

SUPPLEMENTARY MATERIAL

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<https://doi.org/10.15177/seefor.17-05>

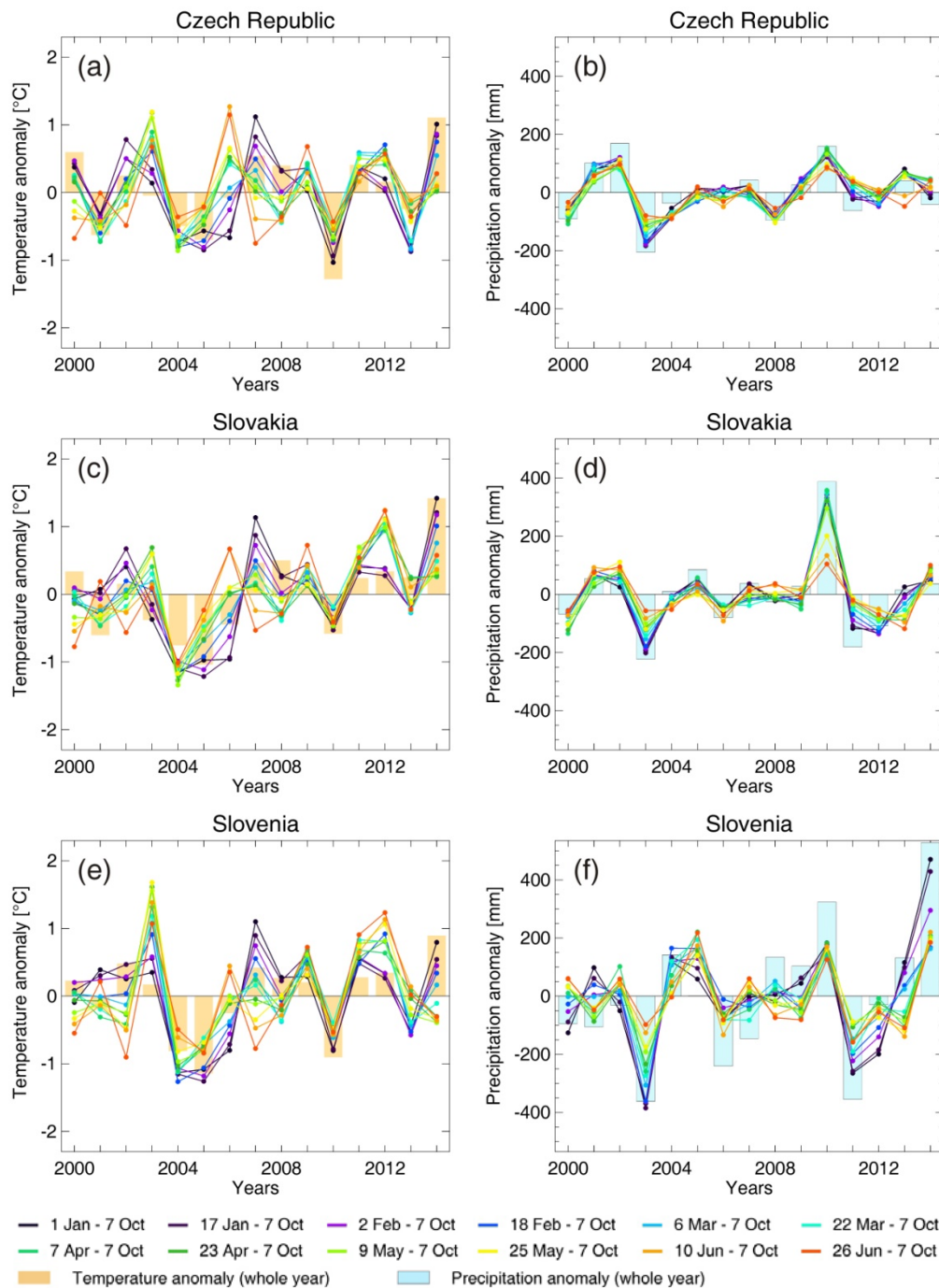


FIGURE S1. Temperature (left side images) and precipitation (right side images) anomalies for different long periods during 2000-2014 for Czech Republic, Slovakia and Slovenia.

Curves are indicating periods ending with 7 of October, while columns are indicating whole year anomalies.

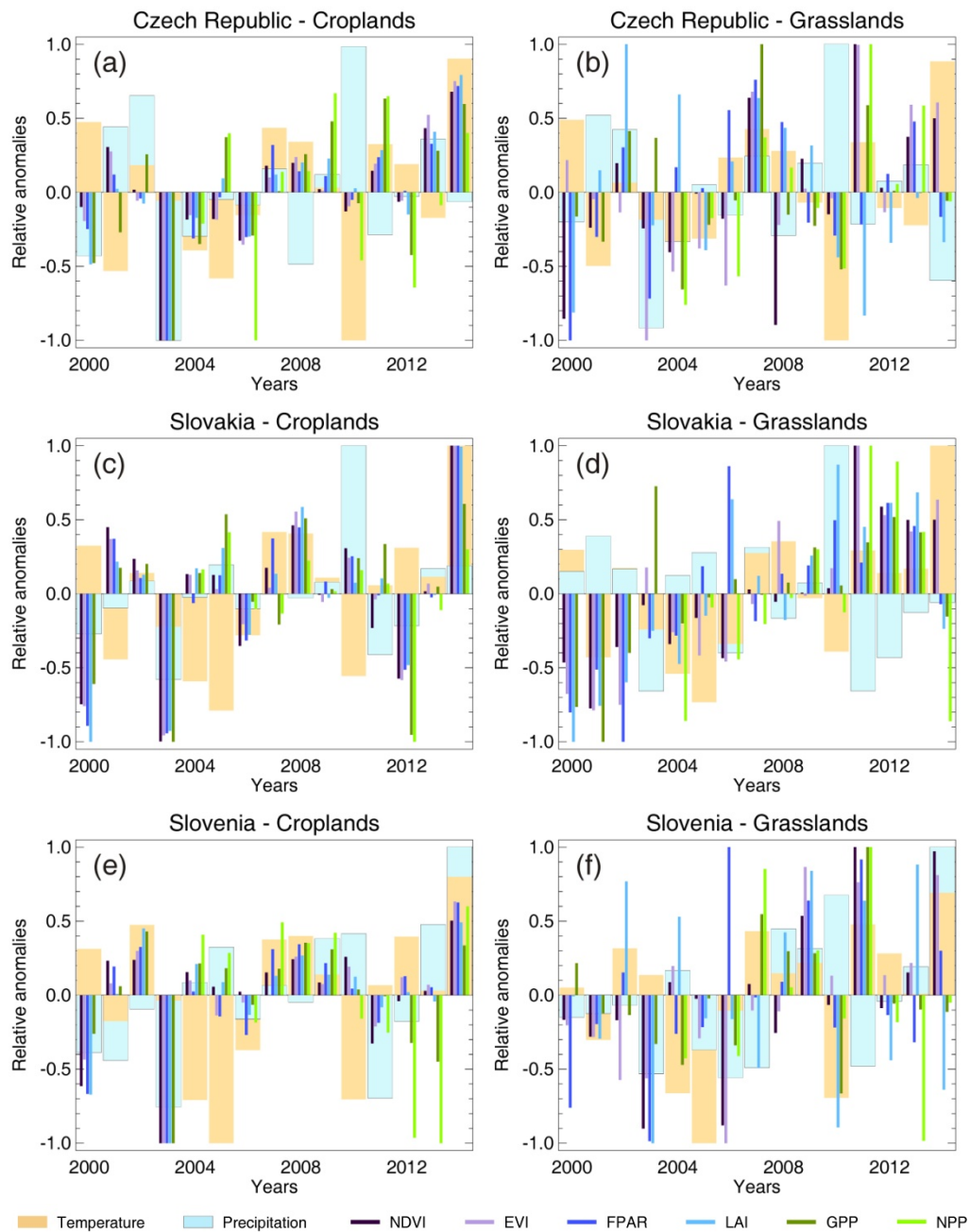
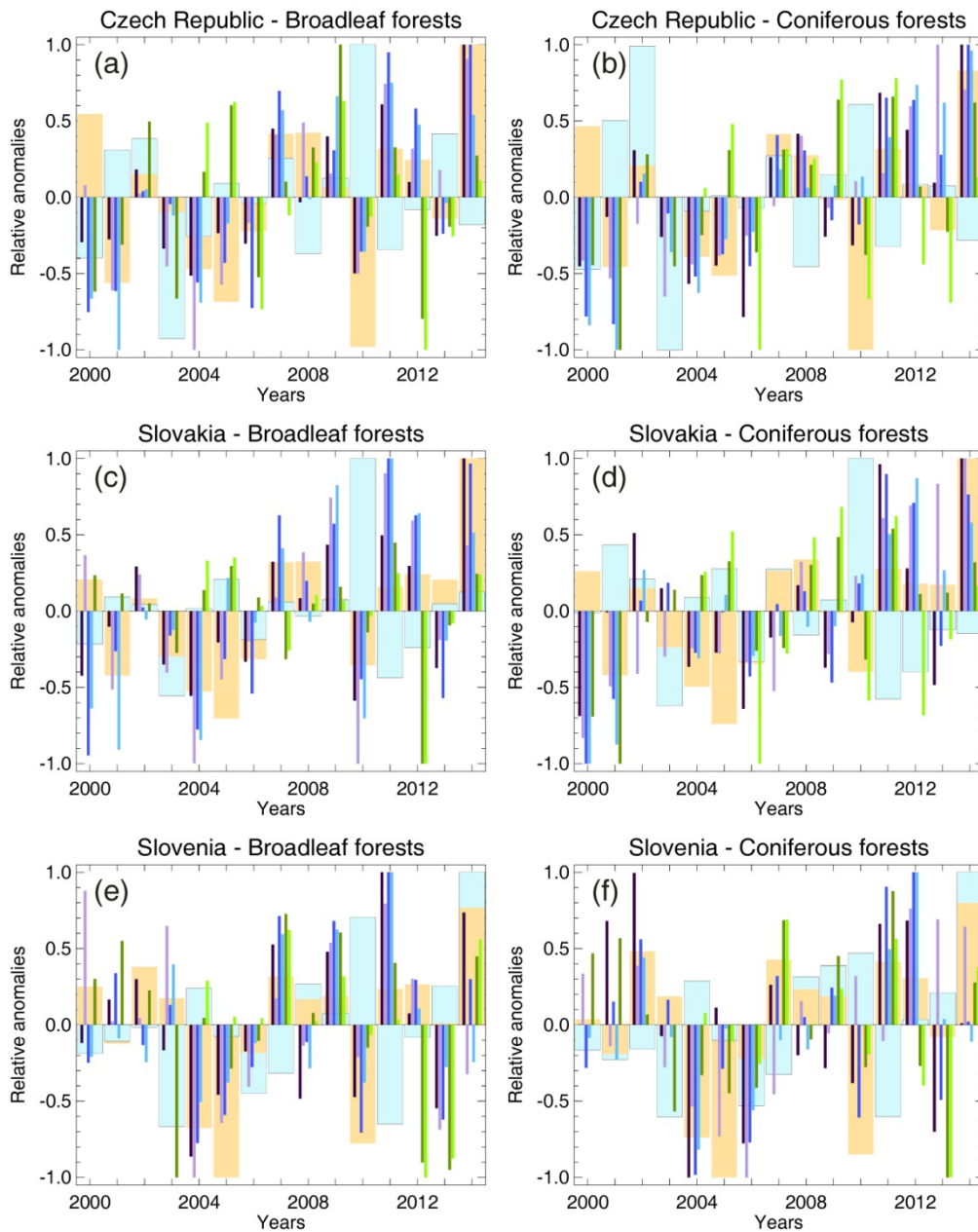


FIGURE S2. Yearly relative anomalies of the vegetation related characteristics (such as NDVI, EVI, FPAR, LAI, GPP and NPP) and of the meteorological variables (temperature and precipitation) during 2000-2014 for croplands and grasslands of Czech Republic, Slovakia and Slovenia.



Temperature
Precipitation

FIGURE S3. Yearly relative anomalies of the vegetation related characteristics (such as NDVI, EVI, FPAR, LAI, GPP and NPP) and of the meteorological variables (temperature and precipitation) during 2000-2014 for broadleaf and coniferous forests of Czech Republic, Slovakia and Slovenia.

Supplementary Results Based on the Analysis of NDVI

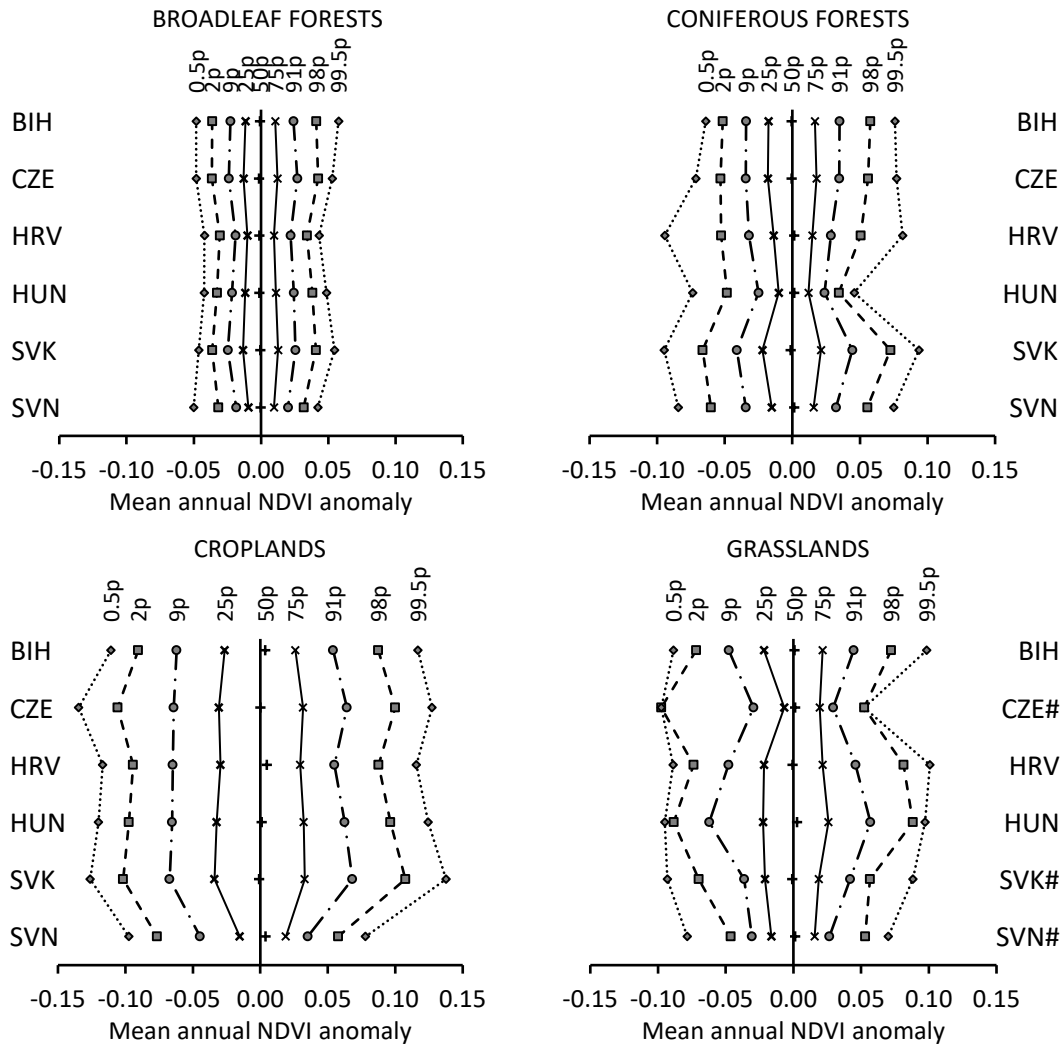


FIGURE S4. Categorization of mean annual NDVI anomalies according to the land cover for countries in the study area. Numbers at the top are percentiles (p; left of 0.5p - most extreme negative anomaly; 0.5p - 2p - extremely negative anomaly; 2p - 9p - very negative anomaly; 9p - 25p - negative anomaly; 25p - 75p - normal range; 50p - median; 75p - 91p positive anomaly; 91p - 98p very positive anomaly; 98p-99.5p extremely positive anomaly normal; right of 99.5p most extreme positive anomaly normal; BIH - Bosnia and Herzegovina, CZE - Czech Republic; HRV- Croatia; HUN - Hungary; SVK - Slovakia; SVN - Slovenia; # not reliable due to $N_{\text{pixels}} < 14$).

TABLE S1. Overview of the best and worst years and the extent (percent of the pixels) of the NDVI anomaly with respect to different land cover categories and countries.

LC	Country	Worst year	2 nd worst year	Best year	2 nd best year
		Share of pixels with very negative anomaly or worse		Share of pixels with very positive anomaly or better	
Broadleaf forests	BIH	2005 (26.7%)	2004 (25.7%)	2014 (61.5%) ⁺	2007 (28.0%)
	CZE	2010 (25.4%)	2004 (24.1%)	2014 (68.1%) ⁺	2011 (26.8%)
	HRV	2004 (31.5%)	2005 (19.0%)	2014 (50.3%) ⁺	2011 (44.4%)
	HUN	2003 (28.0%)	2004 (22.7%)	2014 (69.2%) ⁺	2009 (24.6%)
	SVK	2010 (28.6%)	2000 (23.8%)	2014 (65.5%) ⁺	2011 (15.4%)
	SVN	2004 (35.3%)	2013 (19.8%)	2014 (47.1%)	2011 (39.2%)
Coniferous forests	BIH	2000 (43.6%)	2005 (27.3%)	2014 (67.6%) ⁺	2011 (32.6%)
	CZE	2006 (38.0%)	2004 (22.7%)	2014 (48.8%)	2011 (26.0%)
	HRV	2003 (26.8%)	2000 (24.7%)	2014 (42.8%)	2002 (17.1%)
	HUN	2003 (51.7%) [§]	2000 (25.9%)	2011 (32.8%)	2006 (19.0%)
	SVK	2006 (28.6%)	2000 (22.5%)	2014 (45.4%)	2011 (34.4%)
	SVN	2004 (35.4%)	2013 (27.8%)	2002 (38.7%)	2001 (24.8%)
Croplands	BIH	2003 (46.7%)	2000 (35.7%)	2014 (52.8%) ⁺	2001 (36.2%)
	CZE	2003 (70.8%) [§]	2006 (12.9%)	2014 (40.9%)	2013 (23.3%)
	HRV	2003 (50.2%) [§]	2000 (37.1%)	2014 (31.7%)	2001 (23.6%)
	HUN	2003 (46.5%)	2000 (36.8%)	2014 (37.9%)	2004 (18.8%)
	SVK	2003 (47.5%)	2000 (31.8%)	2014 (46.2%)	2001 (17.0%)
	SVN	2003 (74.0%) [§]	2000 (34.8%)	2014 (38.4%)	2001 (15.4%)
Grasslands	BIH	2003 (56.0%) [§]	2000 (42.0%)	2014 (79.5%) ⁺	2010 (25.0%)
	CZE	#	#	#	#
	HRV	2003 (51.3%) [§]	2000 (41.5%)	2014 (79.7%) ⁺	2013 (19.8%)
	HUN	2000 (81.3%) [§]	2003 (56.3%)	2014 (68.8%) ⁺	2010 (43.8%)
	SVK	#	#	#	#
	SVN	#	#	#	#

BIH – Bosnia and Herzegovina, CZE – Czech Republic; HRV- Croatia; HUN – Hungary; SVK – Slovakia; SVN – Slovenia; # - insufficient number of pixels; § - extremely bad year; + - extremely good year

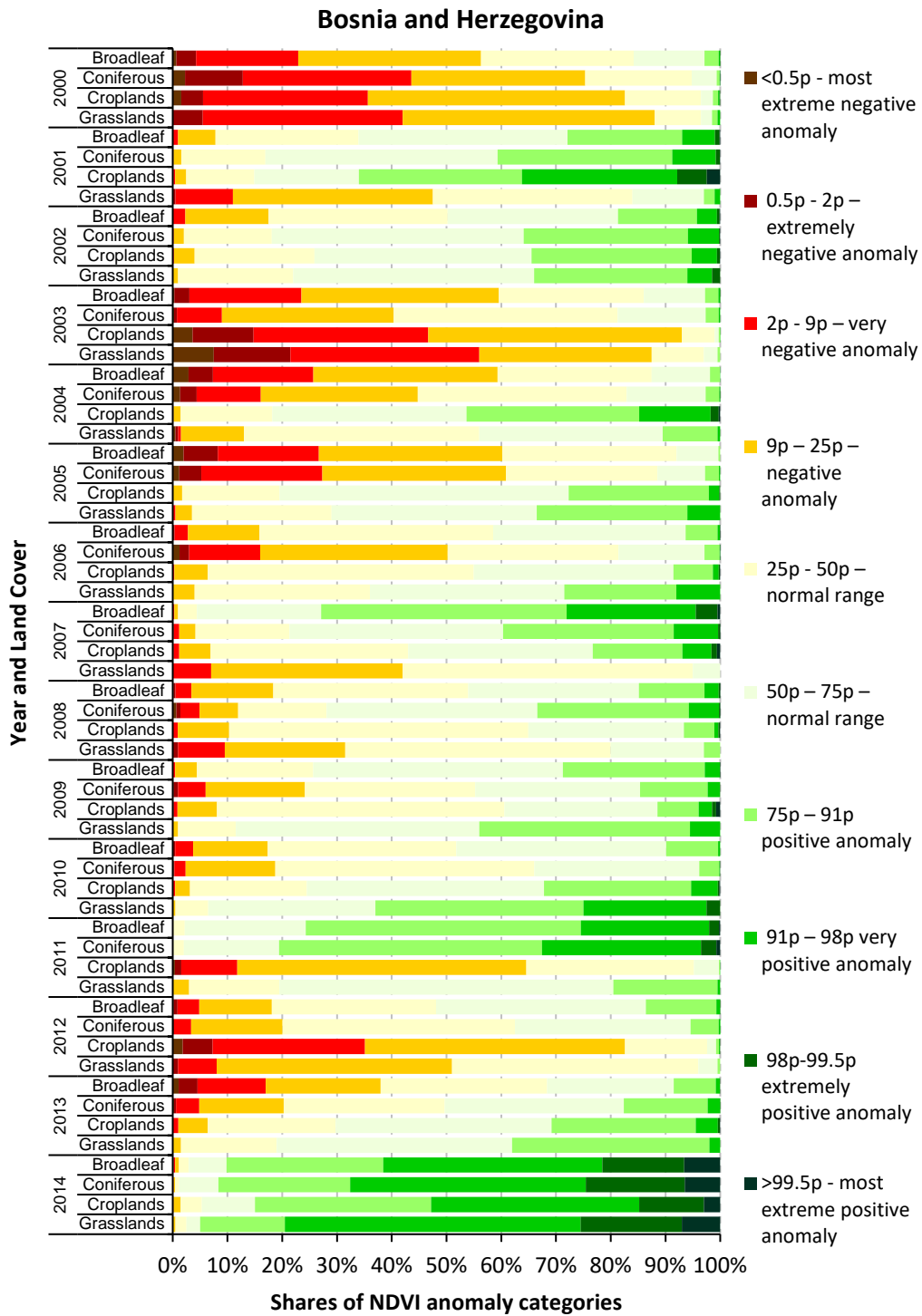


FIGURE S5a. Distribution of shares of NDVI anomalies by categories according to the land cover and years for Bosnia and Herzegovina.

