0.1 Global mean budget

Left column shows global mean fluxes by dcpam, and right column shows those by Trenberth et al. (2009).

```
Rain   :   86.6814542245606 W m-2,     80
EvapB  :   86.788272613724 W m-2,      80
SensA  :   23.7023506587694 W m-2,     17
SLRA   :   70.9563726030976 W m-2,     63
SSRA   : -178.587652795161 W m-2,    -161
OLRA   :  241.140371474642 W m-2,     239
OSRA   : -240.61446140222 W m-2,    -239
Heating: 2.33343300722874 W m-2
Water  : 0.106818389299765 W m-2
```

0.2   Figures

Data from 1988 to 2007 are used for NCEP reanalysis, and those from 1982 to 2001 are used for ECMWF reanalysis.
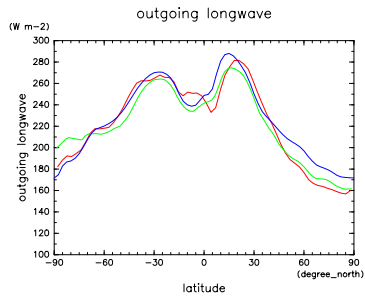
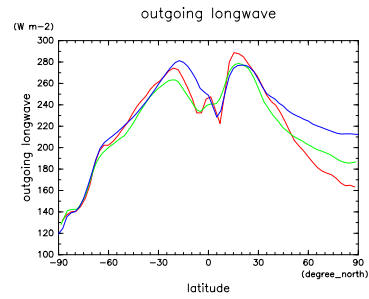Figure 1: OLRA at Jan. by dcpam (red), NCEP (green), and ECMWF (blue)

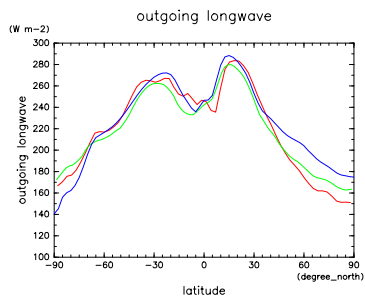Figure 4: OLRA at Apr. by dcpam (red), NCEP (green), and ECMWF (blue)

Figure 2: OLRA at Feb. by dcpam (red), NCEP (green), and ECMWF (blue)
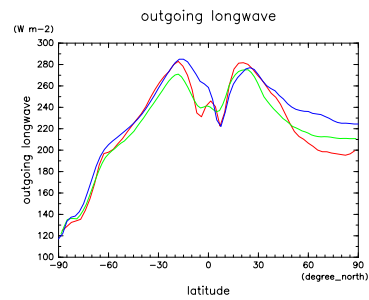

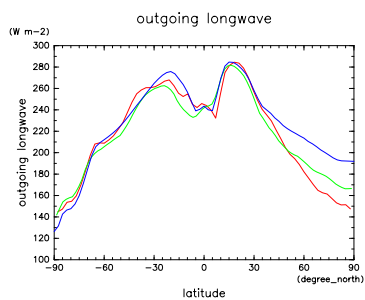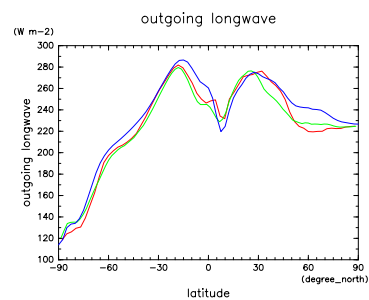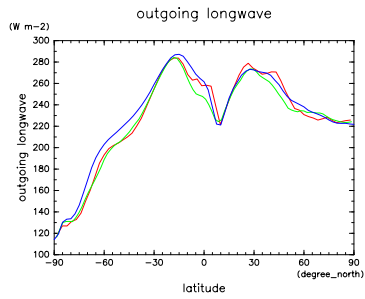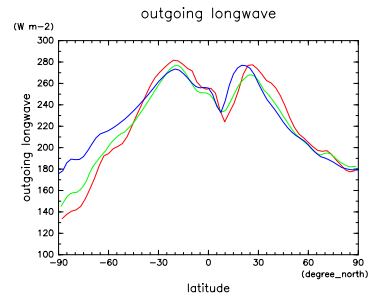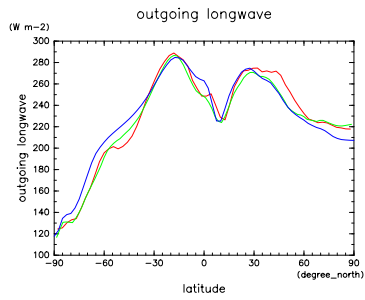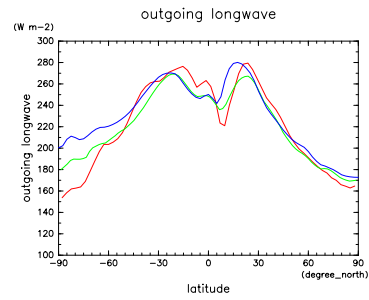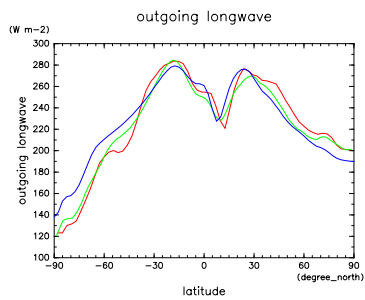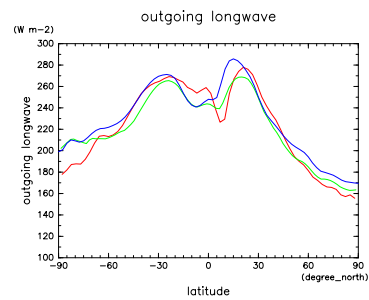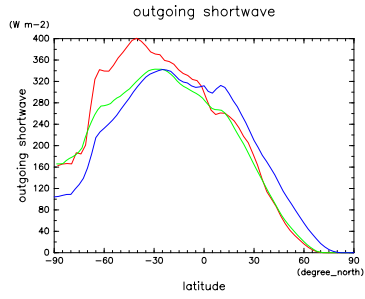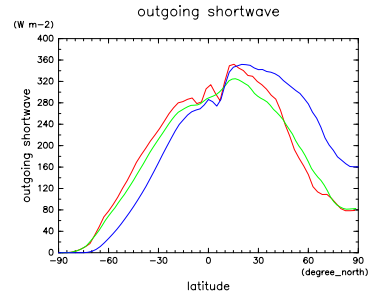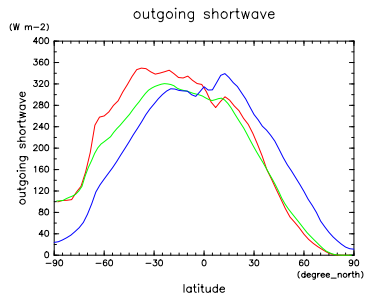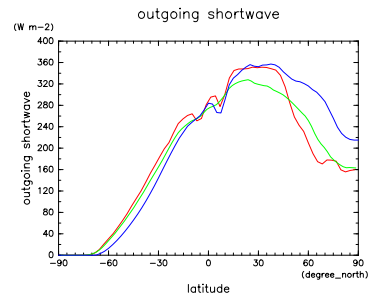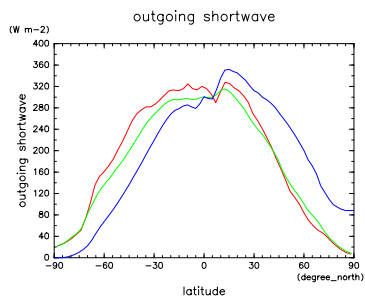Figure 5: OLRA at May by dcpam (red), NCEP (green), and ECMWF (blue)

Figure 3: OLRA at Mar. by dcpam (red), NCEP (green), and ECMWF (blue)

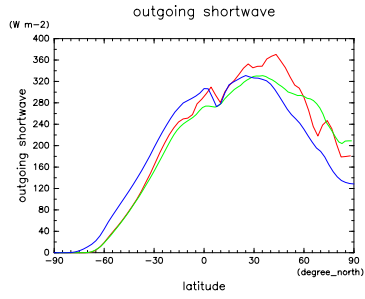Figure 6: OLRA at Jun. by dcpam (red), NCEP (green), and ECMWF (blue)

3

outgoing longwave

(W m−2)

outgoing longwave

latitude (degree_north)

outgoing longwave

(W m−2)

outgoing longwave

latitude (degree_north)

Figure 7: OLRA at Jul. by dcpam (red), NCEP (green), and ECMWF (blue)

Figure 10: OLRA at Oct. by dcpam (red), NCEP (green), and ECMWF (blue)

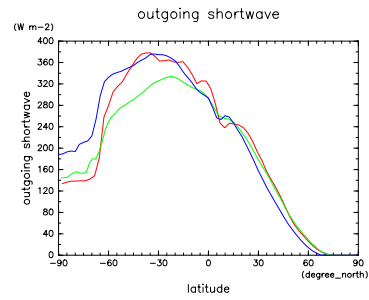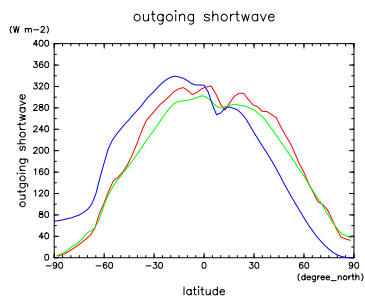outgoing longwave

(W m−2)

outgoing longwave

latitude (degree_north)

outgoing longwave

(W m−2)

outgoing longwave

latitude (degree_north)

Figure 8: OLRA at Aug. by dcpam (red), NCEP (green), and ECMWF (blue)

Figure 11: OLRA at Nov. by dcpam (red), NCEP (green), and ECMWF (blue)

outgoing longwave

(W m−2)

outgoing longwave

latitude (degree_north)

outgoing longwave

(W m−2)

outgoing longwave

latitude (degree_north)

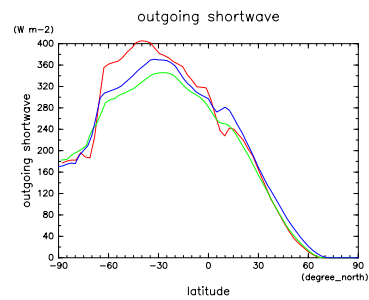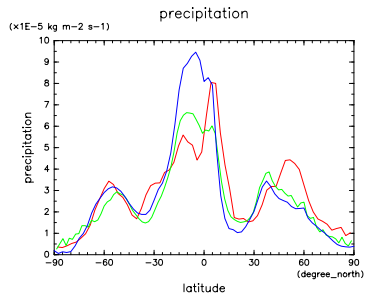Figure 9: OLRA at Sep. by dcpam (red), NCEP (green), and ECMWF (blue)

Figure 12: OLRA at Dec. by dcpam (red), NCEP (green), and ECMWF (blue)

4

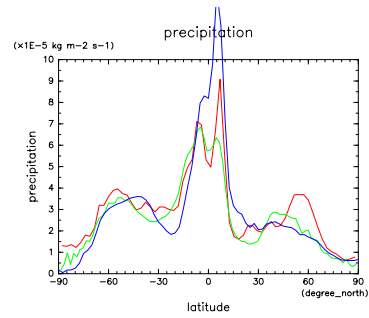Figure 13: OSRA at Jan. by dcpam (red), NCEP (green), and ECMWF (blue)

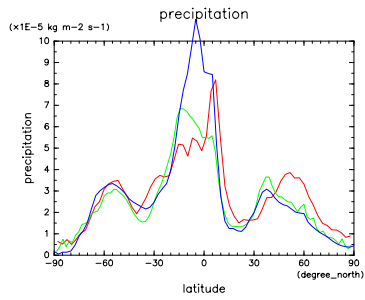Figure 16: OSRA at Apr. by dcpam (red), NCEP (green), and ECMWF (blue)

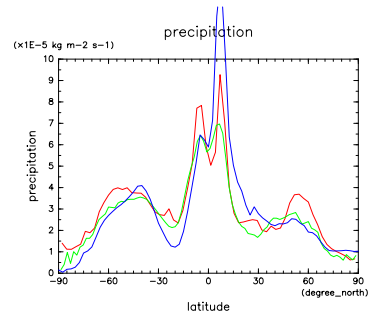Figure 14: OSRA at Feb. by dcpam (red), NCEP (green), and ECMWF (blue)

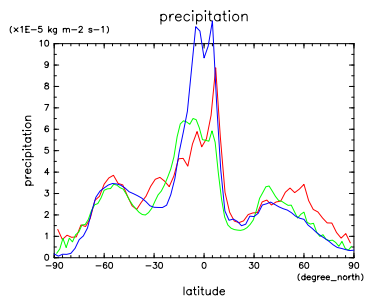Figure 17: OSRA at May by dcpam (red), NCEP (green), and ECMWF (blue)

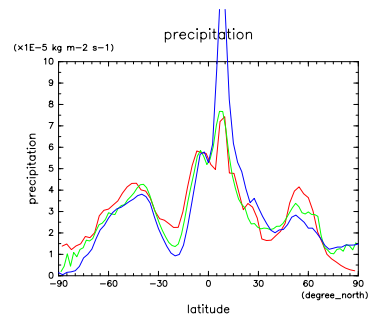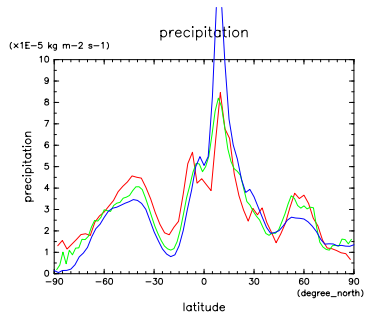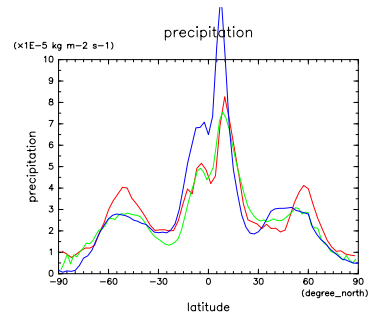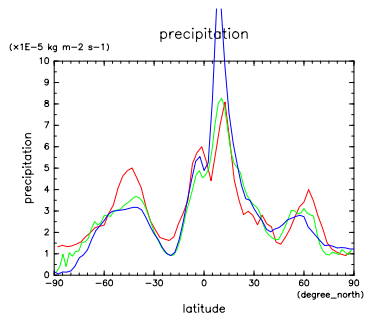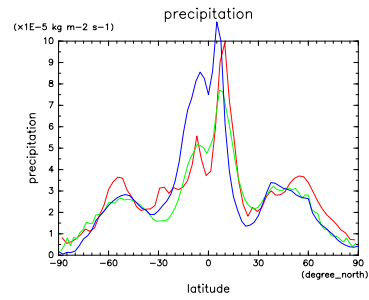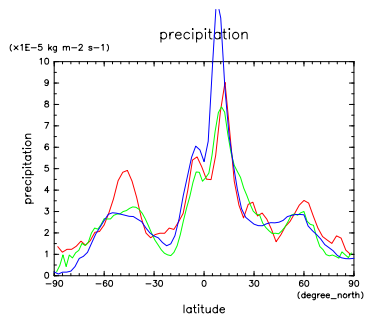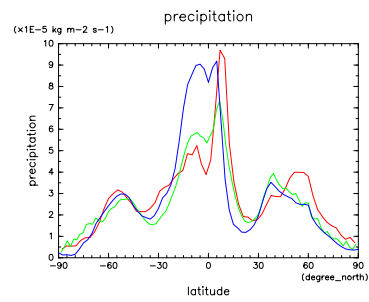Figure 15: OSRA at Mar. by dcpam (red), NCEP (green), and ECMWF (blue)
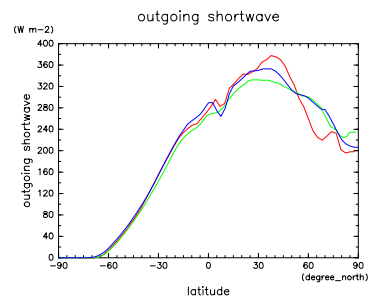
Figure 18: OSRA at Jun. by dcpam (red), NCEP (green), and ECMWF (blue)

5

outgoing shortwave

Figure 19: OSRA at Jul. by dcpam (red), NCEP (green), and ECMWF (blue)

outgoing shortwave
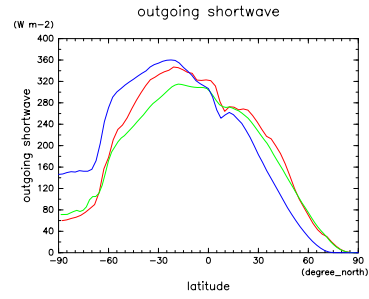
Figure 22: OSRA at Oct. by dcpam (red), NCEP (green), and ECMWF (blue)

outgoing shortwave
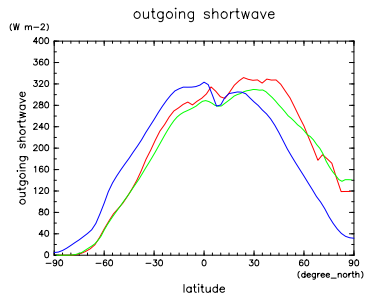
Figure 20: OSRA at Aug. by dcpam (red), NCEP (green), and ECMWF (blue)

outgoing shortwave

Figure 23: OSRA at Nov. by dcpam (red), NCEP (green), and ECMWF (blue)

outgoing shortwave

Figure 21: OSRA at Sep. by dcpam (red), NCEP (green), and ECMWF (blue)

outgoing shortwave

Figure 24: OSRA at Dec. by dcpam (red), NCEP (green), and ECMWF (blue)

