model/ftn/w3updtmd.ftn

Line 545 for wind and line 273 for Current Fields

Matrix.Diff

```
ww3.GFS.glo30.2012_wnd.nc are identical (binary)
out_grd.ww3 are identical (binary)
out_pnt.ww3 are identical (binary)
```

Current

```
! 1.  Prepare auxiliary arrays
!
      IF ( FLFRST ) THEN
        DO ISEA=1, NSEA
!/SMC !!Li  For sea-point SMC grid current, the 1-D current is stored on
!/SMC !!Li  2-D CX0(NSEA, 1) variable.
!/SMC       IF( FSWND ) THEN
!/SMC          IX = ISEA
!/SMC          IY = 1
!/SMC       ELSE
          IX        = MAPSF(ISEA,1)
          IY        = MAPSF(ISEA,2)
!/SMC       ENDIF

          CA0(ISEA) = SQRT ( CX0(IX,IY)**2 + CY0(IX,IY)**2 )
          CAI(ISEA) = SQRT ( CXN(IX,IY)**2 + CYN(IX,IY)**2 )
          IF ( CA0(ISEA) .GT. 1.E-7) THEN
            D0      = MOD ( TPI+ATAN2(CY0(IX,IY),CX0(IX,IY)) , TPI )
          ELSE
            D0      = 0
          END IF
          IF ( CAI(ISEA) .GT. 1.E-7) THEN
            DN      = MOD ( TPI+ATAN2(CYN(IX,IY),CXN(IX,IY)) , TPI )
          ELSE
            DN      = D0
          END IF
          IF ( CA0(ISEA) .GT. 1.E-7) THEN
            CD0(ISEA) = D0
          ELSE
            CD0(ISEA) = DN
          END IF
          DD      = DN - CD0(ISEA)
          IF (ABS(DD).GT.PI) DD = DD - TPI*SIGN(1.,DD)
          CDI(ISEA) = DD
          CAI(ISEA) = CAI(ISEA) - CA0(ISEA)
        END DO
      END IF
```

```
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!
      IF ( FLFRST ) THEN
        DO ISEA=1, NSEA
!/SMC !!Li  For sea-point SMC grid current, the 1-D current is stored on
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!/SMC       IF( FSWND ) THEN
!/SMC          IX = ISEA
!/SMC          IY = 1
!/SMC       ELSE
          IX        = MAPSF(ISEA,1)
          IY        = MAPSF(ISEA,2)
!/SMC       ENDIF

          CA0(ISEA) = SQRT ( CX0(IX,IY)**2 + CY0(IX,IY)**2 )
          CAI(ISEA) = SQRT ( CXN(IX,IY)**2 + CYN(IX,IY)**2 )
          IF ( CA0(ISEA) .GT. 1.E-7) THEN
            D0      = MOD ( TPI+ATAN2(CY0(IX,IY),CX0(IX,IY)) , TPI )
          ELSE
            D0      = 0
          END IF
          IF ( CAI(ISEA) .GT. 1.E-7) THEN
            DN      = MOD ( TPI+ATAN2(CYN(IX,IY),CXN(IX,IY)) , TPI )
          ELSE
            DN      = D0
          END IF
          IF ( CA0(ISEA) .GT. 1.E-7) THEN
            CD0(ISEA) = D0
          ELSE
            CD0(ISEA) = DN
          END IF
          DD      = DN - CD0(ISEA)
          IF (ABS(DD).GT.TPI) DD = DD - TPI*SIGN(1.,DD)
          CDI(ISEA) = DD
          CAI(ISEA) = CAI(ISEA) - CA0(ISEA)
        END DO
      END IF
```