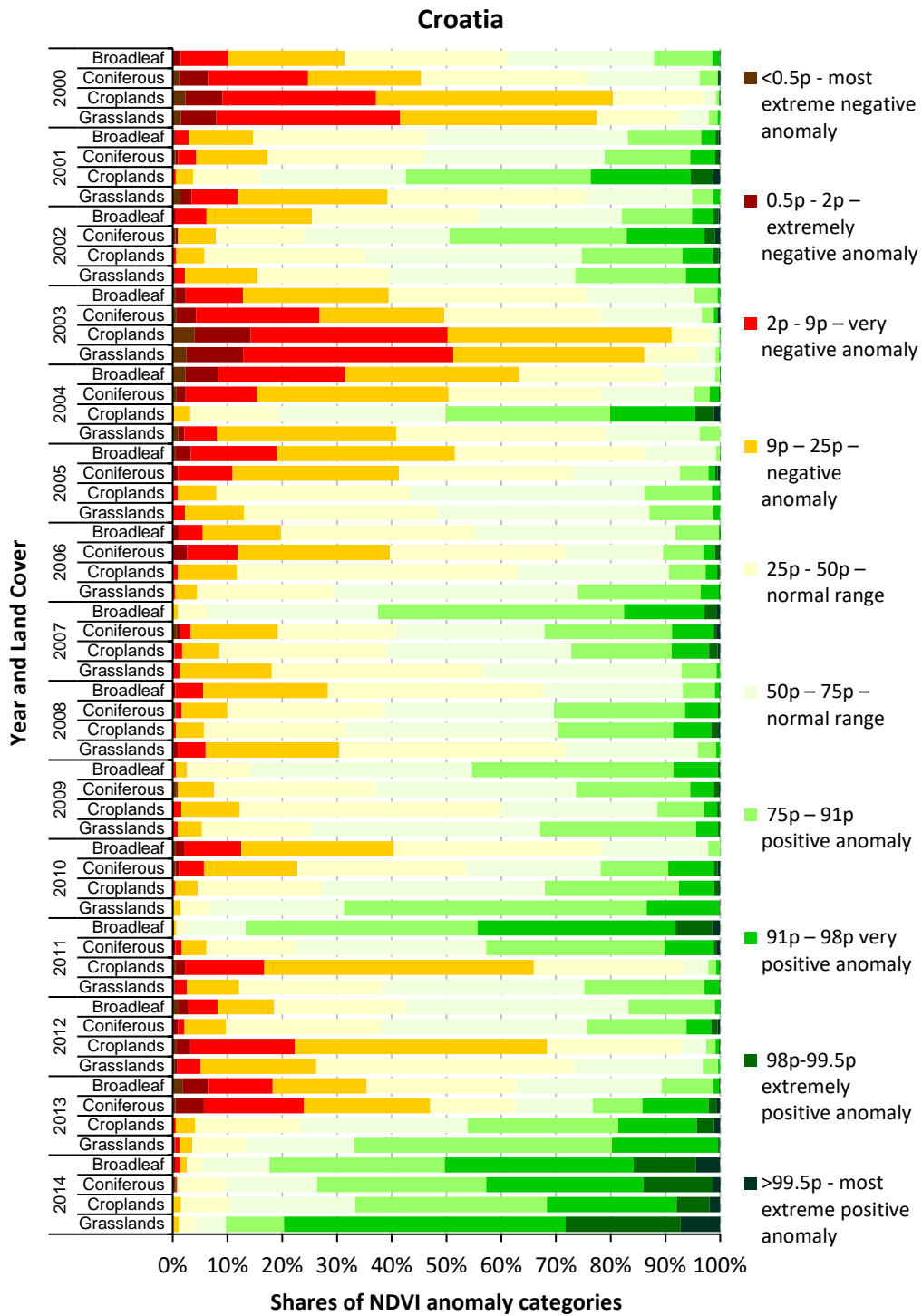


FIGURE S5b. Distribution of shares of NDVI anomalies by categories according to the land cover and years for Croatia.

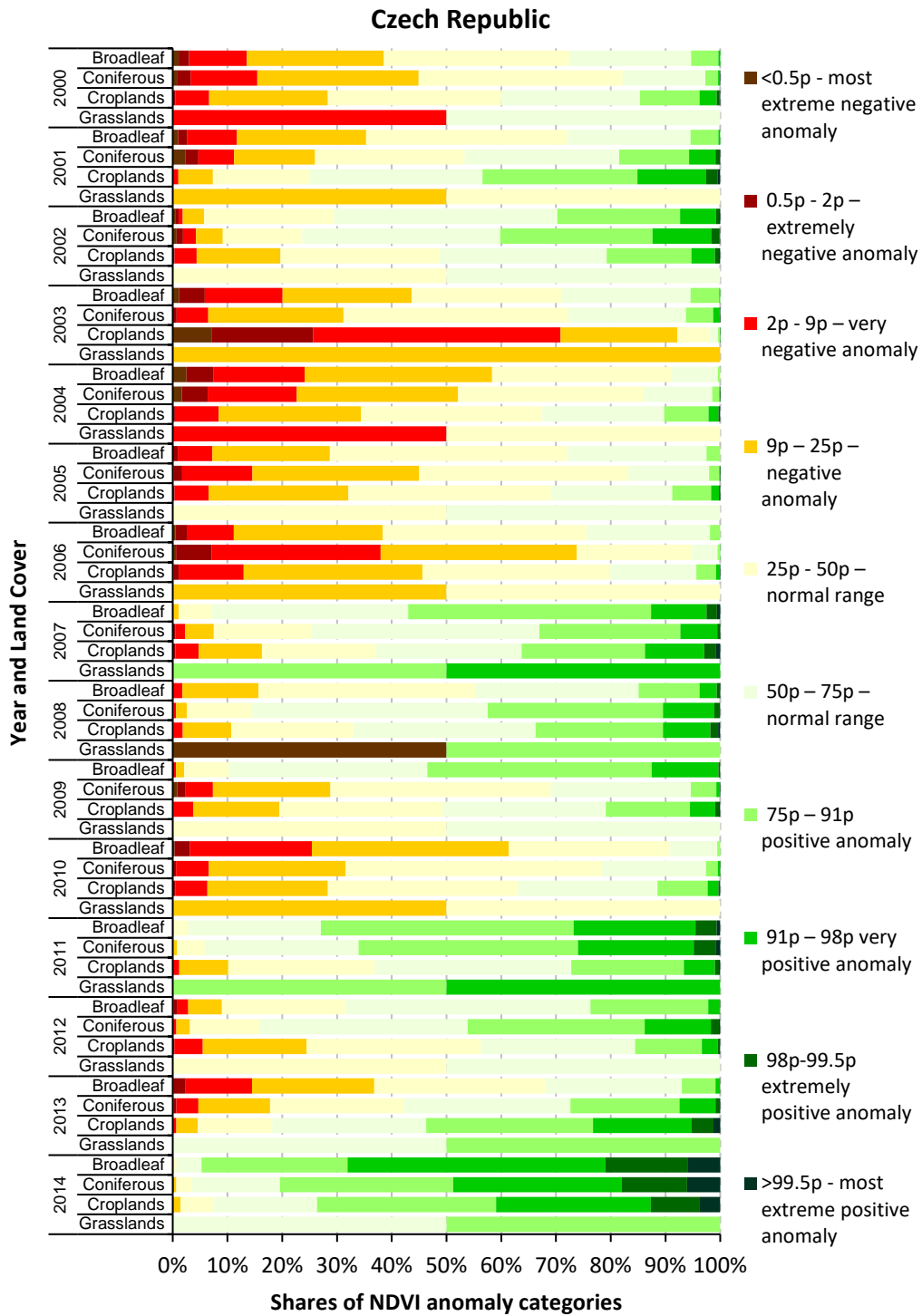


FIGURE S5c. Distribution of shares of NDVI anomalies by categories according to the land cover and years for Czech Republic.

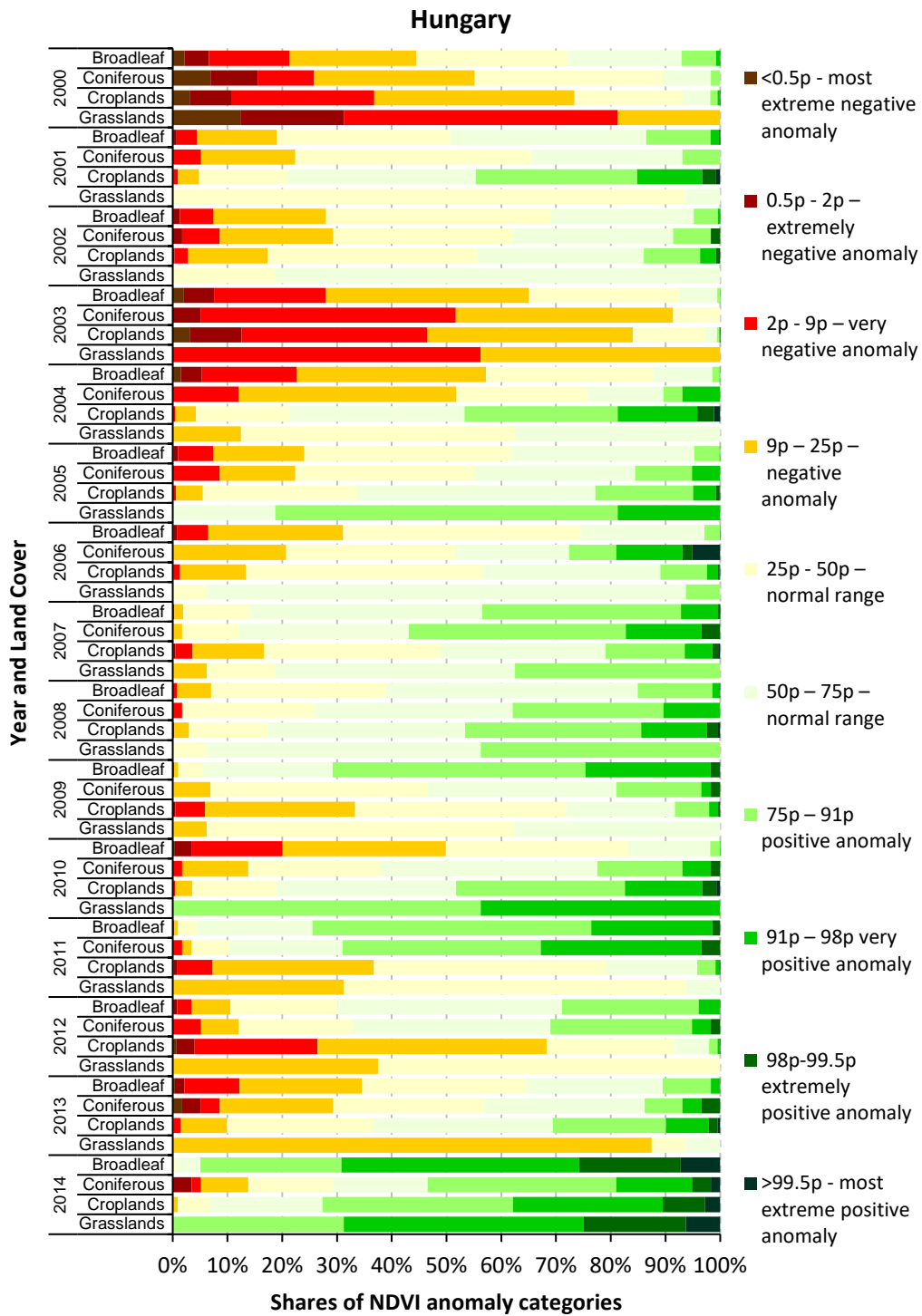


FIGURE S5d. Distribution of shares of NDVI anomalies by categories according to the land cover and years for Hungary.

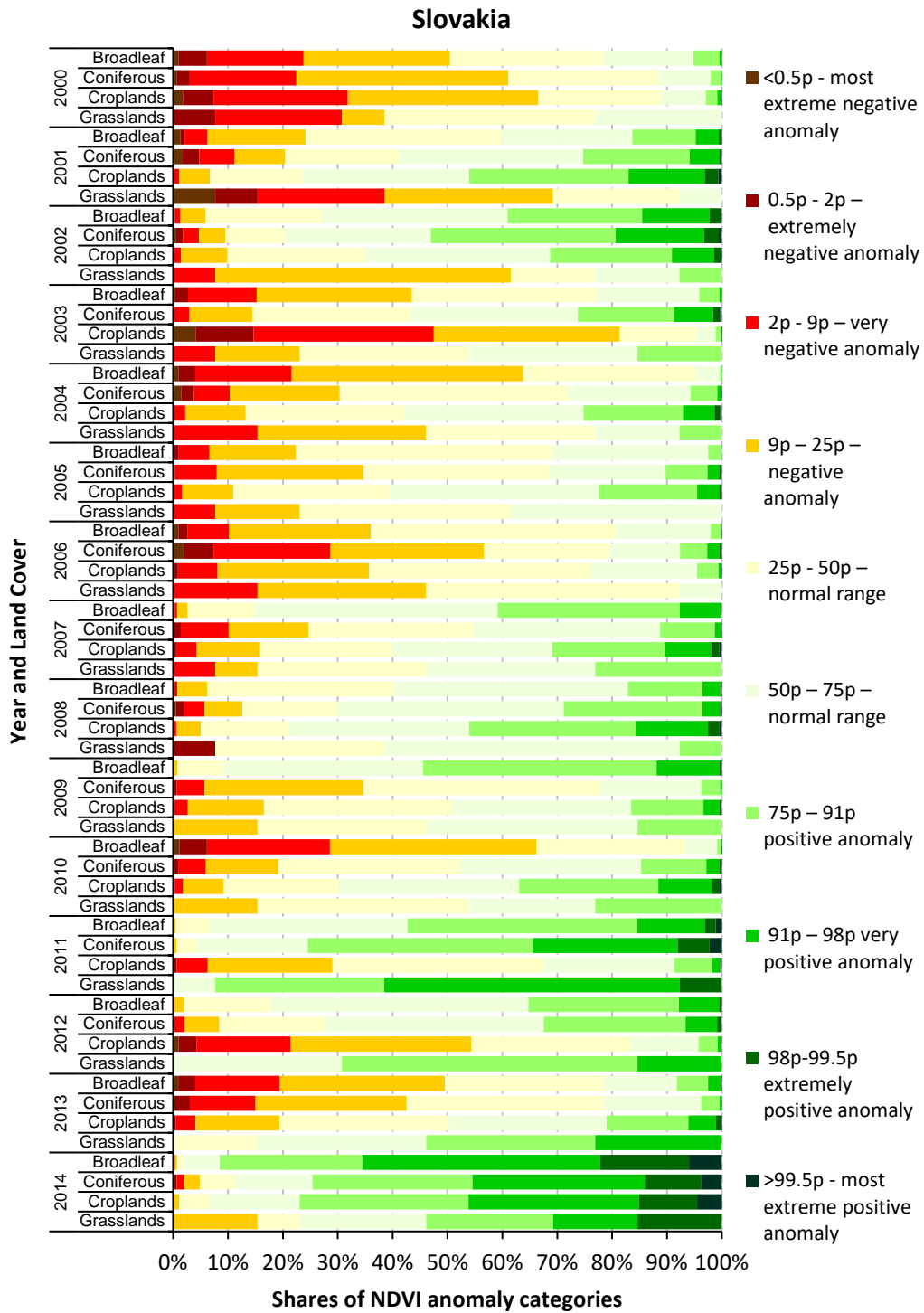


FIGURE S5e. Distribution of shares of NDVI anomalies by categories according to the land cover and years for Slovakia.

