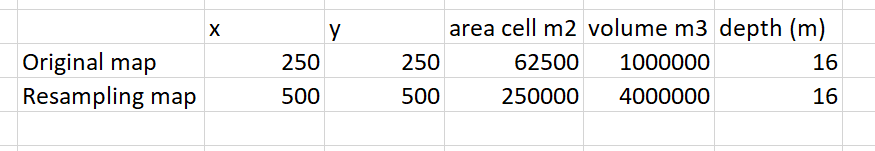
**Description of the Land Use and Subsidence model**

1. Agents

* **Sluice gate**
  + Location
* **Pumper** 
  + Location
  + Power (m3/day)
* **Lake**
  + volume
* **GroundWaterCell (qh)**
  + WaterVolume = Value \* 10^6
  + groundWaterDepth = Water volume/pixel\_size ^2
  + 

**Actions:**

* + UpdateVolume(waterExtracted): Water volume - waterExtracted
* **LandCell**
  + Landuse
  + Elevation
  + WaterVolume
  + groundWaterDepth (Water volume/pixel\_size ^2)
  + WaterDemand
  + plantHealth:
  + WaterExtracted: Water volume - waterExtracted
  + loseDepth: groundwater extracted is converted to water depth lose (WaterExtracted/pixelSize)
  + DEM

**actions:**

* + calWater demand
  + Update subsidence:
    - init\_level – loseDepth
    - WaterExtracted: cumulative water extracted is calculated based on WaterExtracted +waterUsed
    - loseDepth: (**GroundWaterCell.** WaterVolume –WaterExtracted)/pixelSize
    - DEM = DEM – loseDepth
* **AEZ\_Simple**
  + Region
* GPlayLand
  + 4 representative regions: 1: Coast of Tien Giang & Long An; 2: Ben Tre – Tra Vinh; 3: Soc Trang; 4 West coast – Ca Mau

Corresponding to 10x10 cells in Game play (scale 1:3000)

* + Score
  + Heath
  + totalTree
  + FreshwaterUsed
  + NumberPumper **<-**1
  + volumePump

**Actions**

* **DEM**
  + Size 500x500m
  + Elevation: DEM
* Subsidence
  + Init\_level: Init with subsidence in 2018 of Minderhood
* Flood

1. Parameters

* timeStep: 1 year (30s in Game play – Call step every 30s)
* timeExchange: 30s
* scale\_Gplay\_GAMA” 1:3000
* paraWaterUsedSluice
* paraWaterUsedPumper
* paraWaterUsedLake
* lstSluicegate (list object)
* lstPumper (list object)
* lstLake (list object)
* maxwaterPumingVolume : maximum volume allowed per day < 10m3/day--> 10 \* 30day\*3months

1. Global actions
   1. CalWaterUsed.

- calculate total ground water used per year.

- calculate water demand of crops (landuse)

- groundWaterUsed (in dry season) is based on number pumper, lakes, sluice, AEZ\_simple region. The coastal AEZ lack of surface fresh water in the dry season.

- totalWaterPump = Sum ( GPlayLand.numberPumper \* maxwaterPumperVolume)

* 1. CalSubsidence
  2. Get parameter(every 30s)

- list of objects

* 1. SendParameter
  + List of object
  + Score