6

Figure 25: Rain at Jan. by dcpam (red), NCEP (green), and ECMWF (blue)

Figure 28: Rain at Apr. by dcpam (red), NCEP (green), and ECMWF (blue)

Figure 26: Rain at Feb. by dcpam (red), NCEP (green), and ECMWF (blue)

Figure 29: Rain at May by dcpam (red), NCEP (green), and ECMWF (blue)

Figure 27: Rain at Mar. by dcpam (red), NCEP (green), and ECMWF (blue)

Figure 30: Rain at Jun. by dcpam (red), NCEP (green), and ECMWF (blue)

7

Figure 31: Rain at Jul. by dcpam (red), NCEP (green), and ECMWF (blue)

Figure 34: Rain at Oct. by dcpam (red), NCEP (green), and ECMWF (blue)

Figure 32: Rain at Aug. by dcpam (red), NCEP (green), and ECMWF (blue)

Figure 35: Rain at Nov. by dcpam (red), NCEP (green), and ECMWF (blue)

Figure 33: Rain at Sep. by dcpam (red), NCEP (green), and ECMWF (blue)

Figure 36: Rain at Dec. by dcpam (red), NCEP (green), and ECMWF (blue)

8
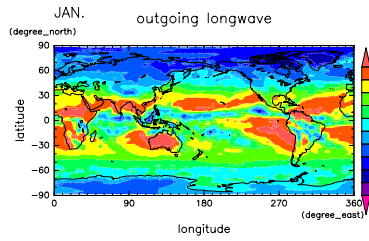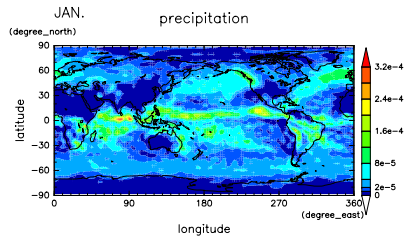
Figure 37: OLR at Jan. by dcpam
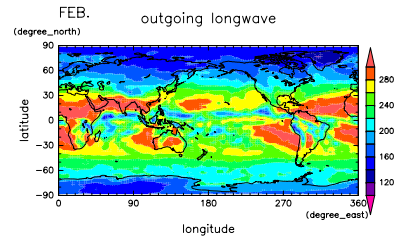
Figure 40: OLR at Feb. by dcpam
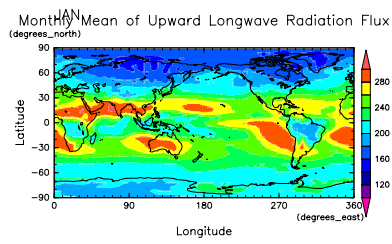
Figure 38: OLR at Jan. by NCEP
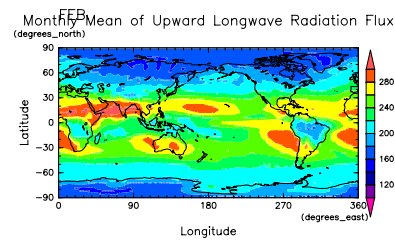

Figure 41: OLR at Feb. by NCEP
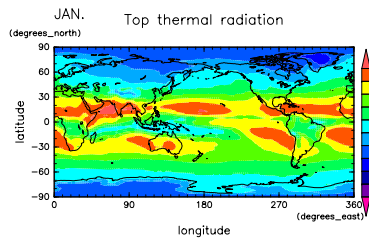
Figure 39: OLR at Jan. by ECMWF
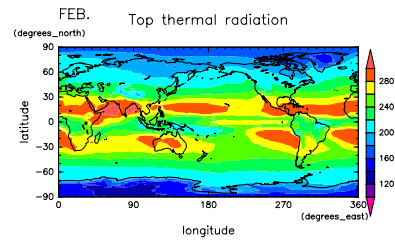
Figure 42: OLR at Feb. by ECMWF

9
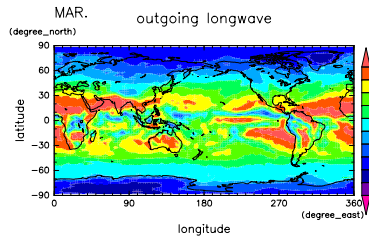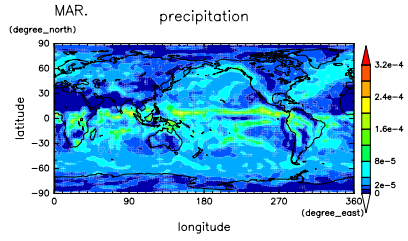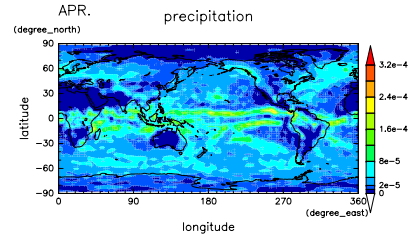
Figure 43: OLR at Mar. by dcpam
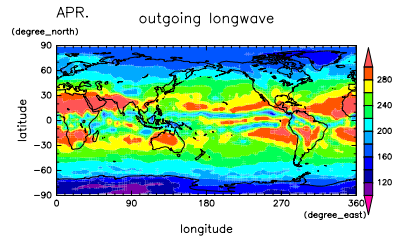
Figure 46: OLR at Apr. by dcpam
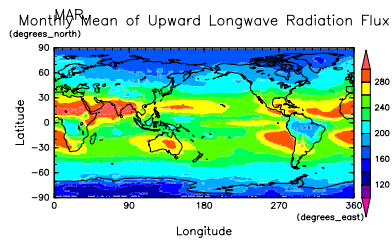
Figure 44: OLR at Mar. by NCEP
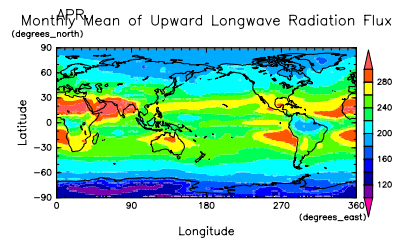
Figure 47: OLR at Apr. by NCEP
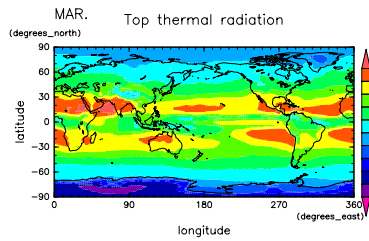
Figure 45: OLR at Mar. by ECMWF
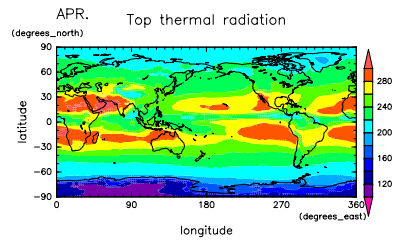

Figure 48: OLR at Apr. by ECMWF

10
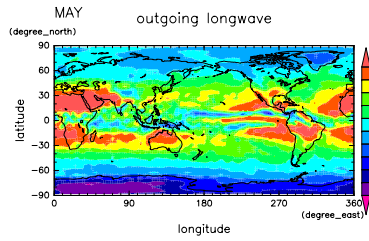
Figure 49: OLR at May by dcpam
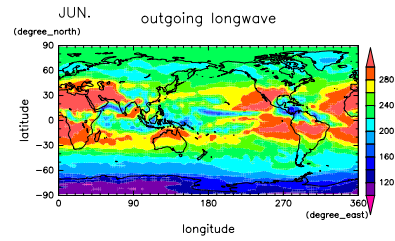
Figure 52: OLR at Jun. by dcpam
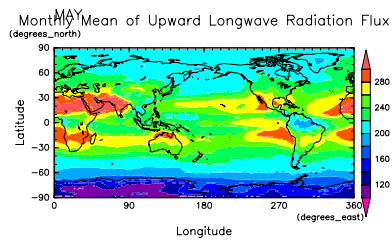
Figure 50: OLR at May by NCEP
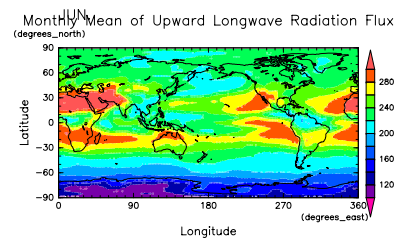
Figure 53: OLR at Jun. by NCEP
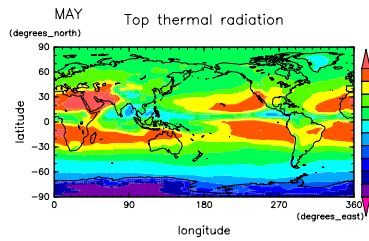
Figure 51: OLR at May by ECMWF
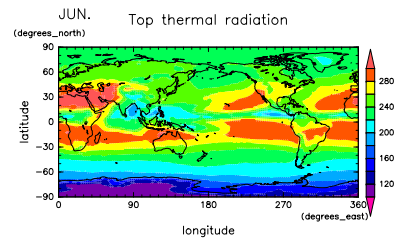
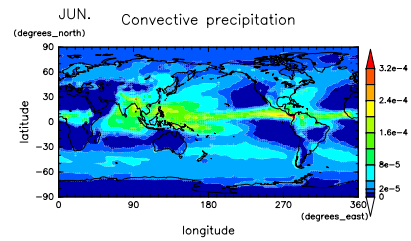Figure 54: OLR at Jun. by ECMWF
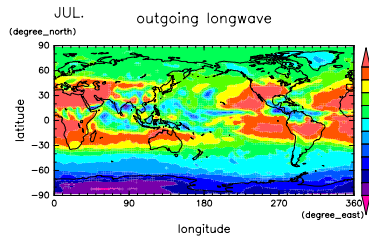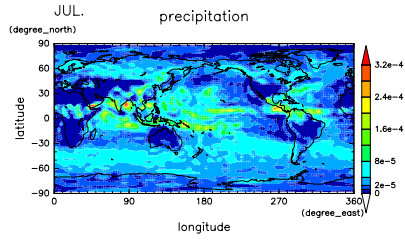
Figure 55: OLR at Jul. by dcpam
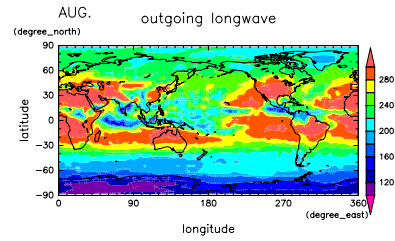
Figure 58: OLR at Aug. by dcpam
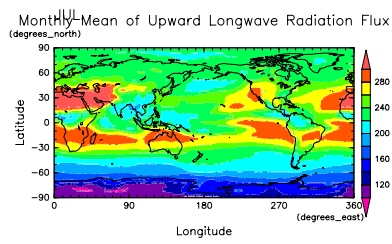
Figure 56: OLR at Jul. by NCEP
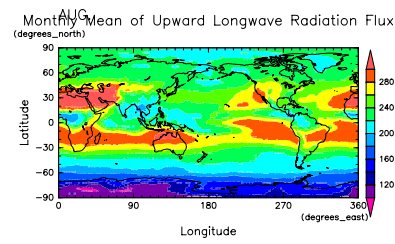
Figure 59: OLR at Aug. by NCEP
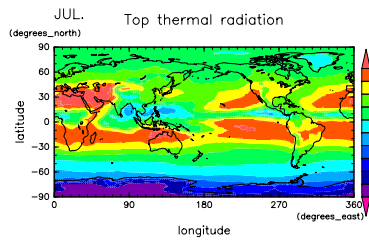
Figure 57: OLR at Jul. by ECMWF
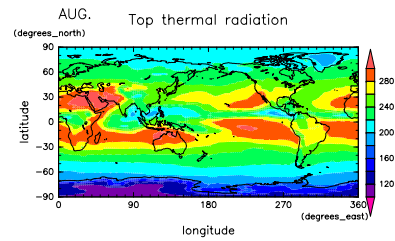
Figure 60: OLR at Aug. by ECMWF
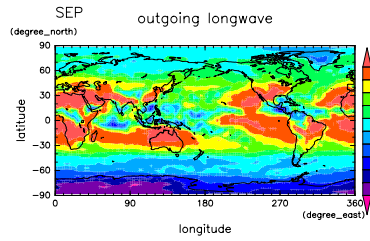
Figure 61: OLR at Sep. by dcpam
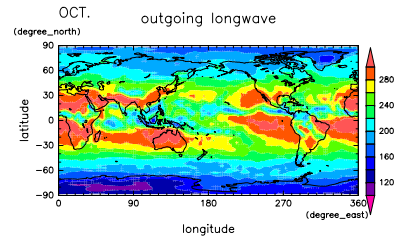
Figure 64: OLR at Oct. by dcpam
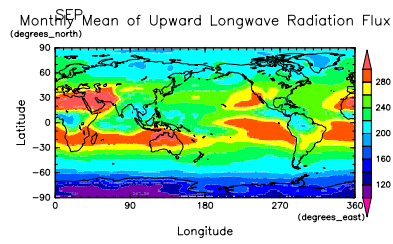
Figure 62: OLR at Sep. by NCEP
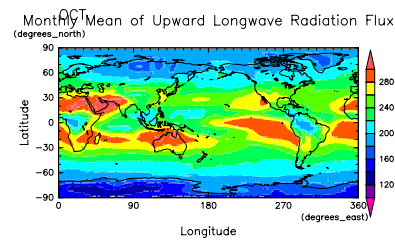
Figure 65: OLR at Oct. by NCEP
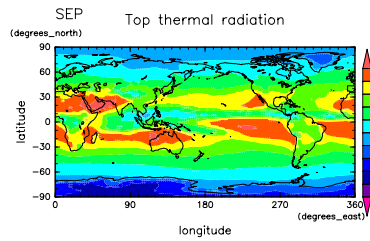
Figure 63: OLR at Sep. by ECMWF
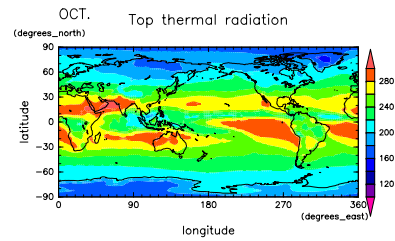
Figure 66: OLR at Oct. by ECMWF

13
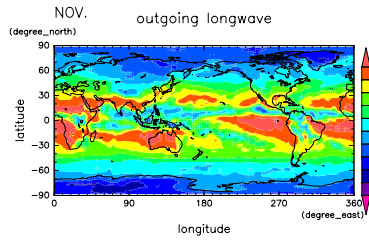
Figure 67: OLR at Nov. by dcpam
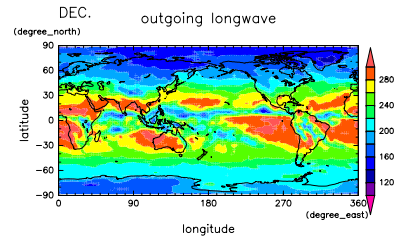
Figure 70: OLR at Dec. by dcpam
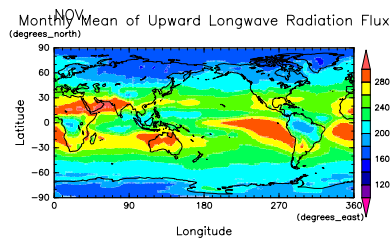
Figure 68: OLR at Nov. by NCEP
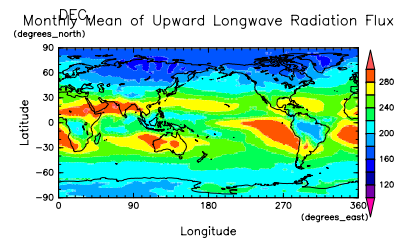
Figure 71: OLR at Dec. by NCEP
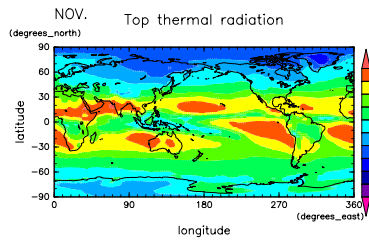
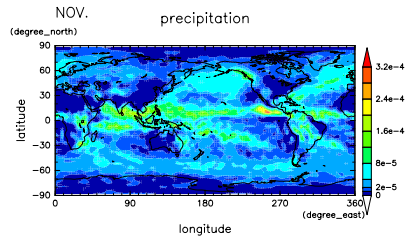Figure 69: OLR at Nov. by ECMWF
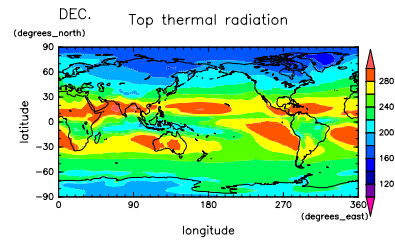
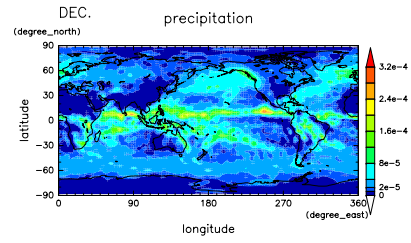Figure 72: OLR at Dec. by ECMWF

