# MEDSLIK II detailed model flow

## Main program

* Load medslik5.par (user input parameters)
* Load medslik5.inp (spill information)
* Load current/wind filenames necessary for the simulation
* List necessary current/wind files
* check for the existence of all current/wind files
* Build bathymetry and grid parameters
* Compute vertical diffusion displacement
* Compute horizontal diffusion displacement
* Check if spill is inside the bathymetry domain
* Print simulation characteristics
* Load satellite/polygon
* Convert tons to barrels
* Boom deployment
* Read spill correction
* Assign initial values to minispill (=0)
* Assign particle status to parcels (1 if from sat, 0 if from point source)
* Open file for fate parameters (medslik.fte) and create headers
* Restart file is read
* Open trajectory file (taken from MDK II v1.02)
* Start temporal loop
* Crop coastline to area surrounding spill
* Compute water currents (whole grid)
* Select current fields for the depth of interest
* Compute wind components (whole grid)
* Compute ce1 (evaporative exposure to wind)
* Compute wind induced drift (whole grid)
* Compute stokes drift (whole grid)
  + Calculate fecth
  + Compute drift
* Compute sea surface temperature (whole grid)
* Compute corrections to oil spill drift from observations
* Load coastline
* Locate beached particles from spill detection
* Release new mini spill
* Start minipstill loop (process applied to each mini spill separately)
  + If timestep = 1 or satellite-derived spill is used, spreading = off
  + Compute centre of spread part
  + Call smagorinsky
  + calculate weathering
  + Calculate slick radius
  + Displace and transform parcels for each mini spill (start loop for through parcels in mini spill)
    - Check if parcels has been dispersed at present timestep
    - Release surface spreading parcels within slick radius
    - Compute horizontal diff displacement
    - Compute vertical diff displacement
    - Interpolate currents, wind drift and stokes drift to the parcel position
    - Compute horizontal and vertical displacements
    - Displace parcels
    - Check if beached parcels are released
    - Check if parcels stuck on booms are released
    - Check if moving parcels hit the coast
    - Apply vertical diffusion to disperse particles (includes loss to bottom)
    - Count fraction of light and heavy oil left in mini spill
    - Compute total parcel volumes for outputs
    - Print spill output
    - Return loop
* Write restart file