)

NNAR(12,1)

ARIMAX(0,1,1)(0,0,2)12
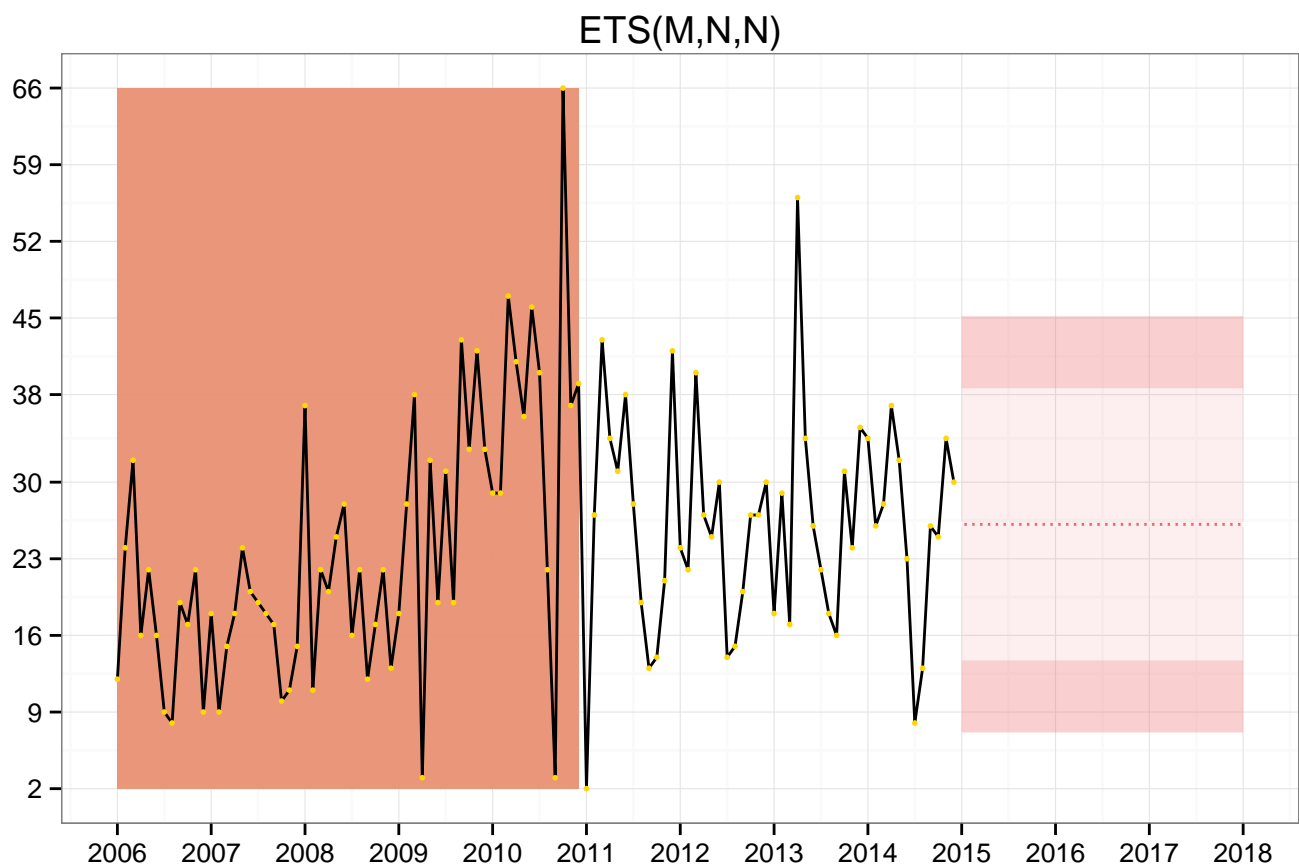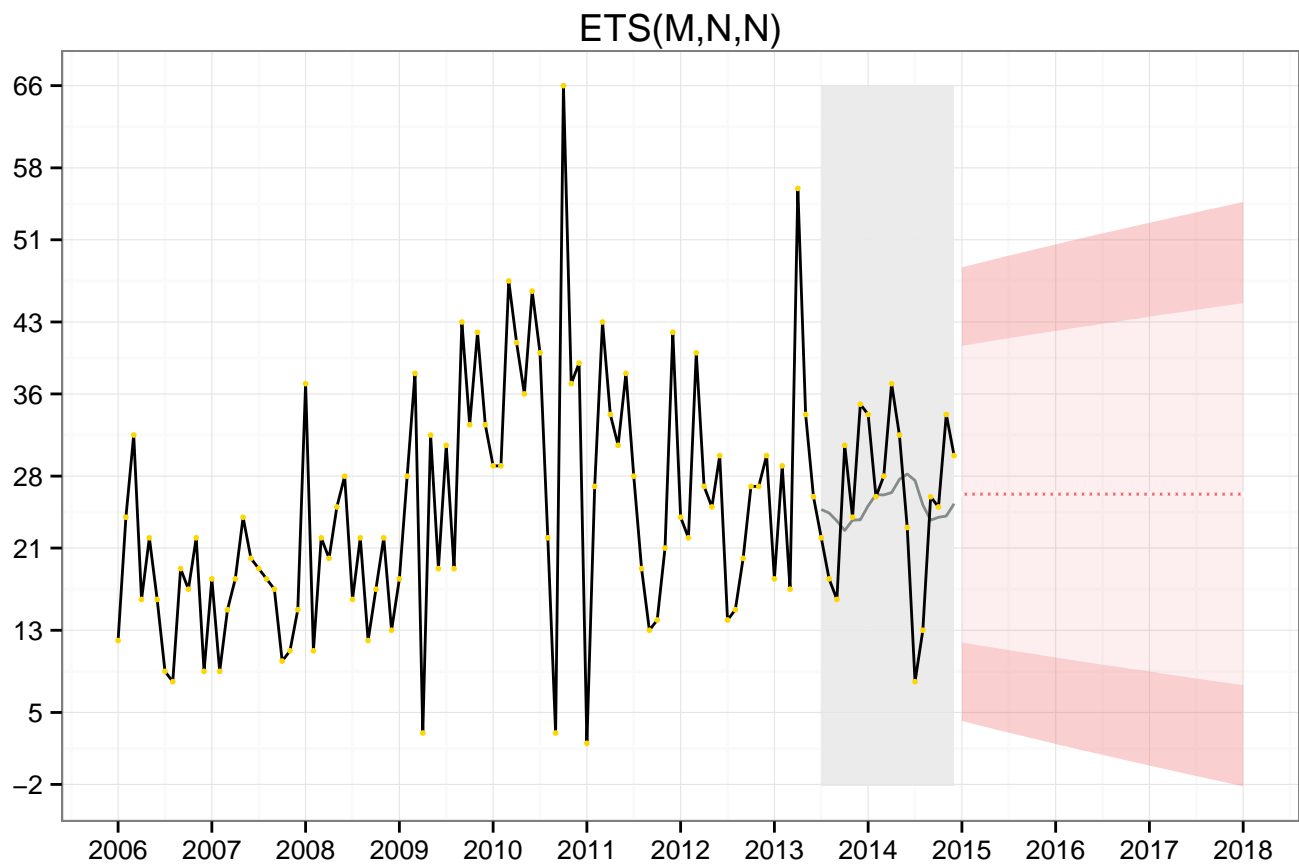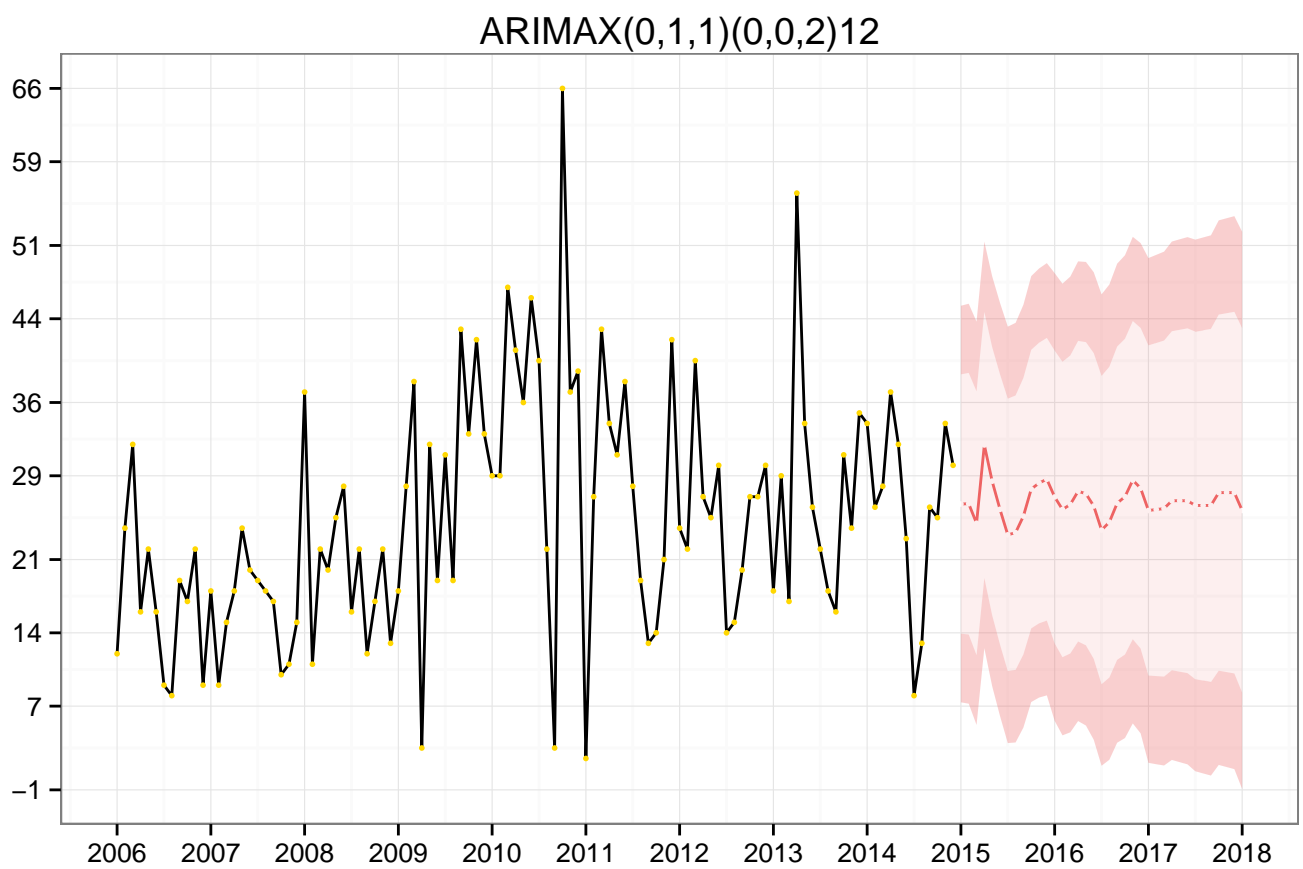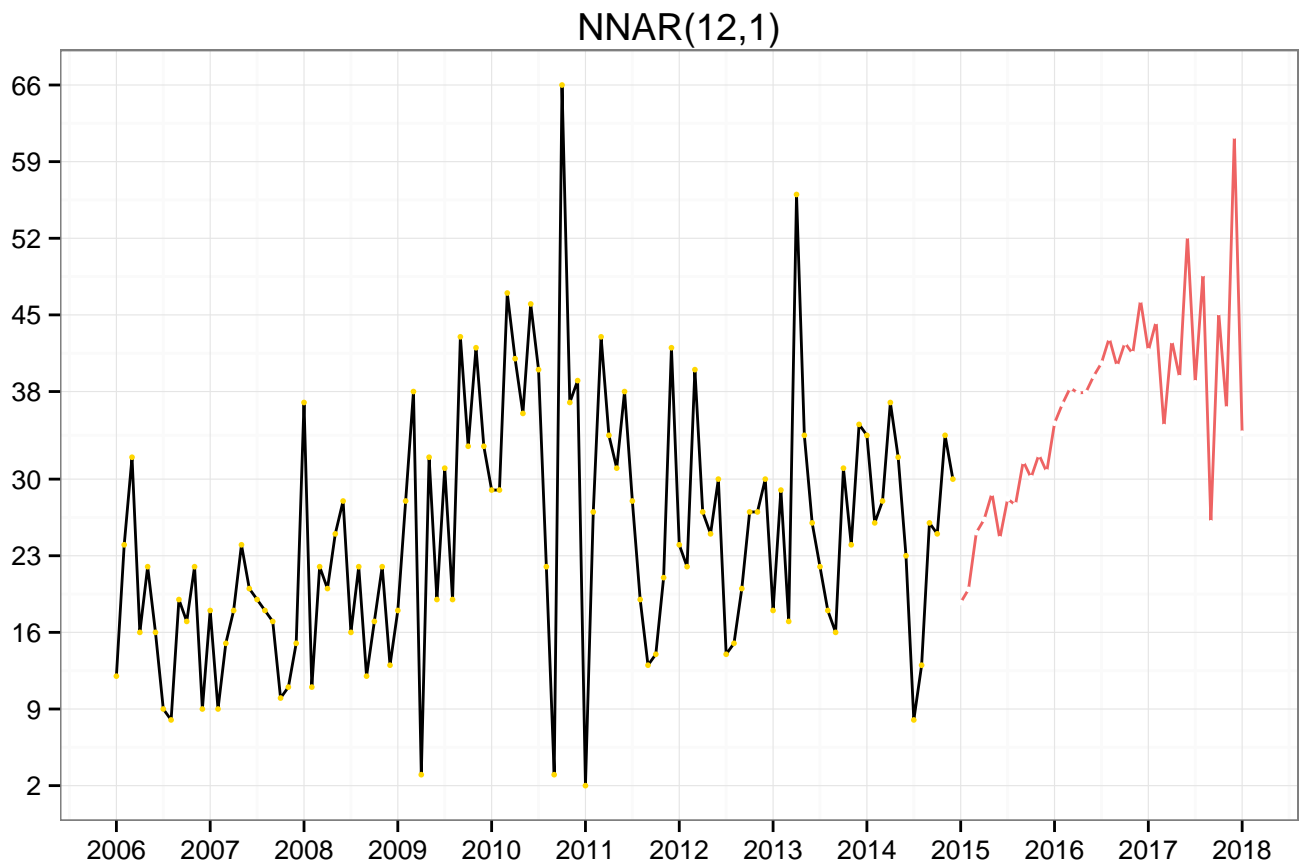
2.7.2 Outputs for BHL_1

