Wailupe Subcatchments

This is code to process the subcatchments layer for use in SWMM.

Erica Johnson

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Code Setup

```
#Load packages
library(tidyverse)
library(dplyr)
library(data.table)
library(janitor)

points <- read_csv("subc_points.csv") %>%
  clean_names() %>%
  rename(name = subcatchment_name,
         x = point_x,
         y = point_y
         ) %>%
  select(name, x, y)

attributes <- read_csv("subc_attributes.csv") %>%
  clean_names() %>%
  rename(name = objectid_1)
```

Process subcatchments for SWMM

Collect Name, Area, Width, X and Y coordinates of each polygon and arrange them into the SWMM format. Rain gage and Outlets were assigned manually in SWMM

See example SWMM format below:

[SUBCATCHMENTS]
;;Name Rain Gage Outlet Area %Imperv Width %Slope CurbLen SnowPack

```
#If you have run the stormwater_network_wailupe_final.rmd, this file will be available.
#If not, use the alternate code chunk below

subc_outlet <- read_csv("subc_outlet.csv") %>% rename(name = subc, outlet = node)

merge_a <- merge(points, attributes, by = "name") %>% distinct (name, .keep_all = TRUE)
merge <-merge (merge_a, subc_outlet, by="name", all = TRUE)

subc <- merge %>%
  mutate(
    area_acre = area_sqft*0.0000229568
    ) %>%
```

```
  rename(
    area = area_acre,
    imperv = percent_imp
  ) %>%
  distinct()

#add columns for "subcatchments" file.


subc$rain_gage <- "R1"
#placeholder until you can manually assign the correct rain gage to the correct subcatchment
subc$curblen <- 0

#arrange
subc_file <- subc %>%
  select(
    name,
    rain_gage,
    outlet,
    area,
    imperv,
    width,
    slope,
    curblen
    ) %>%
  distinct(name, .keep_all = TRUE)

write.csv(subc_file ,"inp_subcatchments.csv", row.names = FALSE)
```

Alternate code chunk

```
merge <- merge(points, attributes, by = "name" )

subc <- merge %>%
  mutate(
    area_acre = area_sqft*0.0000229568
    ) %>%
  rename(
    area = area_acre,
    imperv = percent_imp
  ) %>%
  distinct()

#add columns for "subcatchments" file.
subc$rain_gage <- "R1"
subc$outlet <- "J1"
subc$curblen <- 0

#arrange
subc_file <- subc %>%
  select(
    name,
    rain_gage,
    outlet,
```

```
    area,
    imperv,
    width,
    slope,
    curblen
    ) %>%
  distinct(name, .keep_all = TRUE)

write.csv(subc_file ,"inp_subcatchments.csv", row.names = FALSE)
```

[SUBAREAS]
;;Subcatchment N-Imperv N-Perv S-Imperv S-Perv PctZero RouteTo PctRouted
;;————— ——————- ——————- ——————- ——————-
1 0.01 0.1 0.05 0.05 25 OUTLET

```
suba <- subc_file %>%
  select(name) %>%
  rename (subcatchment = name) %>%
  distinct()

suba$n_imperv <- 0.01 #manning's n for impervious surfaces - values from SWMM Manual

suba$n_perv <- 0.4 #manning's n for pervious (natural) surfaces. 0.4 for forested subcatchments.
#Later, identify urban subcatchments and input 0.15. - values from SWMM Manual

suba$s_imperv <- 0.2 #impervious surface depth of depression storage (in) - values in SWMM Manual

suba$s_perv <- 0.3 #pervious (natural) surface depth of depression storage - values in SWMM manual

suba$pctzero <- 0
suba$RouteTo <- "OUTLET"

#n is for Manning's n, and s is for Depth of Depression Storage.

write.csv(suba ,"inp_subareas.csv", row.names = FALSE)
```

[INFILTRATION]
;;Subcatchment CurveNum DryTime
;;————— ——————- ——————- ——————-

```
infil <- subc %>%
  select(name,
         curve_number
         ) %>%
  rename (
    subcatchment = name
    ) %>%
  distinct()

infil$Blank <- 0.5 #this is conductivity, however this may have been depreciated in the model
infil$DryTime <- 7 #units in days

write.csv(infil ,"inp_infiltration.csv", row.names = FALSE)
```

[Polygons]

;;Subcatchment X-Coord Y-Coord
;;———————— ———————— ————————

```
polygons <- points %>%
  select(
    name,
    x,
    y) %>%
  rename(subcatchment = name
         ) %>%
  distinct()

write.csv(polygons ,"inp_polygons.csv", row.names = FALSE)
```