14

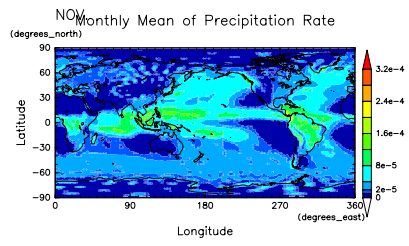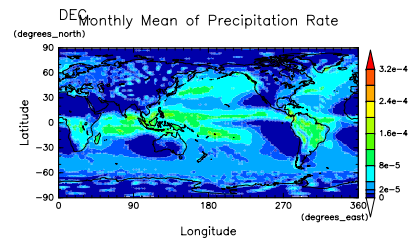Figure 73: Rain at Jan. by dcpam
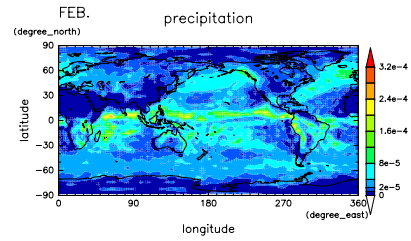
Figure 76: Rain at Feb. by dcpam
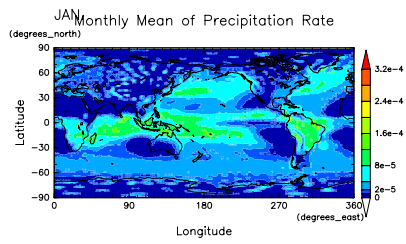
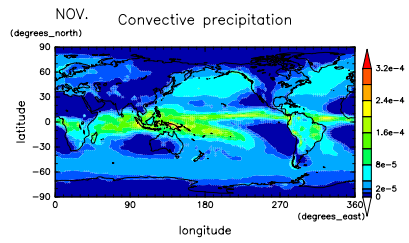Figure 74: Rain at Jan. by NCEP
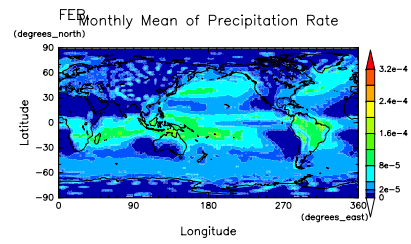
Figure 77: Rain at Feb. by NCEP
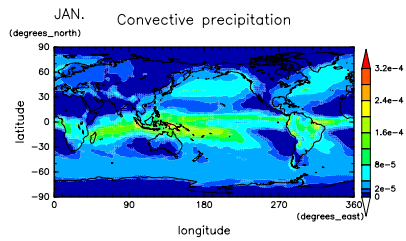
Figure 75: Rain at Jan. by ECMWF
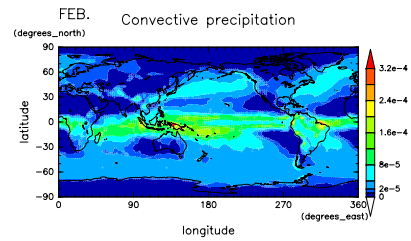
Figure 78: Rain at Feb. by ECMWF

Figure 79: Rain at Mar. by dcpam

Figure 82: Rain at Apr. by dcpam
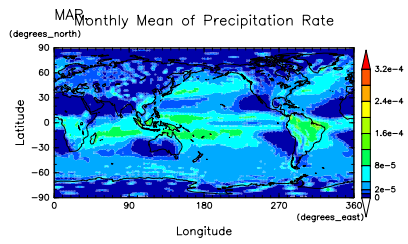
Figure 80: Rain at Mar. by NCEP
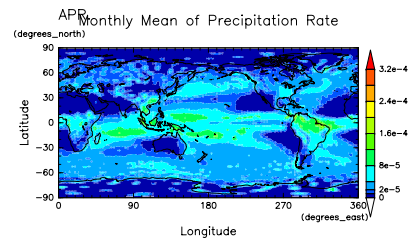
Figure 83: Rain at Apr. by NCEP
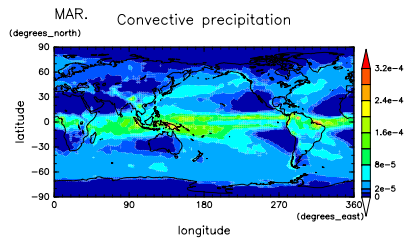
Figure 81: Rain at Mar. by ECMWF
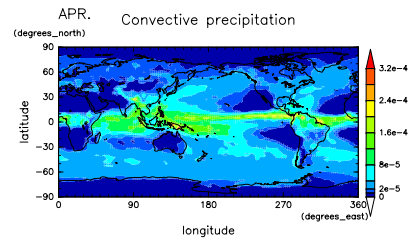
Figure 84: Rain at Apr. by ECMWF
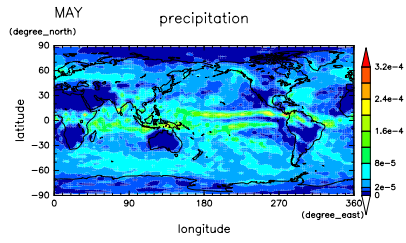
Figure 85: Rain at May by dcpam
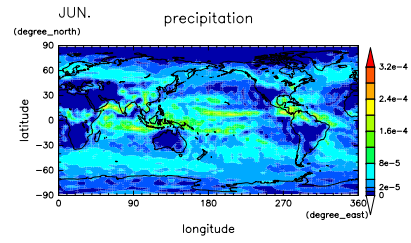
Figure 88: Rain at Jun. by dcpam
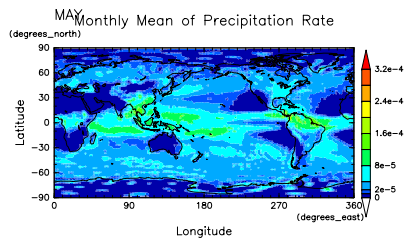
Figure 86: Rain at May by NCEP
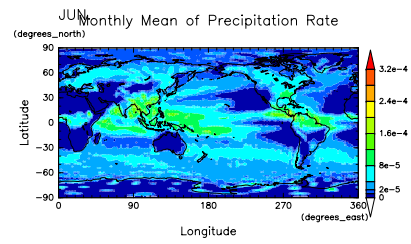
Figure 89: Rain at Jun. by NCEP
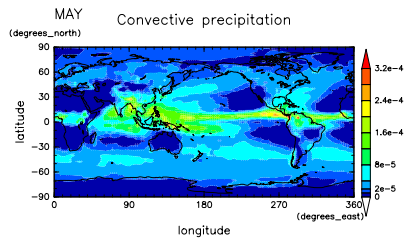
Figure 87: Rain at May by ECMWF

Figure 90: Rain at Jun. by ECMWF

17

Figure 91: Rain at Jul. by dcpam
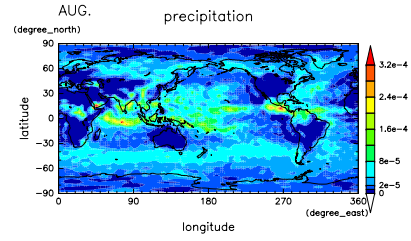
Figure 94: Rain at Aug. by dcpam
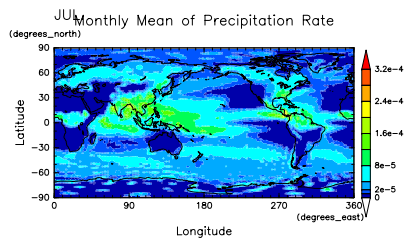
Figure 92: Rain at Jul. by NCEP
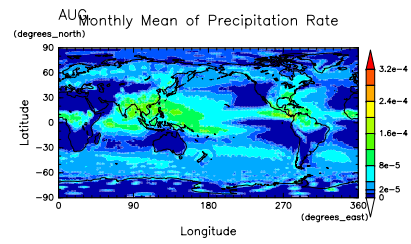
Figure 95: Rain at Aug. by NCEP
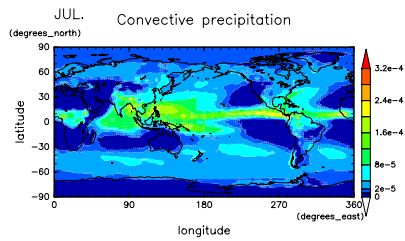
Figure 93: Rain at Jul. by ECMWF
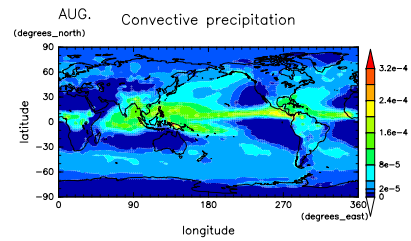
Figure 96: Rain at Aug. by ECMWF
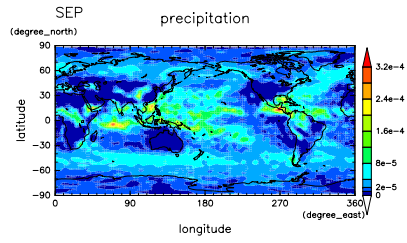
Figure 97: Rain at Sep. by dcpam
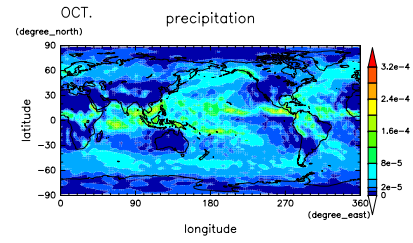
Figure 100: Rain at Oct. by dcpam
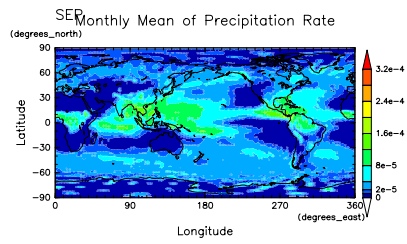
Figure 98: Rain at Sep. by NCEP
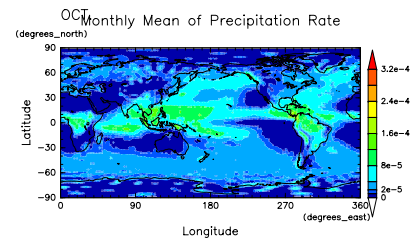
Figure 101: Rain at Oct. by NCEP
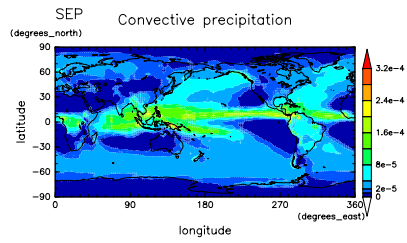
Figure 99: Rain at Sep. by ECMWF
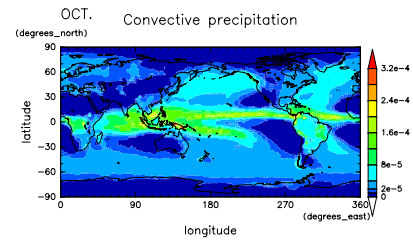
Figure 102: Rain at Oct. by ECMWF

19

Figure 103: Rain at Nov. by dcpam

Figure 106: Rain at Dec. by dcpam

Figure 104: Rain at Nov. by NCEP

Figure 107: Rain at Dec. by NCEP

Figure 105: Rain at Nov. by ECMWF
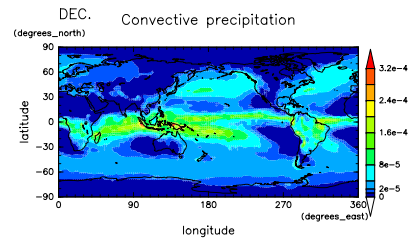
Figure 108: Rain at Dec. by ECMWF
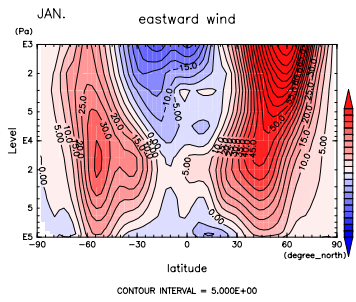
Figure 109: U at Jan. by dcpam
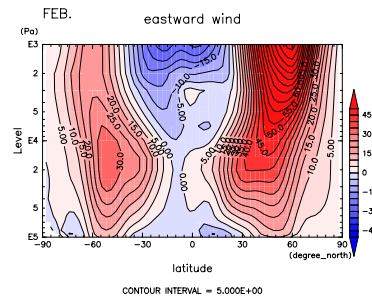
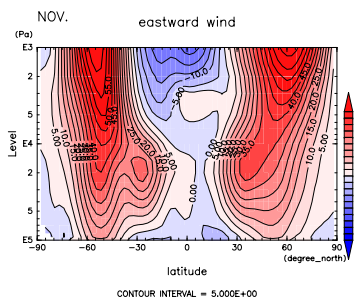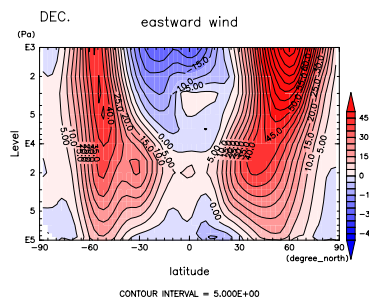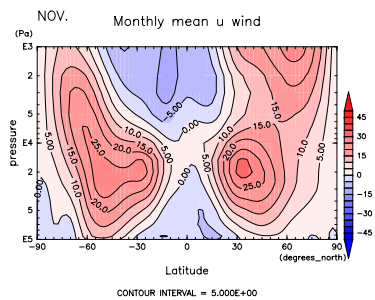Figure 112: U at Feb. by dcpam
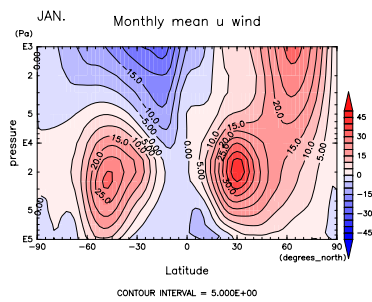
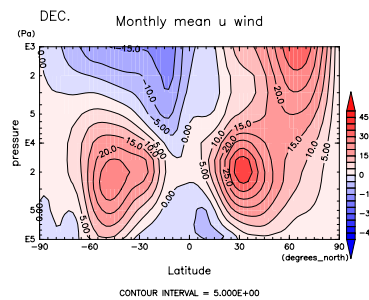Figure 110: U at Jan. by NCEP
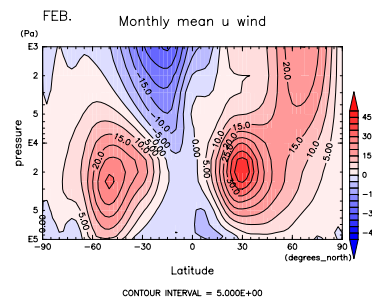
Figure 113: U at Feb. by NCEP
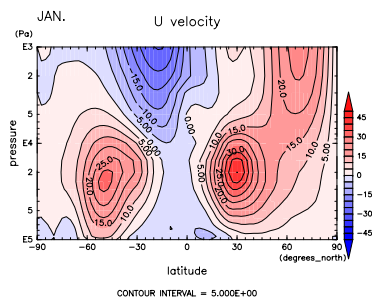
Figure 111: U at Jan. by ECMWF
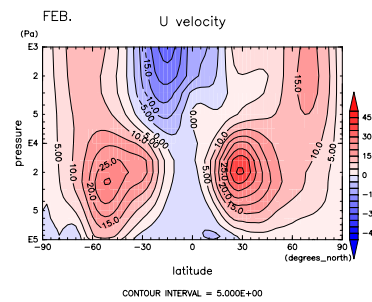
Figure 114: U at Feb. by ECMWF

