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SODA and surface data assimilation in HARMONIE

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(on behalf of many….)

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Status update & information

- SODA history:
  - Workshop on SURFEX data assimilation 5-6 March 2012
  - Not champagne… (SODA=Surfex Offline Data Assimilation)
  - Merged OI_main and EKF routines into one interface summer 2012
  - => Entered cy37h1.2
  - Parallell development regarding I/O treatment and inline OI_main
  - Coordination meeting 28.05.13
    - Agreed on merging development
    - SODA was partly re-written summer 2013 (separated I/O handling from the assimilation)
    - Possible to call SODA directly from CANARI
  - => Entered cy38h1.1. Will be a part of SURFEX 8

SODA runs on all tiles

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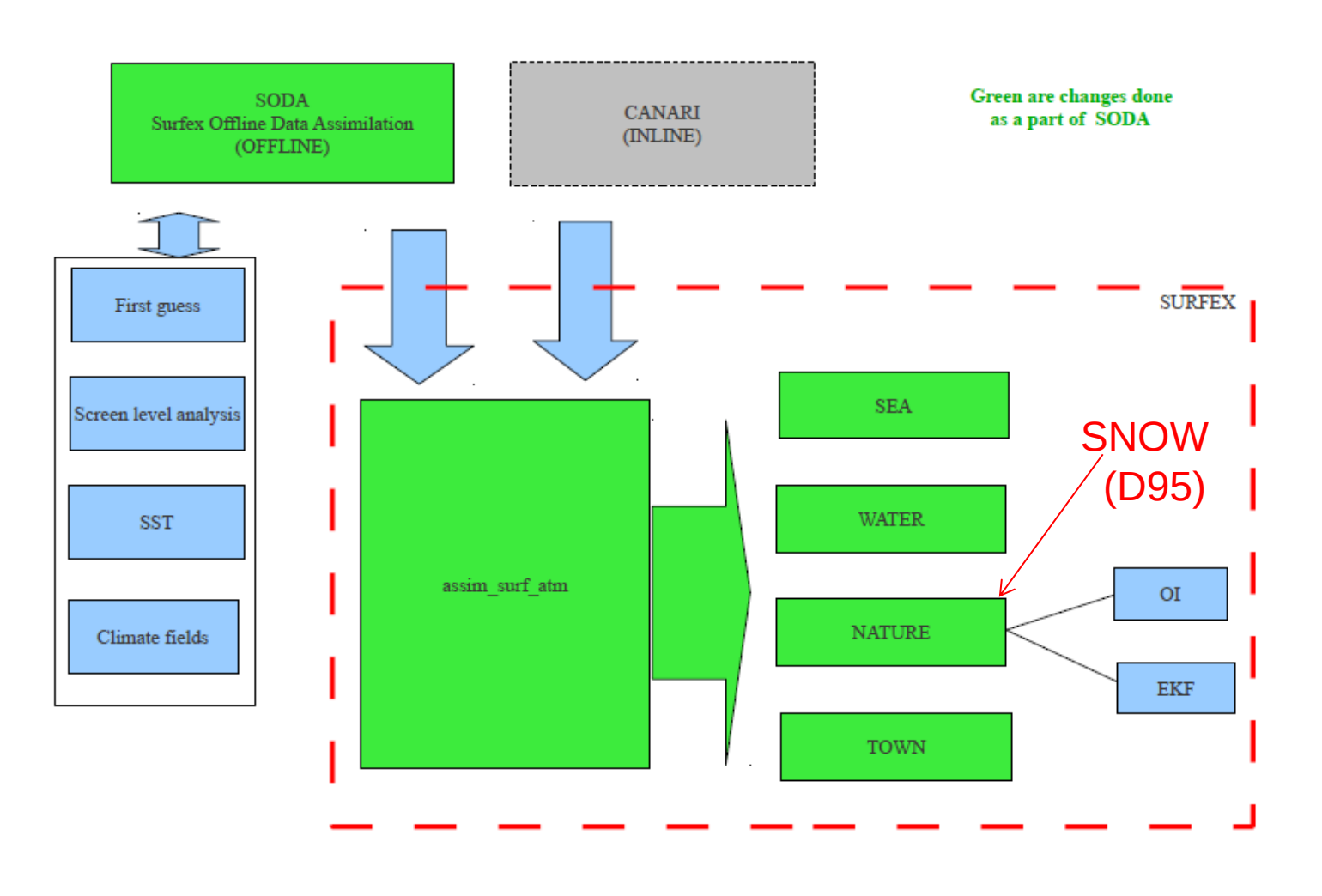
Flowchart