$ETS(M, N, N)$

1. parameters :
   − alpha : 0.1213589

2. init state :
   − l : 17.84215

3. informations critereas :
   − loglik : -502.2914
   − aic : 1008.583
   − bic : 1013.947
   − aicc : 1008.697
   − mse : 111.6879
   − amse : 113.5572
   − sigma2 : 0.1841203

4. accuracy :
   − ME : 0.5191147
   − RMSE : 8.167434
   − MAE : 6.516364
   − MPE : -14.74311
   − MAPE : 36.11891
   − MASE : 0.9231515
   − ACF1 : 0.43202

$ARIMAX(0, 1, 1)(0, 0, 2)_{12}$

1. informations critereas :
   − loglik : -391.416
   − aic : 794.8321
   − bic : 810.869
   − aicc : 795.6721
   − sigma2 : 93.38807

2. coefficients :
   − ma1 : -0.8693517
   − sma1 : 0.1634129
   − sma2 : 0.1507096
   − DEP_EQUIP_CAP_1 : 0.02680011
   − $My_{SD}ummy$: 35.41408

time	ETS	lo 80	up 80	lo 95	up 95	ARIMAX	lo 80	up 80	lo 95	up 95
2015.00	26.24	11.81	40.68	4.17	48.32	26.30	13.92	38.69	7.36	45.24
2015.08	26.24	11.69	40.80	3.98	48.51	26.33	13.84	38.82	7.23	45.43
2015.17	26.24	11.56	40.93	3.79	48.70	24.46	11.87	37.06	5.20	43.73
2015.25	26.24	11.44	41.05	3.60	48.89	31.95	19.25	44.64	12.53	51.37
2015.33	26.24	11.32	41.17	3.41	49.08	28.49	15.69	41.29	8.91	48.06
2015.42	26.24	11.19	41.30	3.23	49.26	25.80	12.89	38.70	6.06	45.53
2015.50	26.24	11.07	41.42	3.04	49.45	23.36	10.35	36.36	3.47	43.24
2015.58	26.24	10.95	41.54	2.85	49.64	23.57	10.47	36.67	3.53	43.61
2015.67	26.24	10.83	41.66	2.67	49.82	25.15	11.94	38.35	4.96	45.34
2015.75	26.24	10.71	41.78	2.49	50.00	27.73	14.43	41.03	7.39	48.08
2015.83	26.24	10.59	41.90	2.30	50.19	28.31	14.91	41.71	7.81	48.80
2015.92	26.24	10.47	42.02	2.12	50.37	28.67	15.17	42.17	8.03	49.31
2016.00	26.24	10.35	42.14	1.94	50.55	26.98	13.00	40.96	5.60	48.36
2016.08	26.24	10.24	42.25	1.76	50.73	25.78	11.67	39.89	4.21	47.35
2016.17	26.24	10.12	42.37	1.58	50.91	26.26	12.03	40.49	4.50	48.02
2016.25	26.24	10.00	42.49	1.40	51.08	27.53	13.17	41.88	5.57	49.48
2016.33	26.24	9.89	42.60	1.23	51.26	27.29	12.81	41.76	5.14	49.43
2016.42	26.24	9.77	42.72	1.05	51.44	26.11	11.51	40.71	3.79	48.44
2016.50	26.24	9.66	42.83	0.87	51.62	23.81	9.09	38.53	1.30	46.33
2016.58	26.24	9.54	42.95	0.70	51.79	24.57	9.73	39.41	1.87	47.27
2016.67	26.24	9.43	43.06	0.52	51.96	26.38	11.42	41.34	3.50	49.26
2016.75	26.24	9.31	43.18	0.35	52.14	27.01	11.93	42.09	3.95	50.07
2016.83	26.24	9.20	43.29	0.18	52.31	28.58	13.39	43.78	5.35	51.82
2016.92	26.24	9.09	43.40	0.00	52.48	27.81	12.50	43.12	4.40	51.23
2017.00	26.24	8.98	43.51	-0.17	52.66	25.69	9.93	41.45	1.58	49.80
2017.08	26.24	8.86	43.63	-0.34	52.83	25.78	9.87	41.68	1.45	50.10
2017.17	26.24	8.75	43.74	-0.51	53.00	25.87	9.82	41.92	1.33	50.41
2017.25	26.24	8.64	43.85	-0.68	53.17	26.62	10.43	42.81	1.86	51.37
2017.33	26.24	8.53	43.96	-0.85	53.34	26.62	10.29	42.94	1.65	51.59
2017.42	26.24	8.42	44.07	-1.02	53.50	26.62	10.15	43.08	1.44	51.80

2.8   BHL_2

2.8.1   plots for BHL_2

ETS(M,N,M)

ETS(M,N,M)

NNAR(3,1)