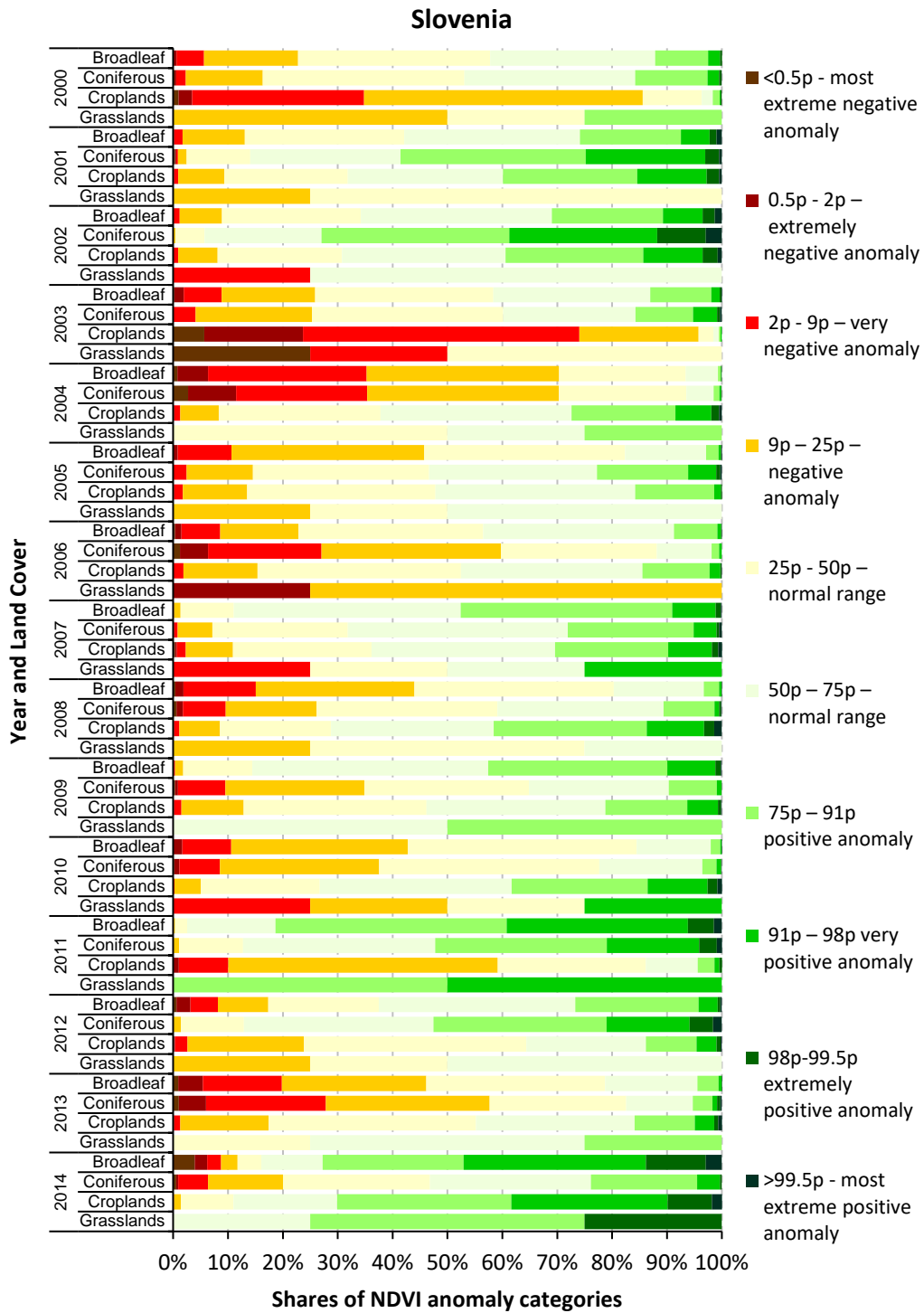


FIGURE S5f. Distribution of shares of NDVI anomalies by categories according to the land cover and years for Slovenia.

Supplementary results based on the analysis of EVI

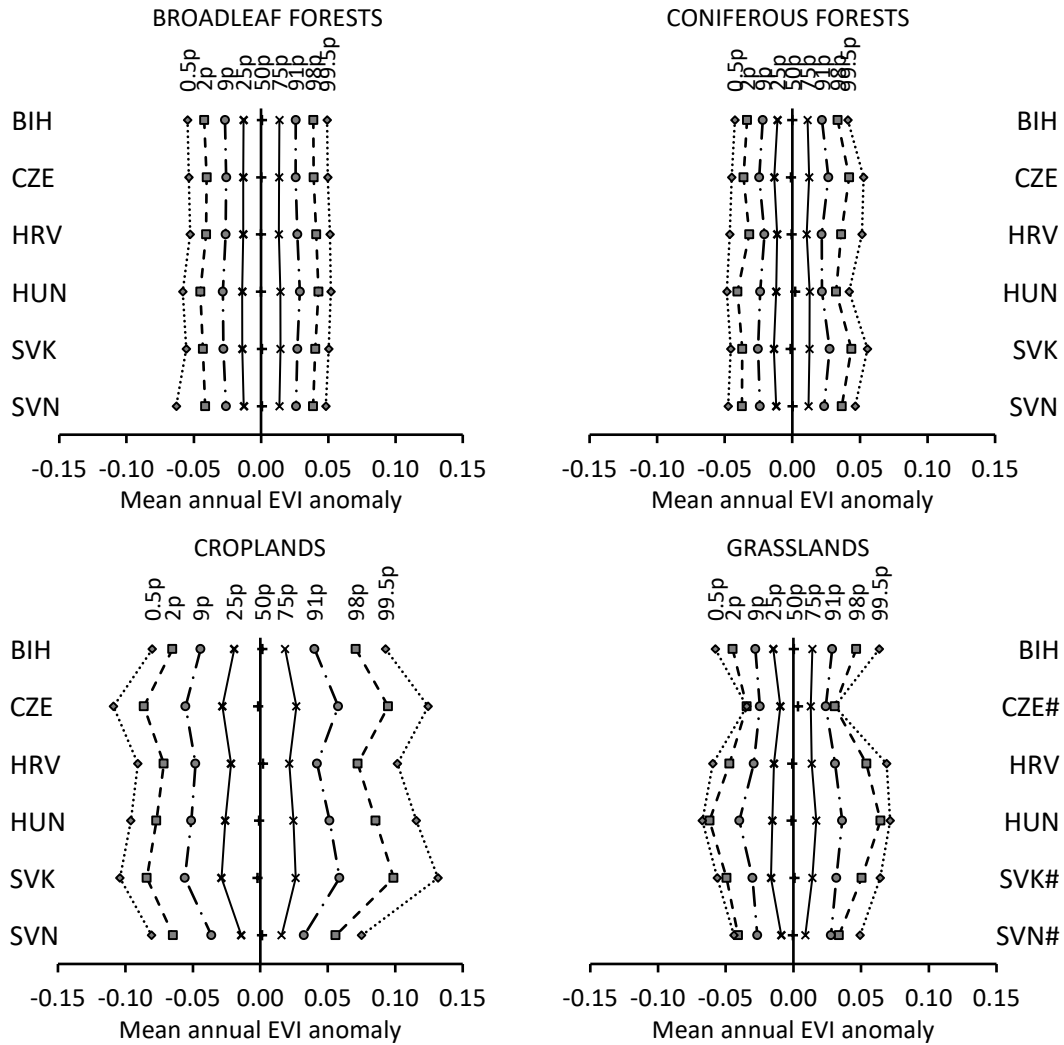


FIGURE S6. Categorization of mean annual EVI anomalies according to the land cover for countries in the study area (BIH - Bosnia and Herzegovina, CZE - Czech Republic; HRV- Croatia; HUN - Hungary; SVK - Slovakia; SVN – Slovenia; # Insufficient number of pixels).

Table S2. Overview of the best and worst years and the extent (percent of the pixels) of the EVI anomaly with respect to different land cover categories and countries.

LC	Country	Worst year	2 nd worst year	Best year	2 nd best year
		(Share of pixels with very negative anomaly or worse)		(Share of pixels with very positive anomaly or better)	
Broadleaf forests	BIH	2005 (39.0%)	2013 (23.7%)	2011 (38.6%)	2009 (23.1%)
	CZE	2004 (42.9%)	2001 (22.7%)	2014 (41.4%)	2011 (30.1%)
	HRV	2004 (35.7%)	2005 (26.0%)	2000 (36.8%)	2011 (31.2%)
	HUN	2004 (39.2%)	2005 (24.4%)	2011 (42.0%)	2000 (25.7%)
	SVK	2010 (35.2%)	2004 (34.1%)	2011 (29.9%)	2009 (20.7%)
	SVN	2004 (37.6%)	2013 (25.0%)	2000 (29.5%)	2011 (25.3%)
Coniferous forests	BIH	2001 (33.1%)	2005 (24.4%)	2012 (36.5%)	2011 (24.4%)
	CZE	2003 (30.1%)	2001 (25.8%)	2013 (50.5%) ⁺	2014 (29.9%)
	HRV	2001 (22.6%)	2005 (19.2%)	2014 (36.8%)	2009 (24.7%)
	HUN	2003 (63.8%) [§]	2002 (34.5%)	2014 (39.7%)	2013 (20.7%)
	SVK	2000 (29.1%)	2007 (17.6%)	2014 (39.6%)	2013 (27.6%)
	SVN	2006 (33.0%)	2007 (19.7%)	2014 (23.7%)	2013 (22.2%)
Croplands	BIH	2003 (54.5%) [§]	2000 (37.1%)	2014 (50.0%) ⁺	2001 (37.3%)
	CZE	2003 (63.3%) [§]	2006 (13.6%)	2014 (37.8%)	2013 (25.1%)
	HRV	2003 (56.7%) [§]	2000 (38.3%)	2014 (30.0%)	2001 (20.5%)
	HUN	2003 (50.5%) [§]	2000 (34.6%)	2014 (32.4%)	2008 (23.5%)
	SVK	2003 (44.2%)	2000 (32.4%)	2014 (42.3%)	2008 (18.2%)
	SVN	2003 (81.5%) [§]	2000 (21.3%)	2014 (49.9%)	2002 (15.4%)
Grasslands	BIH	2003 (55.0%) [§]	2000 (38.0%)	2014 (86.0%) ⁺	2010 (15.5%)
	CZE	#	#	#	#
	HRV	2003 (41.4%)	2000 (36.6%)	2014 (75.7%) ⁺	2013 (21.0%)
	HUN	2000 (81.3%) [§]	2003 (56.3%)	2014 (81.3%) ⁺	2010 (50.0%) ⁺
	SVK	#	#	#	#
	SVN	#	#	#	#

BIH - Bosnia and Herzegovina, CZE - Czech Republic; HRV- Croatia; HUN - Hungary; SVK - Slovakia; SVN - Slovenia; # Insufficient number of pixels; § Extremely bad year; + Extremely good year

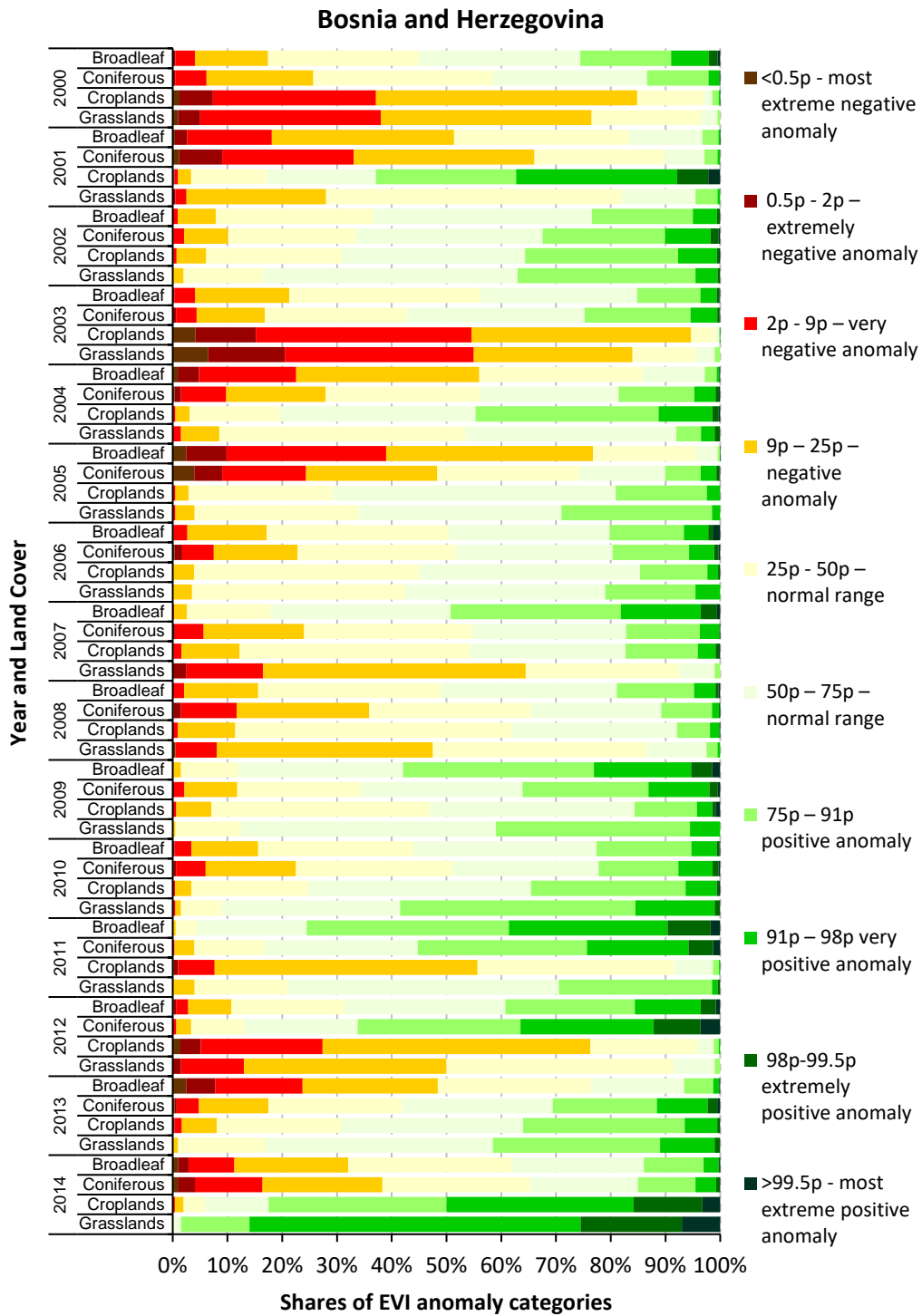


FIGURE S7a. Distribution of shares of EVI anomalies by categories according to the land cover and years for Bosnia and Herzegovina.

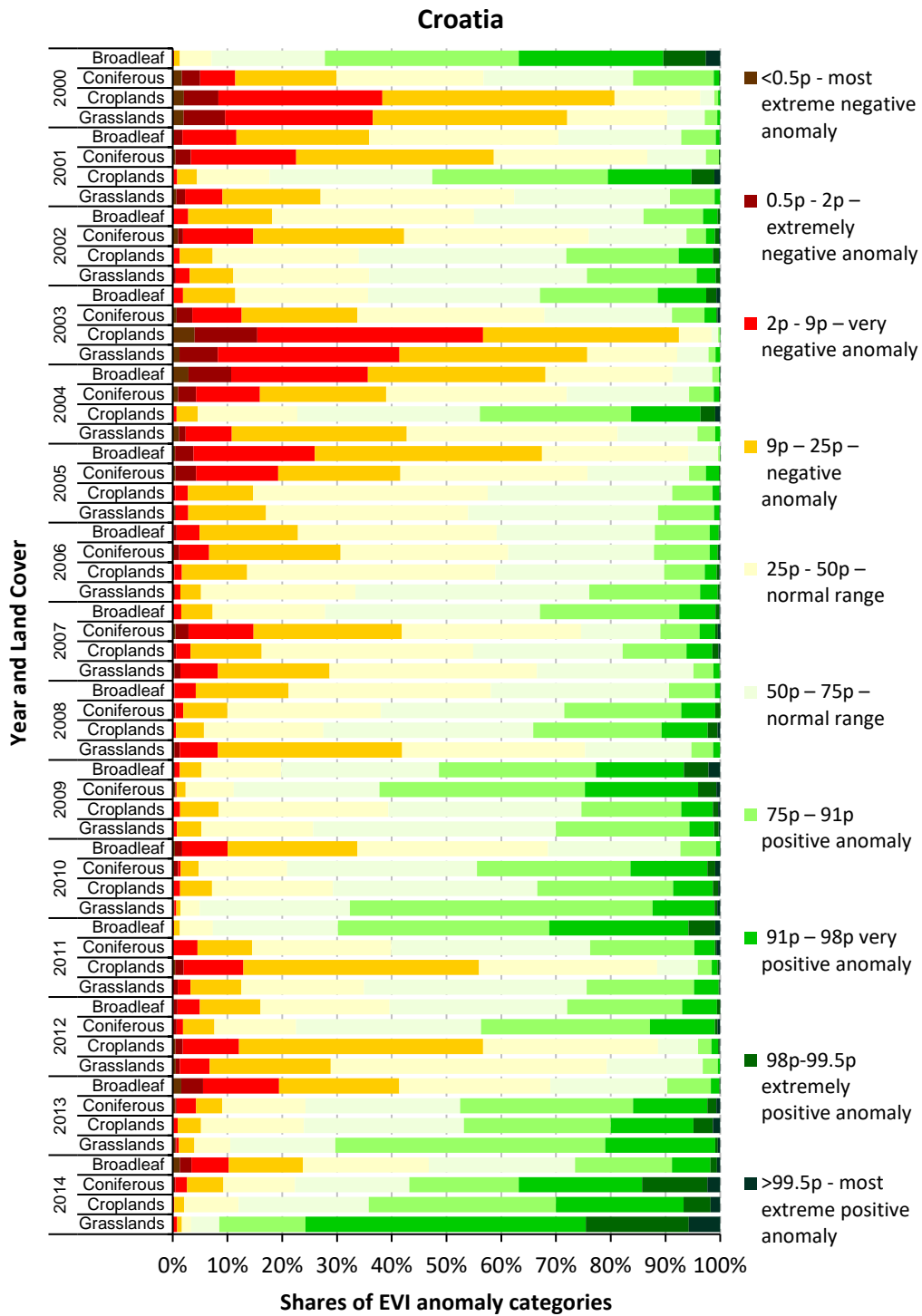


FIGURE S7b. Distribution of shares of EVI anomalies by categories according to the land cover and years for Croatia.

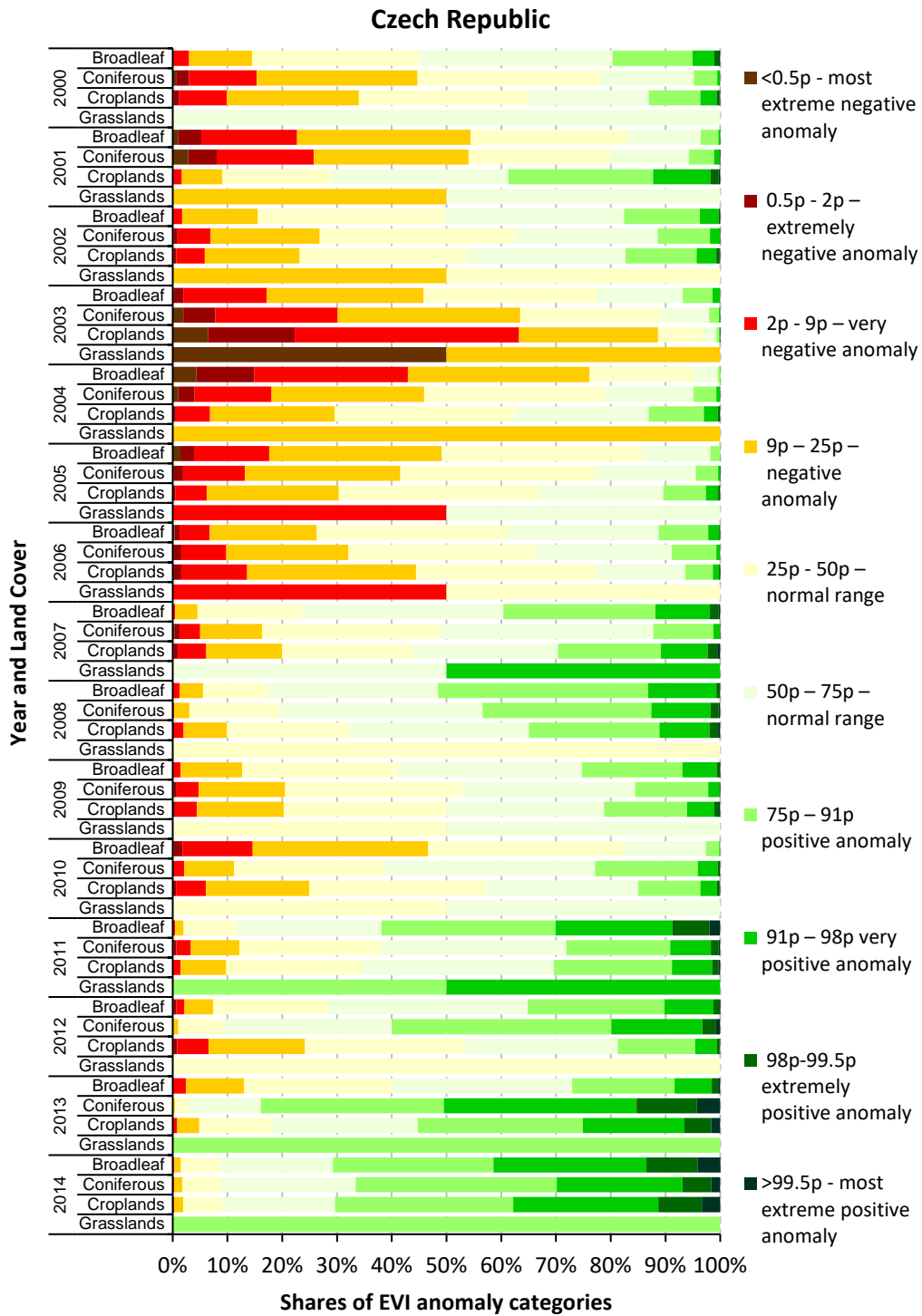


FIGURE S7c. Distribution of shares of EVI anomalies by categories according to the land cover and years for Czech Republic.