21
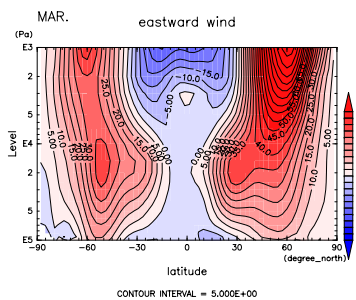
Figure 115: U at Mar. by dcpam
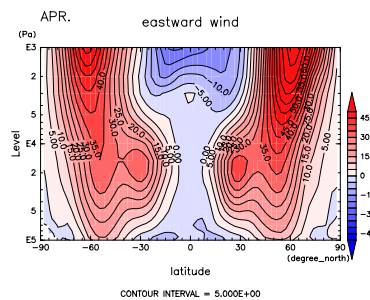
Figure 118: U at Apr. by dcpam
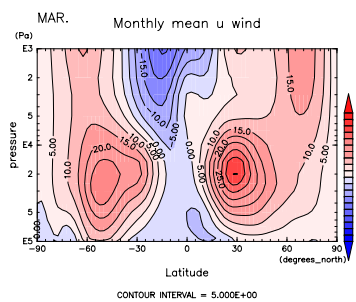
Figure 116: U at Mar. by NCEP
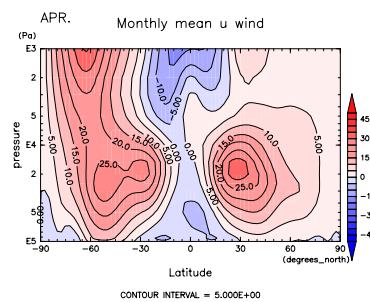
Figure 119: U at Apr. by NCEP
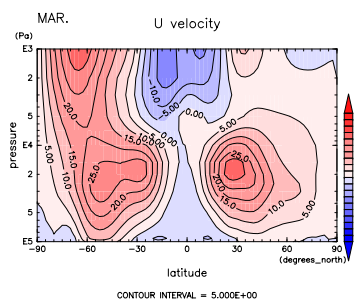
Figure 117: U at Mar. by ECMWF
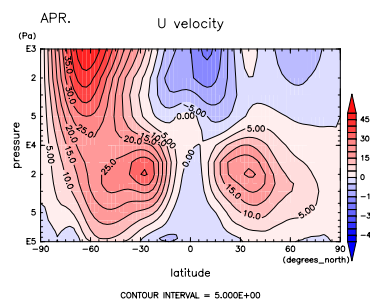
Figure 120: U at Apr. by ECMWF
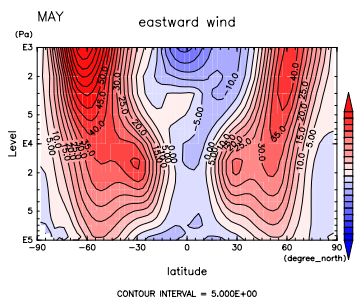
Figure 121: U at May by dcpam
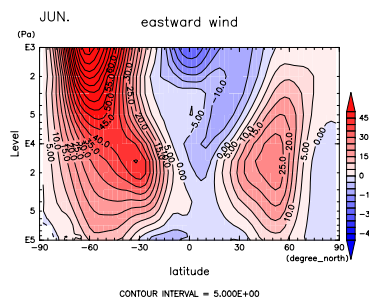
Figure 124: U at Jun. by dcpam
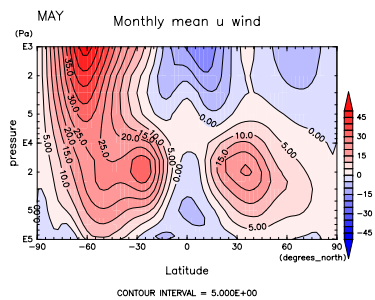
Figure 122: U at May by NCEP
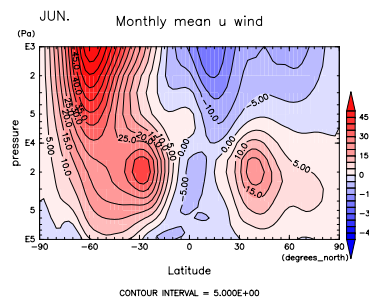
Figure 125: U at Jun. by NCEP
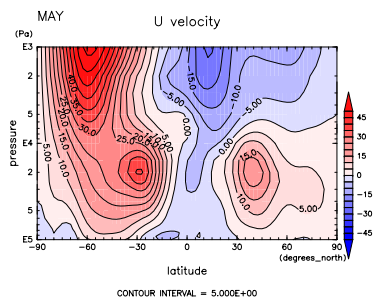
Figure 123: U at May by ECMWF
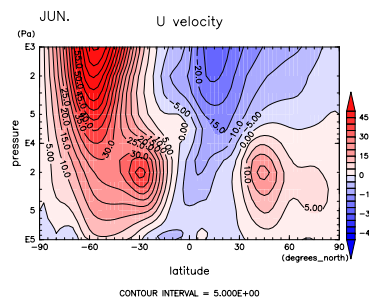
Figure 126: U at Jun. by ECMWF
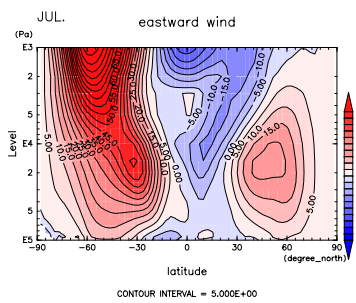
Figure 127: U at Jul. by dcpam
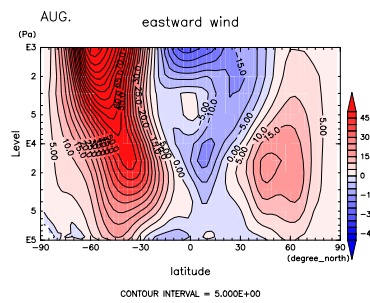
Figure 130: U at Aug. by dcpam
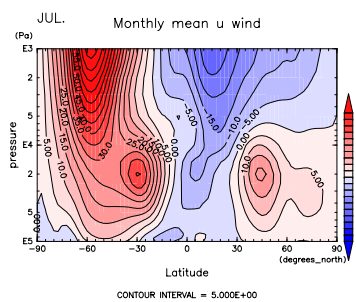
Figure 128: U at Jul. by NCEP
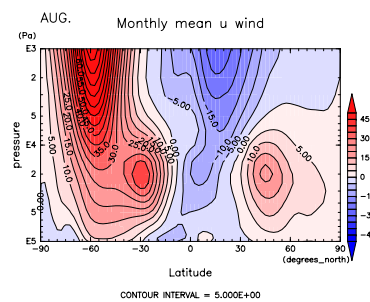
Figure 131: U at Aug. by NCEP
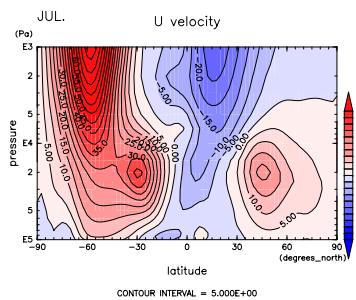
Figure 129: U at Jul. by ECMWF
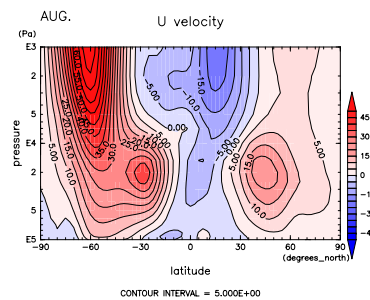
Figure 132: U at Aug. by ECMWF

24
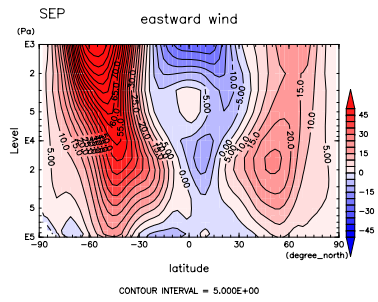
Figure 133: U at Sep. by dcpam
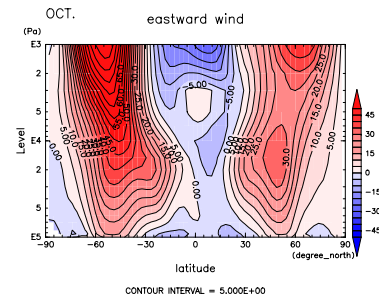
Figure 136: U at Oct. by dcpam
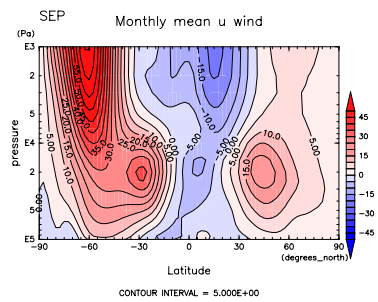
Figure 134: U at Sep. by NCEP
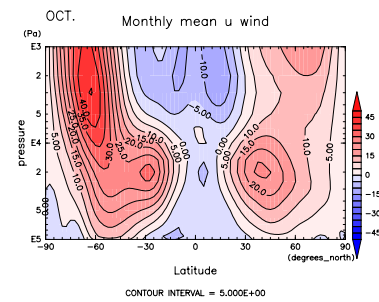
Figure 137: U at Oct. by NCEP
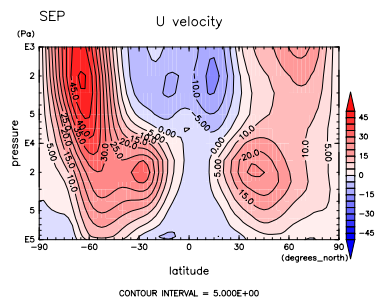
Figure 135: U at Sep. by ECMWF
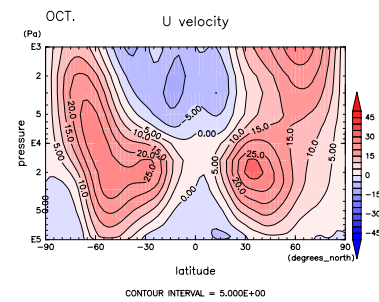
Figure 138: U at Oct. by ECMWF

25

Figure 139: U at Nov. by dcpam

Figure 142: U at Dec. by dcpam

Figure 140: U at Nov. by NCEP

Figure 143: U at Dec. by NCEP
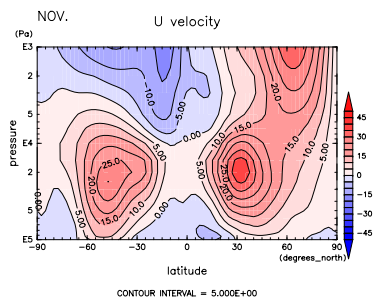
Figure 141: U at Nov. by ECMWF
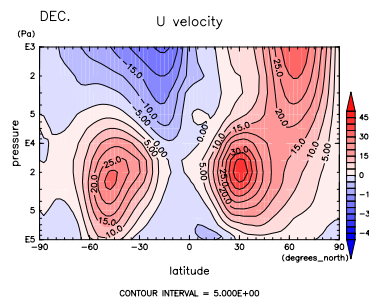
Figure 144: U at Dec. by ECMWF
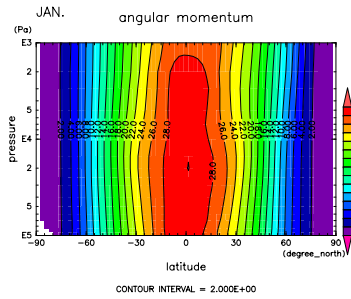
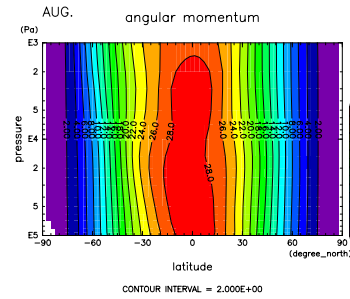Figure 145: ANGMOM at Jan. by dcpam
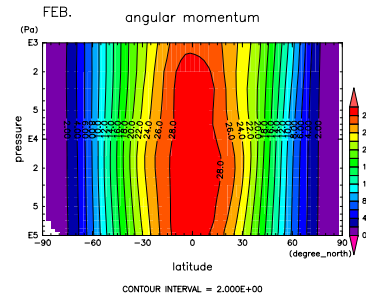


Figure 148: ANGMOM at Feb. by dcpam
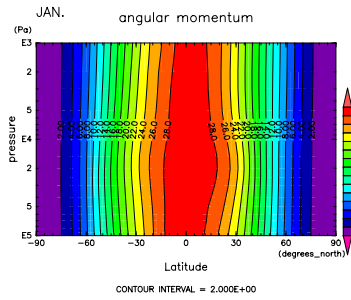

Figure 146: ANGMOM at Jan. by NCEP
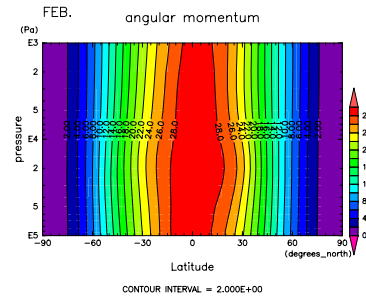
Figure 149: ANGMOM at Feb. by NCEP
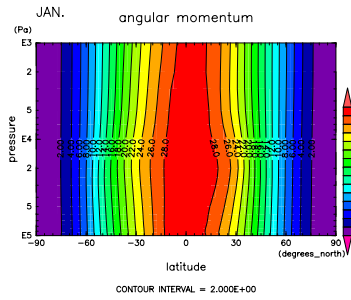

Figure 147: ANGMOM at Jan. by ECMWF
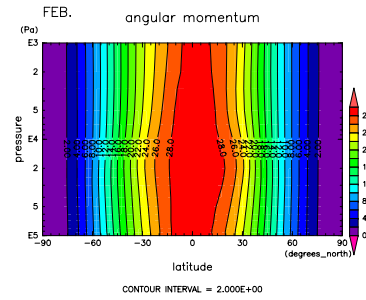
Figure 150: ANGMOM at Feb. by ECMWF
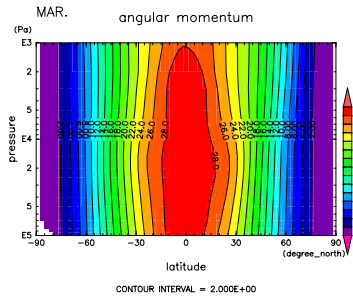
Figure 151: ANGMOM at Mar. by dcpam
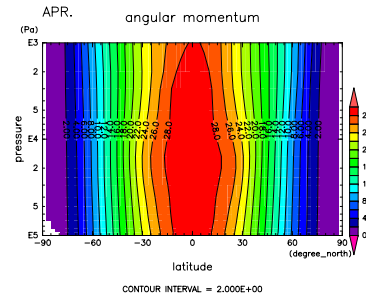
Figure 154: ANGMOM at Apr. by dcpam
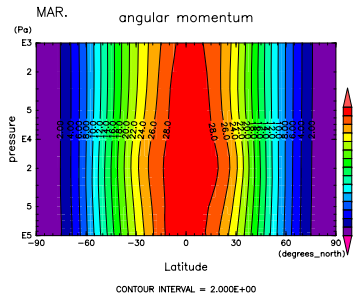
Figure 152: ANGMOM at Mar. by NCEP
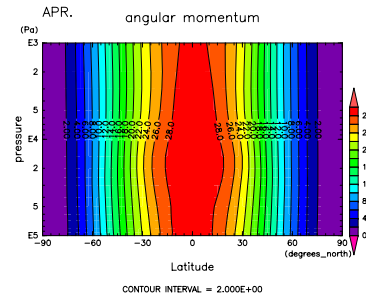
Figure 155: ANGMOM at Apr. by NCEP
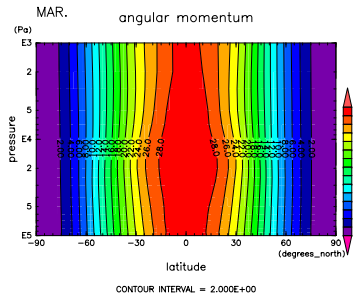
Figure 153: ANGMOM at Mar. by ECMWF
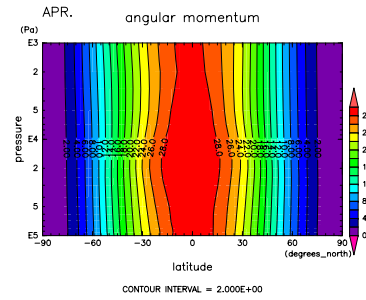
Figure 156: ANGMOM at Apr. by ECMWF

28
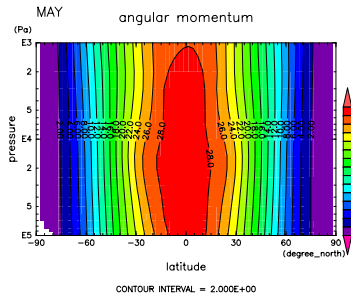
Figure 157: ANGMOM at May by dc-pam
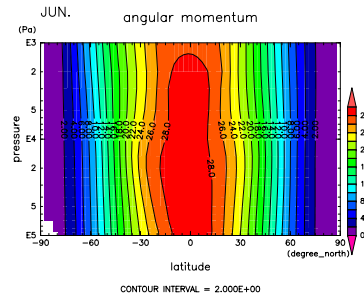
Figure 160: ANGMOM at Jun. by dcpam
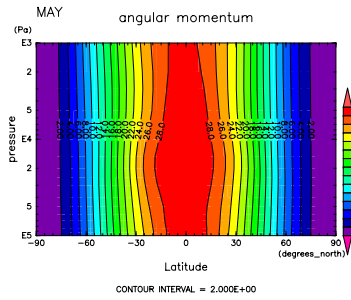
Figure 158: ANGMOM at May by NCEP
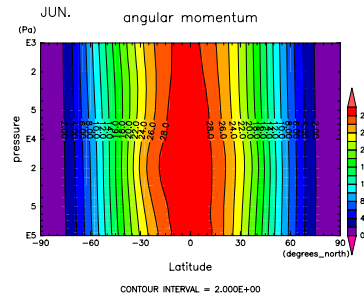
Figure 161: ANGMOM at Jun. by NCEP
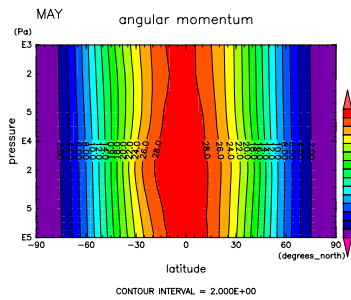
Figure 159: ANGMOM at May by ECMWF
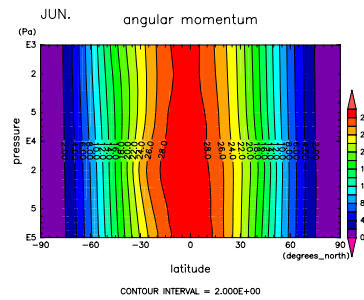
Figure 162: ANGMOM at Jun. by ECMWF