ARIMAX(1,1,1)(0,0,1)6
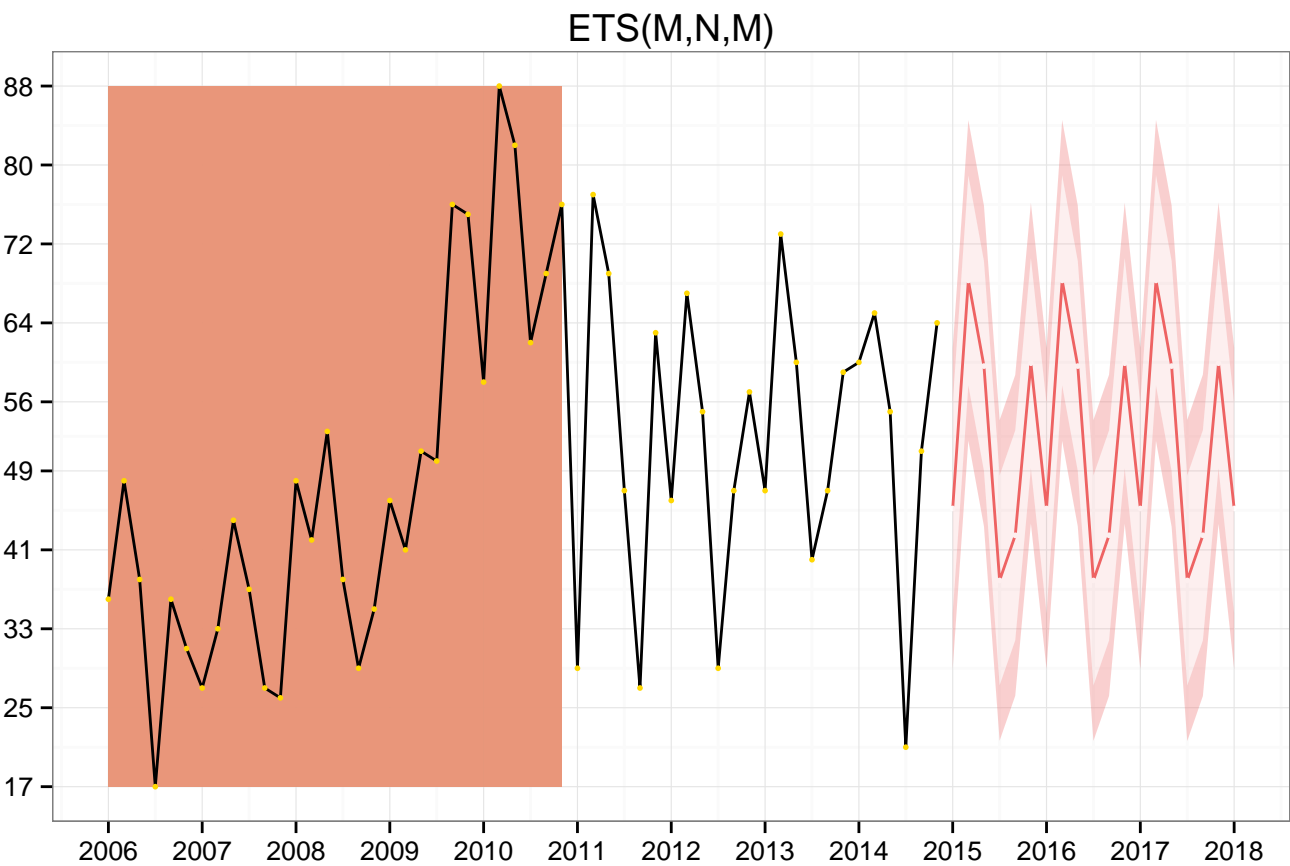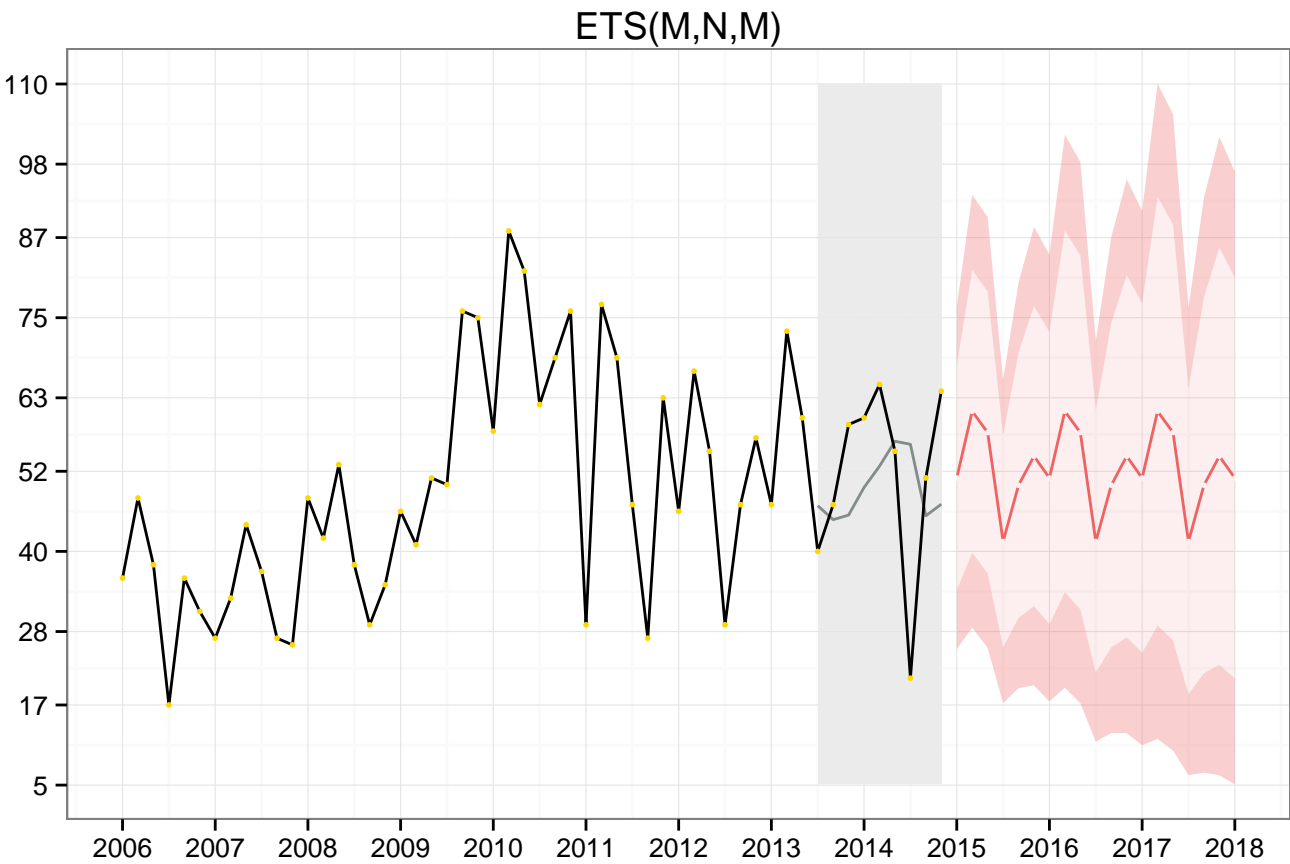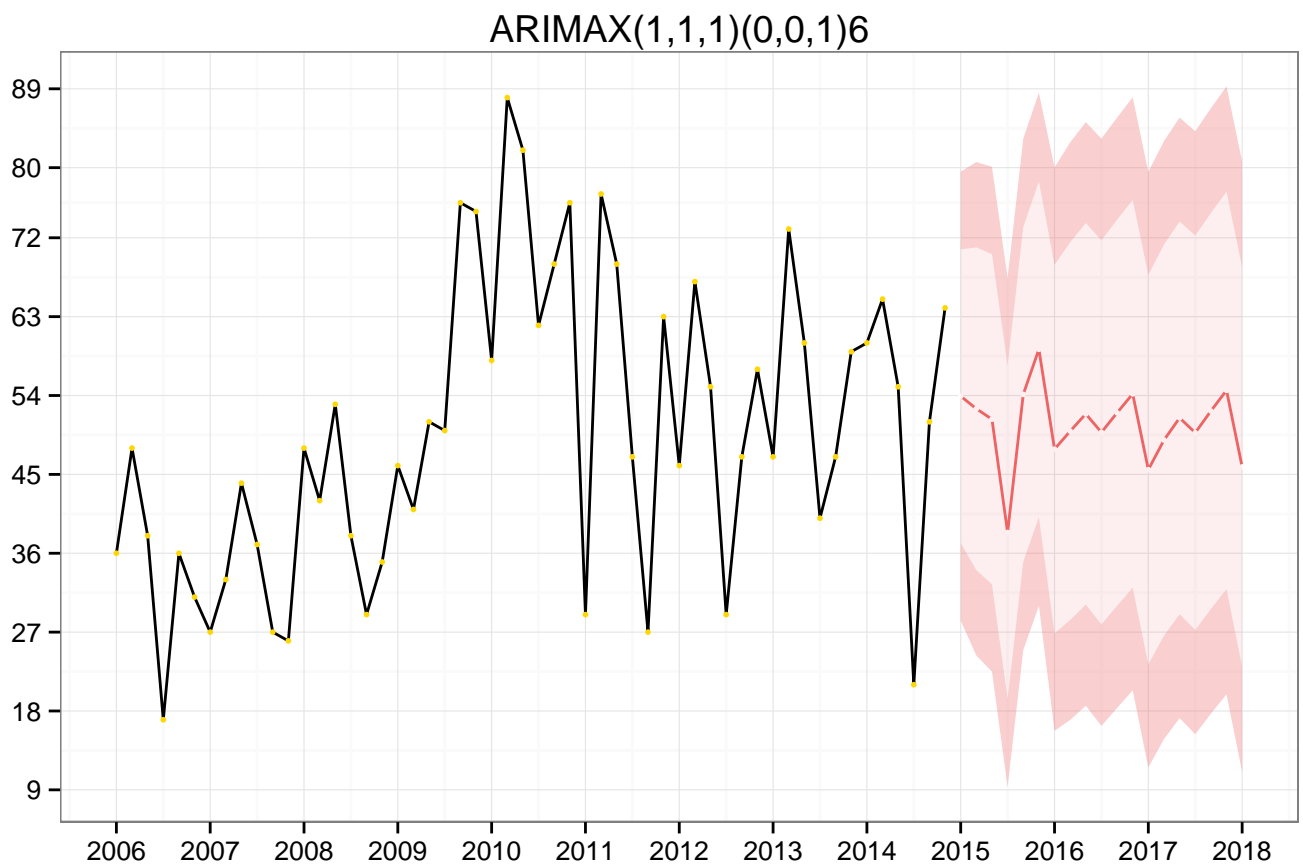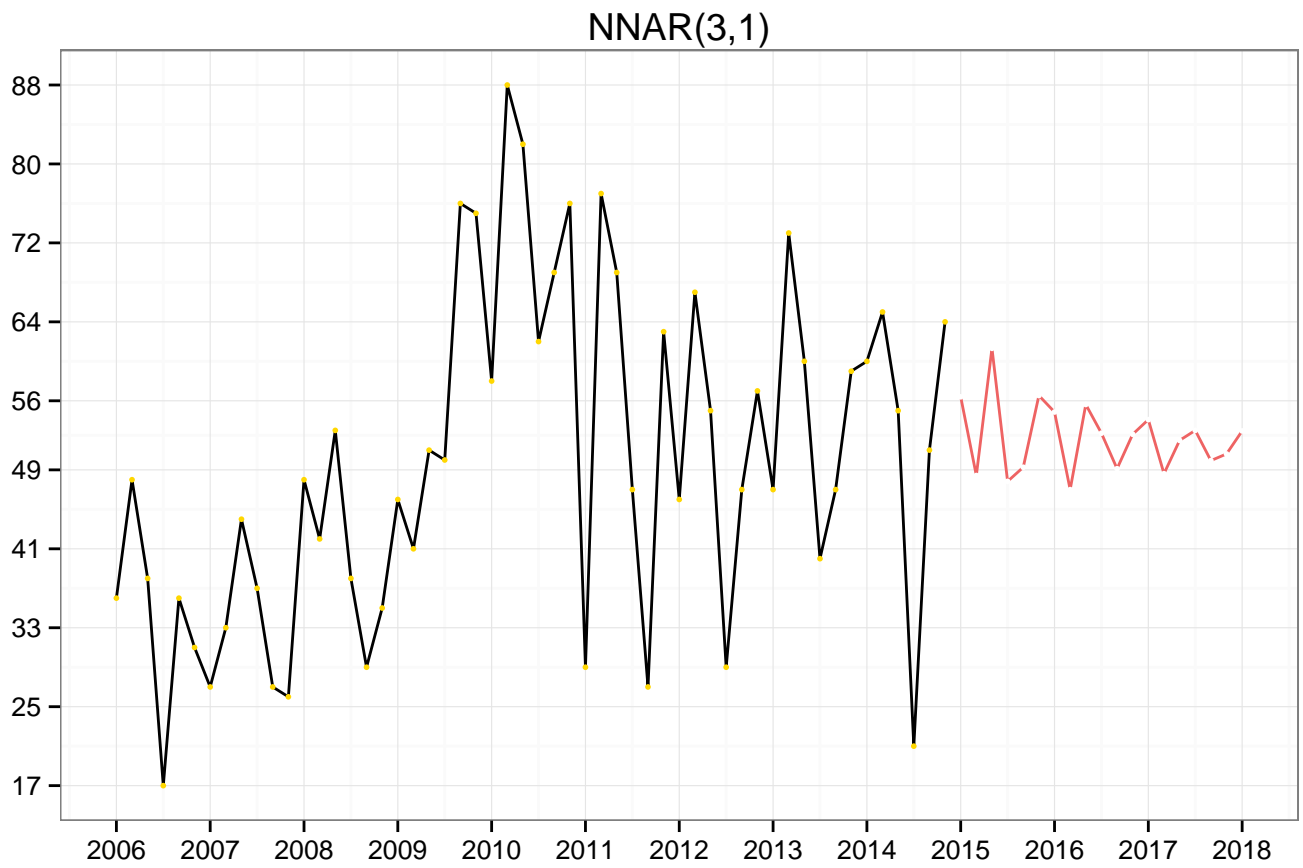
2.8.2 Outputs for BHL_2

$ETS(M, N, M)$

1. parameters :
   - alpha : 0.3282228
   - gamma : 0.0001000144
2. init state :
   - l : 34.872
   - s1 : 1.032098
   - s2 : 0.9493816
   - s3 : 0.7889845
   - s4 : 1.099608
   - s5 : 1.159976
   - s6 : 0.9699529
3. informations critereas :
   - loglik : -241.6546
   - aic : 499.3091
   - bic : 515.221
   - aicc : 502.5091
   - mse : 142.548
   - amse : 158.9795
   - sigma2 : 0.06588889
4. accuracy :
   - ME : 1.96399
   - RMSE : 15.0662
   - MAE : 11.60422
   - MPE : -9.464194
   - MAPE : 32.02249
   - MASE : 0.8288726
   - ACF1 : 0.09803535

$ARIMAX(1, 1, 1)(0, 0, 1)_6$

1. informations critereas :
   - loglik : -208.0156
   - aic : 428.0312
   - bic : 439.853
   - aicc : 429.8573
   - sigma2 : 170.7536
2. coefficients :
   - ar1 : 0.4063895
   - ma1 : -0.9497164
   - sma1 : 0.4290093
   - DEP_EQUIP_CAP_2 : 0.05521706
   - My$_{SD}ummy$: 16.50199

time	ETS	lo 80	up 80	lo 95	up 95	ARIMAX	lo 80	up 80	lo 95	up 95
2015.00	50.99	34.22	67.76	25.34	76.64	53.93	37.18	70.67	28.31	79.54
2015.17	60.98	39.80	82.16	28.59	93.38	52.49	34.07	70.90	24.33	80.65
2015.33	57.81	36.71	78.90	25.55	90.07	51.30	32.47	70.13	22.50	80.10
2015.50	41.48	25.64	57.31	17.26	65.69	38.37	19.37	57.36	9.32	67.41
2015.67	49.91	30.04	69.77	19.53	80.29	54.13	35.05	73.21	24.95	83.31
2015.83	54.26	31.81	76.71	19.92	88.60	59.28	40.13	78.43	30.00	88.56
2016.00	50.99	29.11	72.87	17.53	84.45	47.88	26.85	68.90	15.73	80.02
2016.17	60.98	33.91	88.06	19.58	102.39	49.93	28.38	71.48	16.98	82.89
2016.33	57.81	31.31	84.31	17.28	98.34	51.90	30.13	73.68	18.60	85.20
2016.50	41.48	21.88	61.07	11.50	71.45	49.80	27.89	71.71	16.29	83.31
2016.67	49.91	25.64	74.18	12.79	87.03	52.03	30.00	74.05	18.34	85.71
2016.83	54.26	27.14	81.38	12.78	95.74	54.19	32.07	76.32	20.35	88.03
2017.00	50.99	24.83	77.15	10.97	91.01	45.54	23.32	67.76	11.56	79.52
2017.17	60.98	28.90	93.07	11.91	110.05	48.92	26.60	71.23	14.79	83.04
2017.33	57.81	26.65	88.97	10.16	105.46	51.45	29.05	73.86	17.18	85.72
2017.50	41.48	18.60	64.35	6.49	76.46	49.75	27.25	72.25	15.34	84.16
2017.67	49.91	21.76	78.05	6.87	92.95	52.23	29.64	74.82	17.68	86.78
2017.83	54.26	23.00	85.52	6.45	102.07	54.59	31.91	77.27	19.90	89.27
2018.00	50.99	21.00	80.98	5.12	96.86	45.86	23.09	68.63	11.03	80.68

2.9 BHL_3

2.9.1 plots for BHL_3

ETS(M,N,N)

ETS(M,N,N)