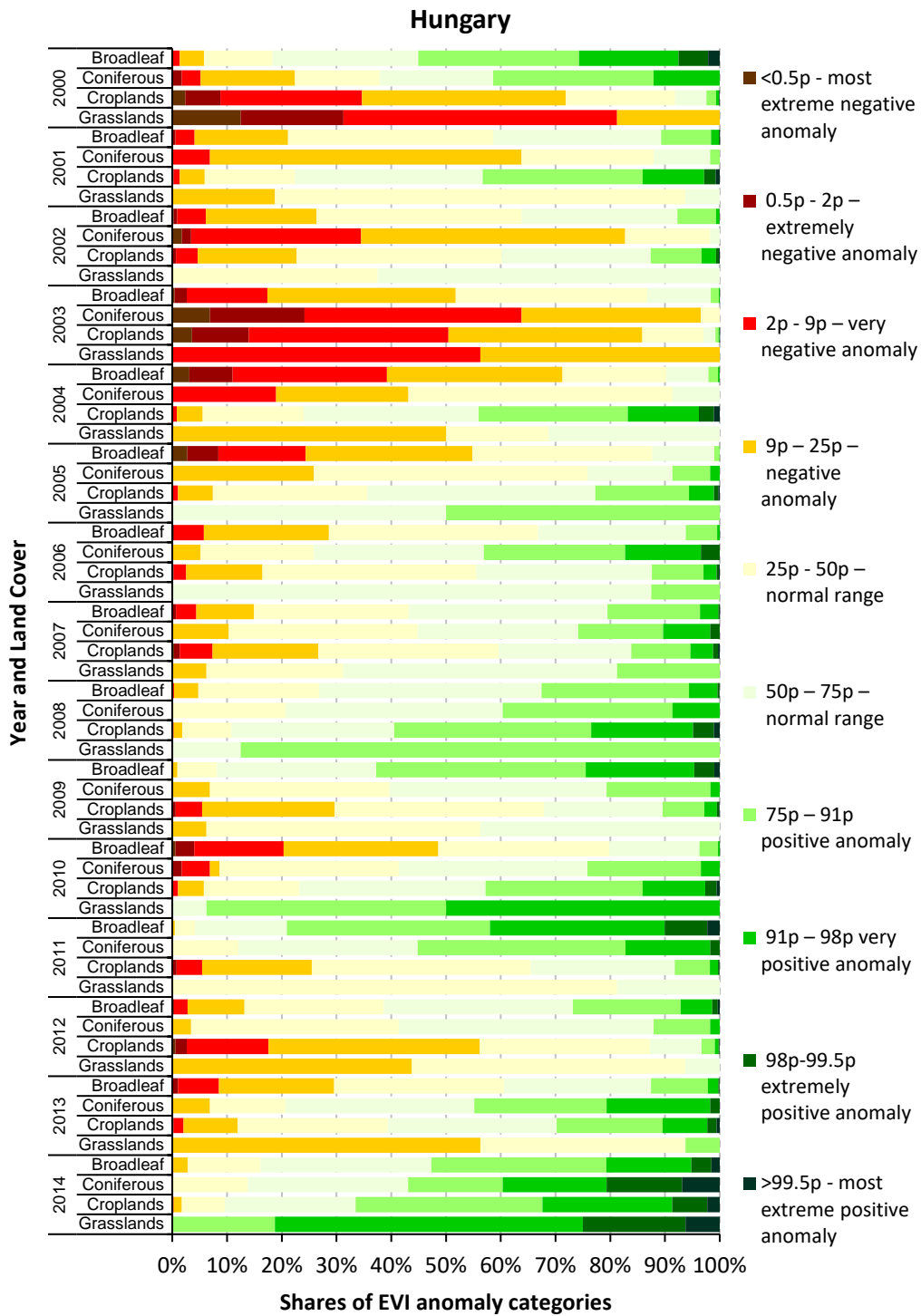


FIGURE S7d. Distribution of shares of EVI anomalies by categories according to the land cover and years for Hungary.

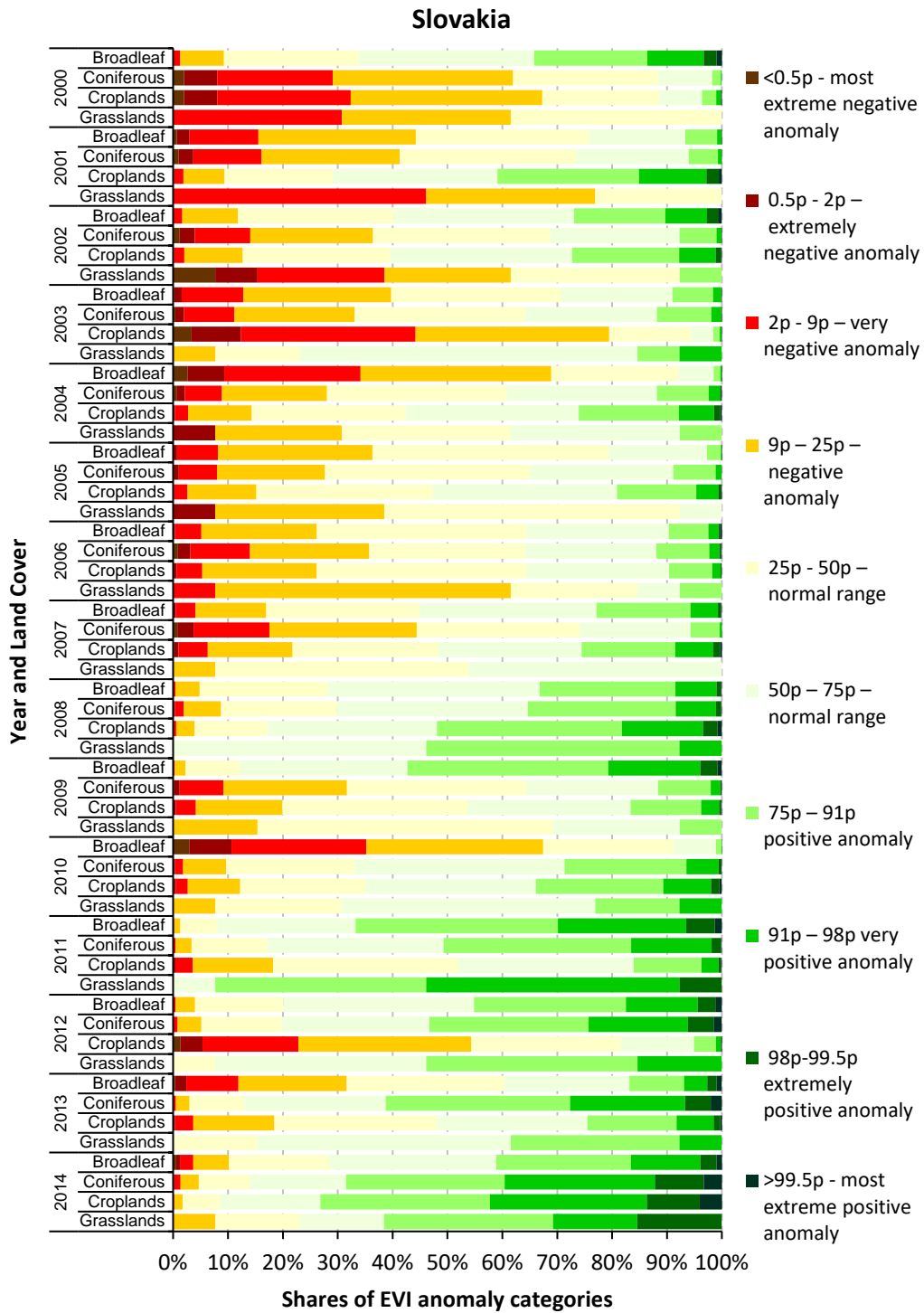


FIGURE S7e. Distribution of shares of EVI anomalies by categories according to the land cover and years for Slovakia.

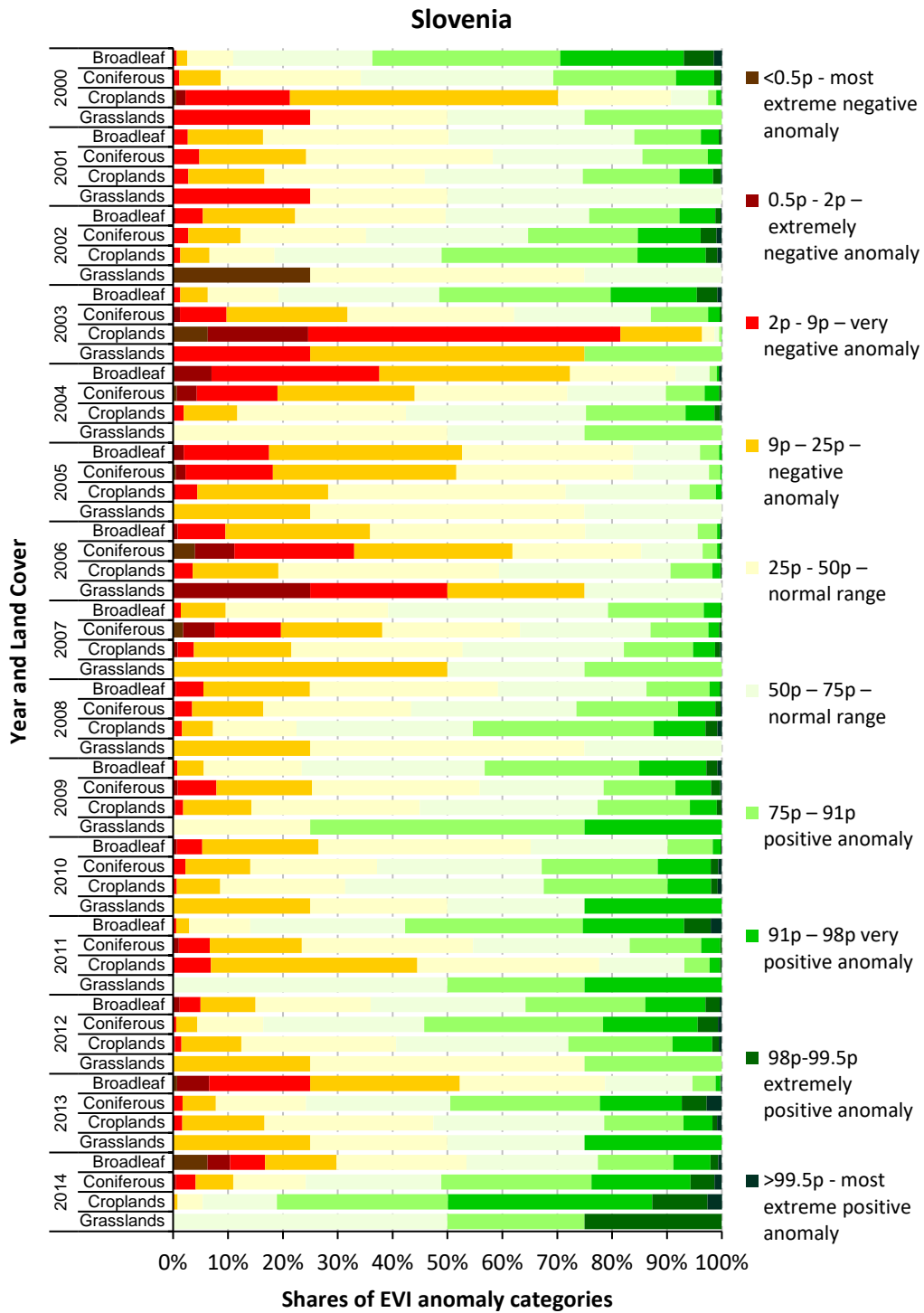


FIGURE S7f. Distribution of shares of EVI anomalies by categories according to the land cover and years for Slovenia.

Supplementary results based on the analysis of FPAR

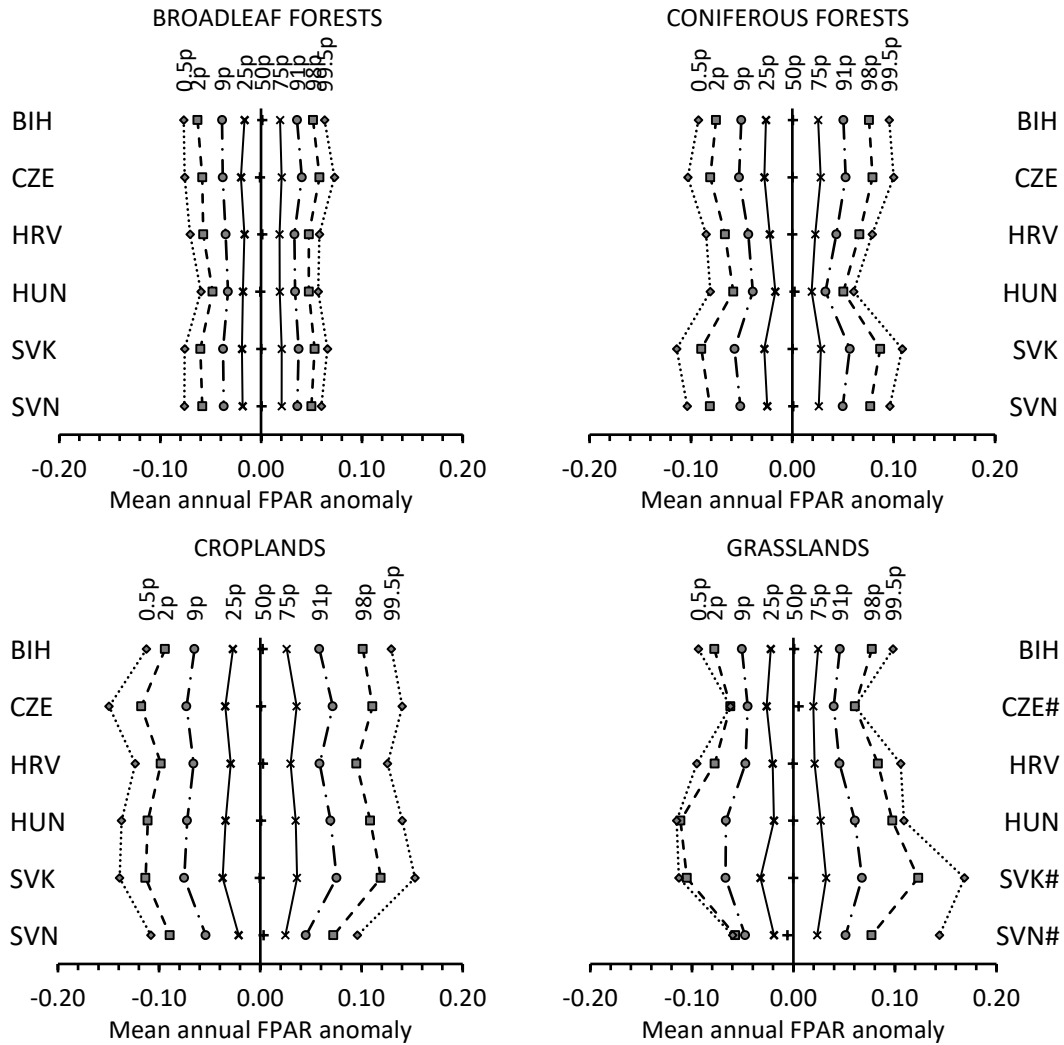


FIGURE S8. Categorization of mean annual FPAR anomalies according to the land cover for countries in the study area (BIH - Bosnia and Herzegovina, CZE - Czech Republic; HRV - Croatia; HUN - Hungary; SVK - Slovakia; SVN - Slovenia; # - Insufficient number of pixels).

Table S3. Overview of the best and worst years and the extent (percent of the pixels) of the FPAR anomaly with respect to different land cover categories and countries.

LC	Country	Worst year	2 nd worst year	Best year	2 nd best year
		(Share of pixels with very negative anomaly or worse)		(Share of pixels with very positive anomaly or better)	
Broadleaf forests	BIH	2005 (79.5%) [§]	2004 (17.4%)	2011 (41.7%)	2014 (39.2%)
	CZE	2006 (30.1%)	2000 (26.3%)	2014 (47.8%)	2011 (39.9%)
	HRV	2005 (60.2%) [§]	2004 (20.8%)	2011 (48.3%)	2014 (27.0%)
	HUN	2004 (32.3%)	2005 (23.5%)	2011 (49.8%)	2014 (43.7%)
	SVK	2000 (41.8%)	2004 (25.4%)	2011 (43.9%)	2014 (43.8%)
	SVN	2004 (31.5%)	2010 (27.9%)	2011 (59.2%) ⁺	2007 (23.5%)
Coniferous forests	BIH	2005 (41.2%)	2000 (30.4%)	2014 (44.4%)	2011 (42.7%)
	CZE	2001 (38.6%)	2000 (33.2%)	2014 (52.1%) ⁺	2011 (23.5%)
	HRV	2004 (26.8%)	2001 (22.5%)	2014 (46.1%)	2011 (30.3%)
	HUN	2003 (53.4%) [§]	2000 (22.4%)	2011 (39.7%)	2014 (31.0%)
	SVK	2000 (42.6%)	2001 (21.2%)	2014 (35.9%)	2011 (35.0%)
	SVN	2004 (35.3%)	2006 (24.4%)	2012 (38.4%)	2011 (30.9%)
Croplands	BIH	2003 (48.6%)	2000 (44.7%)	2014 (62.0%) ⁺	2001 (36.9%)
	CZE	2003 (67.7%) [§]	2004 (13.9%)	2014 (43.3%)	2007 (18.8%)
	HRV	2003 (50.8%) [§]	2000 (45.5%)	2014 (34.3%)	2001 (27.8%)
	HUN	2003 (50.3%) [§]	2000 (46.7%)	2014 (36.3%)	2008 (21.1%)
	SVK	2003 (45.3%)	2000 (42.4%)	2014 (47.4%)	2007 (16.6%)
	SVN	2003 (74.2%) [§]	2000 (37.9%)	2014 (46.6%)	2008 (16.6%)
Grasslands	BIH	2000 (66.0%) [§]	2003 (48.5%)	2014 (85.0%) ⁺	2010 (19.5%)
	CZE	#	#	#	#
	HRV	2003 (41.4%)	2000 (36.6%)	2014 (75.7%) ⁺	2013 (21.0%)
	HUN	2000 (81.3%) [§]	2003 (56.3%)	2014 (81.3%) ⁺	2010 (50.0%) ⁺
	SVK	#	#	#	#
	SVN	#	#	#	#

BIH - Bosnia and Herzegovina, CZE - Czech Republic; HRV- Croatia; HUN - Hungary; SVK - Slovakia; SVN – Slovenia; # - Insufficient number of pixels; § - Extremely bad year; + - Extremely good year

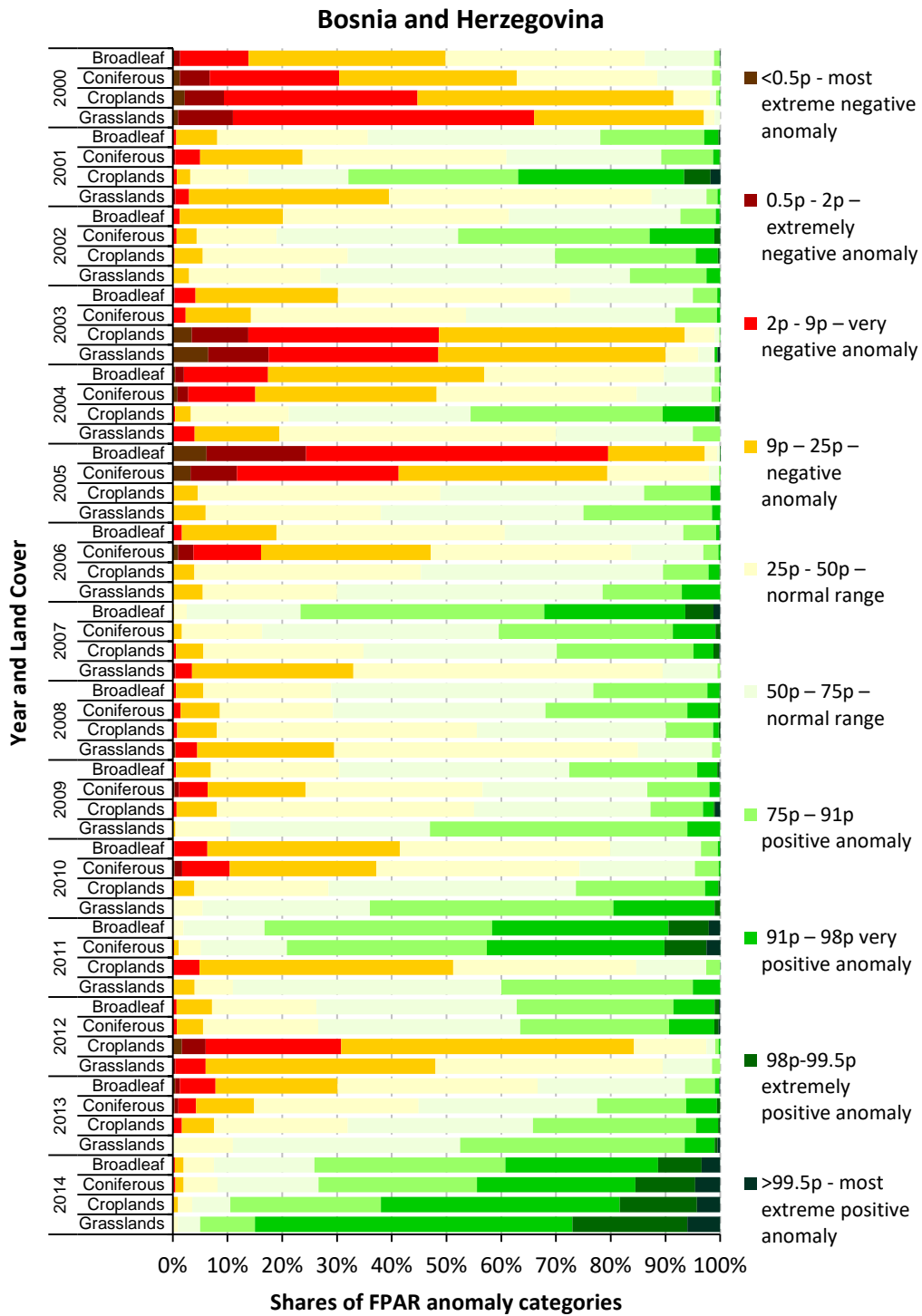


FIGURE S9a. Distribution of shares of FPAR anomalies by categories according to the land cover and years for Bosnia and Herzegovina.