29
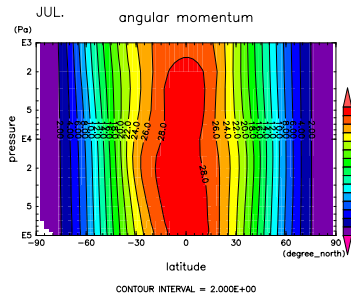
Figure 163: ANGMOM at Jul. by dc-pam

Figure 166: ANGMOM at Aug. by dcpam
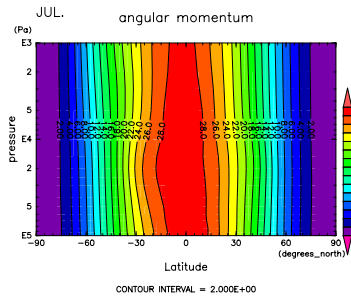
Figure 164: ANGMOM at Jul. by NCEP
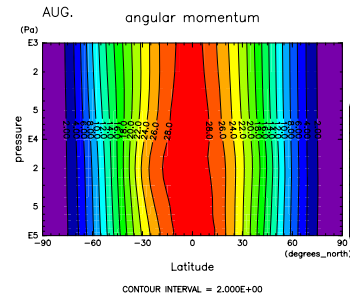
Figure 167: ANGMOM at Aug. by NCEP
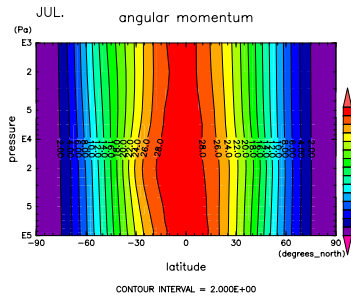
Figure 165: ANGMOM at Jul. by ECMWF
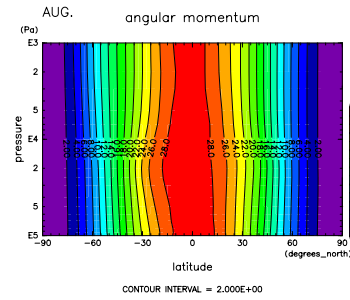
Figure 168: ANGMOM at Aug. by ECMWF

30
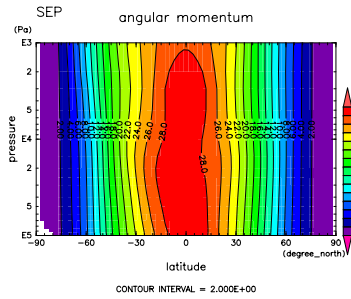
Figure 169: ANGMOM at Sep. by dcpam
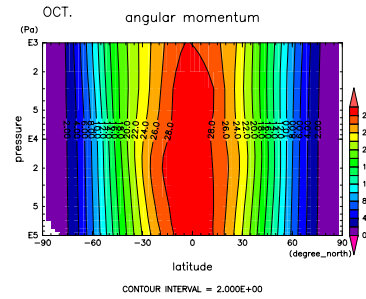
Figure 172: ANGMOM at Oct. by dcpam
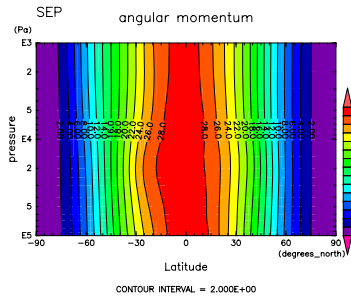
Figure 170: ANGMOM at Sep. by NCEP
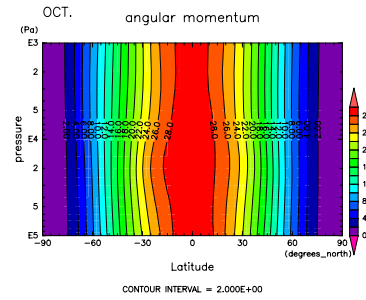
Figure 173: ANGMOM at Oct. by NCEP
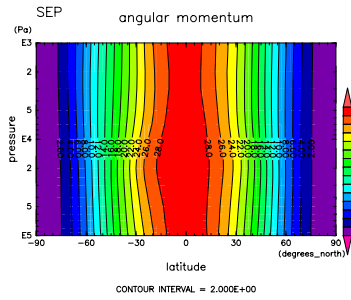
Figure 171: ANGMOM at Sep. by ECMWF
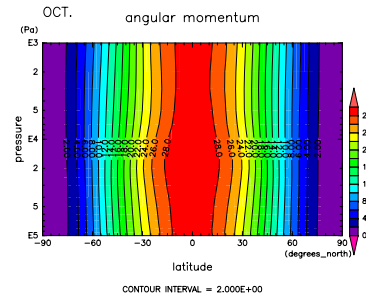
Figure 174: ANGMOM at Oct. by ECMWF

31
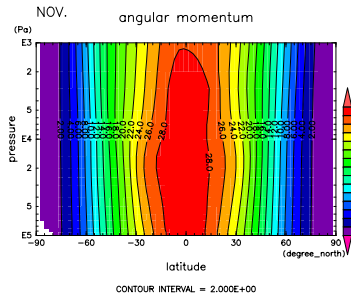
Figure 175: ANGMOM at Nov. by dcpam
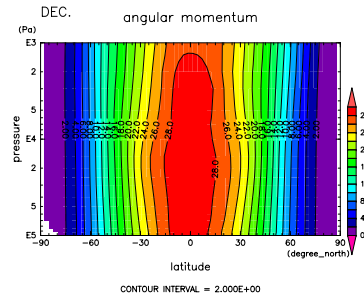
Figure 178: ANGMOM at Dec. by dcpam
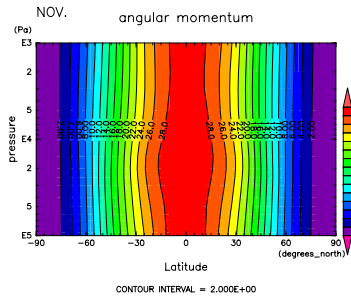
Figure 176: ANGMOM at Nov. by NCEP
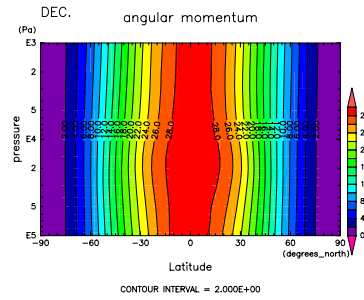
Figure 179: ANGMOM at Dec. by NCEP
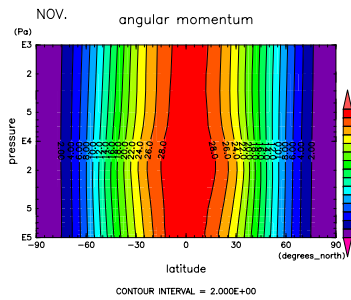
Figure 177: ANGMOM at Nov. by ECMWF
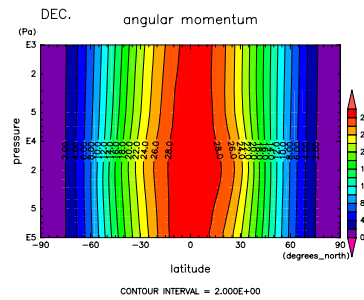
Figure 180: ANGMOM at Dec. by ECMWF

32
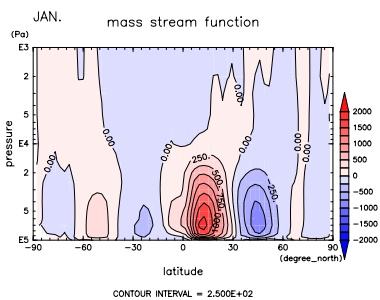
Figure 181: MSF at Jan. by dcpam
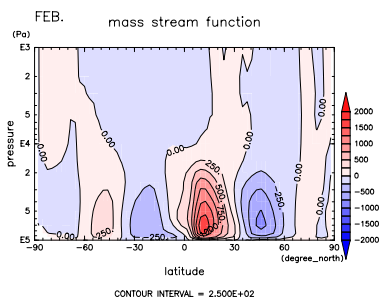

Figure 184: MSF at Feb. by dcpam
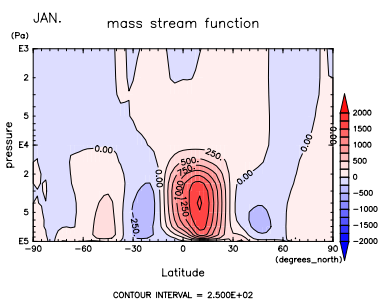
Figure 182: MSF at Jan. by NCEP
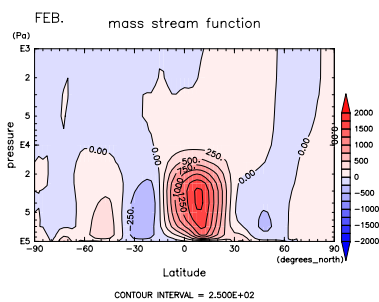

Figure 185: MSF at Feb. by NCEP
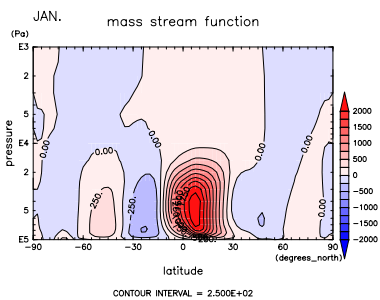
Figure 183: MSF at Jan. by ECMWF
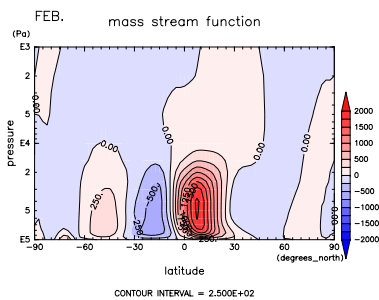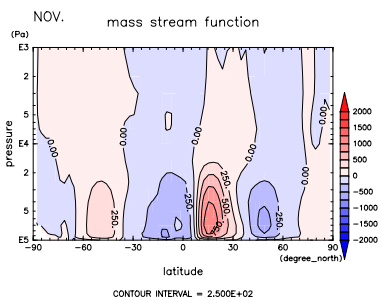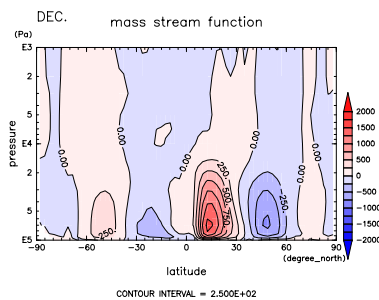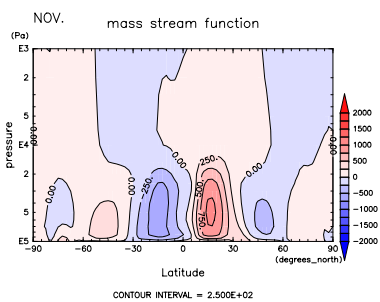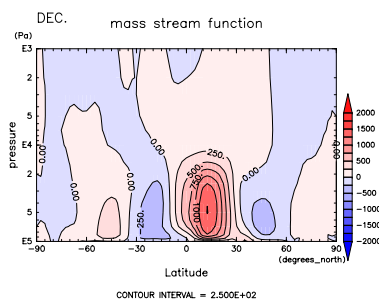

Figure 186: MSF at Feb. by ECMWF

33
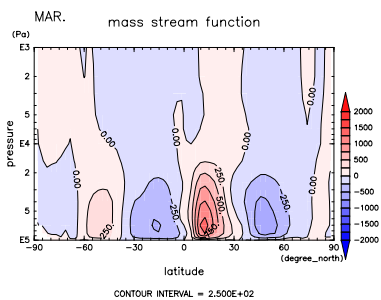
Figure 187: MSF at Mar. by dcpam
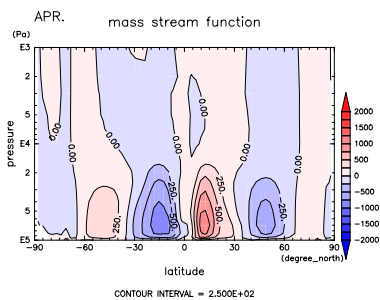
Figure 190: MSF at Apr. by dcpam
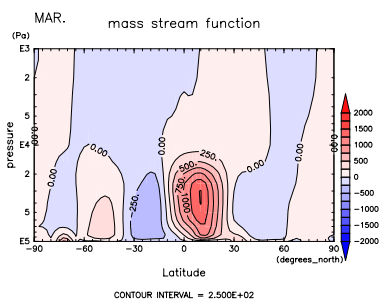
Figure 188: MSF at Mar. by NCEP
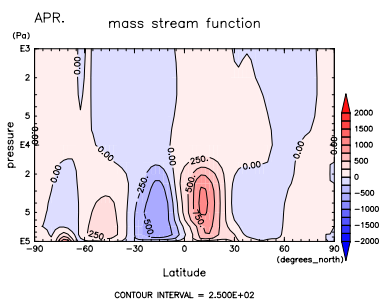
Figure 191: MSF at Apr. by NCEP
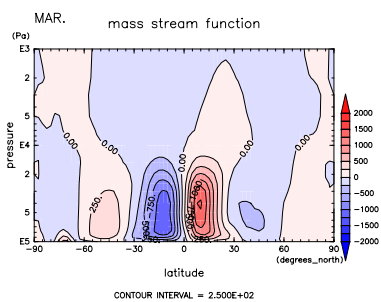
Figure 189: MSF at Mar. by ECMWF
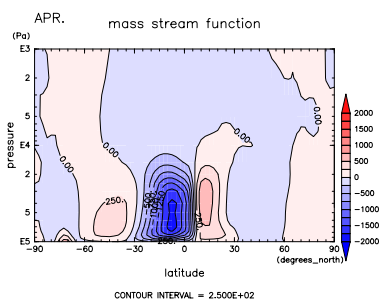
Figure 192: MSF at Apr. by ECMWF
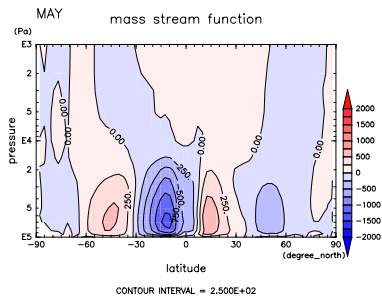
Figure 193: MSF at May by dcpam
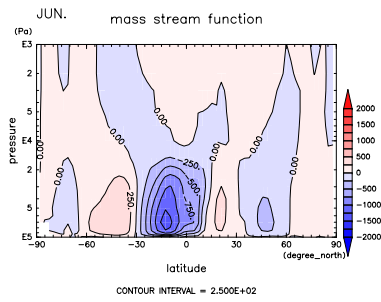
Figure 196: MSF at Jun. by dcpam
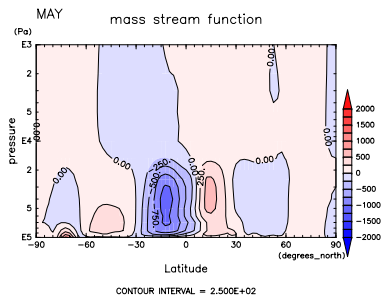
Figure 194: MSF at May by NCEP
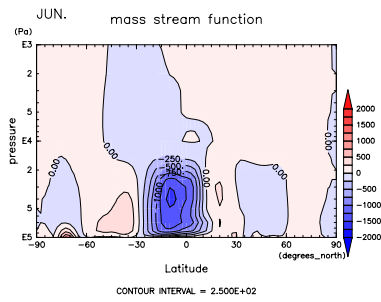
Figure 197: MSF at Jun. by NCEP
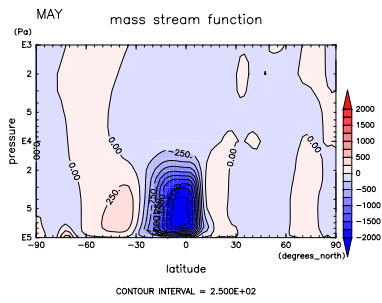
Figure 195: MSF at May by ECMWF
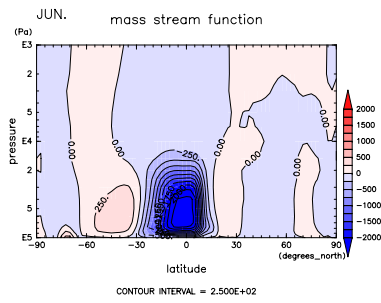
Figure 198: MSF at Jun. by ECMWF