NNAR(4,1)
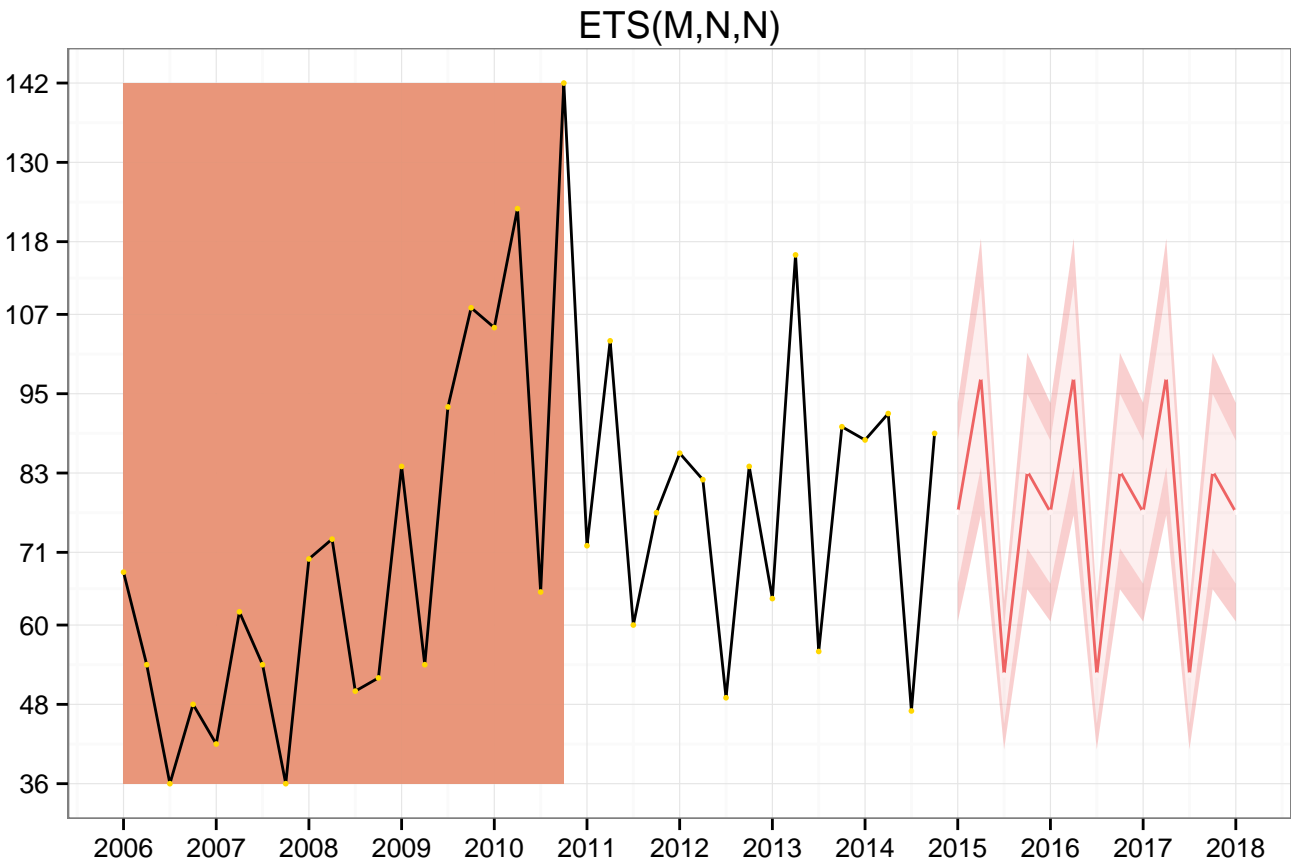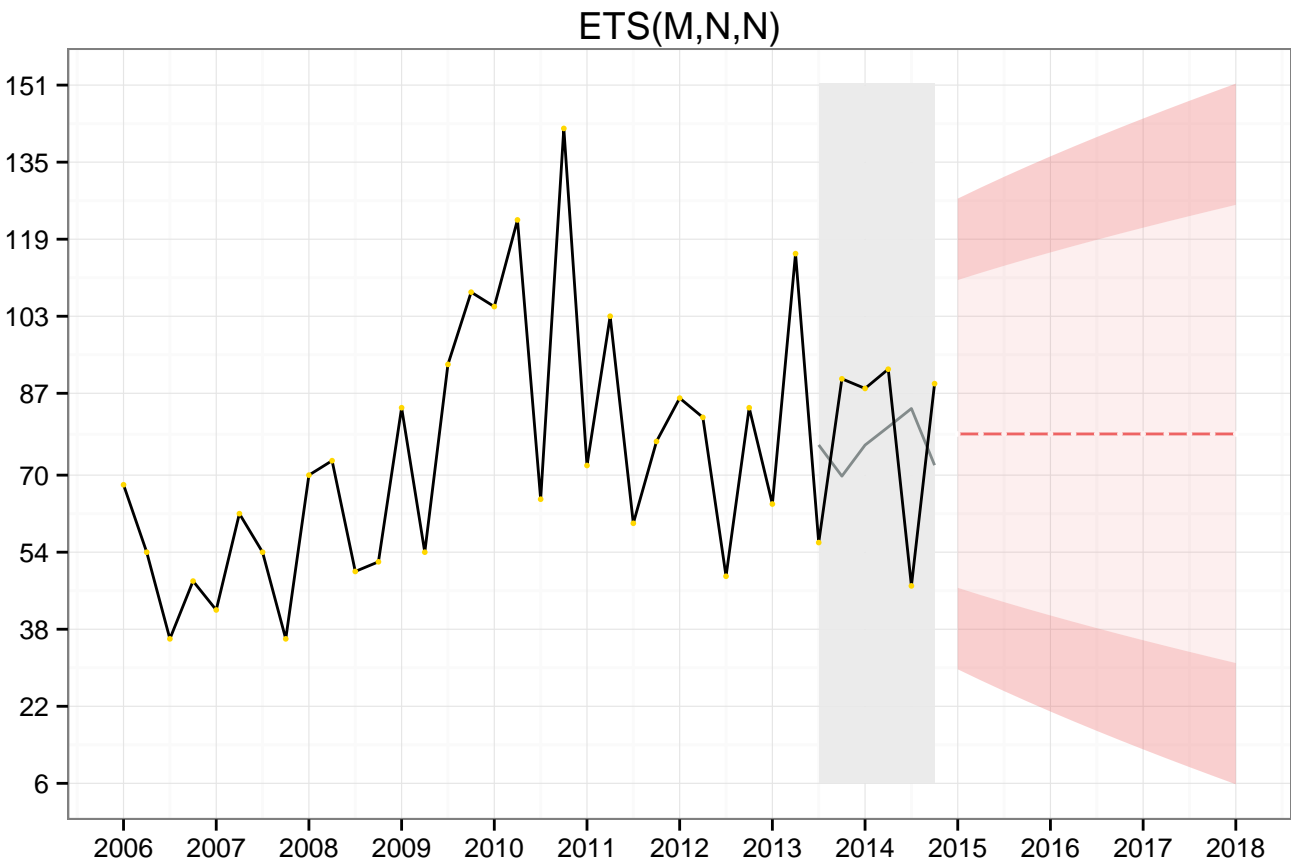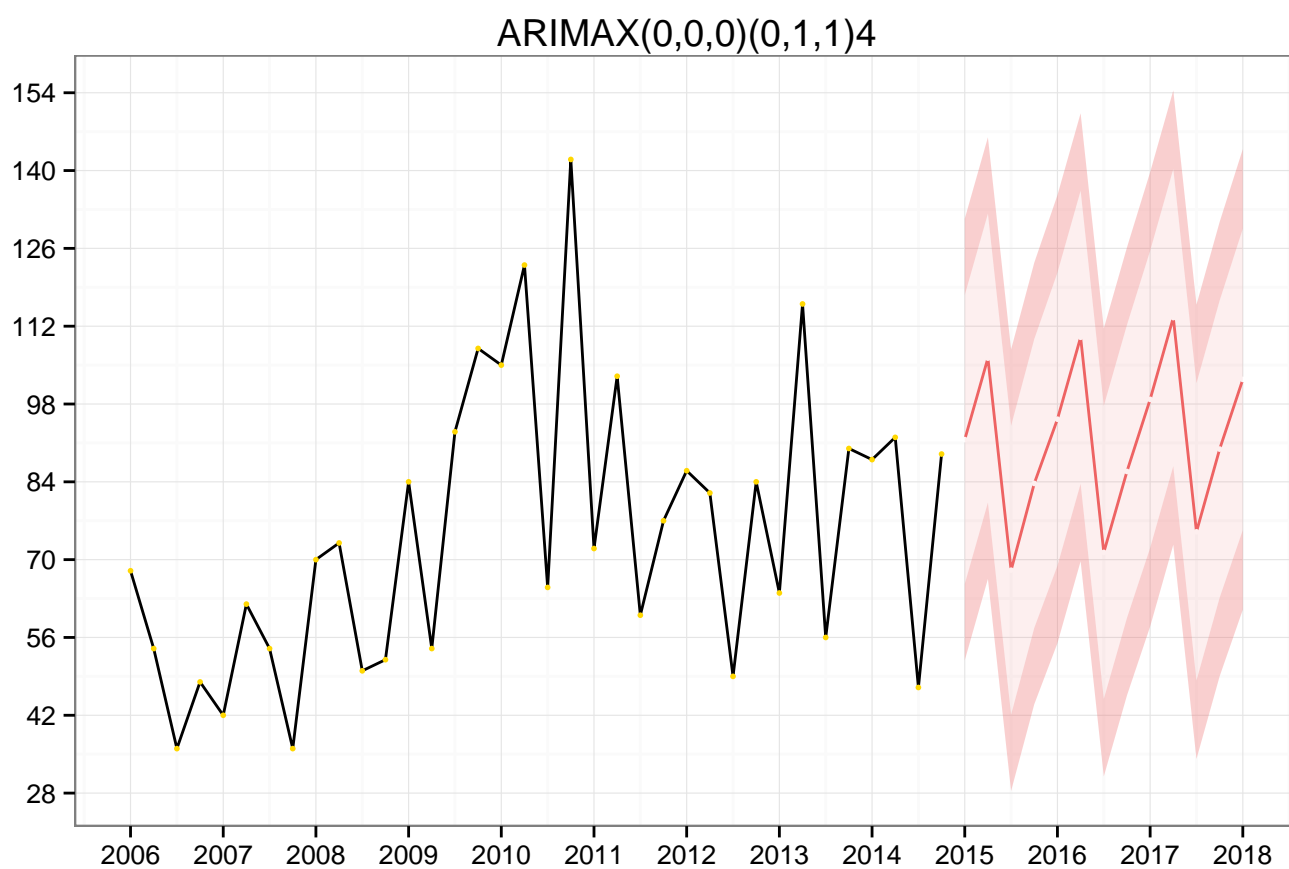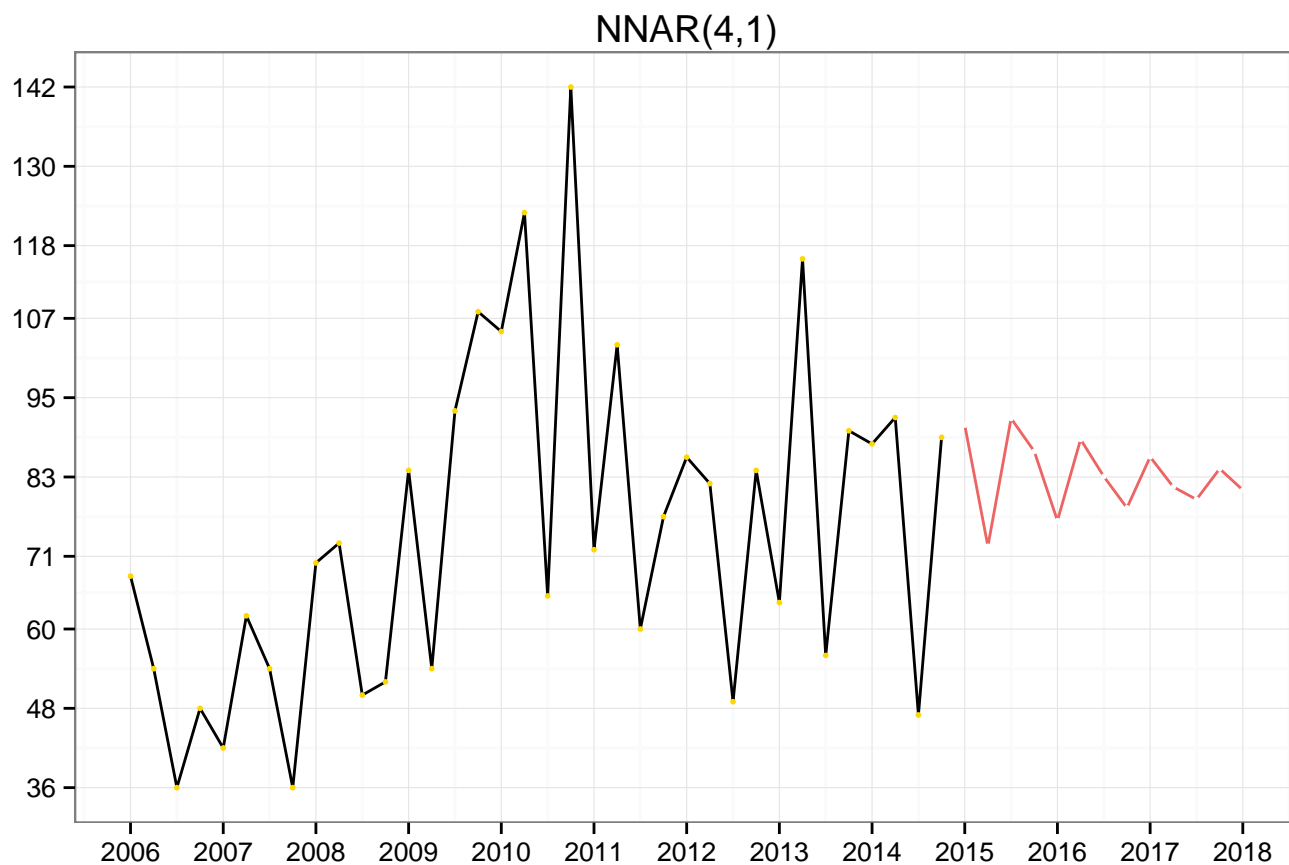
ARIMAX(0,0,0)(0,1,1)4