Wind

```
! 1.  Prepare auxiliary arrays
!
      IF ( FLFRST ) THEN
        DO ISEA=1, NSEA
!/SMC !!Li  For sea-point only SMC grid wind 1-D wind is stored on
!/SMC !!Li  2-D WX0(NSEA, 1) variable.
!/SMC       IF( FSWND ) THEN
!/SMC          IX = ISEA
!/SMC          IY = 1
!/SMC       ELSE
          IX        = MAPSF(ISEA,1)
          IY        = MAPSF(ISEA,2)
!/SMC       ENDIF

          UA0(ISEA) = SQRT ( WX0(IX,IY)**2 + WY0(IX,IY)**2 )
          UAI(ISEA) = SQRT ( WXN(IX,IY)**2 + WYN(IX,IY)**2 )
          IF ( UA0(ISEA) .GT. 1.E-7) THEN
            D0      = MOD ( TPI+ATAN2(WY0(IX,IY),WX0(IX,IY)) , TPI )
          ELSE
            D0      = 0
          END IF
          IF ( UAI(ISEA) .GT. 1.E-7) THEN
            DN      = MOD ( TPI+ATAN2(WYN(IX,IY),WXN(IX,IY)) , TPI )
          ELSE
            DN      = D0
          END IF
          IF ( UA0(ISEA) .GT. 1.E-7) THEN
            UD0(ISEA) = D0
          ELSE
            UD0(ISEA) = DN
          END IF
          DD      = DN - UD0(ISEA)
          IF (ABS(DD).GT.PI) DD = DD - TPI*SIGN(1.,DD)
          UDI(ISEA) = DD
          UAI(ISEA) = UAI(ISEA) - UA0(ISEA)
          AS0(ISEA) = DT0(IX,IY)
          ASI(ISEA) = DTN(IX,IY) - DT0(IX,IY)
        END DO
      END IF
```

```
! 1.  Prepare auxiliary arrays
!
      IF ( FLFRST ) THEN
        DO ISEA=1, NSEA
!/SMC !!Li  For sea-point only SMC grid wind 1-D wind is stored on
!/SMC !!Li  2-D WX0(NSEA, 1) variable.