35
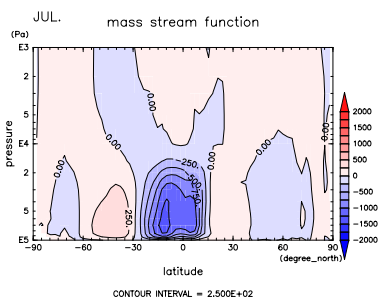
Figure 199: MSF at Jul. by dcpam
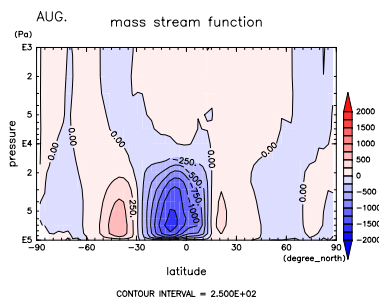
Figure 202: MSF at Aug. by dcpam
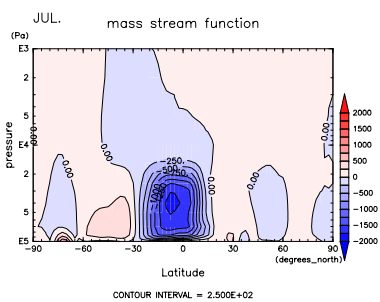
Figure 200: MSF at Jul. by NCEP
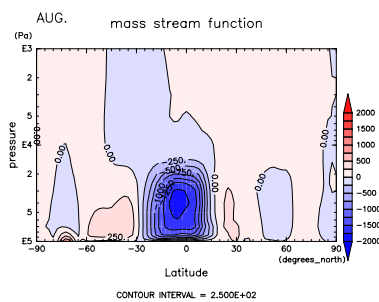
Figure 203: MSF at Aug. by NCEP
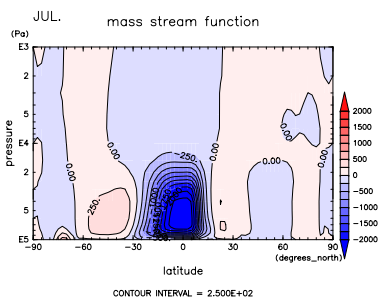
Figure 201: MSF at Jul. by ECMWF
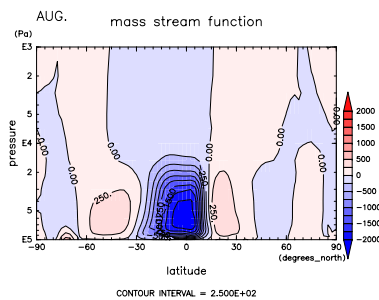
Figure 204: MSF at Aug. by ECMWF

36
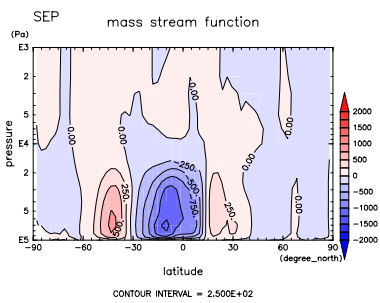
Figure 205: MSF at Sep. by dcpam
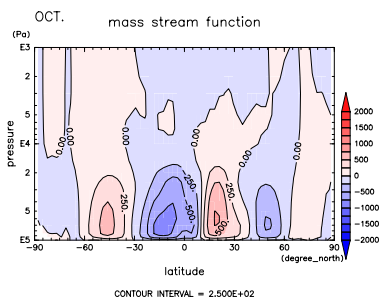
Figure 208: MSF at Oct. by dcpam
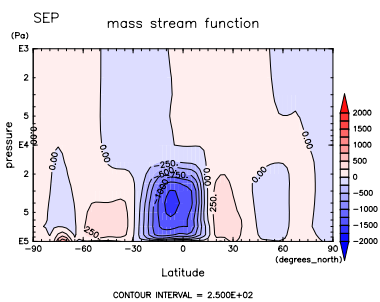
Figure 206: MSF at Sep. by NCEP
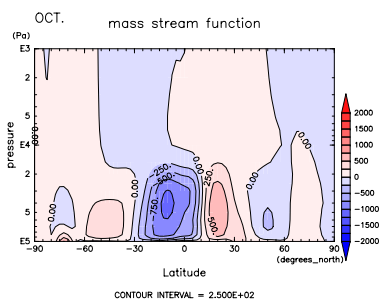
Figure 209: MSF at Oct. by NCEP
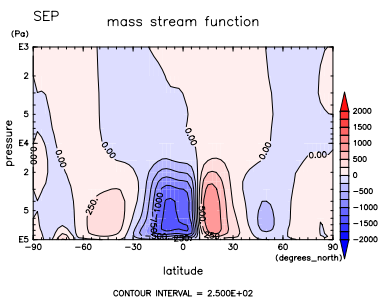
Figure 207: MSF at Sep. by ECMWF
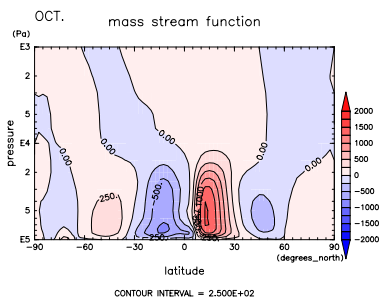
Figure 210: MSF at Oct. by ECMWF

37

Figure 211: MSF at Nov. by dcpam

Figure 214: MSF at Dec. by dcpam

Figure 212: MSF at Nov. by NCEP

Figure 215: MSF at Dec. by NCEP
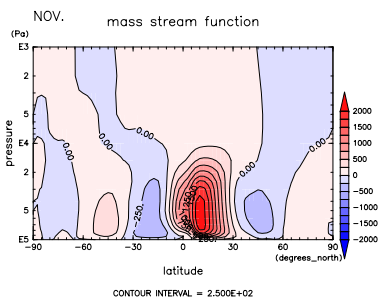
Figure 213: MSF at Nov. by ECMWF
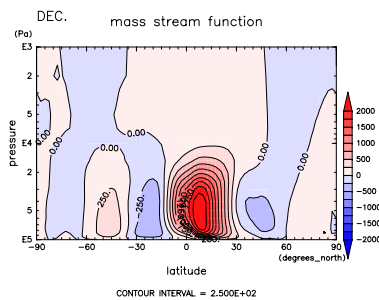
Figure 216: MSF at Dec. by ECMWF
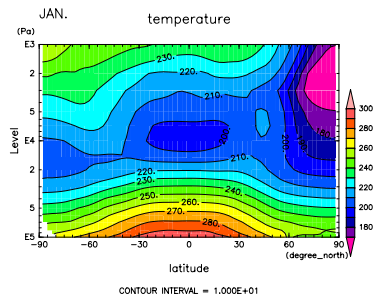
Figure 217: T at Jan. by dcpam
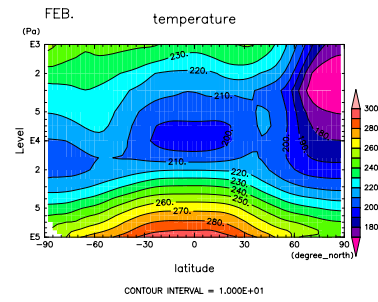
Figure 220: T at Feb. by dcpam
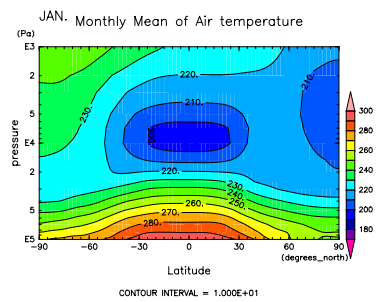
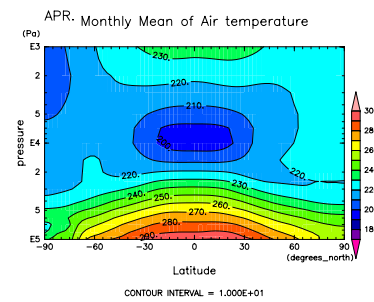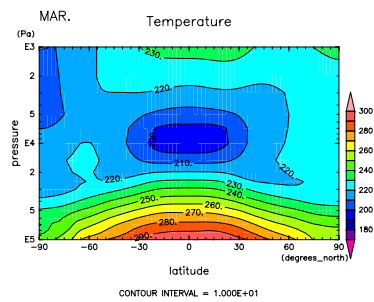Figure 218: T at Jan. by NCEP
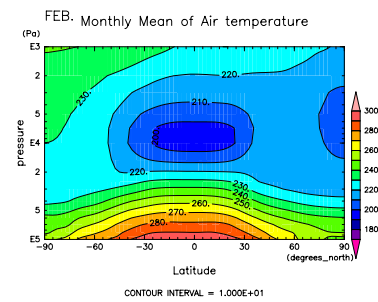
Figure 221: T at Feb. by NCEP
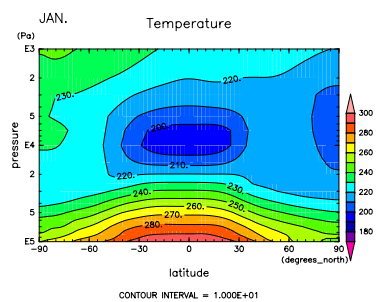
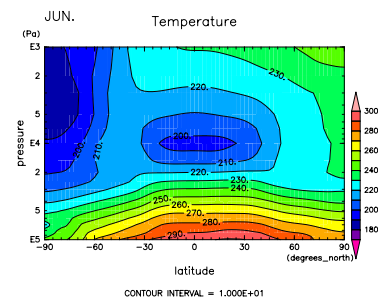Figure 219: T at Jan. by ECMWF
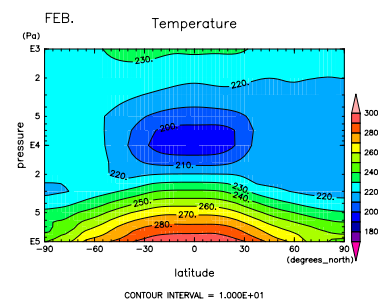
Figure 222: T at Feb. by ECMWF
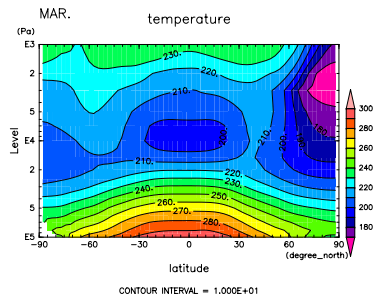
Figure 223: T at Mar. by dcpam
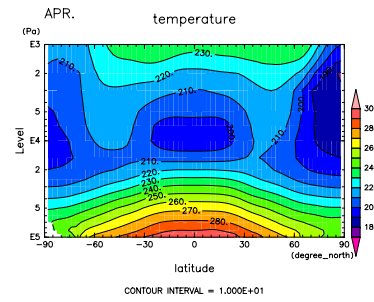

Figure 226: T at Apr. by dcpam
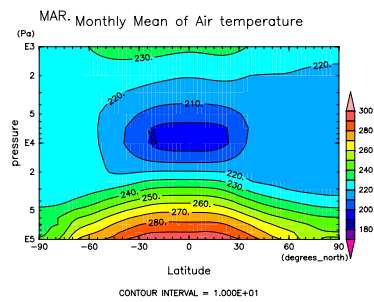
Figure 224: T at Mar. by NCEP

Figure 227: T at Apr. by NCEP

Figure 225: T at Mar. by ECMWF
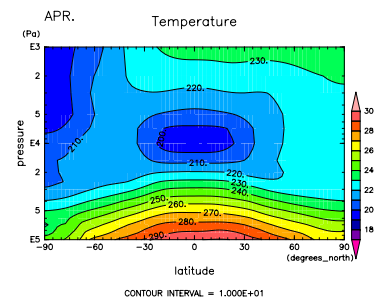
Figure 228: T at Apr. by ECMWF

40
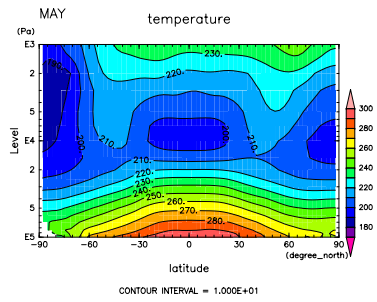
Figure 229: T at May by dcpam
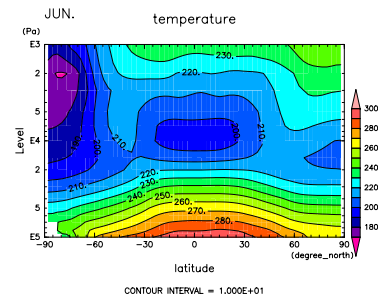
Figure 232: T at Jun. by dcpam
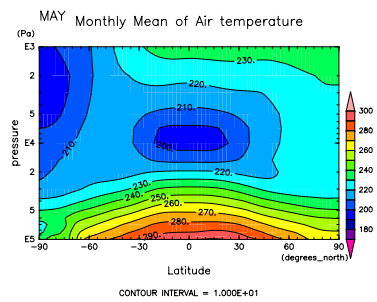
Figure 230: T at May by NCEP
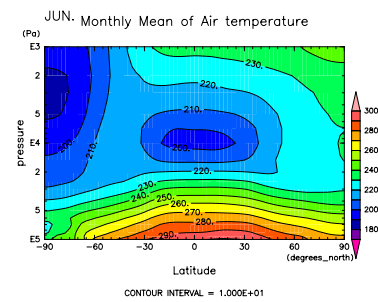
Figure 233: T at Jun. by NCEP
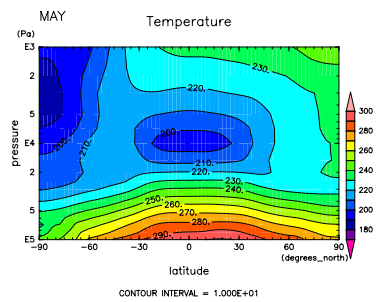
Figure 231: T at May by ECMWF

Figure 234: T at Jun. by ECMWF

41
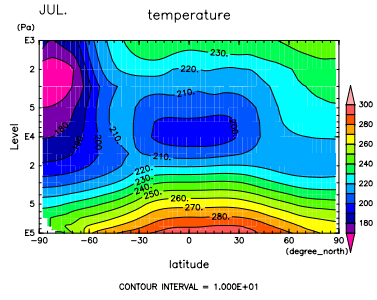
Figure 235: T at Jul. by dcpam
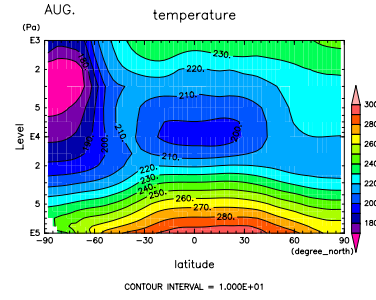
Figure 238: T at Aug. by dcpam
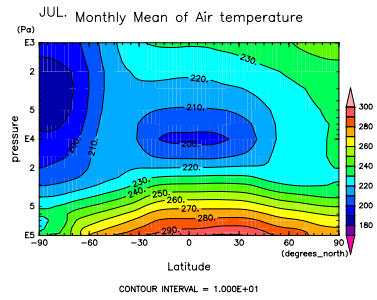
Figure 236: T at Jul. by NCEP
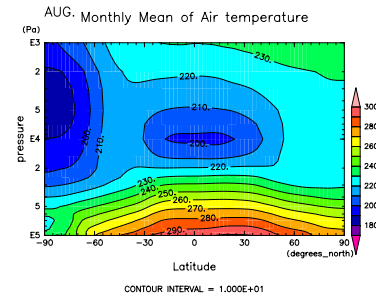
Figure 239: T at Aug. by NCEP
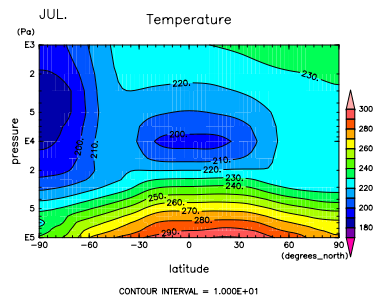
Figure 237: T at Jul. by ECMWF
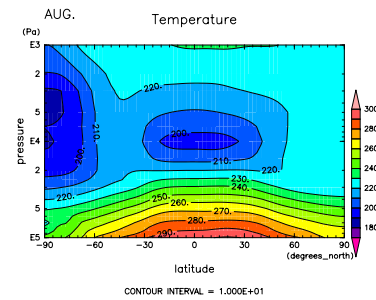
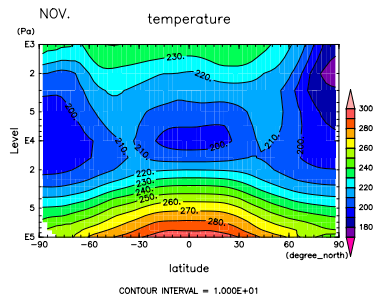Figure 240: T at Aug. by ECMWF