2.9.2 Outputs for BHL_3

$ETS(M, N, N)$

1. parameters :
   – alpha : 0.2960671

2. init state :
   – l : 52.57548

3. informations critereas :
   – loglik : -176.0909
   – aic : 356.1817
   – bic : 359.3488
   – aicc : 356.5454
   – mse : 557.9357
   – amse : 557.7875
   – sigma2 : 0.1007649
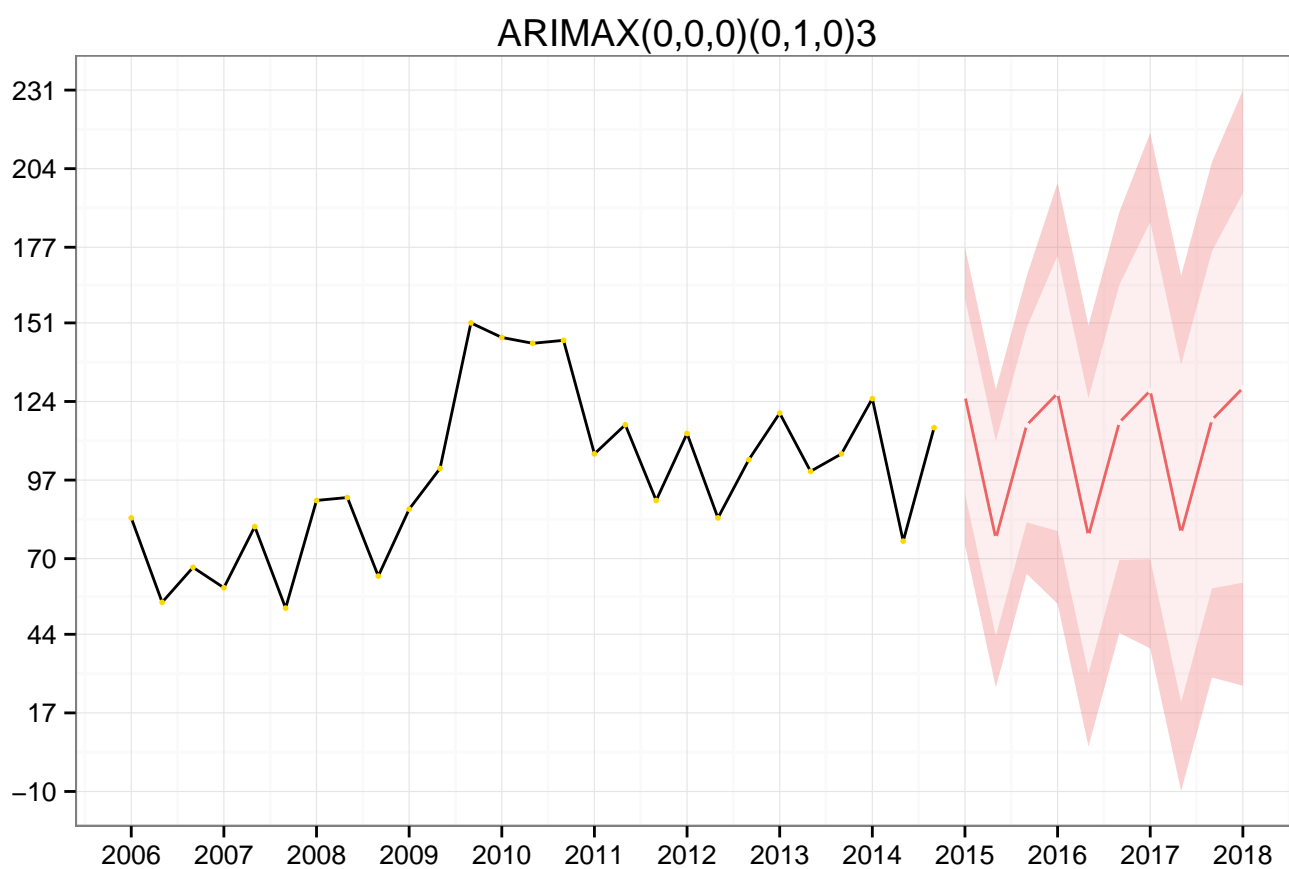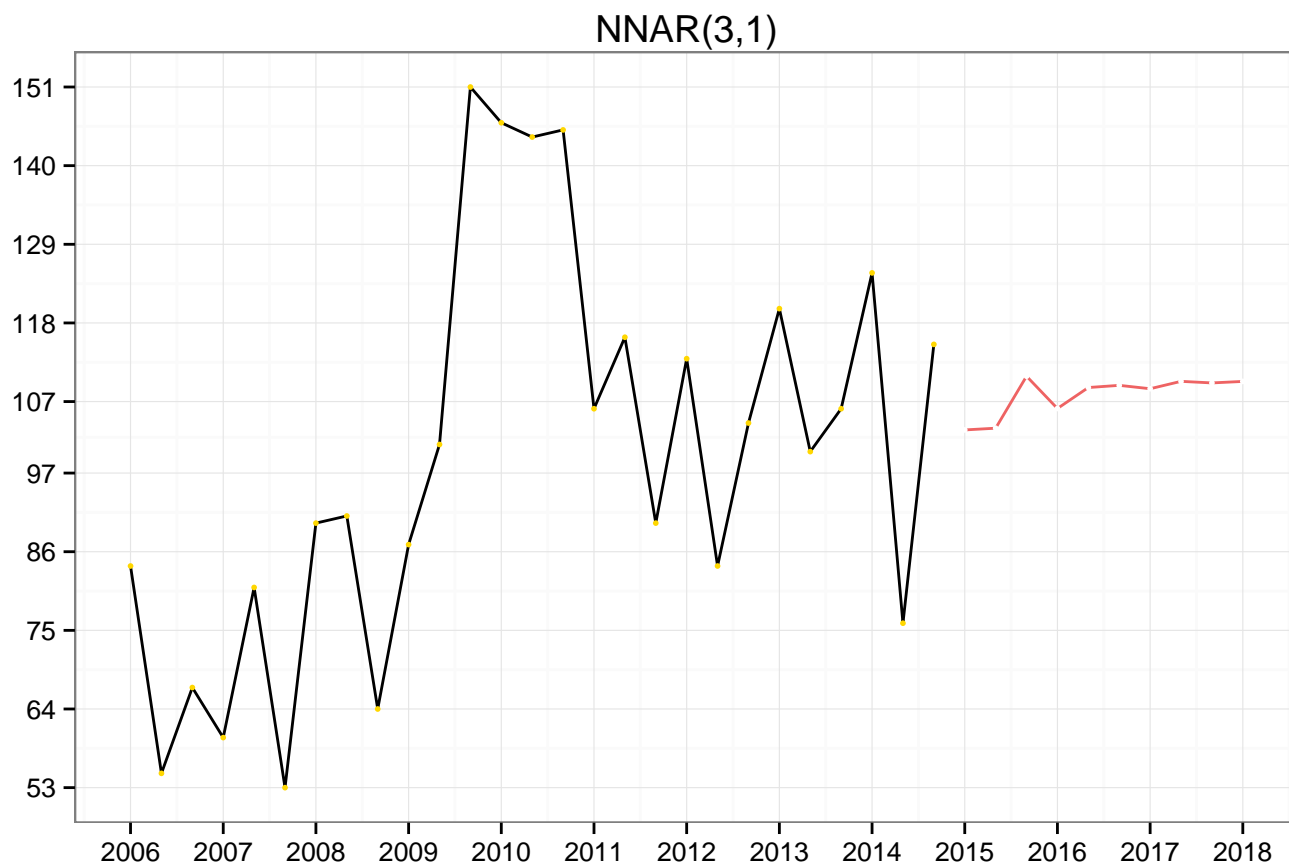
$ARIMAX(0, 0, 0)(0, 1, 1)_4$

1. informations critereas :
   – loglik : -123.9285
   – aic : 257.857
   – bic : 265.1857
   – aicc : 260.1647
   – sigma2 : 406.4042

2. coefficients :
   – sma1 : -0.82794
   – drift : 0.7769559
– xreg.My$_{ArimaX}$: 0.07982564 xreg.My$_{SDummy}$: 40.82451

time	ETS	lo 80	up 80	lo 95	up 95	ARIMAX	lo 80	up 80	lo 95	up 95
2015.00	78.55	46.60	110.51	29.68	127.42	91.61	65.63	117.58	51.88	131.33
2015.25	78.55	45.09	112.01	27.38	129.73	106.26	80.28	132.23	66.53	145.98
2015.50	78.55	43.64	113.47	25.15	131.95	68.09	42.12	94.07	28.37	107.82
2015.75	78.55	42.23	114.88	23.00	134.10	83.71	57.73	109.68	43.98	123.43
2016.00	78.55	40.86	116.24	20.91	136.19	95.27	68.91	121.62	54.96	135.57
2016.25	78.55	39.53	117.57	18.88	138.23	110.01	83.66	136.36	69.71	150.31
2016.50	78.55	38.23	118.87	16.89	140.21	71.30	44.94	97.65	30.99	111.60
2016.75	78.55	36.97	120.14	14.95	142.15	85.87	59.51	112.22	45.56	126.17
2017.00	78.55	35.72	121.38	13.05	144.05	98.83	72.11	125.56	57.96	139.70
2017.25	78.55	34.51	122.60	11.19	145.91	113.55	86.82	140.27	72.67	154.42
2017.50	78.55	33.31	123.79	9.36	147.74	75.00	48.28	101.73	34.13	115.87
2017.75	78.55	32.14	124.97	7.57	149.54	89.89	63.16	116.61	49.02	130.76
2018.00	78.55	30.98	126.12	5.80	151.30	102.43	75.33	129.52	60.99	143.86

2.10 BHL_4

2.10.1 plots for BHL_4

ETS(A,N,N)

ETS(A,N,N)