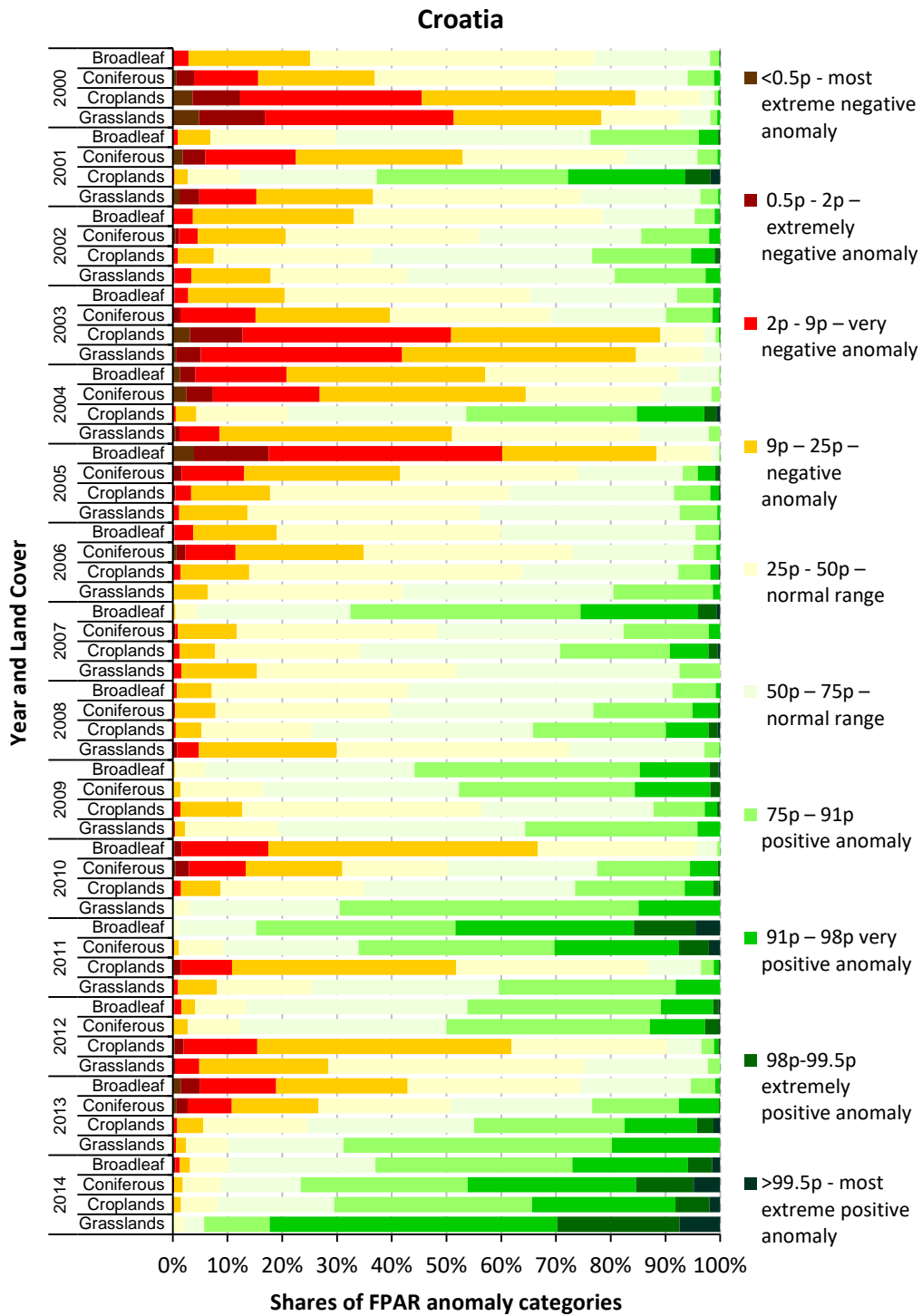


FIGURE S9b. Distribution of shares of FPAR anomalies by categories according to the land cover and years for Croatia.

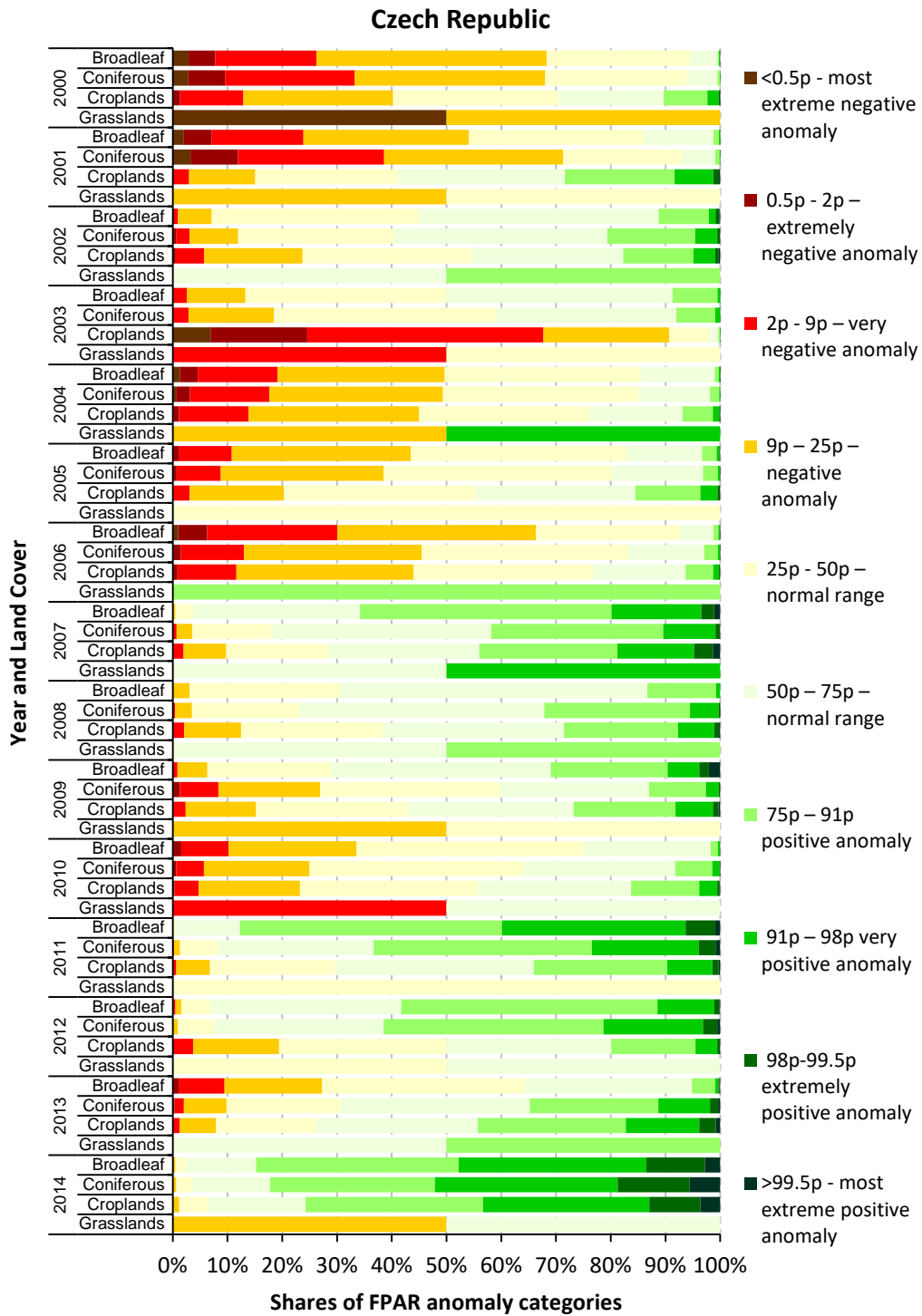


FIGURE S9c. Distribution of shares of FPAR anomalies by categories according to the land cover and years for Czech Republic.

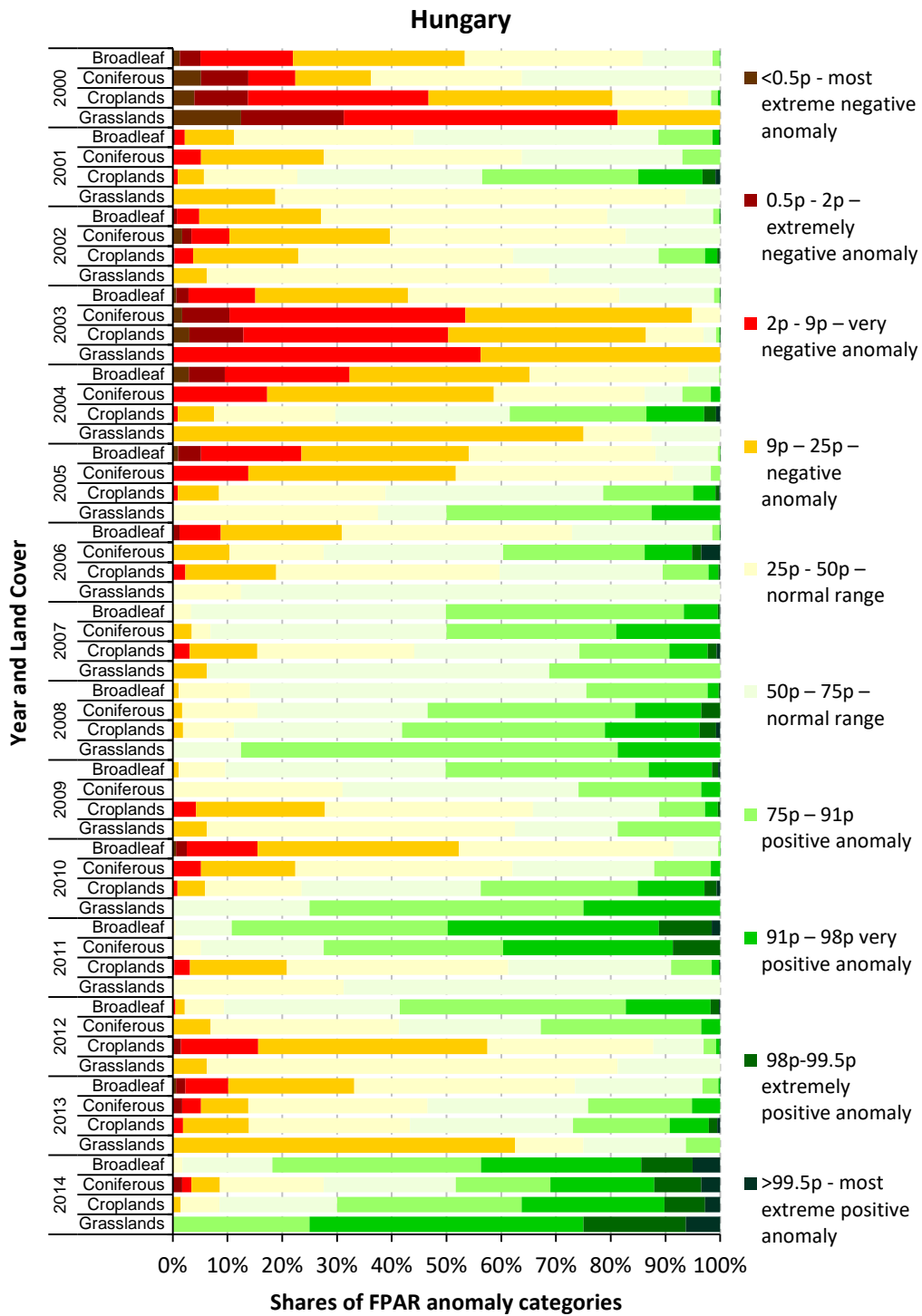


FIGURE S9d. Distribution of shares of FPAR anomalies by categories according to the land cover and years for Hungary.

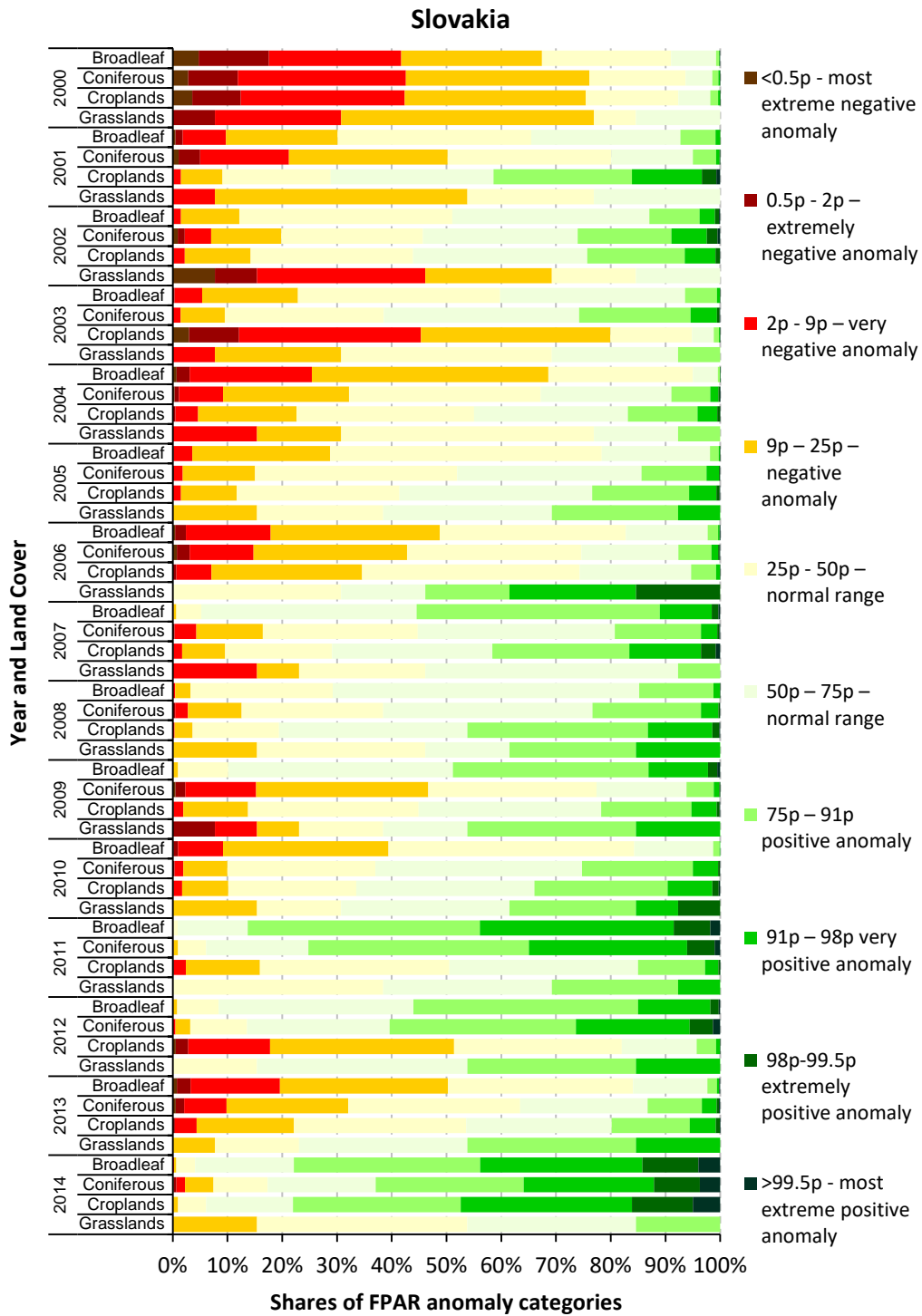


FIGURE S9e. Distribution of shares of FPAR anomalies by categories according to the land cover and years for Slovakia.

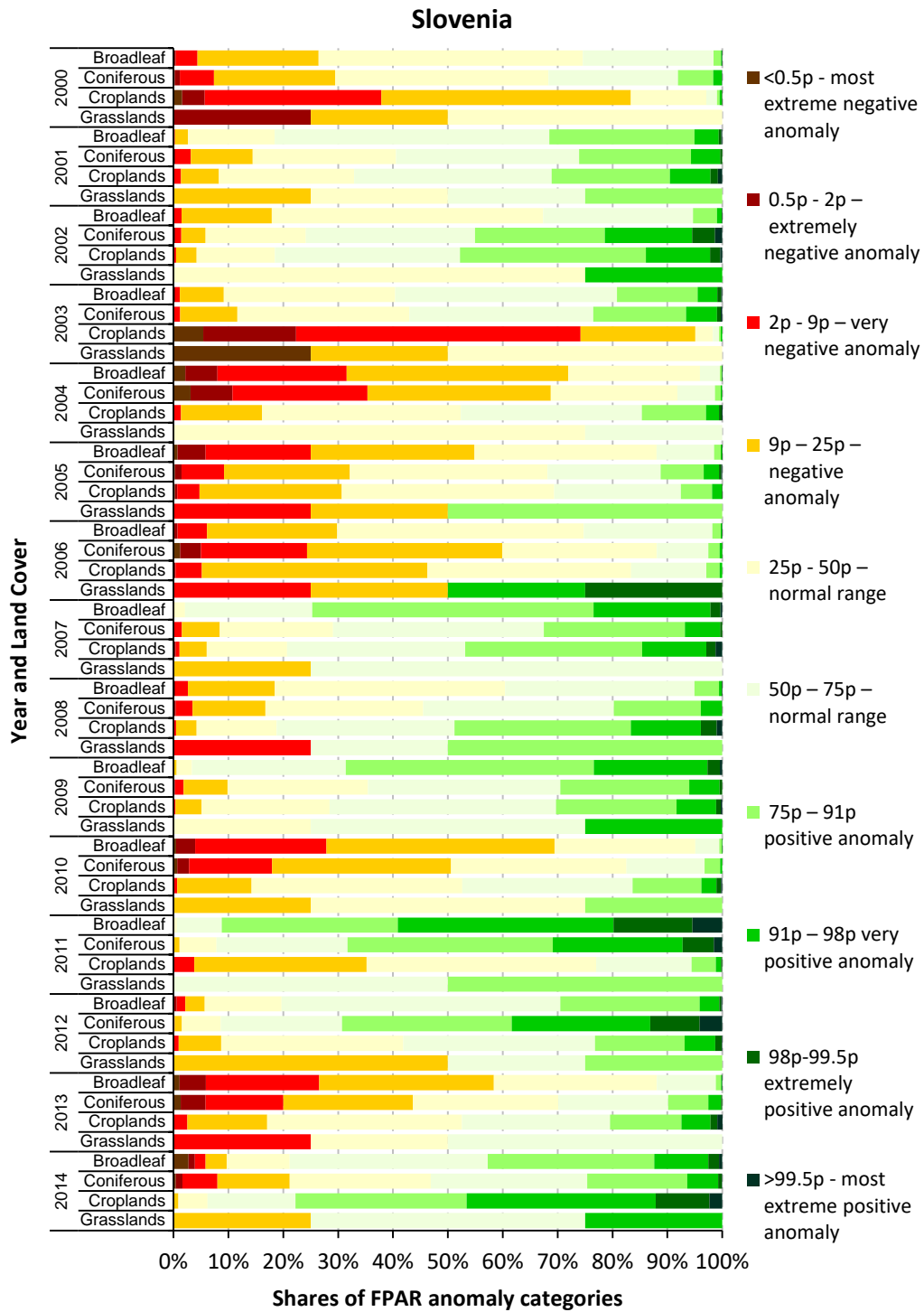


FIGURE S9f. Distribution of shares of FPAR anomalies by categories according to the land cover and years for Slovenia.