42
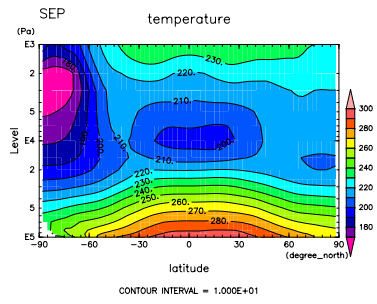
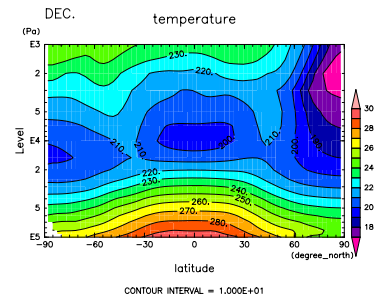Figure 241: T at Sep. by dcpam
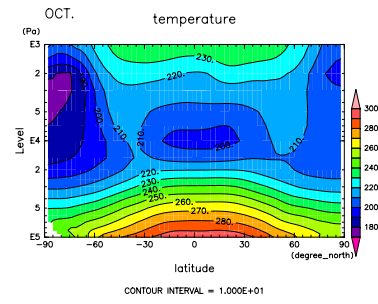
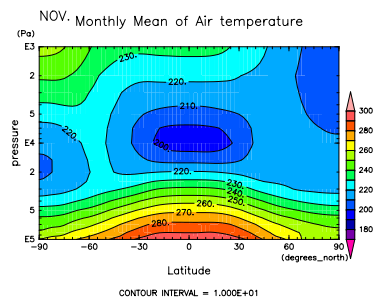Figure 244: T at Oct. by dcpam
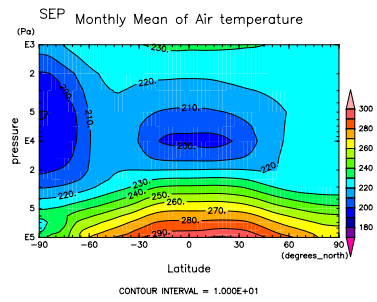
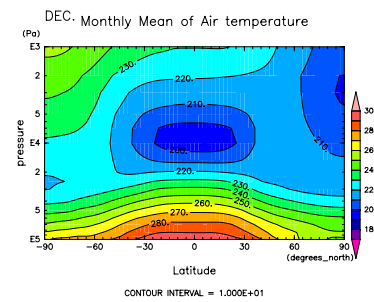

Figure 242: T at Sep. by NCEP
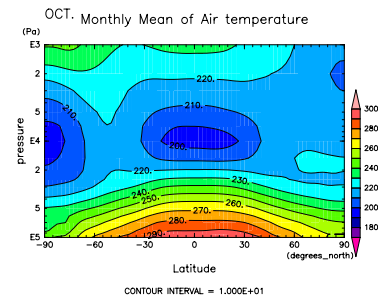
Figure 245: T at Oct. by NCEP
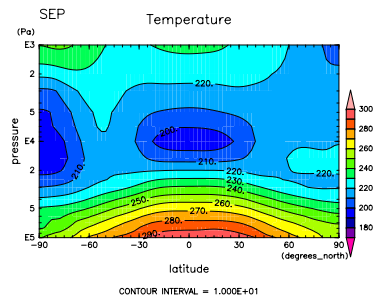
Figure 243: T at Sep. by ECMWF
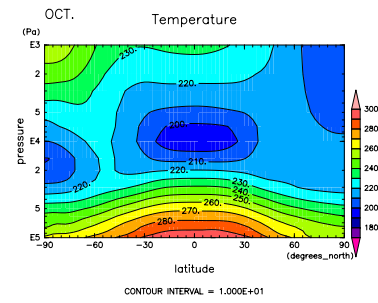
Figure 246: T at Oct. by ECMWF

43

Figure 247: T at Nov. by dcpam

Figure 250: T at Dec. by dcpam

Figure 248: T at Nov. by NCEP
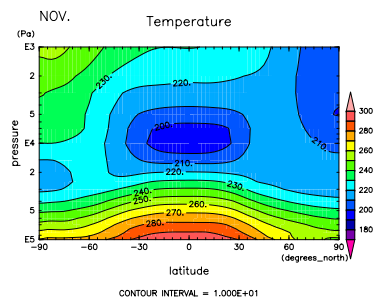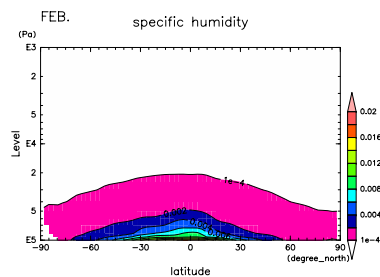

Figure 251: T at Dec. by NCEP

Figure 249: T at Nov. by ECMWF
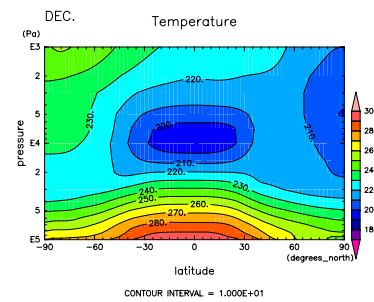
Figure 252: T at Dec. by ECMWF

44
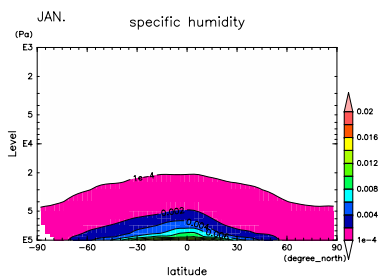
Figure 253: q at Jan. by dcpam

Figure 256: q at Feb. by dcpam
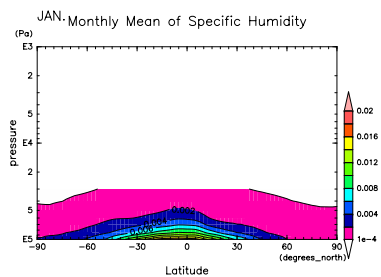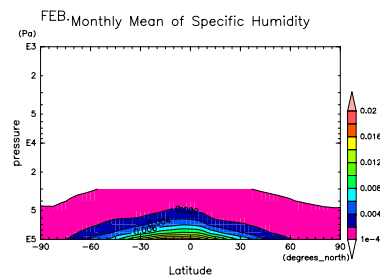

Figure 254: q at Jan. by NCEP
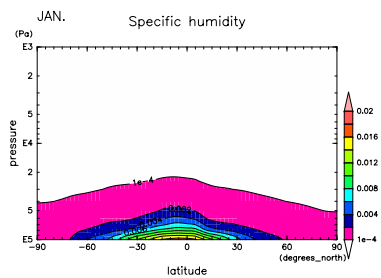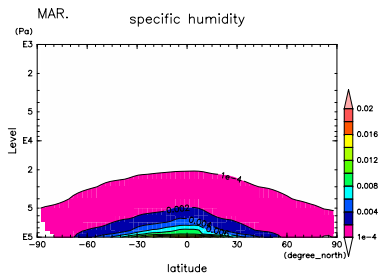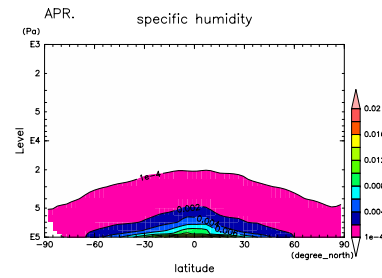

Figure 257: q at Feb. by NCEP

Figure 255: q at Jan. by ECMWF
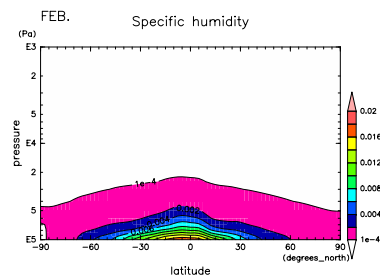
Figure 258: q at Feb. by ECMWF

45

Figure 259: q at Mar. by dcpam

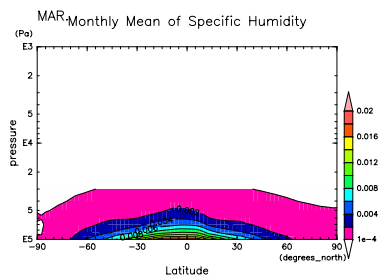
Figure 262: q at Apr. by dcpam
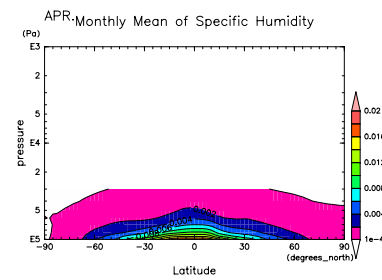

Figure 260: q at Mar. by NCEP
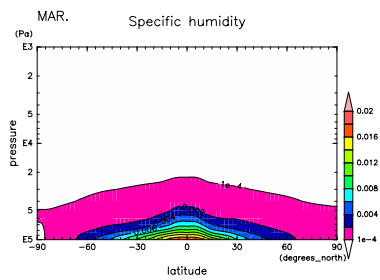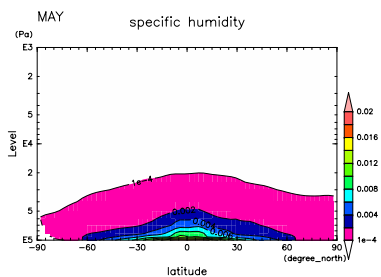

Figure 263: q at Apr. by NCEP

Figure 261: q at Mar. by ECMWF
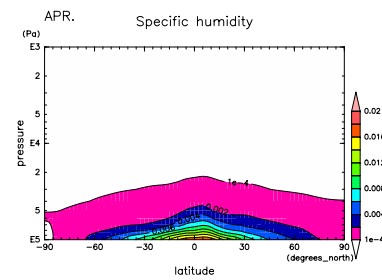
Figure 264: q at Apr. by ECMWF

46

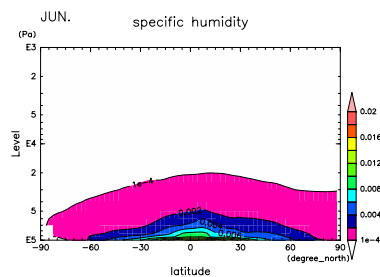Figure 265: q at May by dcpam

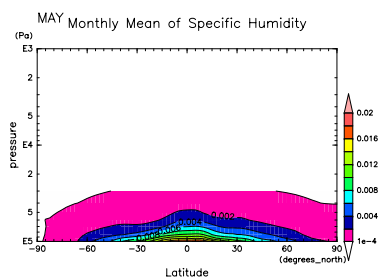Figure 268: q at Jun. by dcpam
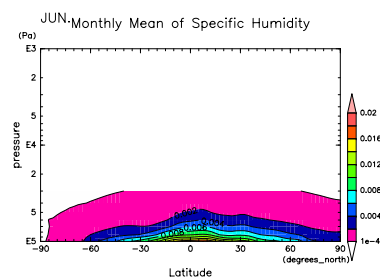

Figure 266: q at May by NCEP
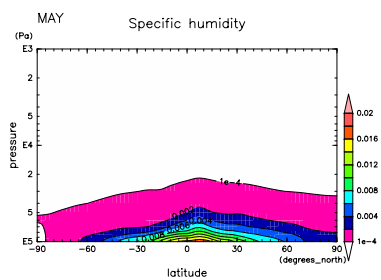

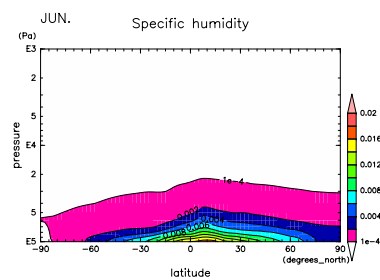Figure 269: q at Jun. by NCEP

Figure 267: q at May by ECMWF

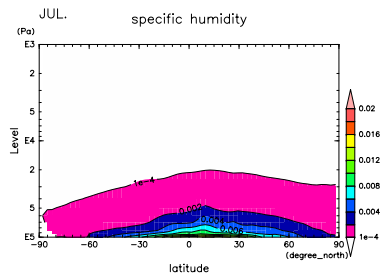Figure 270: q at Jun. by ECMWF

47

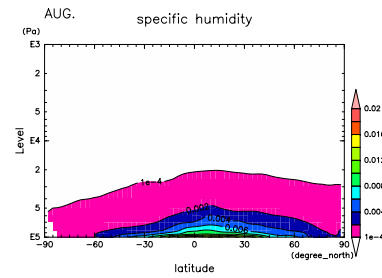Figure 271: q at Jul. by dcpam

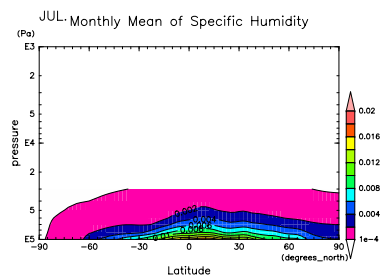Figure 274: q at Aug. by dcpam

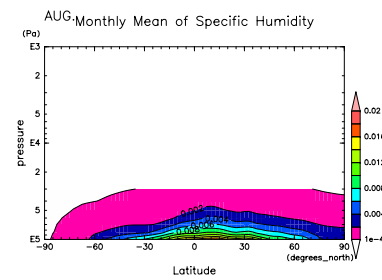

Figure 272: q at Jul. by NCEP
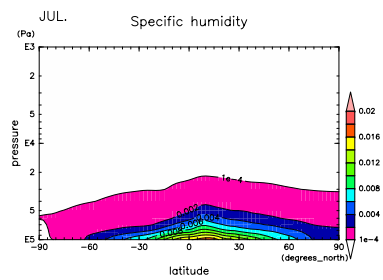

Figure 275: q at Aug. by NCEP
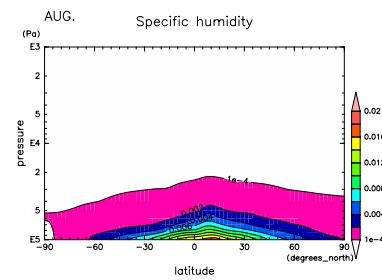

Figure 273: q at Jul. by ECMWF

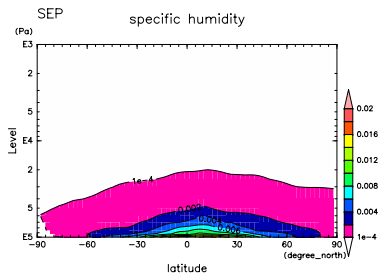Figure 276: q at Aug. by ECMWF

48

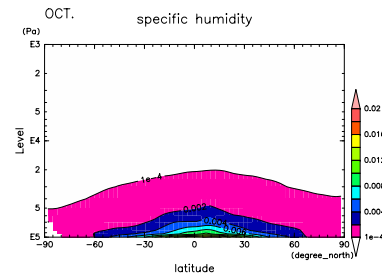Figure 277: q at Sep. by dcpam

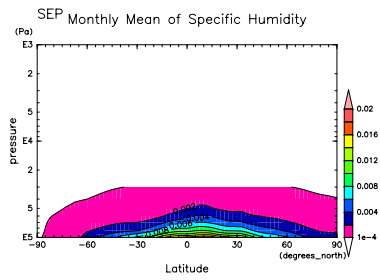Figure 280: q at Oct. by dcpam

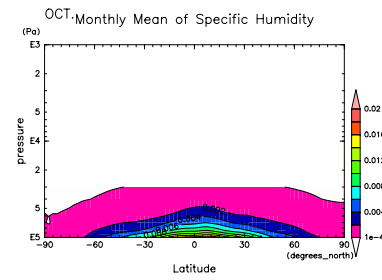

Figure 278: q at Sep. by NCEP
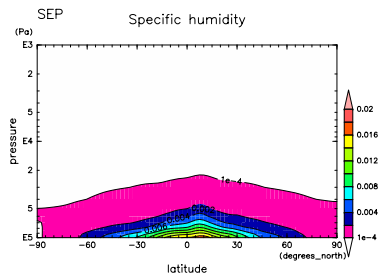

Figure 281: q at Oct. by NCEP
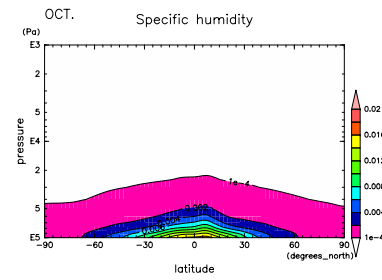

Figure 279: q at Sep. by ECMWF

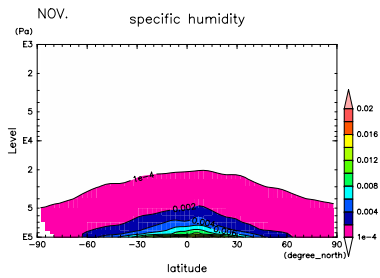Figure 282: q at Oct. by ECMWF

49

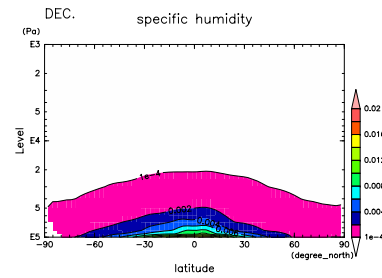Figure 283: q at Nov. by dcpam

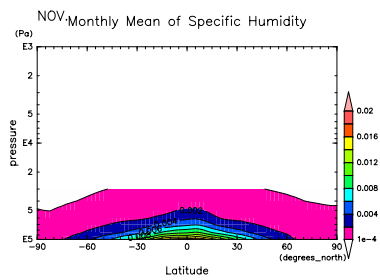
Figure 286: q at Dec. by dcpam
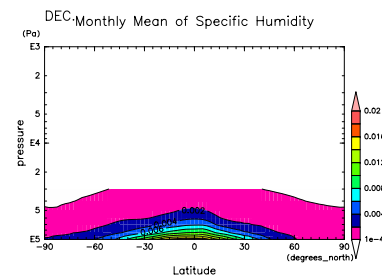