NNAR(3,1)
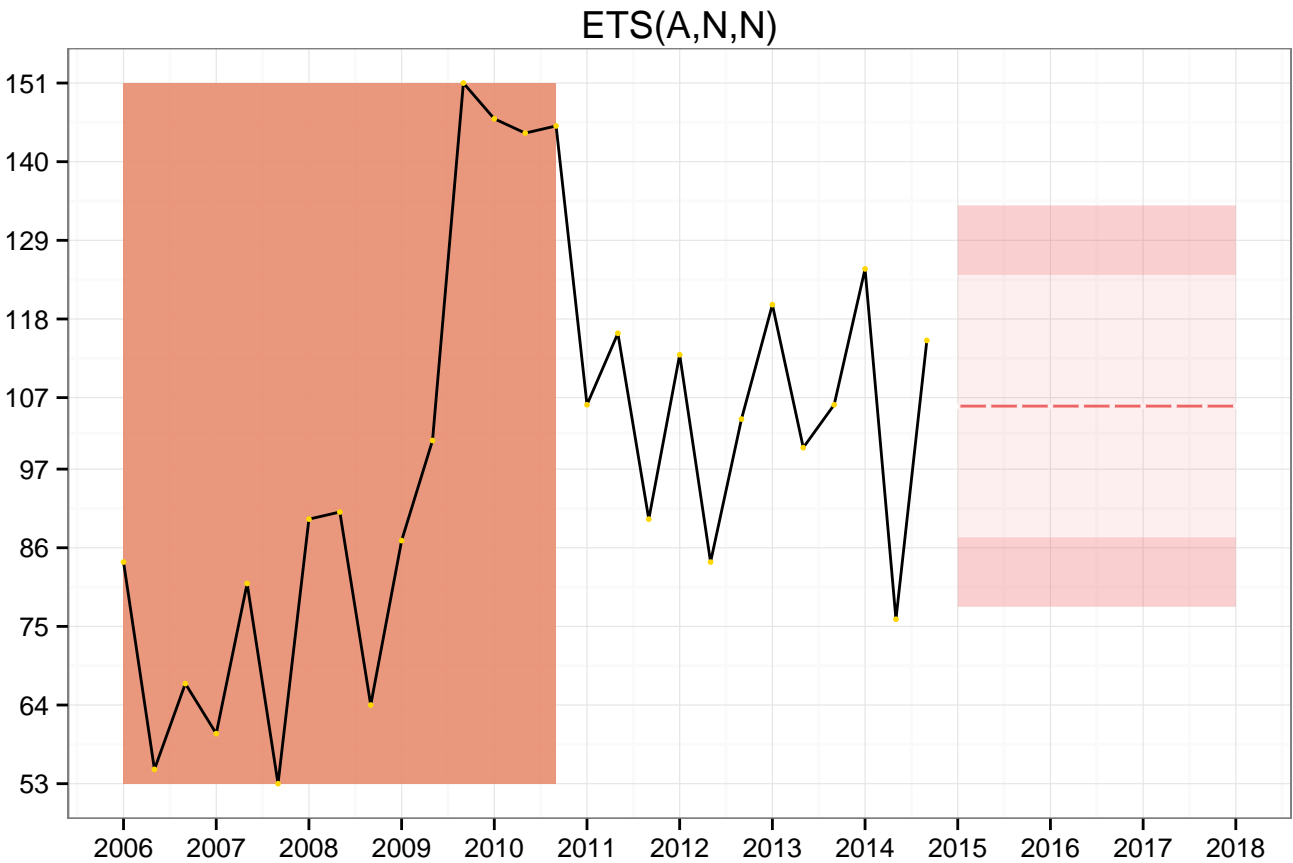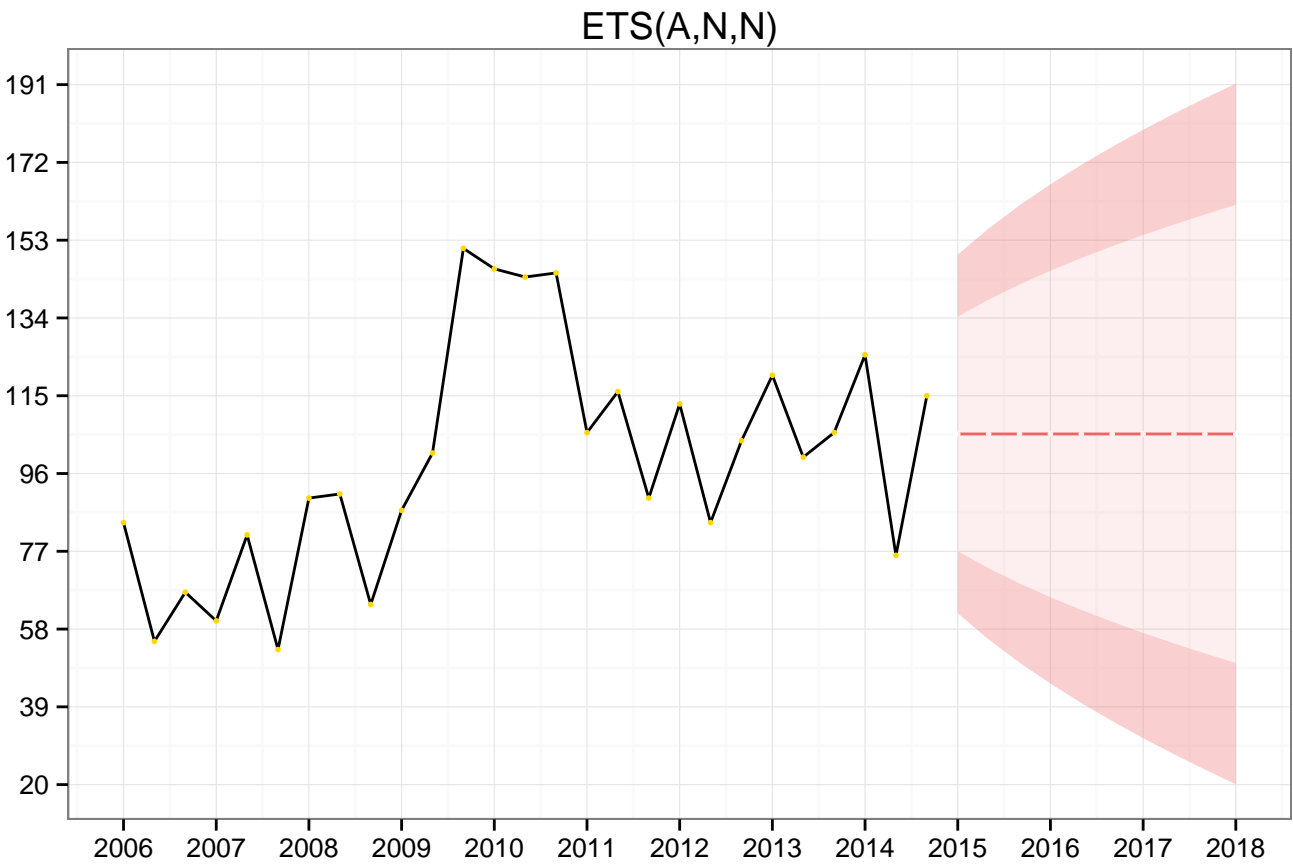
ARIMAX(0,0,0)(0,1,0)3

2.10.2   Outputs for BHL_4

$ETS(A, N, N)$

1. parameters :
   – alpha : 0.5594682
2. init state :
   – l : 73.53248
3. informations critereas :
   – loglik : -128.3764
   – aic : 260.7527
   – bic : 263.3444
   – aicc : 261.2527
   – mse : 499.4584
   – amse : 649.2325
   – sigma2 : 499.4584

$ARIMAX(0, 0, 0)(0, 1, 0)_3$

1. informations critereas :

   – loglik : -96.88794
   – aic : 199.7759
   – bic : 203.31
   – aicc : 200.9759
   – sigma2 : 680.67

2. coefficients :

   – DEP_EQUIP_CAP_4 : 0.1412693
   – My$_{SD}ummy$: 60.9239

time	ETS	lo 80	up 80	lo 95	up 95	ARIMAX	lo 80	up 80	lo 95	up 95
2015.00	105.66	77.02	134.30	61.86	149.47	125.90	92.47	159.34	74.77	177.04
2015.33	105.66	72.84	138.48	55.47	155.86	76.90	43.47	110.34	25.77	128.04
2015.67	105.66	69.14	142.18	49.81	161.52	115.90	82.47	149.34	64.77	167.04
2016.00	105.66	65.78	145.55	44.67	166.66	126.81	79.52	174.09	54.49	199.12
2016.33	105.66	62.68	148.64	39.93	171.40	77.81	30.52	125.09	5.49	150.12
2016.67	105.66	59.79	151.53	35.51	175.82	116.81	69.52	164.09	44.49	189.12
2017.00	105.66	57.07	154.25	31.35	179.97	127.71	69.80	185.62	39.14	216.28
2017.33	105.66	54.50	156.83	27.42	183.91	78.71	20.80	136.62	-9.86	167.28
2017.67	105.66	52.05	159.28	23.67	187.66	117.71	59.80	175.62	29.14	206.28
2018.00	105.66	49.71	161.62	20.09	191.24	128.62	61.75	195.49	26.35	230.89

2.11 BHL_6

2.11.1 plots for BHL_6

ETS(A,N,A)

ETS(A,N,A)

NNAR(2,1)