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Future of SODA

- New development
  - Assimilate LAI (merge an EKF_main spin-off with SODA)
  - Assimilate lake properties
  - Snow assimilation in more complex snow schemes
  - Sea ice scheme + assimilation

- Discussion on MG level (January 2014)
  - External coupler?
  - Integrated in hybrid upper air and surface data assimilation?
  - Existing methods (at least some) can hopefully still be used whatever the future brings…

Default setup of cy38h1.1 (surface assimilation)

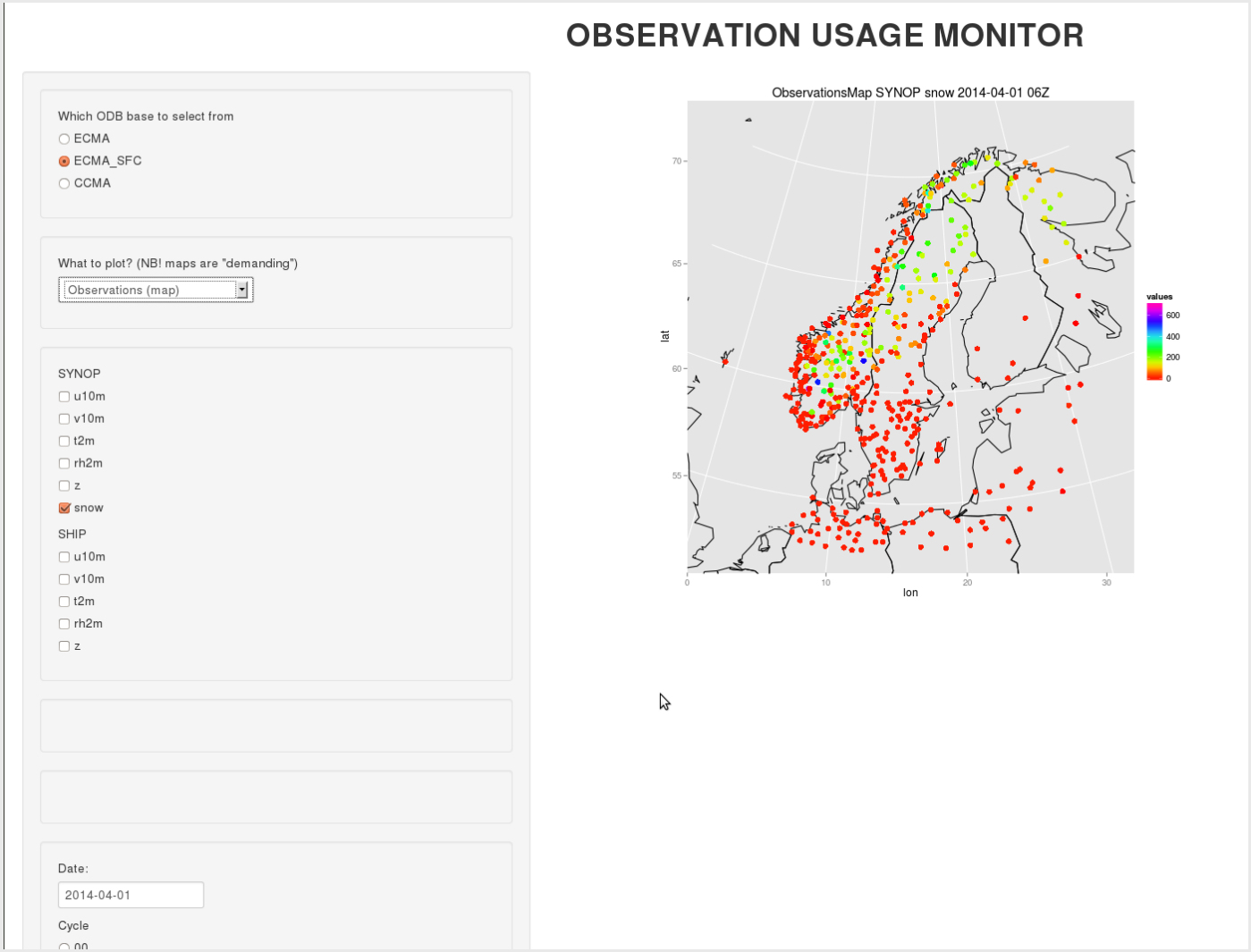
- Initalization:
  - Extrapolation of TG1,TG2,WG1,WG2,WGI1,WGI2 and SNOW in points where atmospheric LSM and SURFEX has a mismatch.
    - ECMWF (H-TESSEL) => gl => FullPos (ISBA 2-L) => SURFEX (ISBA 3-L)