Figure 284: q at Nov. by NCEP
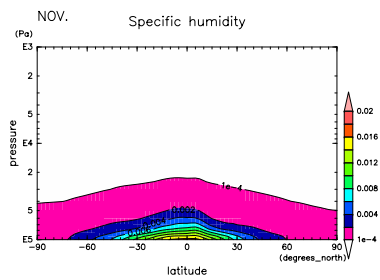

Figure 287: q at Dec. by NCEP
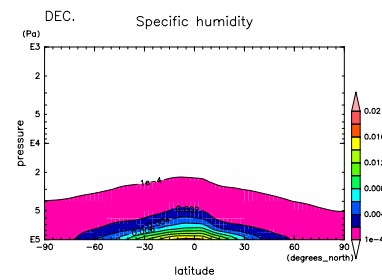

Figure 285: q at Nov. by ECMWF

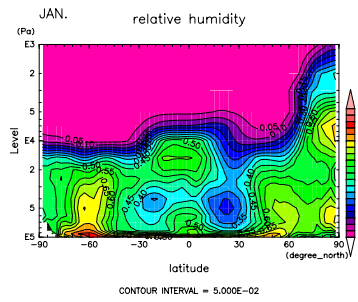Figure 288: q at Dec. by ECMWF

50

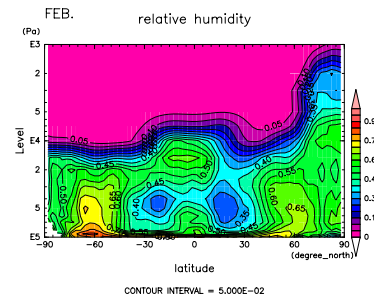Figure 289: RH at Jan. by dcpam
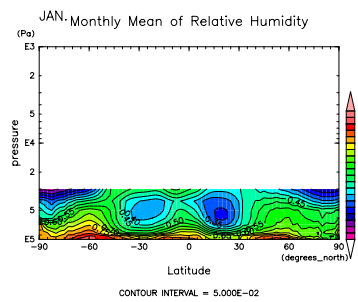

Figure 292: RH at Feb. by dcpam
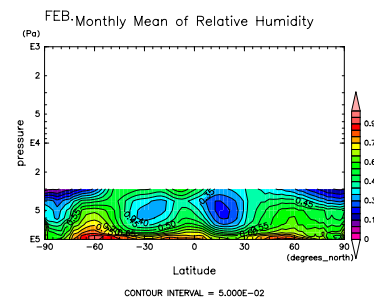

Figure 290: RH at Jan. by NCEP
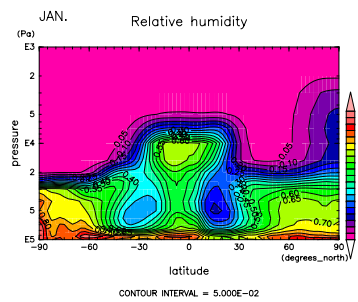

Figure 293: RH at Feb. by NCEP

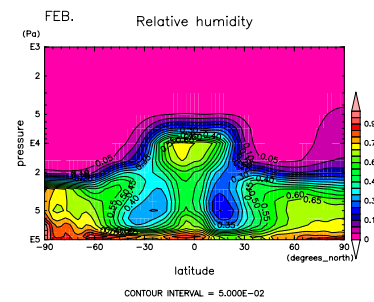Figure 291: RH at Jan. by ECMWF

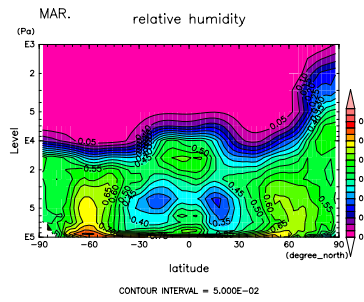Figure 294: RH at Feb. by ECMWF
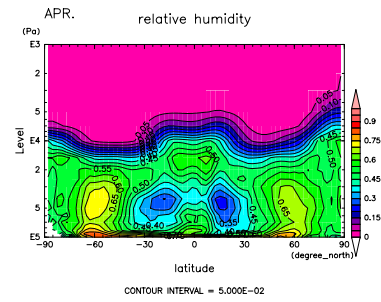
Figure 295: RH at Mar. by dcpam
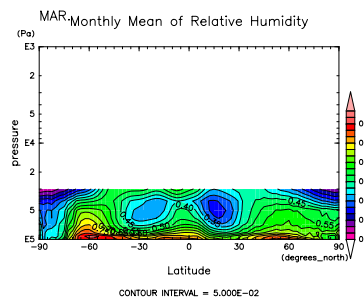

Figure 298: RH at Apr. by dcpam
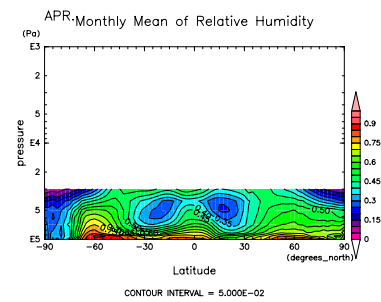

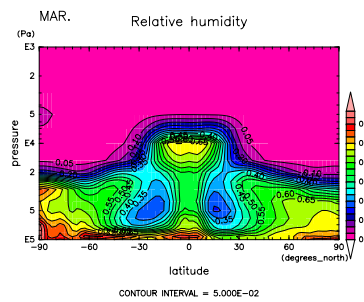Figure 296: RH at Mar. by NCEP

Figure 299: RH at Apr. by NCEP

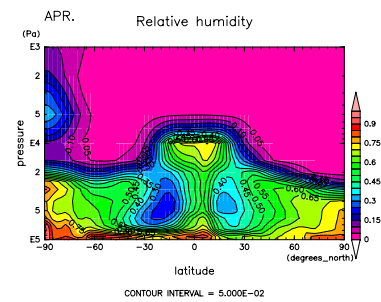Figure 297: RH at Mar. by ECMWF

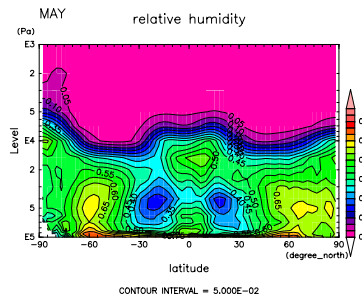

Figure 300: RH at Apr. by ECMWF
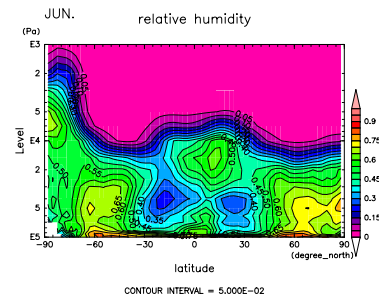
52

Figure 301: RH at May by dcpam
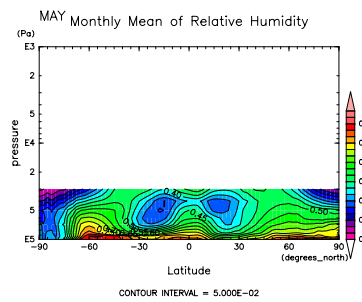

Figure 304: RH at Jun. by dcpam
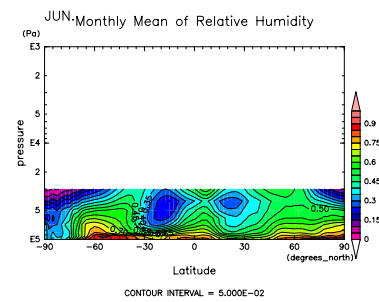

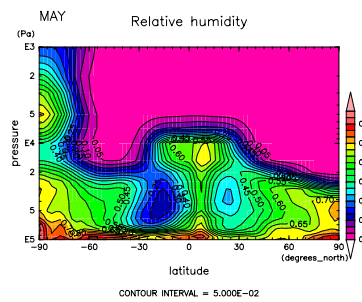Figure 302: RH at May by NCEP

Figure 305: RH at Jun. by NCEP

Figure 303: RH at May by ECMWF

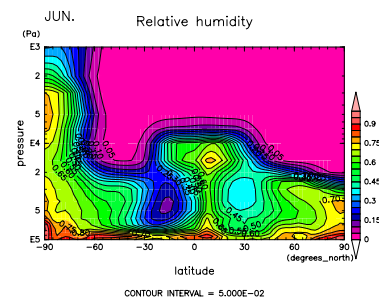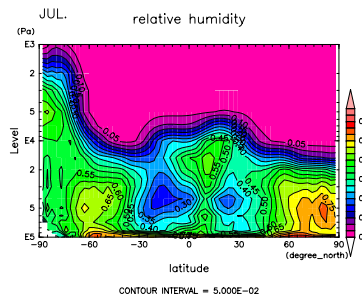Figure 306: RH at Jun. by ECMWF
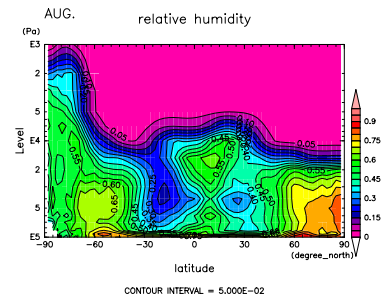
Figure 307: RH at Jul. by dcpam
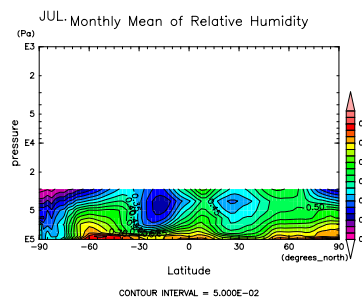

Figure 310: RH at Aug. by dcpam
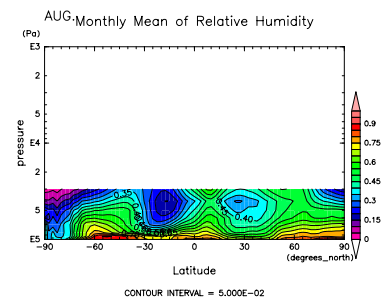

Figure 308: RH at Jul. by NCEP

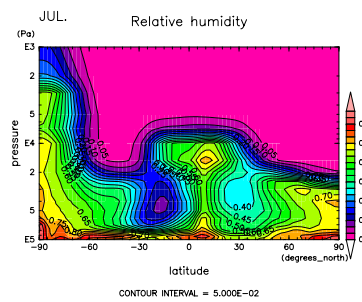Figure 311: RH at Aug. by NCEP

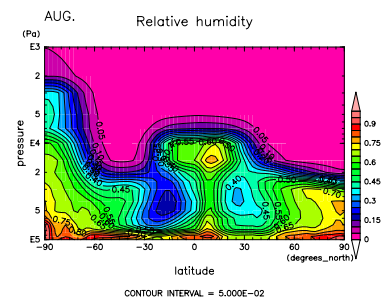Figure 309: RH at Jul. by ECMWF

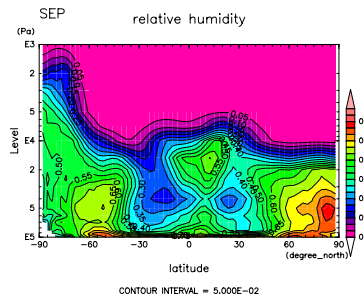

Figure 312: RH at Aug. by ECMWF
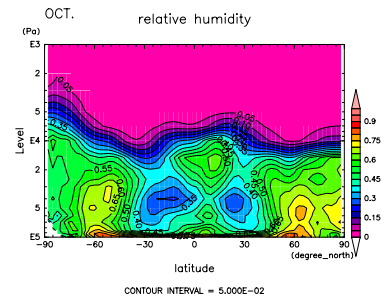
54

Figure 313: RH at Sep. by dcpam
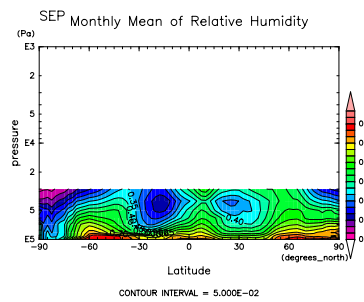

Figure 316: RH at Oct. by dcpam
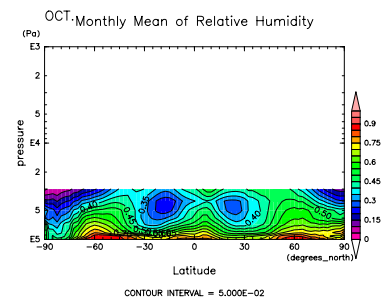

Figure 314: RH at Sep. by NCEP

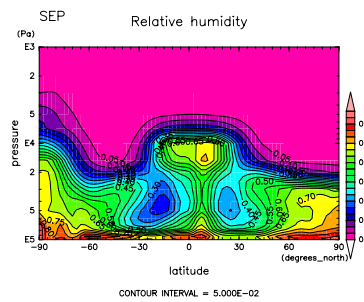Figure 317: RH at Oct. by NCEP

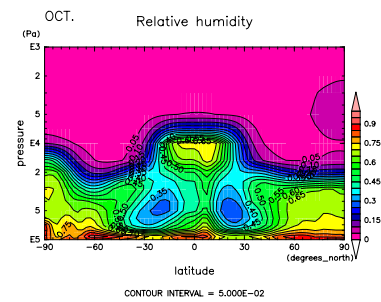Figure 315: RH at Sep. by ECMWF

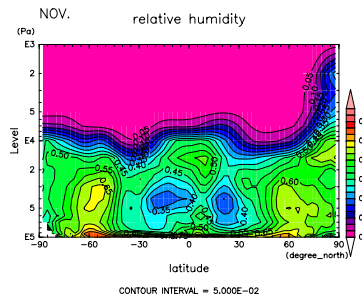

Figure 318: RH at Oct. by ECMWF
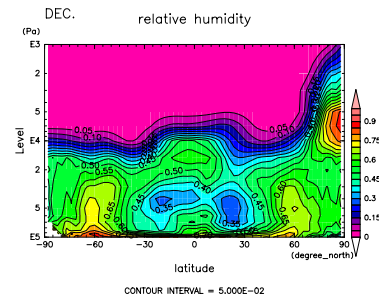
Figure 319: RH at Nov. by dcpam
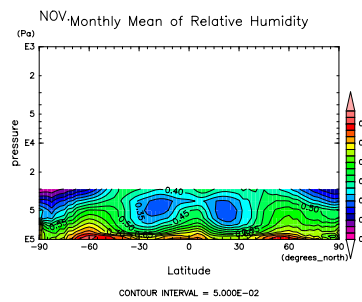

Figure 322: RH at Dec. by dcpam
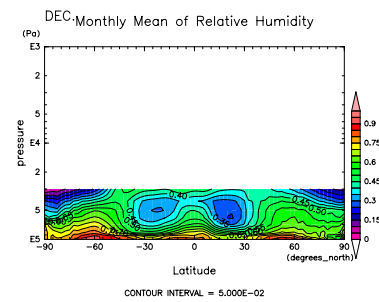

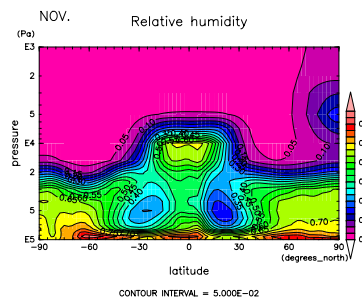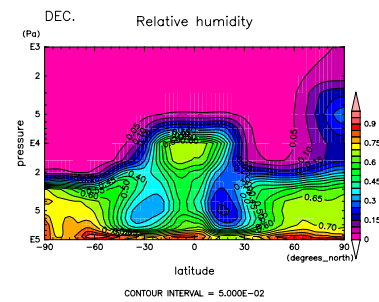Figure 320: RH at Nov. by NCEP

Figure 323: RH at Dec. by NCEP

Figure 321: RH at Nov. by ECMWF

Figure 324: RH at Dec. by ECMWF

56