ARIMAX(0,1,0)(0,0,0)2
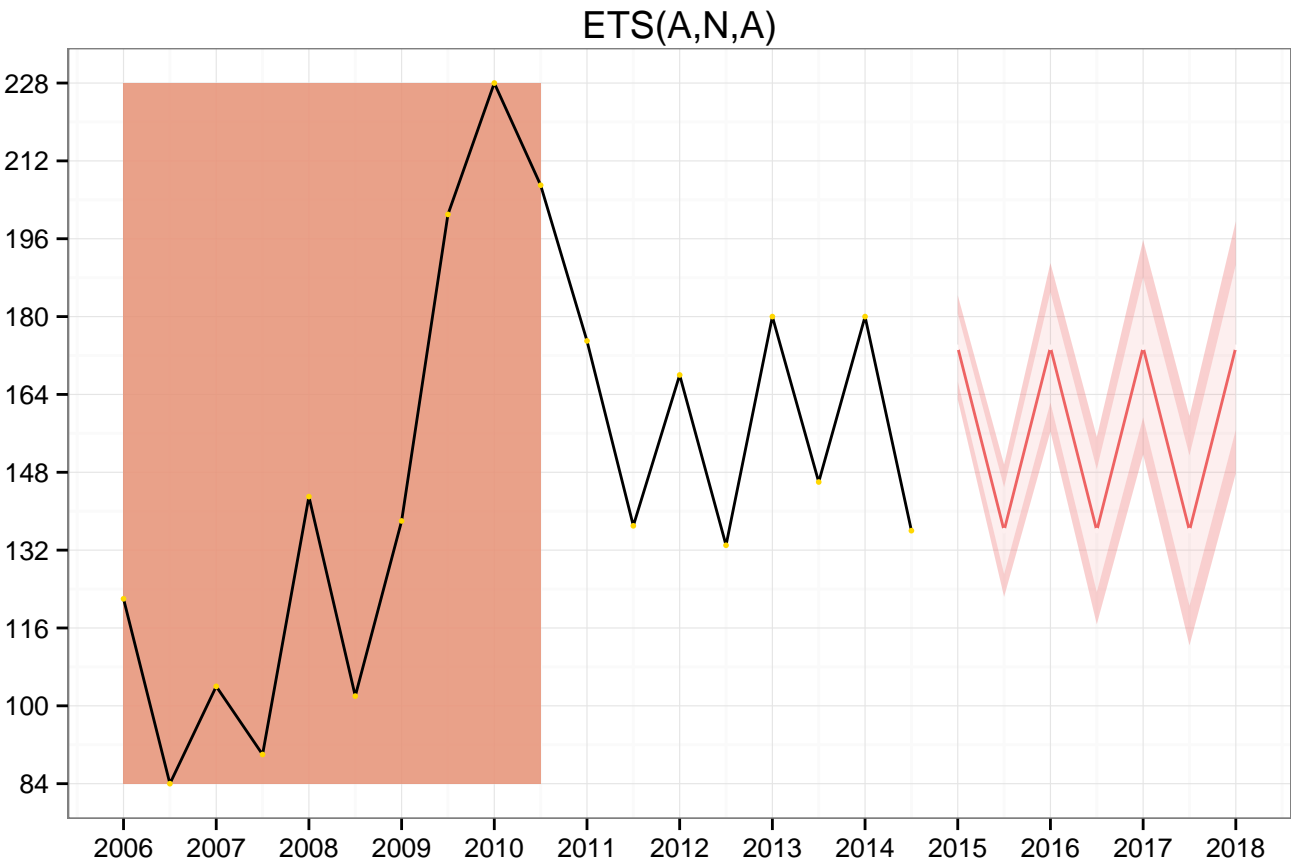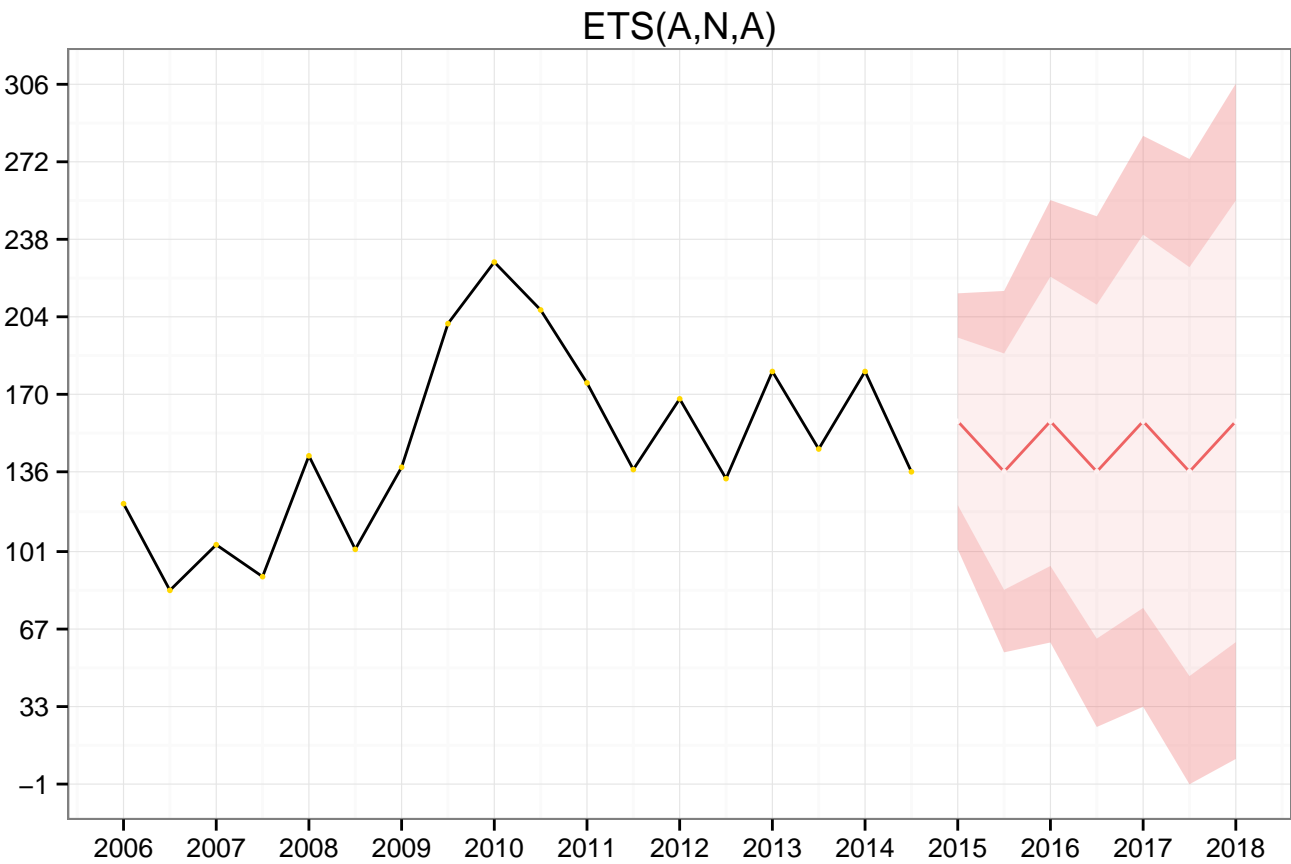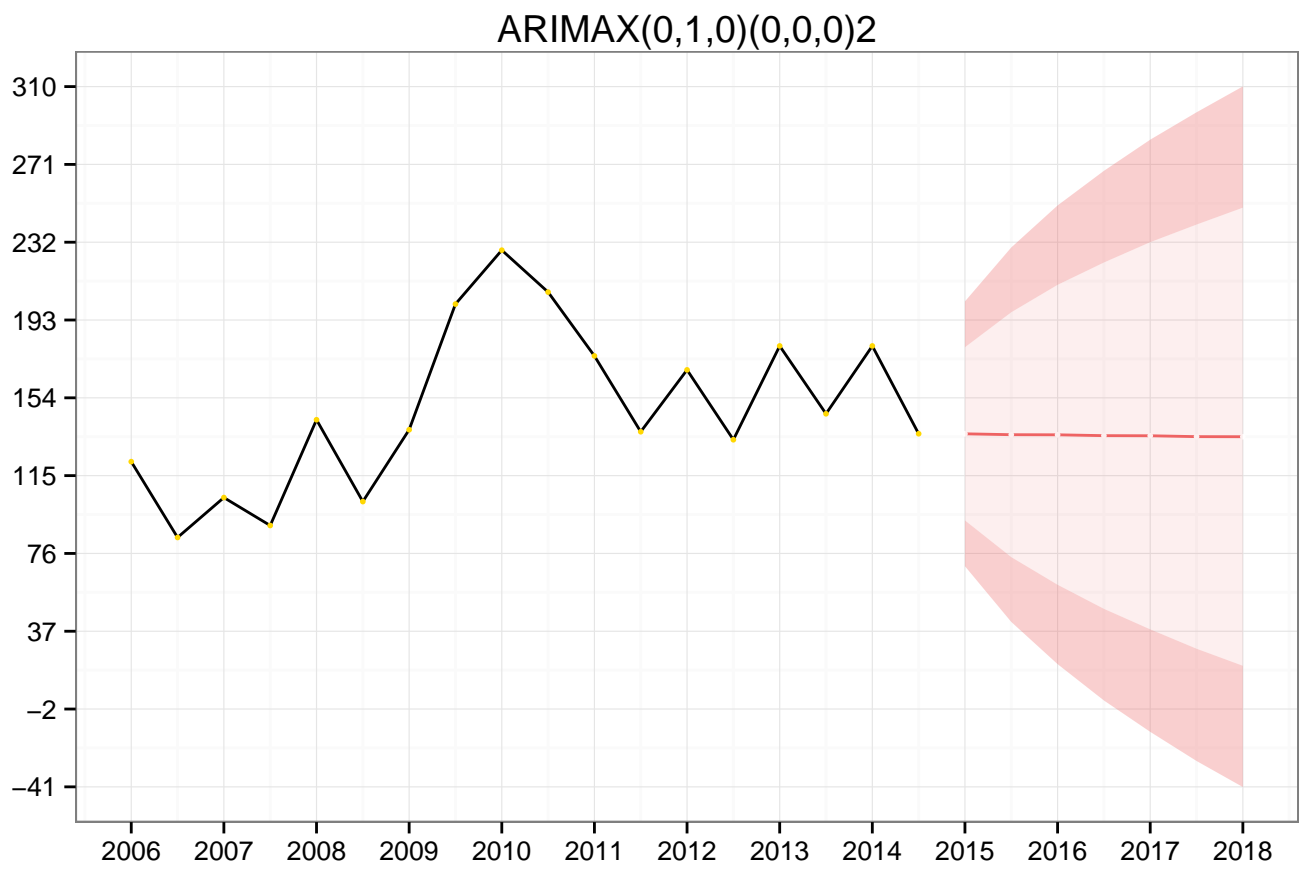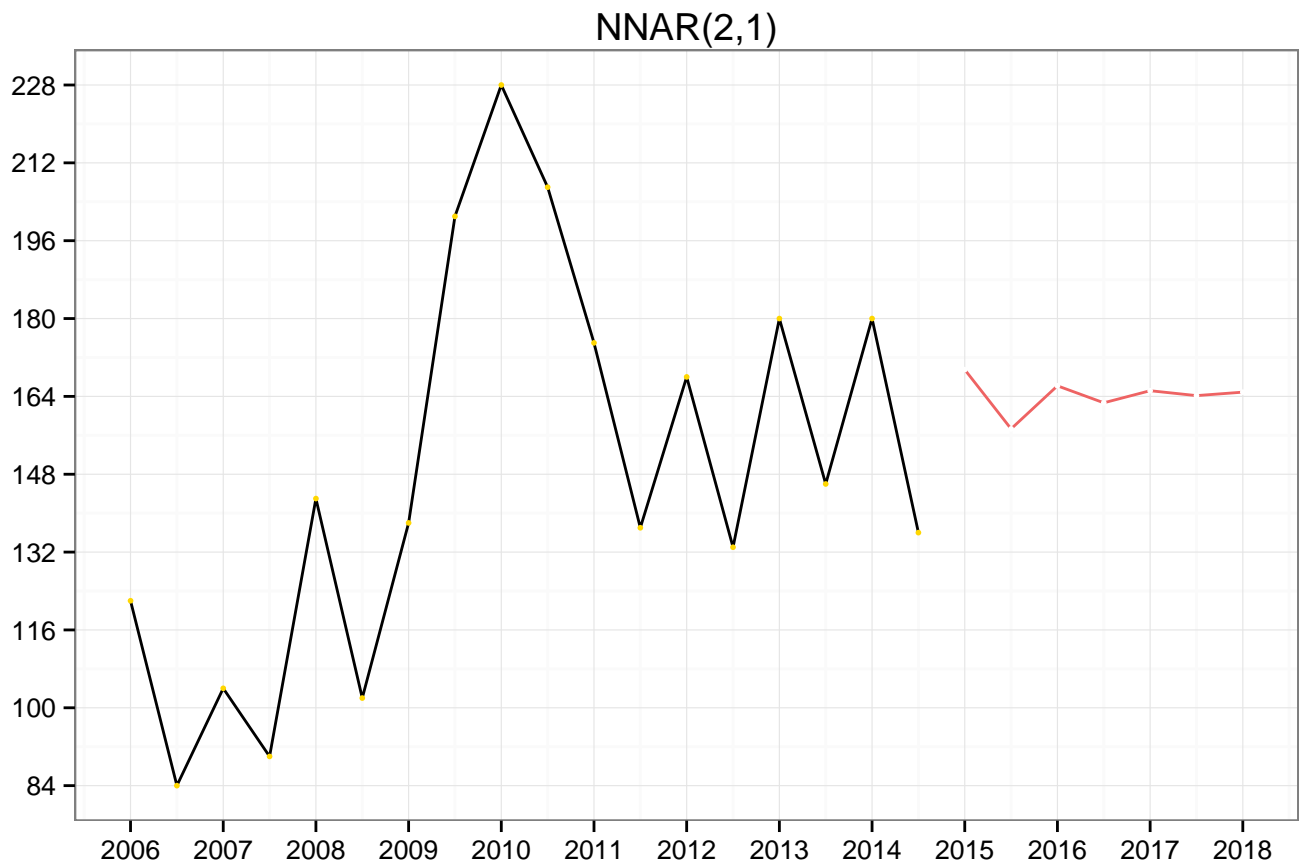
2.11.2 Outputs for BHL_6

$ETS(A, N, A)$

1. parameters :
   − alpha : 0.9966577
   − gamma : 0.0001002108
2. init state :
   − l : 140.272
   − s1 : -11.04126
   − s2 : 11.04126
3. informations critereas :
   − loglik : -86.40458
   − aic : 180.8092
   − bic : 184.3706
   − aicc : 183.8861
   − mse : 820.6831
   − amse : 1629.398
   − sigma2 : 820.6831

$ARIMAX(0, 1, 0)(0, 0, 0)_2$

1. informations critereas :
   − loglik : -78.57505
   − aic : 163.1501
   − bic : 165.6497
   − aicc : 164.9962
   − sigma2 : 1146.682
2. coefficients :
   − DEP_EQUIP_CAP_6 : -0.0505214
   − $My_{SD}ummy$: 3.956267

time	ETS	lo 80	up 80	lo 95	up 95	ARIMAX	lo 80	up 80	lo 95	up 95
2015.00	158.15	121.44	194.87	102.01	214.30	135.95	92.56	179.35	69.58	202.32
2015.50	136.07	84.24	187.90	56.80	215.34	135.51	74.14	196.89	41.65	229.38
2016.00	158.15	94.70	221.60	61.12	255.19	135.47	60.30	210.63	20.51	250.42
2016.50	136.07	62.83	209.32	24.05	248.09	135.03	48.24	221.82	2.29	267.77
2017.00	158.15	76.28	240.03	32.93	283.38	134.98	37.94	232.02	-13.43	283.39
2017.50	136.07	46.39	225.75	-1.09	273.23	134.54	28.24	240.84	-28.03	297.12
2018.00	158.15	61.29	255.02	10.02	306.29	134.50	19.68	249.31	-41.10	310.09

2.12   BHL_12

2.12.1   plots for BHL_12

ETS(M,N,N)

ETS(M,N,N)