!/SMC       IF( FSWND ) THEN
!/SMC          IX = ISEA
!/SMC          IY = 1
!/SMC       ELSE
          IX        = MAPSF(ISEA,1)
          IY        = MAPSF(ISEA,2)
!/SMC       ENDIF

          UA0(ISEA) = SQRT ( WX0(IX,IY)**2 + WY0(IX,IY)**2 )
          UAI(ISEA) = SQRT ( WXN(IX,IY)**2 + WYN(IX,IY)**2 )
          IF ( UA0(ISEA) .GT. 1.E-7) THEN
            D0      = MOD ( TPI+ATAN2(WY0(IX,IY),WX0(IX,IY)) , TPI )
          ELSE
            D0      = 0
          END IF
          IF ( UAI(ISEA) .GT. 1.E-7) THEN
            DN      = MOD ( TPI+ATAN2(WYN(IX,IY),WXN(IX,IY)) , TPI )
          ELSE
            DN      = D0
          END IF
          IF ( UA0(ISEA) .GT. 1.E-7) THEN
            UD0(ISEA) = D0
          ELSE
            UD0(ISEA) = DN
          END IF
          DD      = DN - UD0(ISEA)
          IF (ABS(DD).GT.TPI) DD = DD - TPI*SIGN(1.,DD)
          UDI(ISEA) = DD
          UAI(ISEA) = UAI(ISEA) - UA0(ISEA)
          AS0(ISEA) = DT0(IX,IY)
          ASI(ISEA) = DTN(IX,IY) - DT0(IX,IY)
        END DO
      END IF
```
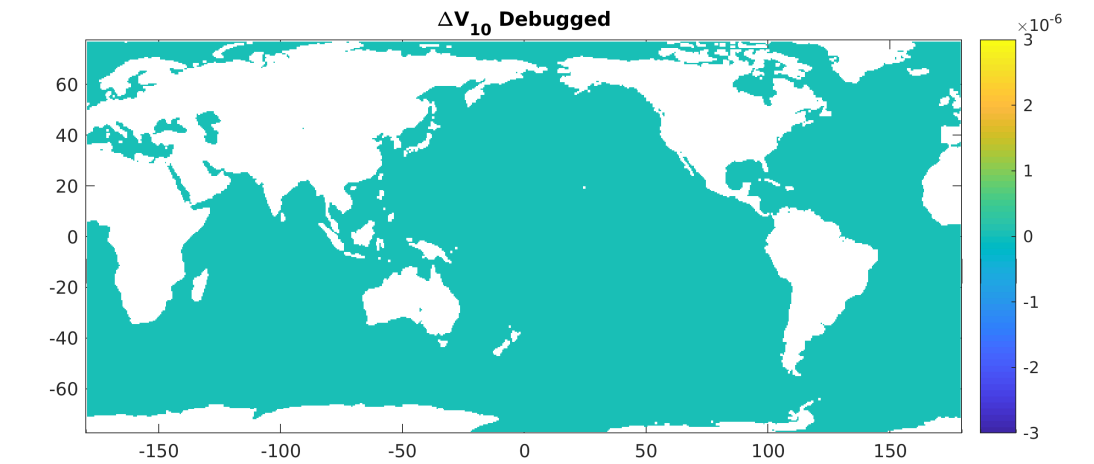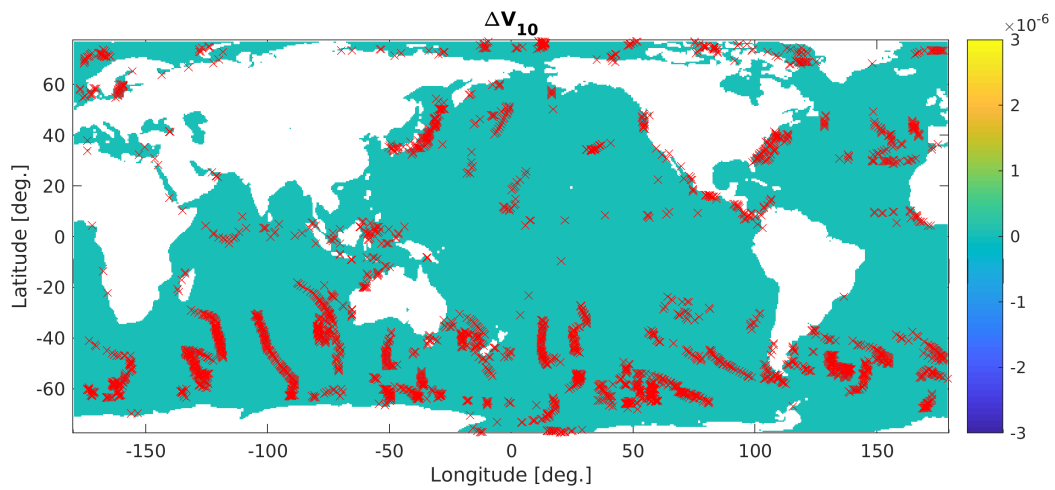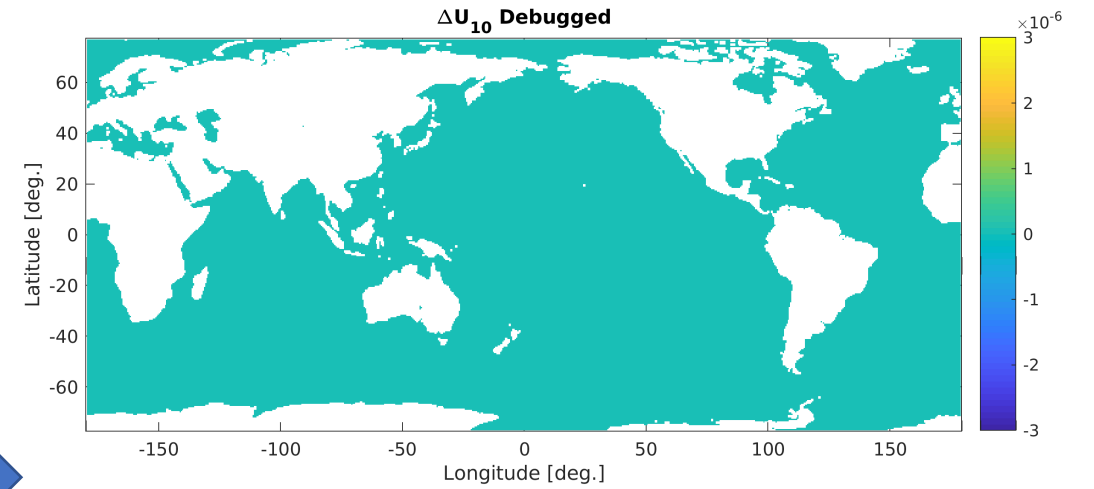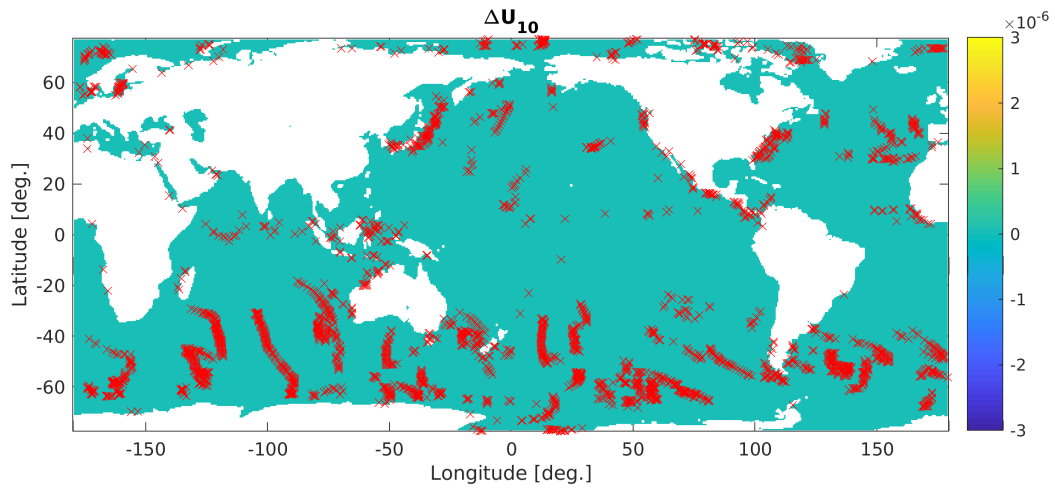
Global 0.5 degree grid

Run1: Cold Start at 0 and write hourly restarts - t=0 to t=4 hrs.

Run2: Hot Start at t=2 (restart002.ww3 from Run1) - t=2 to t=4 hrs.

The difference is < 1e-6, at points we had non-identical results