Supplementary results based on the analysis of LAI

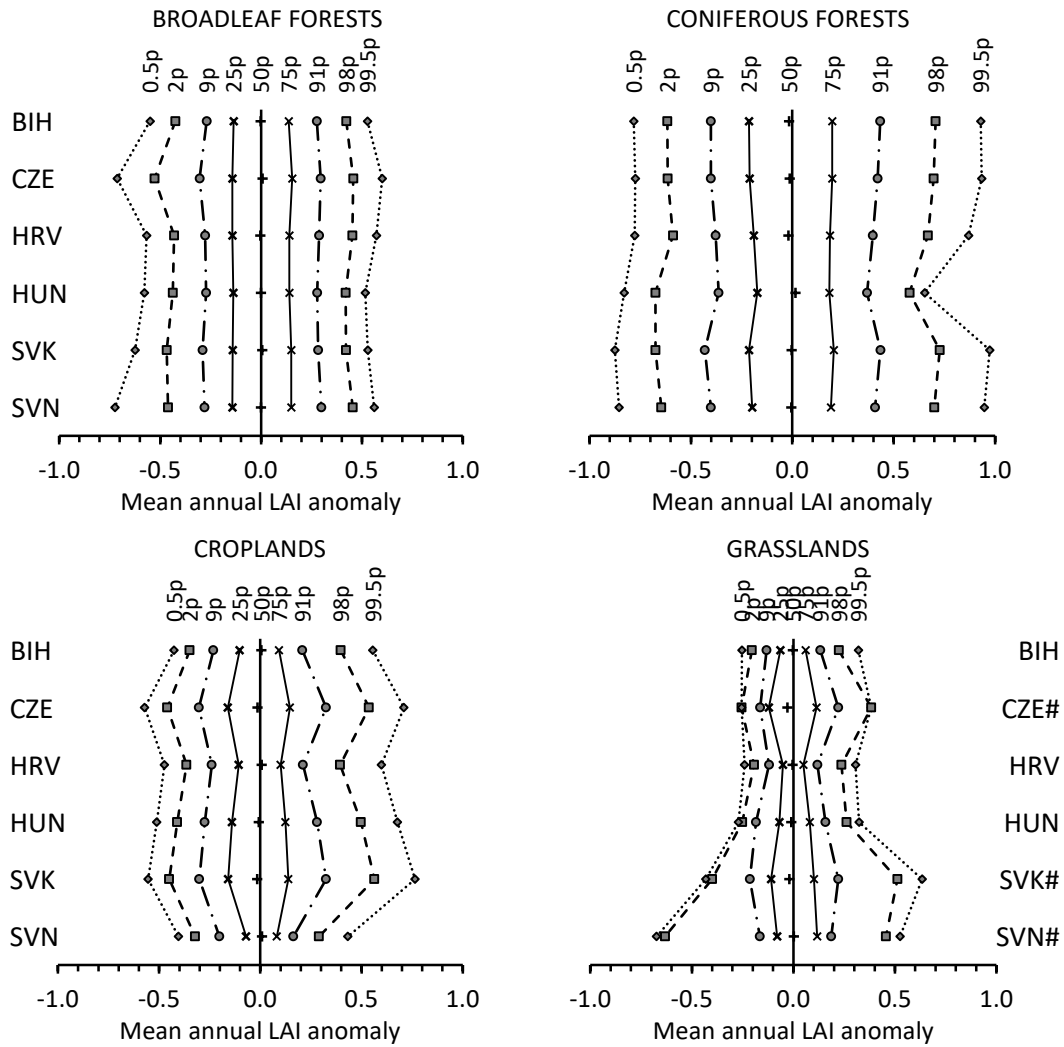


FIGURE S10. Categorization of mean annual LAI anomalies according to the land cover for countries in the study area (BIH - Bosnia and Herzegovina, CZE - Czech Republic; HRV - Croatia; HUN - Hungary; SVK - Slovakia; SVN - Slovenia; # - Insufficient number of pixels).

Table S4. Overview of the best and worst years and the extent (percent of the pixels) of the LAI anomaly with respect to different land cover categories and countries.

LC	Country	Worst year	2 nd worst year	Best year	2 nd best year
		(Share of pixels with very negative anomaly or worse)		(Share of pixels with very positive anomaly or better)	
Broadleaf forests	BIH	2005 (39.3%)	2000 (16.9%)	2011 (52.5%) ⁺	2012 (21.7%)
	CZE	2001 (44.8%)	2004 (26.0%)	2011 (33.5%)	2009 (24.2%)
	HRV	2005 (30.0%)	2004 (17.4%)	2011 (59.4%) ⁺	2007 (18.8%)
	HUN	2004 (28.7%)	2001 (19.2%)	2011 (49.1%)	2014 (23.7%)
	SVK	2001 (33.8%)	2004 (28.4%)	2011 (39.9%)	2009 (26.2%)
	SVN	2004 (20.2%)	2010 (15.8%)	2011 (54.2%) ⁺	2009 (23.5%)
Coniferous forests	BIH	2001 (27.0%)	2000 (24.2%)	2014 (38.5%)	2011 (38.0%)
	CZE	2001 (42.5%)	2000 (31.6%)	2014 (37.2%)	2012 (24.8%)
	HRV	2001 (34.4%)	2004 (19.5%)	2014 (42.7%)	2011 (22.0%)
	HUN	2003 (46.6%)	2002 (31.0%)	2011 (46.6%)	2014 (24.1%)
	SVK	2000 (31.4%)	2001 (28.3%)	2012 (26.0%)	2014 (23.9%)
	SVN	2004 (25.4%)	2006 (16.4%)	2012 (31.7%)	2002 (17.7%)
Croplands	BIH	2003 (52.6%) [§]	2000 (46.5%)	2014 (44.7%)	2001 (27.1%)
	CZE	2003 (50.3%) [§]	2000 (20.6%)	2014 (34.7%)	2013 (18.3%)
	HRV	2003 (50.0%) [§]	2000 (44.4%)	2014 (26.3%)	2001 (24.3%)
	HUN	2003 (44.3%)	2000 (43.3%)	2008 (26.2%)	2014 (22.4%)
	SVK	2000 (44.2%)	2003 (38.2%)	2014 (36.2%)	2008 (19.5%)
	SVN	2003 (73.2%) [§]	2000 (37.7%)	2014 (32.0%)	2002 (27.0%)
Grasslands	BIH	2000 (52.5%) [§]	2003 (49.5%)	2014 (81.0%) ⁺	2010 (22.5%)
	CZE	#	#	#	#
	HRV	2003 (49.3%)	2000 (44.5%)	2014 (77.5%) ⁺	2013 (20.5%)
	HUN	2000 (87.5%) [§]	2003 (50.0%)	2014 (75.0%) ⁺	2010 (25.0%)
	SVK	#	#	#	#
	SVN	#	#	#	#

BIH - Bosnia and Herzegovina, CZE - Czech Republic; HRV- Croatia; HUN - Hungary; SVK - Slovakia; SVN - Slovenia; # - Insufficient number of pixels; § - Extremely bad year; + - Extremely good year

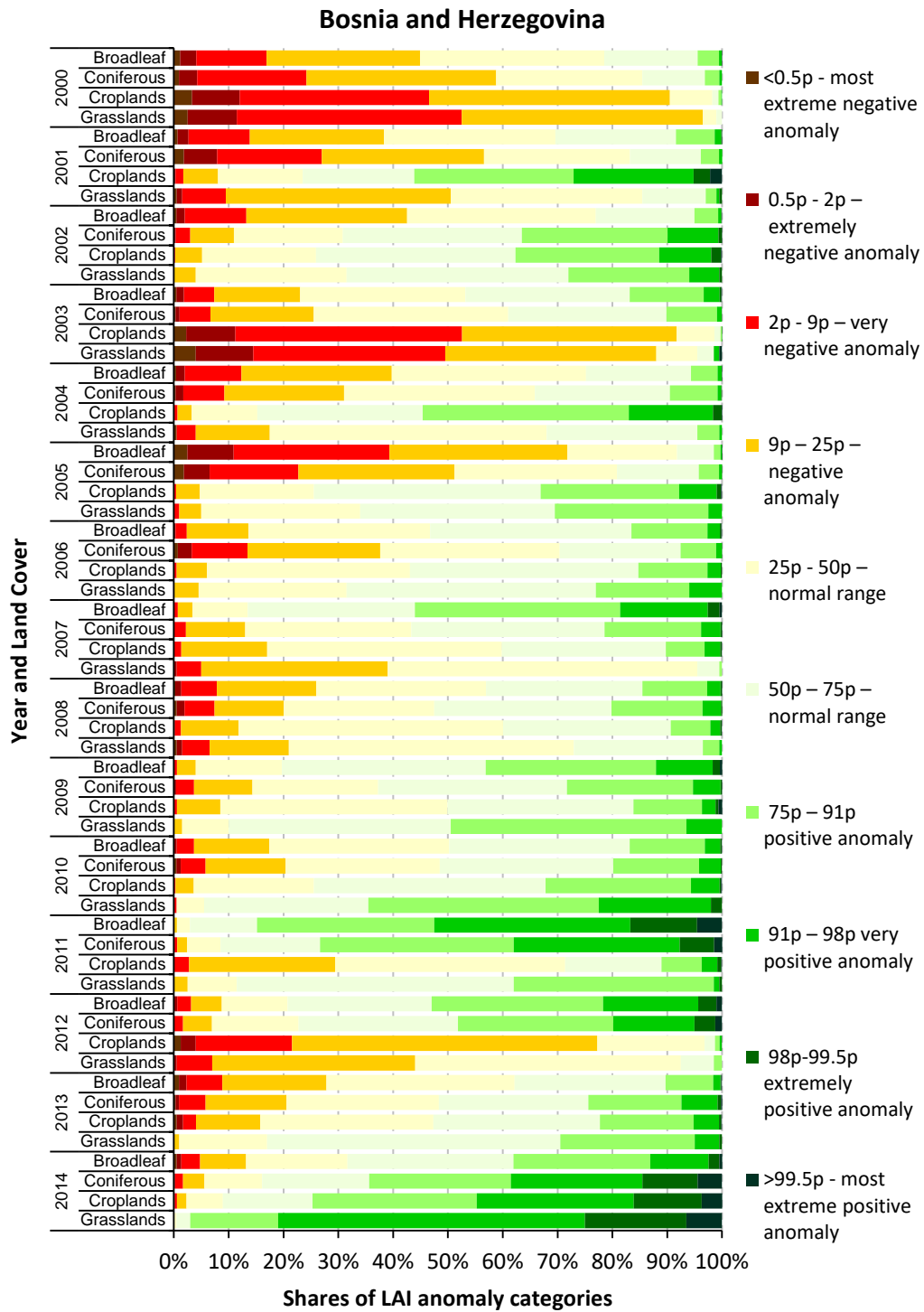


FIGURE S11a. Distribution of shares of LAI anomalies by categories according to the land cover and years for Bosnia and Herzegovina.

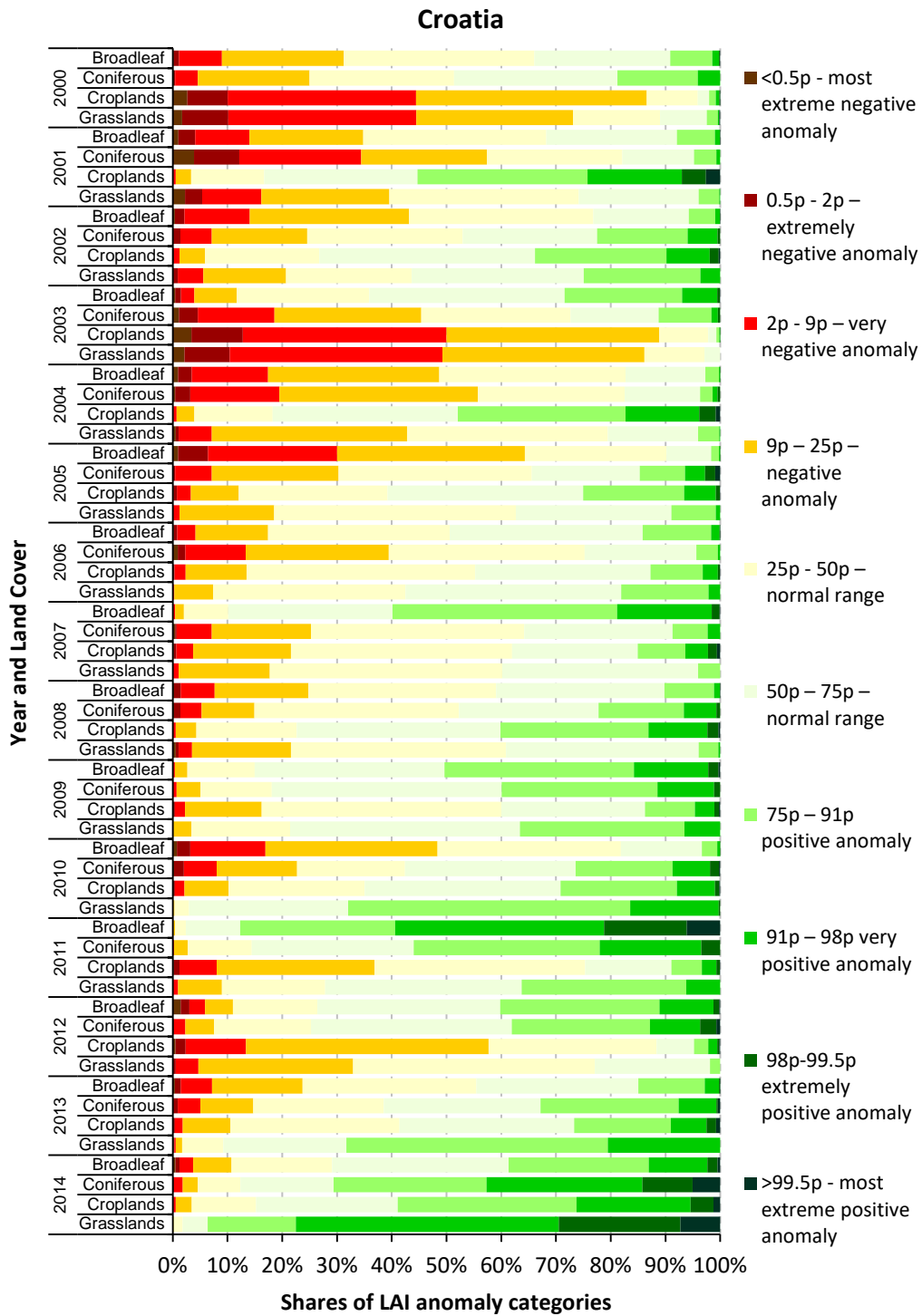


FIGURE S11b. Distribution of shares of LAI anomalies by categories according to the land cover and years for Croatia.

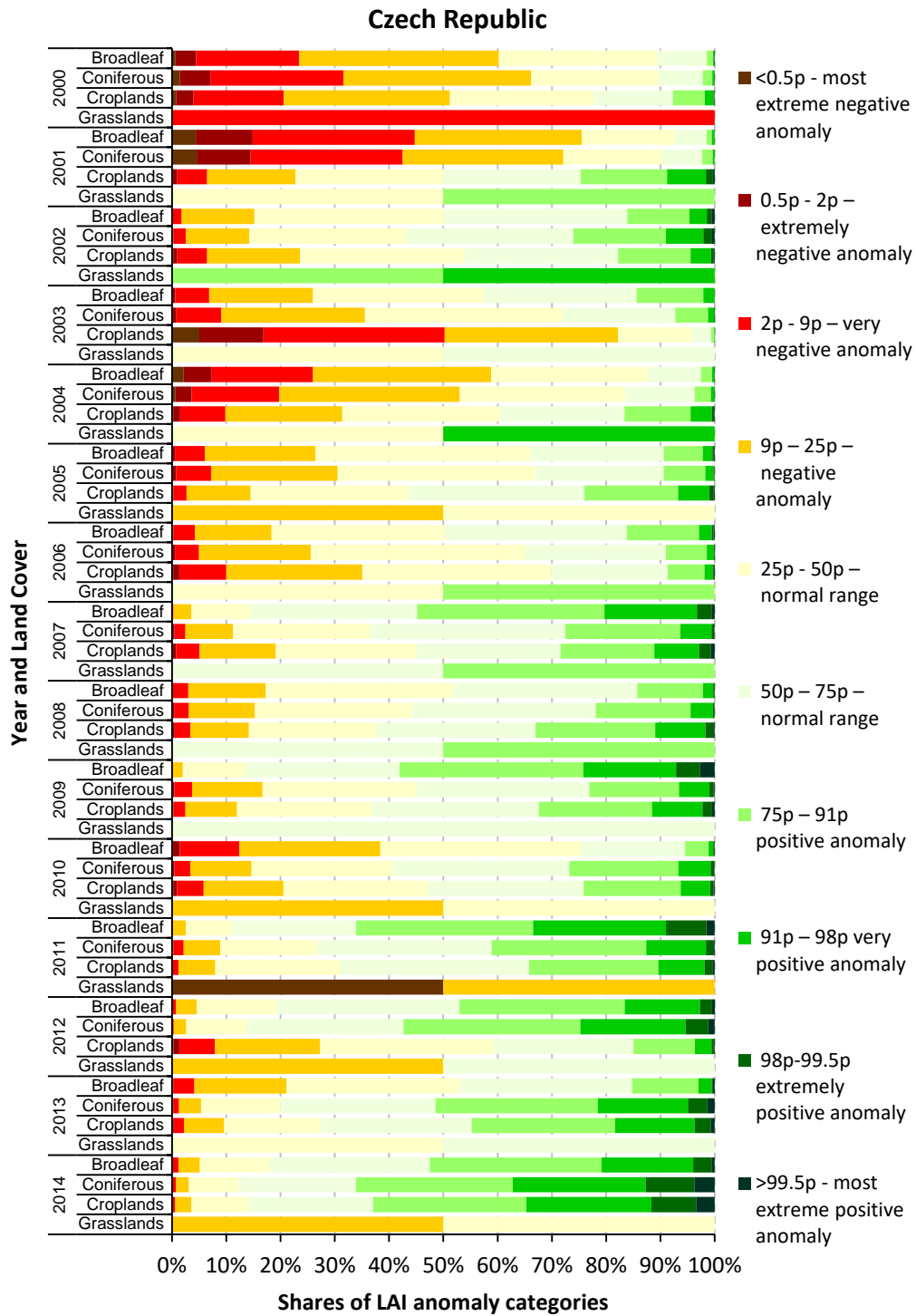


FIGURE S11c. Distribution of shares of LAI anomalies by categories according to the land cover and years for Czech Republic.

