# MEDSLIK II detailed model flow

# Initial conditions

* Load config1.txt (description of the spill event: e.g., spill position, duration, time, shape)

# Model configuration

* Load config2.txt (model configuration: wind drag, wind deflection, horizontal diff, etc )
* Load medslik5.inp (spill information)

# Environmental variables

* 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

# Model initialization

* Compute vertical diffusion displacement (da studiare)
* Compute horizontal diffusion displacement (da studiare)
* 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 computation

* Start temporal loop
* Crop coastline to area surrounding spill
* Compute water currents – interpolation in time (whole grid)
* Select current fields for the depth of interest
* Compute wind components – interpolation in time (whole grid)
* Compute ce1 (evaporative exposure to wind)
* Compute wind induced drift (whole grid)
* Compute stokes drift (whole grid) – we might consider eliminating this part of the code
  + Calculate fetch
  + Compute drift
* Compute sea surface temperature – interpolation in time (whole grid)
* Compute corrections to oil spill drift from observations
* Load coastline (studiare)
* Locate beached particles from spill detection (polygon)
* Release new mini spill
* Start mini-spill loop (process applied to each mini spill separately)
  + If timestep = 1 or satellite-derived spill is used, spreading = off
  + Compute centre of spread part

# Evaporation and dispersion

* + calculate Weathering (studiare: I processi mini-spill sono indipendenti e parallelizzabili?)

# Update particle positions

* + 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

# Update particle status

* + - 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

Come viene calcollata l’area?