- CANARI + SODA inline
  - CANARI:
    - Assimilating T2M,RH2M,SNOW (depth) from SYNOP stations
  - SODA:
    - Sea:
      - SST interpolated from ECMWF boundary files + extrapolated (e.g. long fjords)
    - Lakes:
      - LST updated from LAND values of TG2 and extrapolated
      - Height adjustment of LST
    - Nature:
      - Snow analysed at 06 UTC
      - OI_main (EKF experimental)
    - TEB:
      - T_ROAD3 updated from T2M increments

Obsmon

- As a part of MetCoOp a monitoring system was developed
  - ODB statistics calculated and stored in SQLite database
    - https://svn.hirlam.org/branches/obsmon
  - R+shiny+RQSLite plot the data on-the-fly
    - https://svn.hirlam.org/trunk/contrib/obsmon
  - In use at hirlam.org:3838/obsmon
- Still under development

Obsmon examples (Snow observations)



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Obsmon examples (observation usage)

OBSERVATION USAGE MONITOR

Which ODB base to select from

- ECMA
- ECMA_SFC
- CCMA

What to plot? (NB! maps are "demanding")

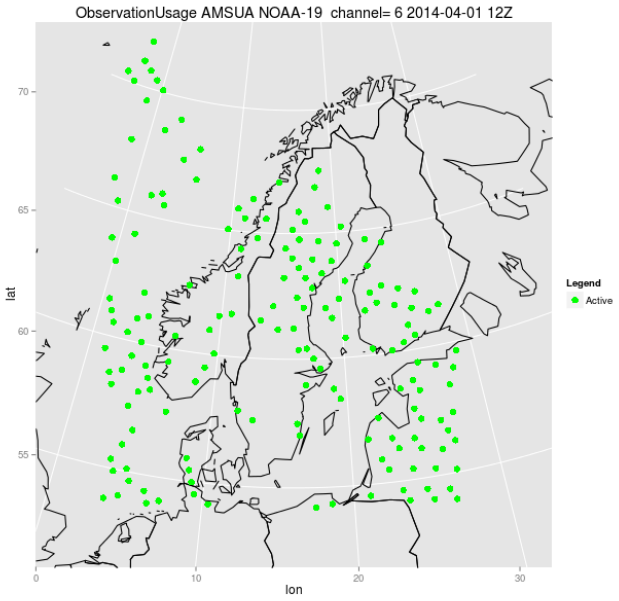
Observation usage (map)