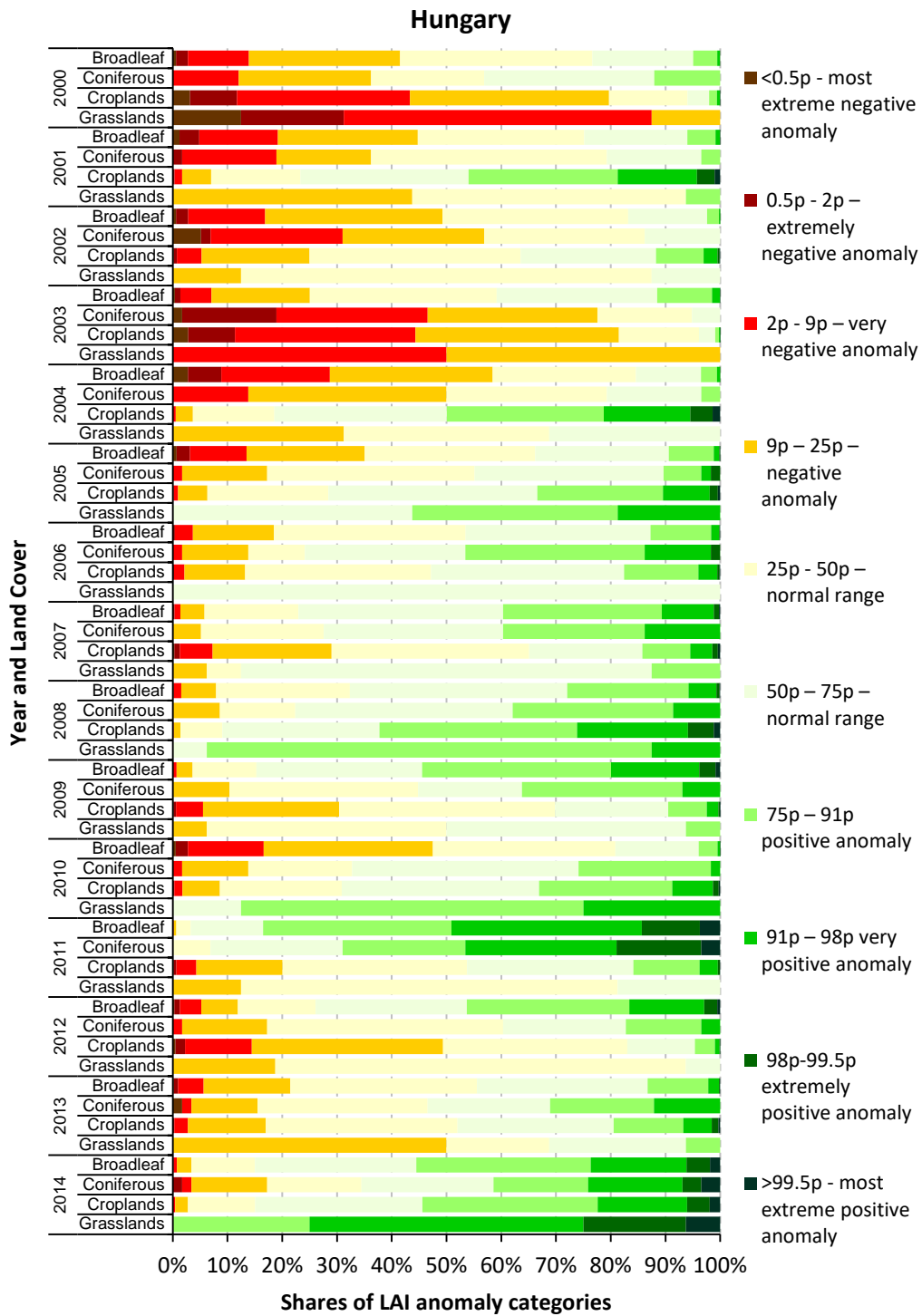


FIGURE S11d. Distribution of shares of LAI anomalies by categories according to the land cover and years for Hungary.

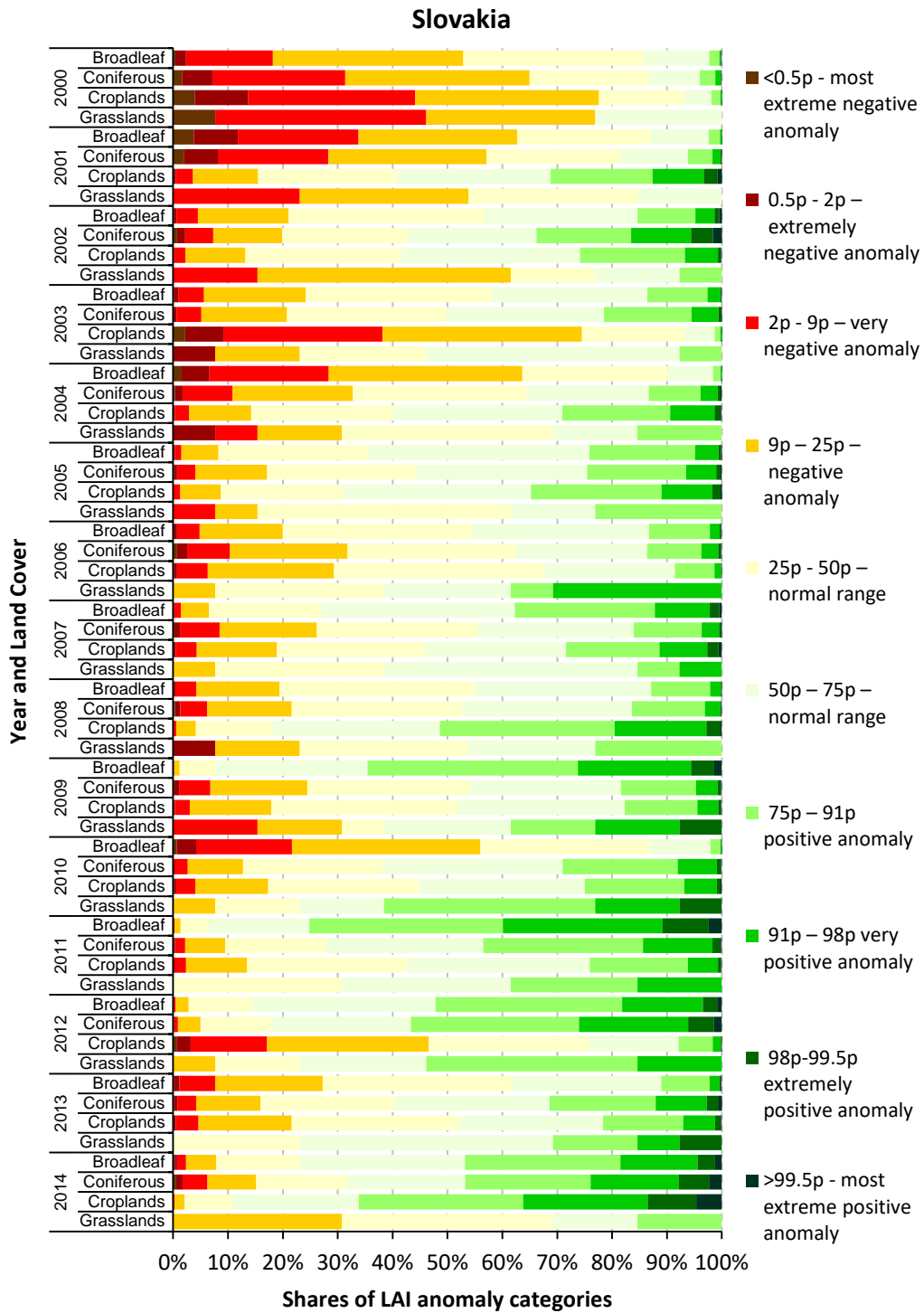


FIGURE S11e. Distribution of shares of LAI anomalies by categories according to the land cover and years for Slovakia.

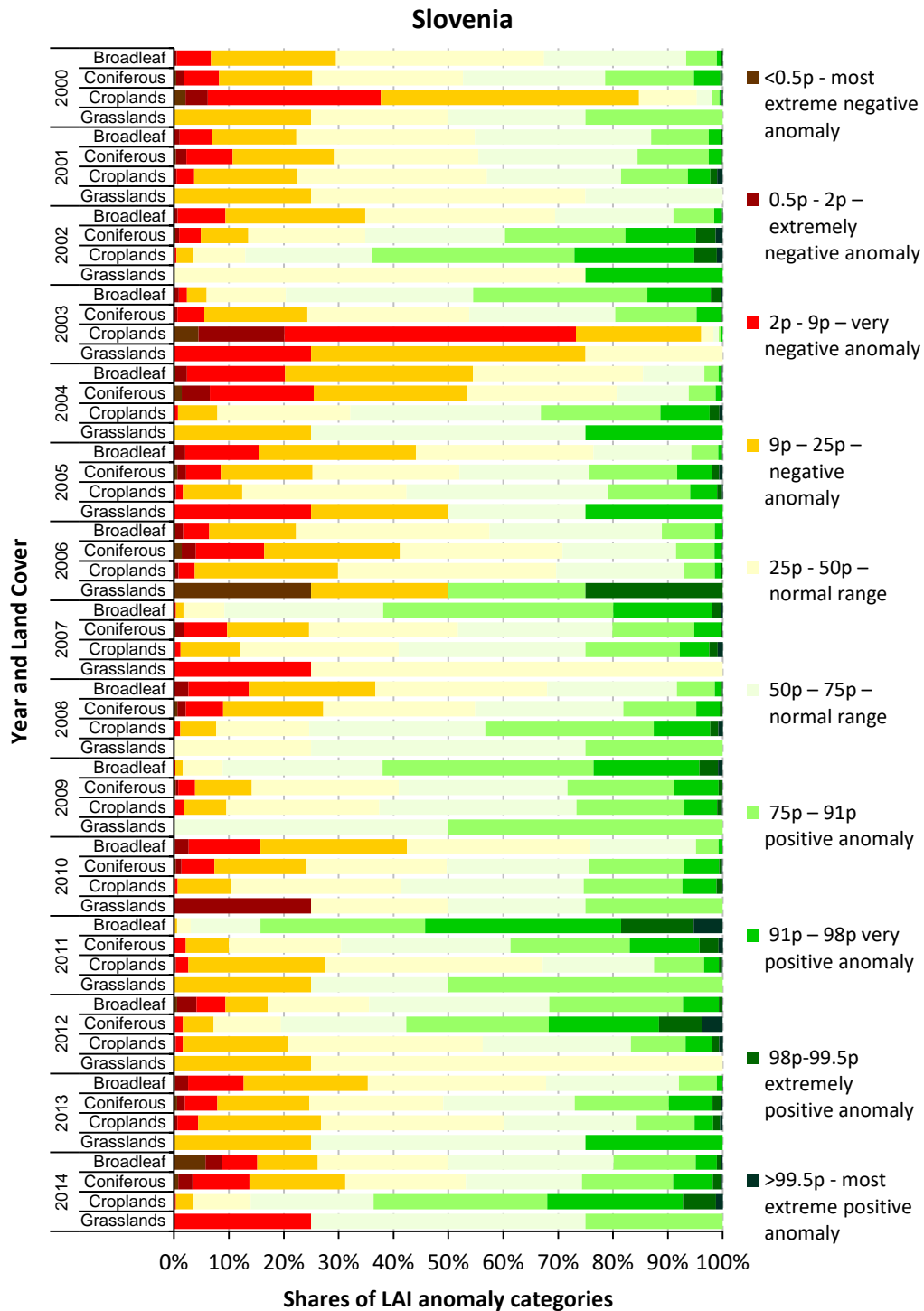


FIGURE S11f. Distribution of shares of LAI anomalies by categories according to the land cover and years for Slovenia.

Supplementary results based on the analysis of GPP

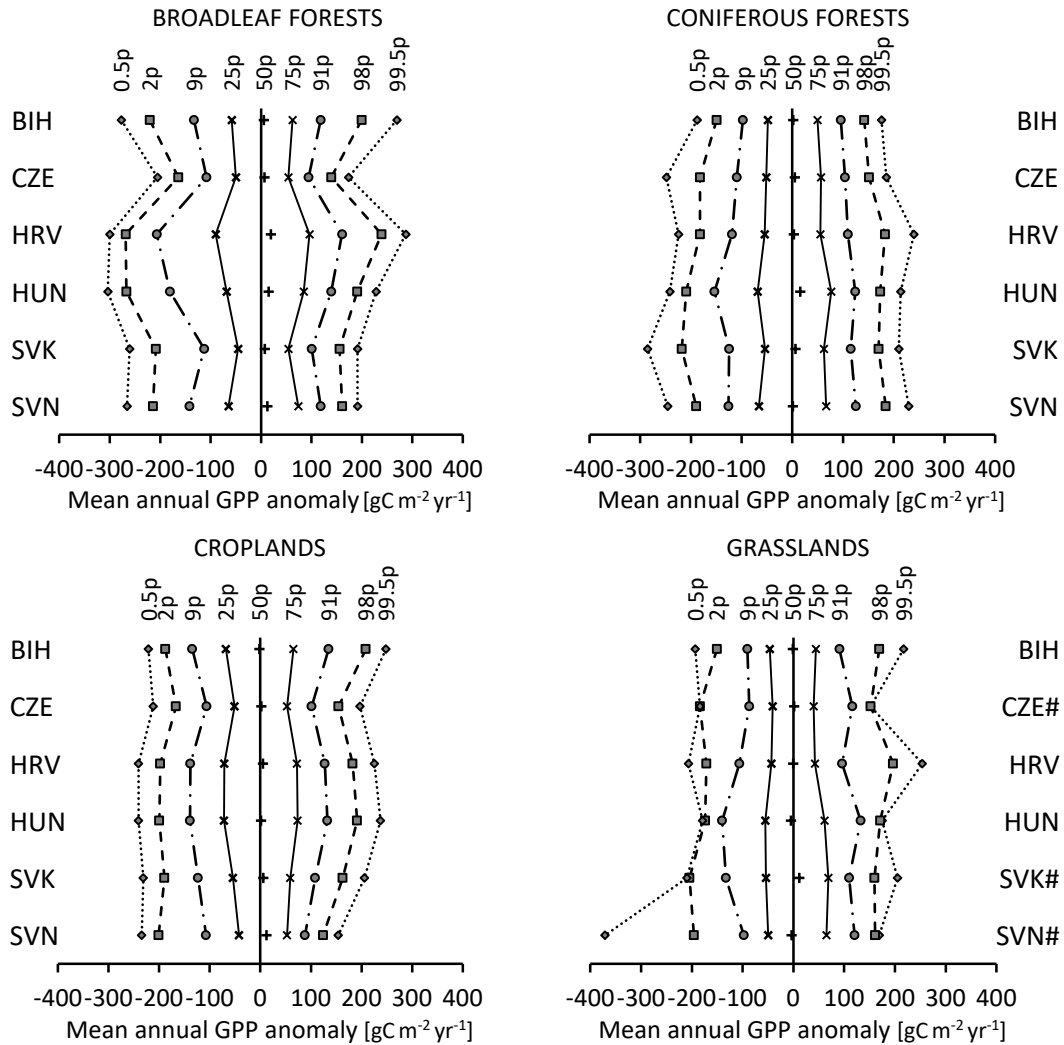


FIGURE S12. Categorization of mean annual GPP anomalies according to the land cover for countries in the study area (BIH - Bosnia and Herzegovina, CZE - Czech Republic; HRV - Croatia; HUN - Hungary; SVK - Slovakia; SVN - Slovenia; # - Insufficient number of pixels).

Table S5. Overview of the best and worst years and the extent (percent of the pixels) of the GPP anomaly with respect to different land cover categories and countries.

LC	Country	Worst year	2 nd worst year	Best year	2 nd best year
		(Share of pixels with very negative anomaly or worse)		(Share of pixels with very positive anomaly or better)	
Broadleaf forests	BIH	2005 (26.7%)	2004 (25.7%)	2014 (61.5%) ⁺	2007 (28.0%)
	CZE	2012 (34.0%)	2000 (26.6%)	2009 (51.7%) ⁺	2011 (21.0%)
	HRV	2012 (53.5%)	2003 (47.7%)	2014 (50.1%) ⁺	2001 (41.7%)
	HUN	2012 (87.6%) [§]	2003 (35.2%)	2001 (39.9%)	2005 (34.6%)
	SVK	2012 (71.6%) [§]	2003 (13.9%)	2011 (40.9%)	2000 (23.0%)
	SVN	2003 (44.9%)	2013 (38.2%)	2007 (29.7%)	2014 (22.6%)
Coniferous forests	BIH	2000 (43.6%)	2005 (27.3%)	2014 (67.6%) ⁺	2011 (32.6%)
	CZE	2001 (44.1%)	2000 (19.9%)	2011 (26.7%)	2014 (26.4%)
	HRV	2003 (77.5%) [§]	2012 (17.0%)	2014 (65.5%) ⁺	2001 (15.4%)
	HUN	2003 (81.0%) [§]	2012 (43.1%)	2005 (41.4%)	2014 (29.3%)
	SVK	2001 (44.9%)	2000 (30.7%)	2011 (25.6%)	2014 (18.1%)
	SVN	2013 (43.0%)	2003 (19.5%)	2011 (36.6%)	2007 (22.0%)
Croplands	BIH	2003 (46.7%)	2000 (35.7%)	2014 (52.8%) ⁺	2001 (36.2%)
	CZE	2003 (41.1%)	2000 (20.5%)	2014 (22.5%)	2011 (22.4%)
	HRV	2003 (65.4%) [§]	2012 (30.9%)	2001 (51.1%) ⁺	2004 (26.8%)
	HUN	2003 (50.5%) [§]	2012 (40.2%)	2001 (29.0%)	2004 (26.8%)
	SVK	2012 (45.4%)	2003 (45.2%)	2014 (26.0%)	2005 (23.7%)
	SVN	2003 (91.8%) [§]	2013 (21.3%)	2002 (37.5%)	2008 (27.9%)
Grasslands	BIH	2003 (56.0%) [§]	2000 (42.0%)	2014 (79.5%) ⁺	2010 (25.0%)
	CZE	#	#	#	#
	HRV	2003 (74.7%) [§]	2000 (26.0%)	2014 (82.3%) ⁺	2010 (26.2%)
	HUN	2003 (81.3%) [§]	2000 (56.3%) [§]	2014 (56.3%) ⁺	2008 (43.8%)
	SVK	#	#	#	#
	SVN	#	#	#	#

BIH - Bosnia and Herzegovina, CZE - Czech Republic; HRV- Croatia; HUN - Hungary; SVK - Slovakia; SVN - Slovenia; # - Insufficient number of pixels; § - Extremely bad year; + - Extremely good year

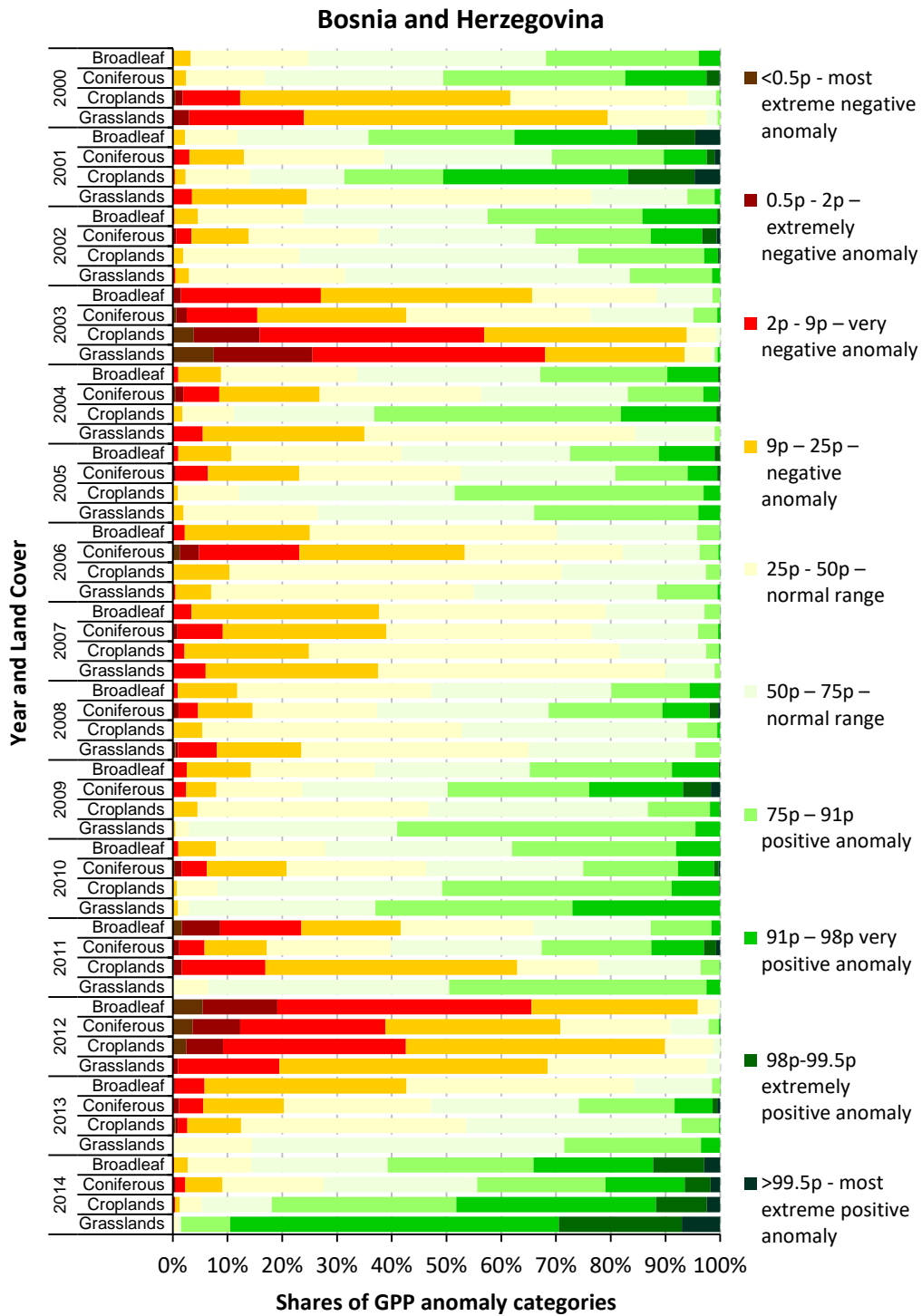


FIGURE S13a. Distribution of shares of GPP anomalies by categories according to the land cover and years for Bosnia and Herzegovina.