NNAR(2)
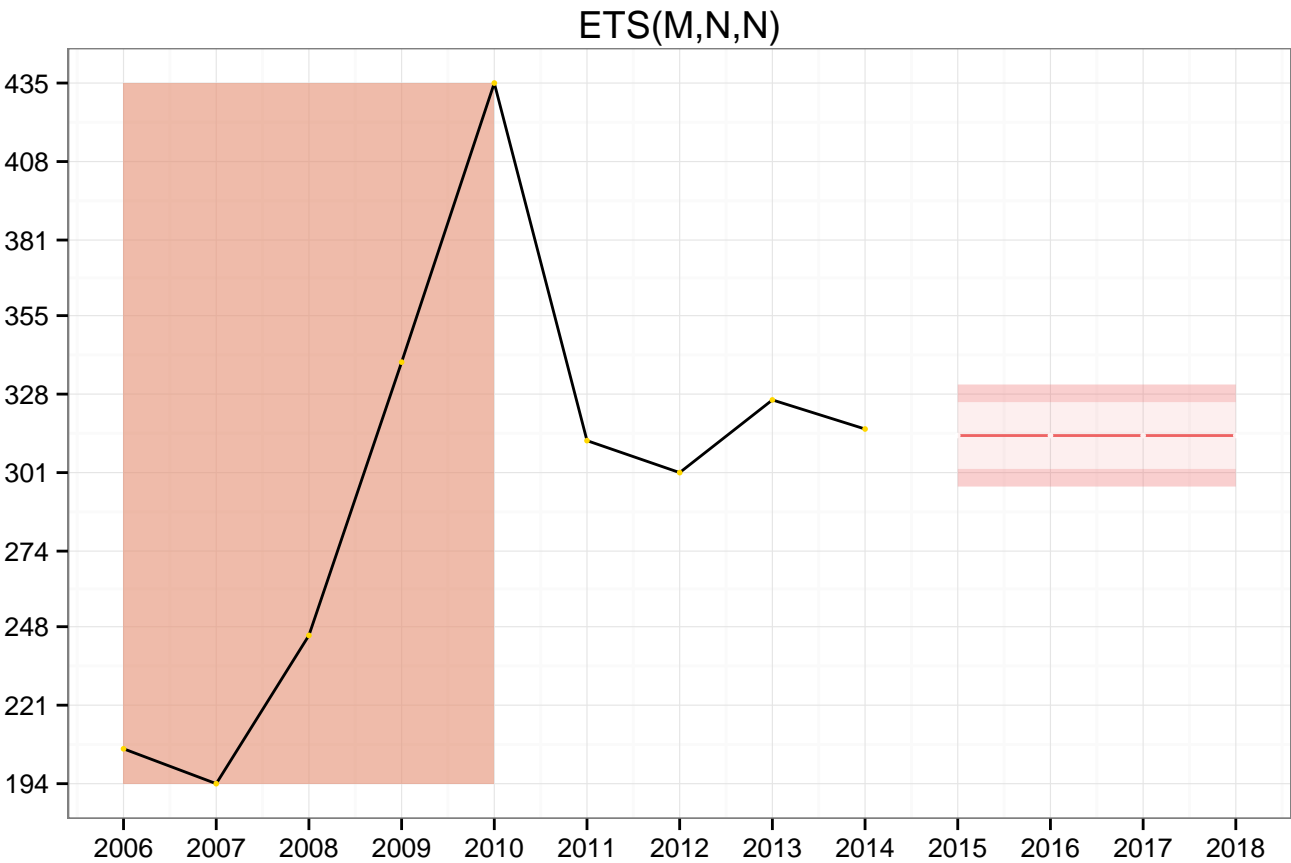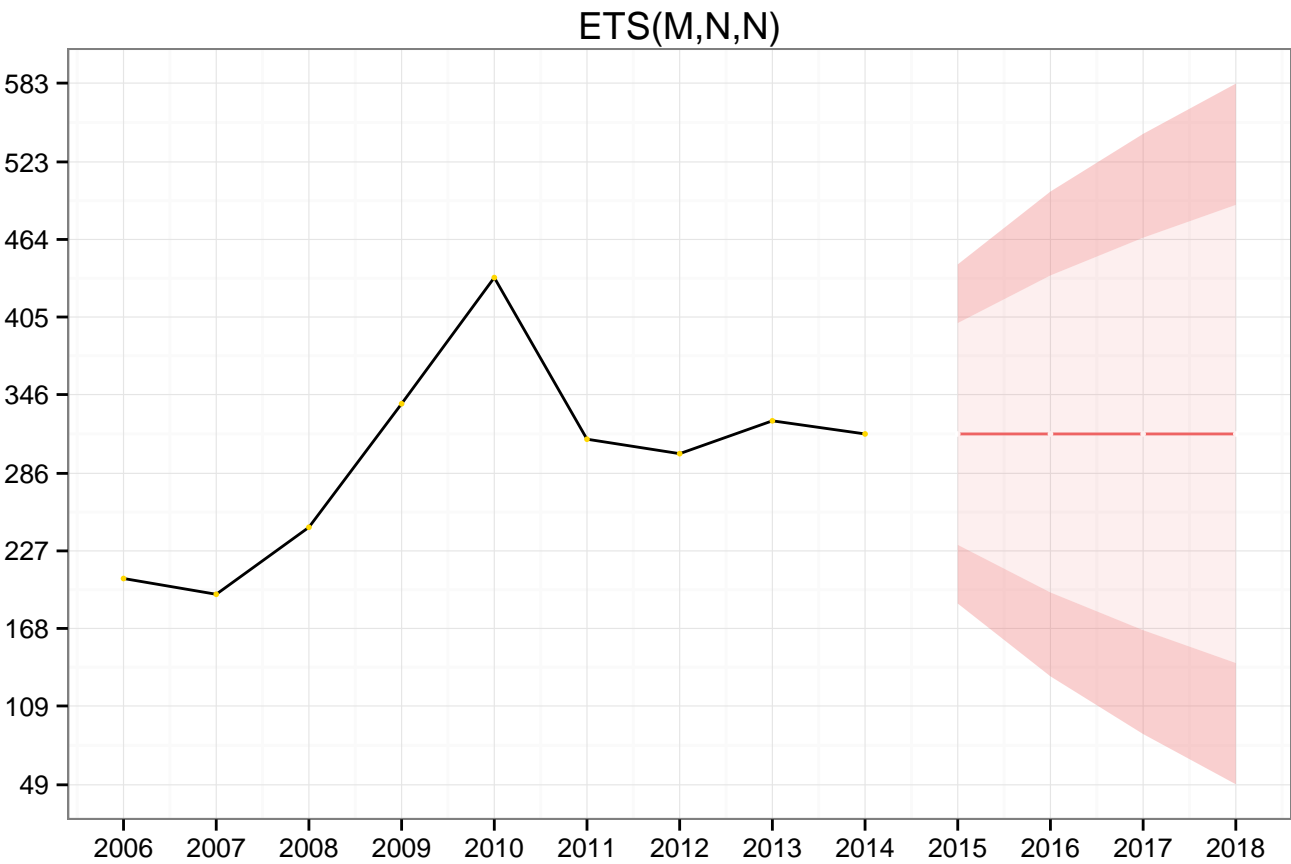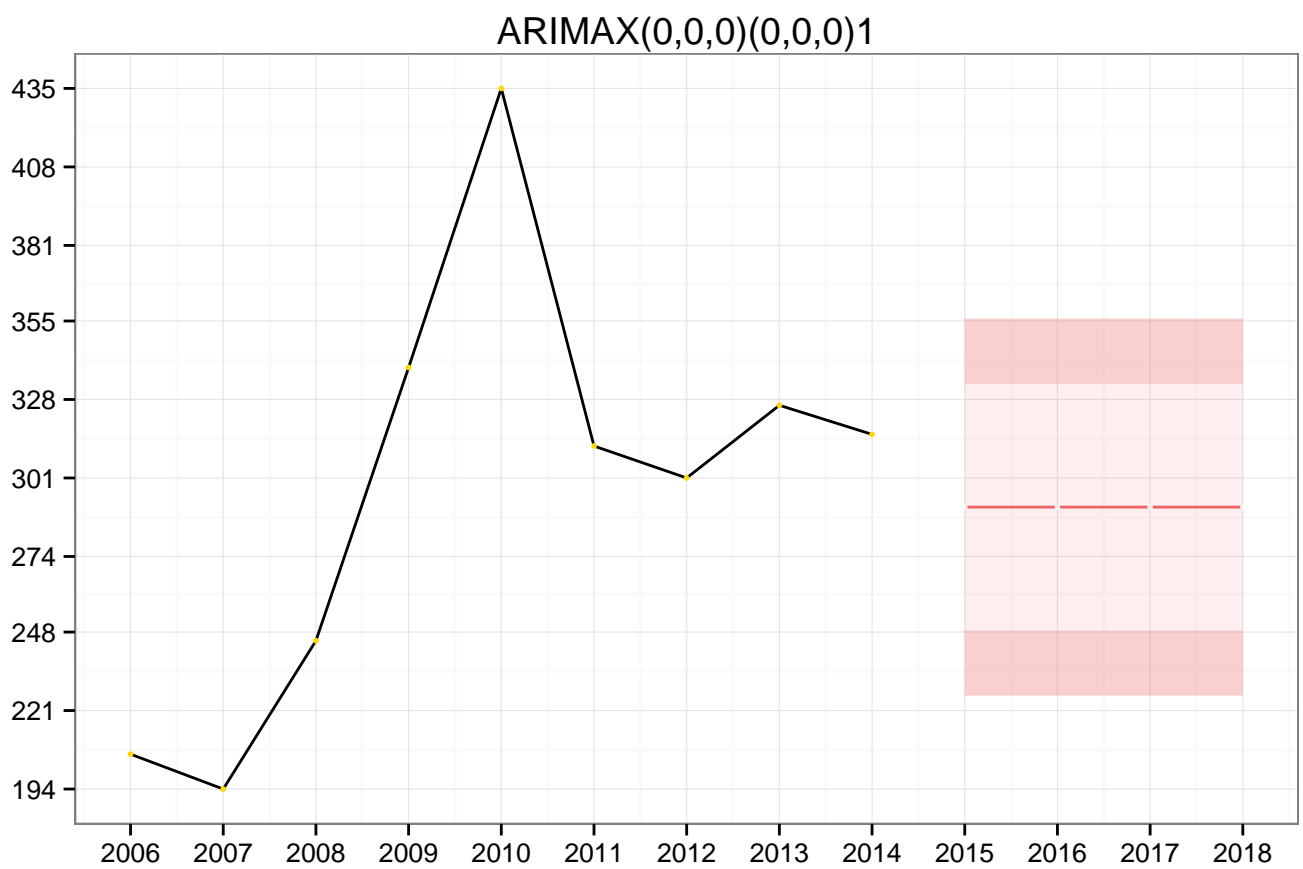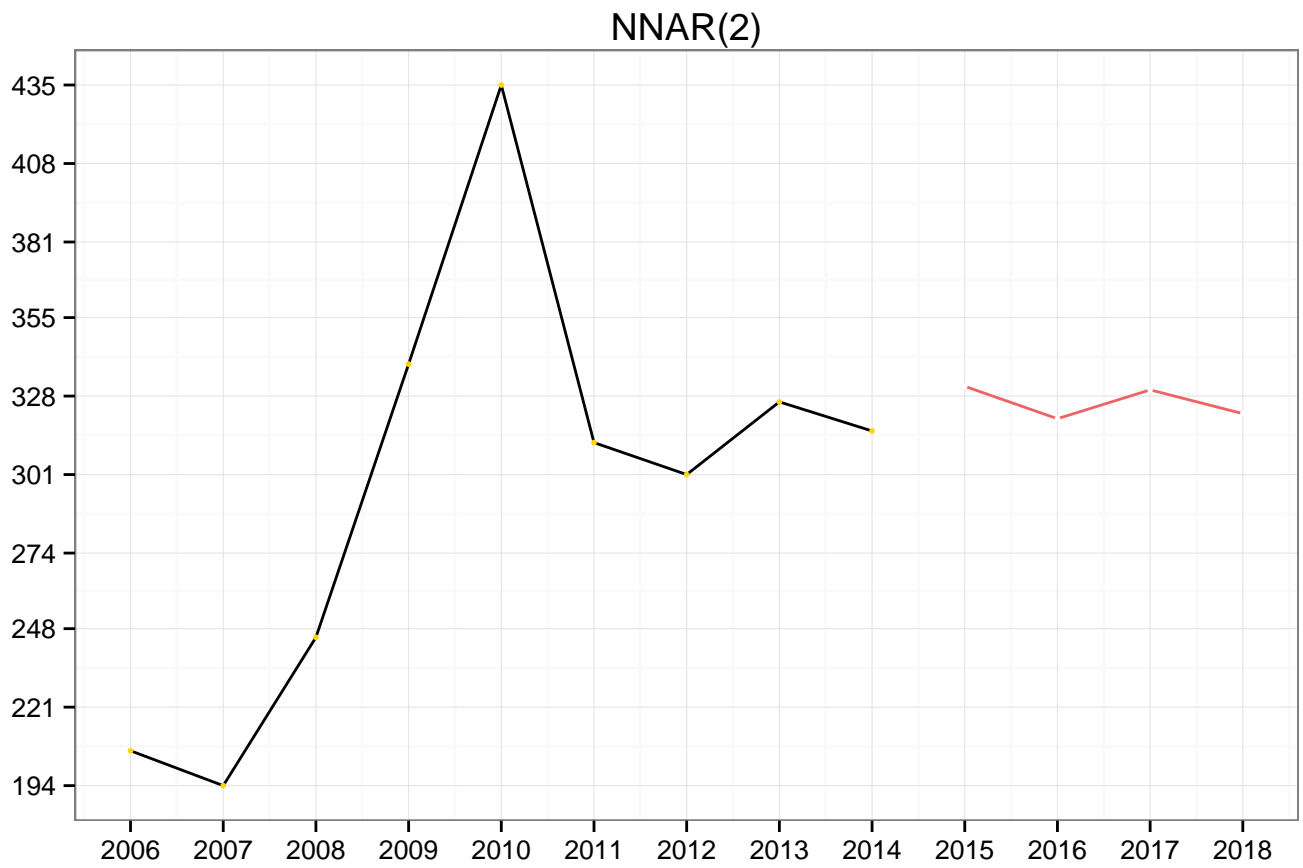
ARIMAX(0,0,0)(0,0,0)1

2.12.2 Outputs for BHL_12

$ETS(M, N, N)$

1. parameters :
   − alpha : 0.9998999
2. init state :
   − l : 197.6983
3. informations critereas :
   − loglik : -46.29324
   − aic : 96.58649
   − bic : 96.98094
   − aicc : 98.58649
   − mse : 4093.483
   − amse : 7794.077
   − sigma2 : 0.04341452

$ARIMAX(0, 0, 0)(0, 0, 0)_1$

1. informations critereas :
   − loglik : -44.26063
   − aic : 96.52126
   − bic : 97.31016
   − aicc : 106.5213
   − sigma2 : 1094.244

2. coefficients :
   − intercept : 163.5661
   − DEP_EQUIP_CAP_12 : 0.2411509
   − My$_{SD}ummy$: 55.19263

time	ETS	lo 80	up 80	lo 95	up 95	ARIMAX	lo 80	up 80	lo 95	up 95
2015.00	316.00	231.62	400.38	186.95	445.05	290.98	248.59	333.37	226.14	355.81
2016.00	316.00	195.39	436.62	131.54	500.46	290.98	248.59	333.37	226.14	355.81
2017.00	316.00	166.68	465.33	87.63	544.37	290.98	248.59	333.37	226.14	355.81
2018.00	316.00	141.69	490.31	49.42	582.59	290.98	248.59	333.37	226.14	355.81

3 Results for automatic ets and ARIMA on Xregs