SYNOP
- u10m
- v10m
- t2m
- rh2m
- z
- snow

SHIP
- u10m
- v10m
- t2m
- rh2m
- z

AIRCRAFT
- u
- v
- t

TEMP
- u
- v
- t
- q



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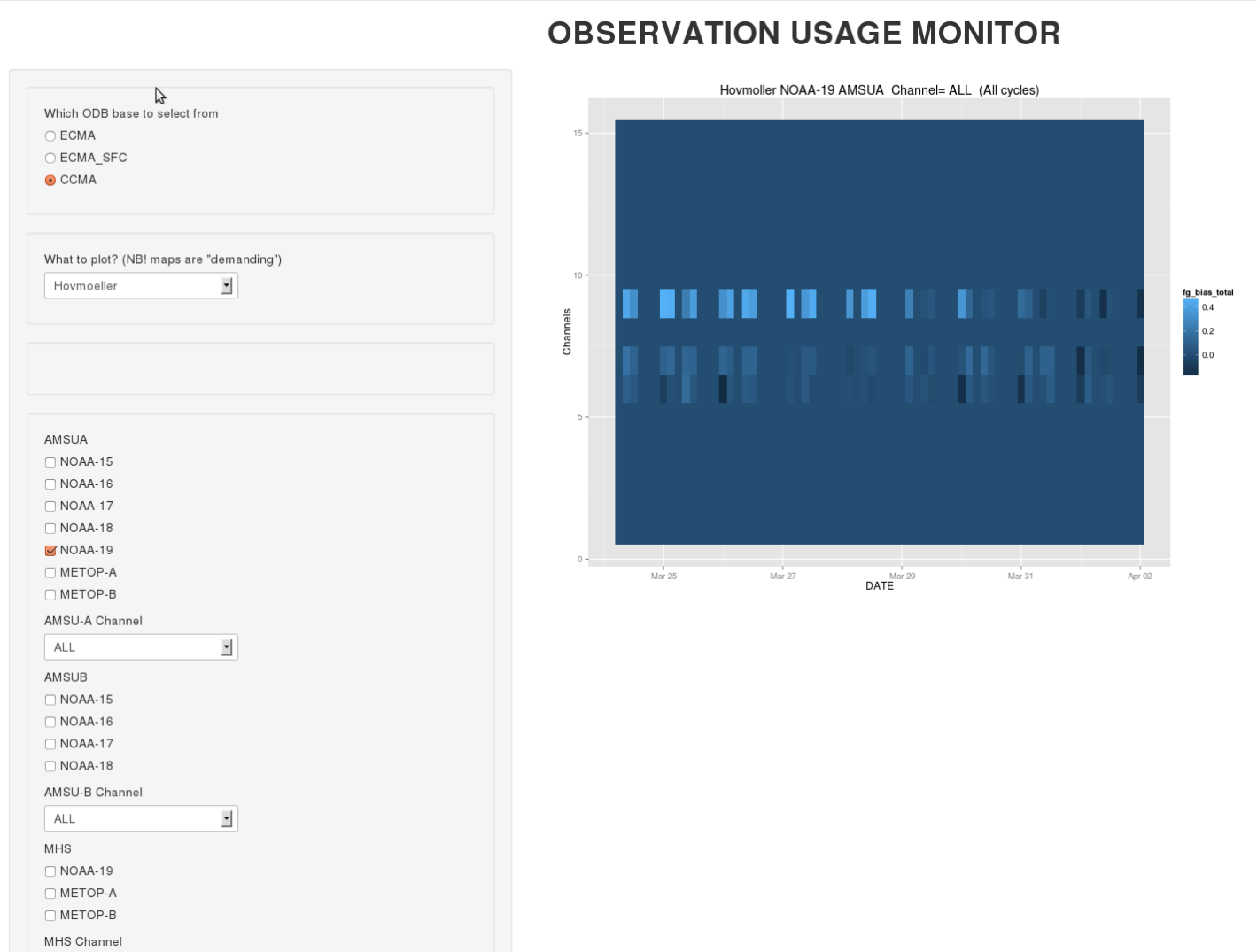
Obsmon examples (Hovmöller diagram)



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