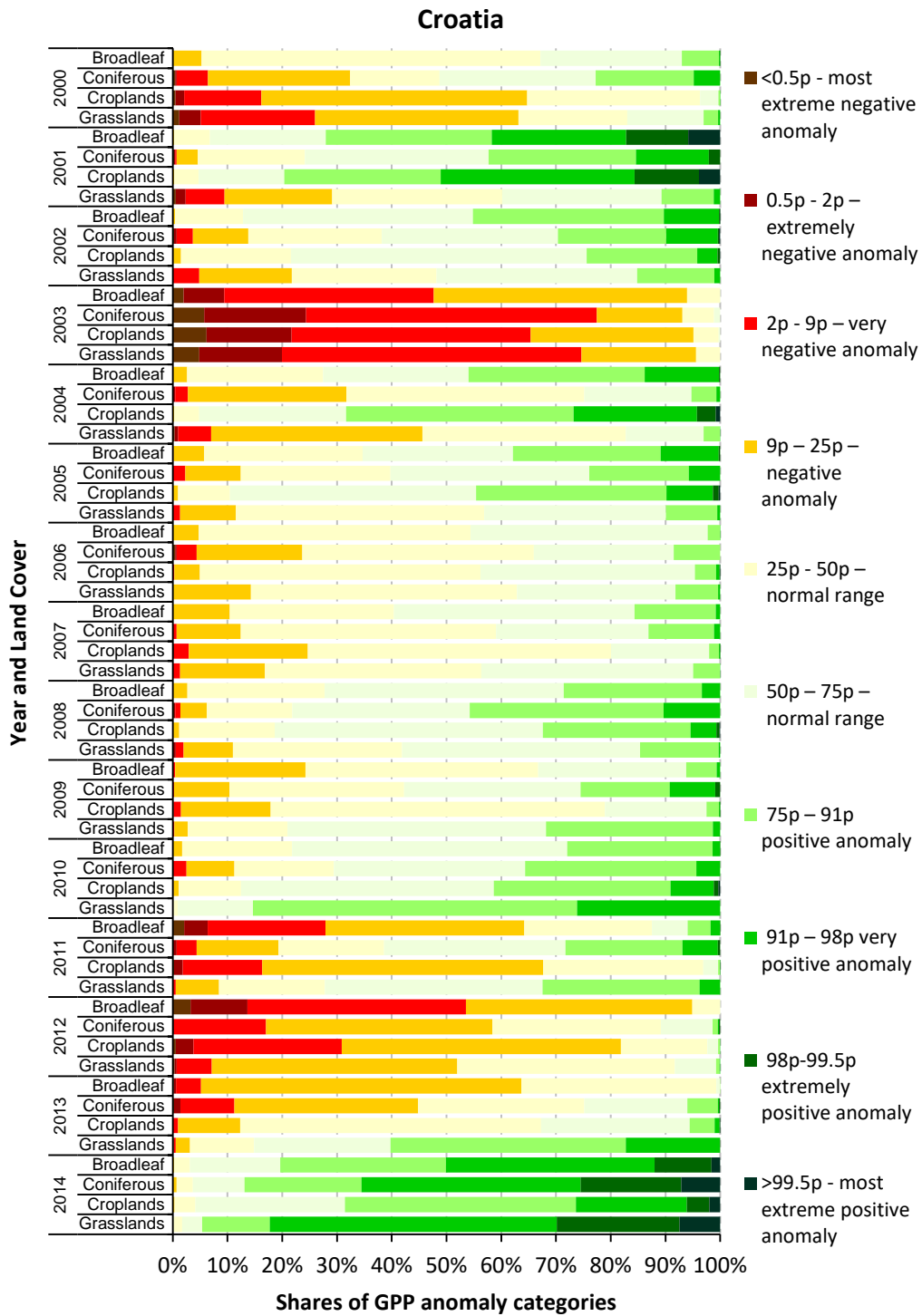


FIGURE S13b. Distribution of shares of GPP anomalies by categories according to the land cover and years for Croatia.

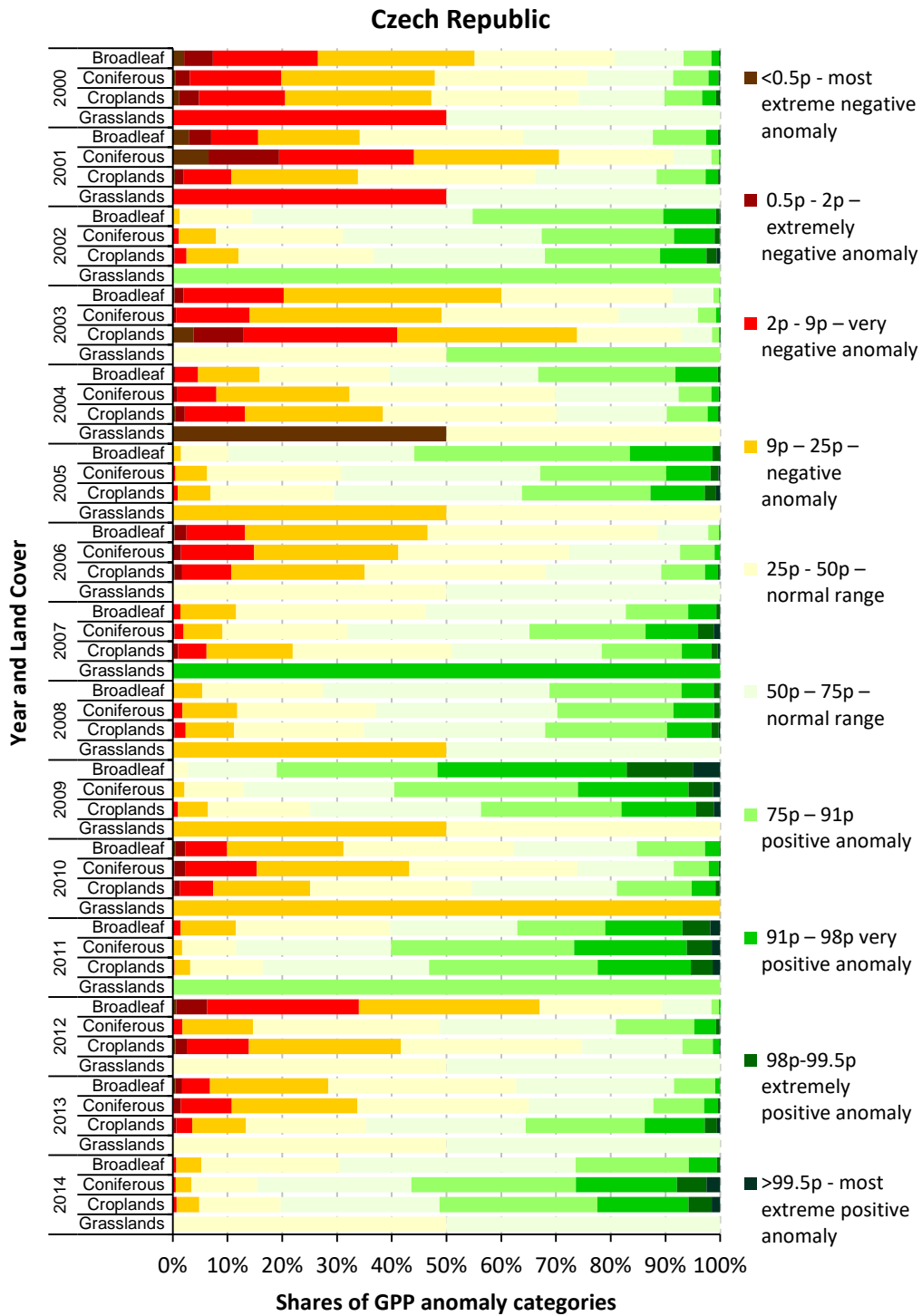


FIGURE S13c. Distribution of shares of GPP anomalies by categories according to the land cover and years for Czech Republic.

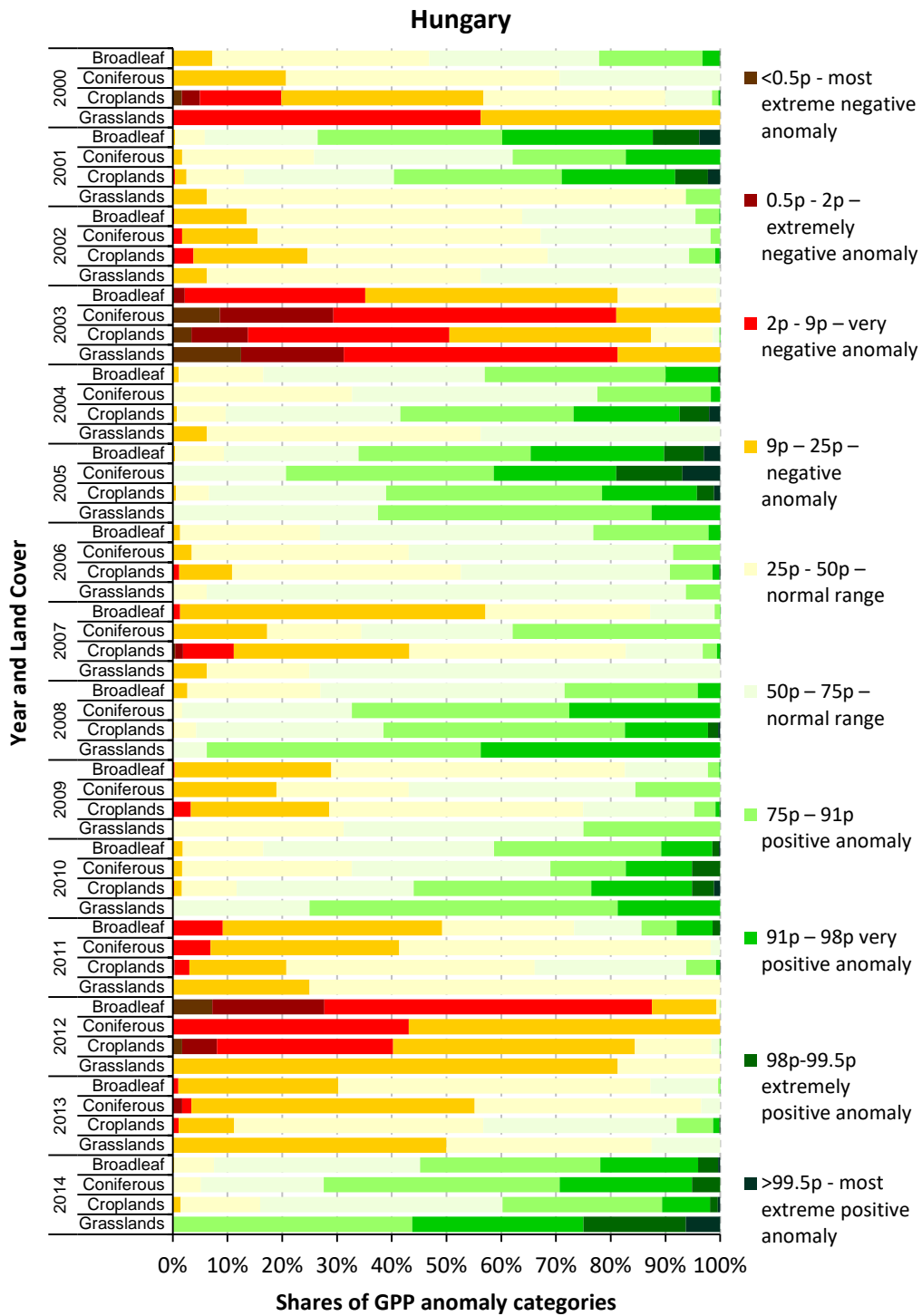


FIGURE S13d. Distribution of shares of GPP anomalies by categories according to the land cover and years for Hungary.

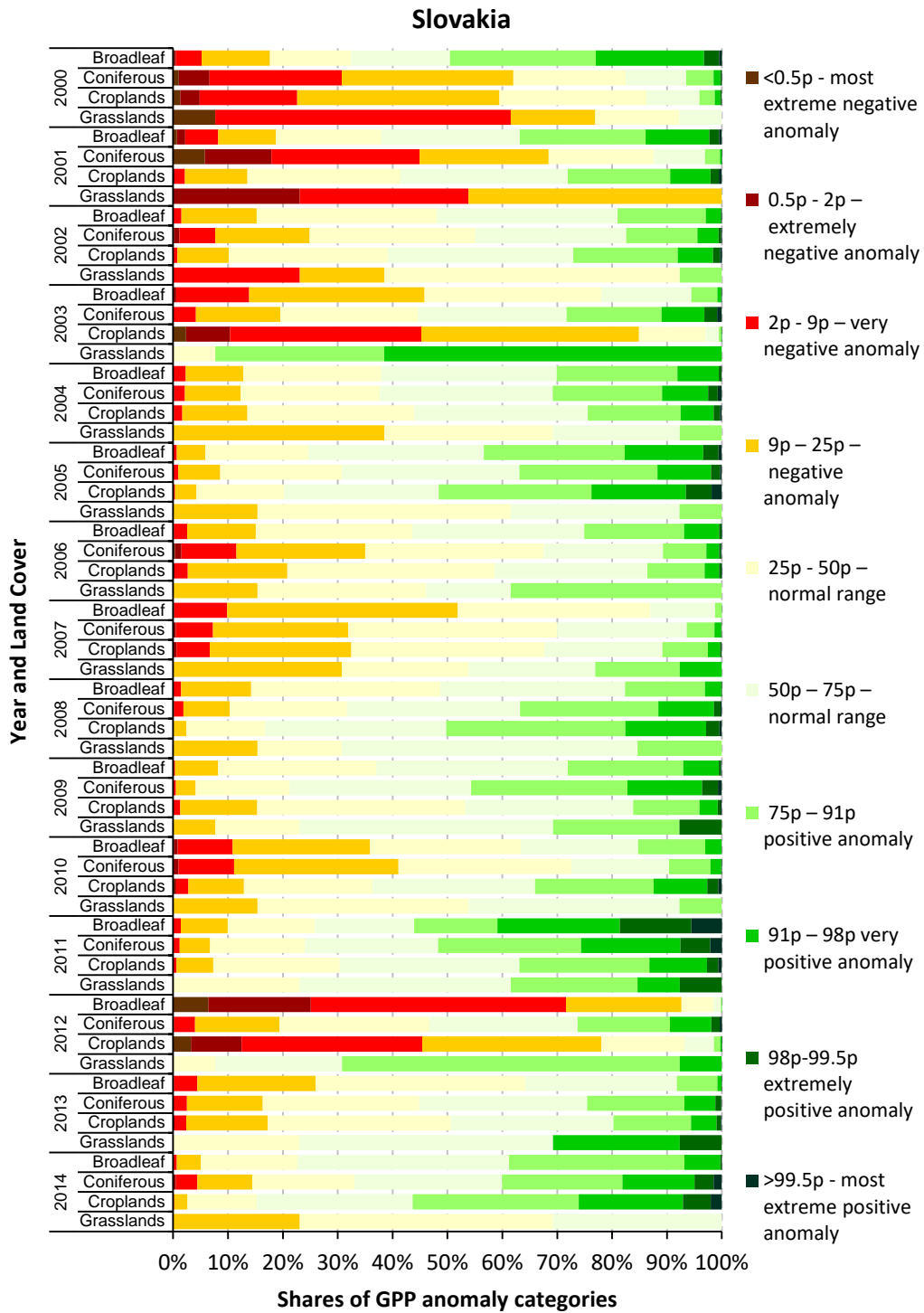


FIGURE S13e. Distribution of shares of GPP anomalies by categories according to the land cover and years for Slovakia.

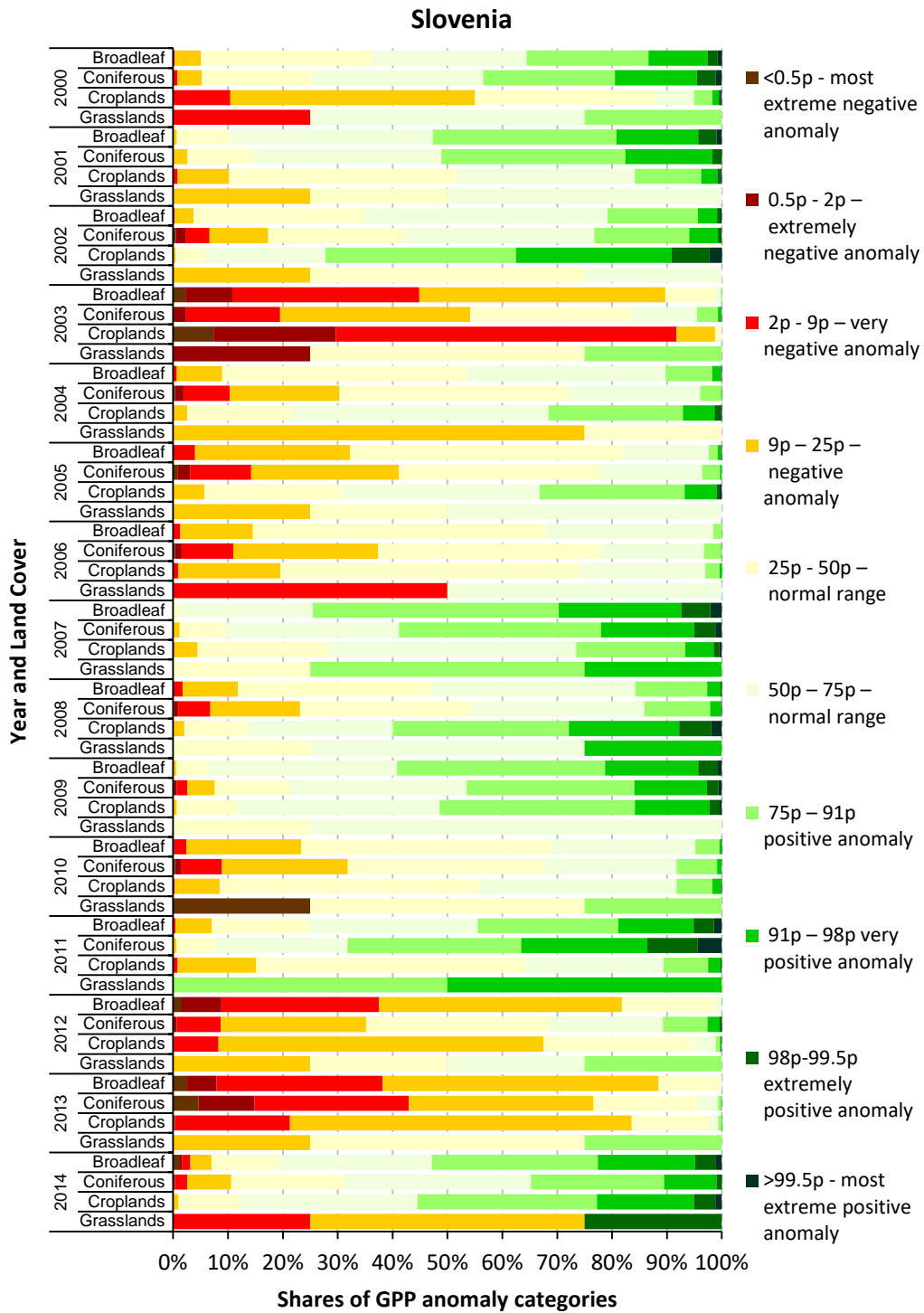


FIGURE S13f. Distribution of shares of GPP anomalies by categories according to the land cover and years for Slovenia.