Cluster Processing User Guide

Sections

1. Processing GPS Data
2. Filter, Clean and Rarify Data

Collar Cleaning User Guide

3. Cluster Generation

Warren Wolf Algorithm User Guide

4. Merging
5. Matching

Cluster Processing User Guide

Programs:

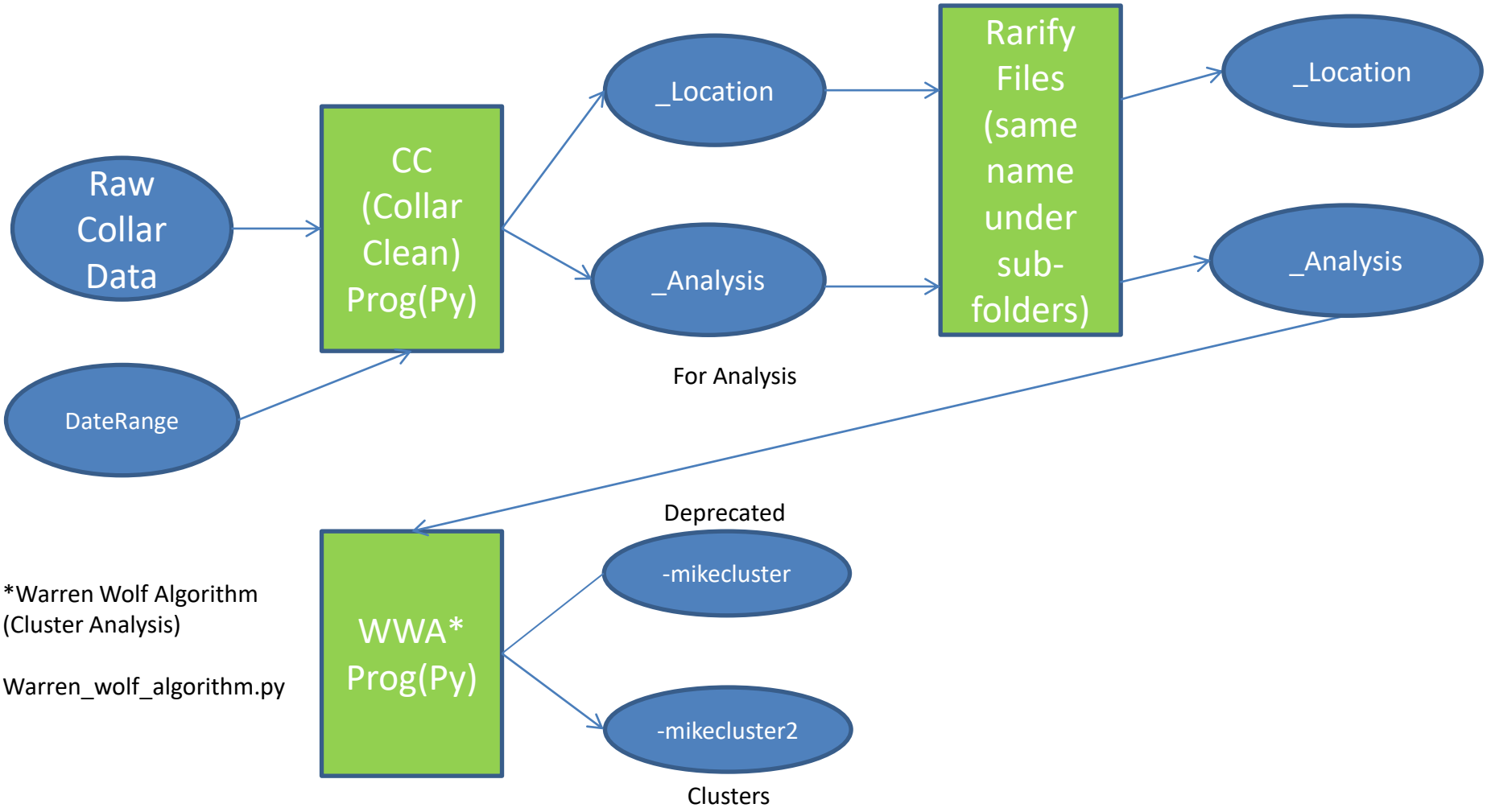
mergelocW_v7.R	merges location files
mergeMC2_v3.R	merges mikecluster2 files

4. MERGING

Merging

- Overview of directory structure
- Key programs written in R
- Tags added to each line to enable bi-directional tracing:
  - Rfolder: which folder rows taken from
  - Findex: F[ile] Index - multiple files for the same WolfID are numbered 1,2…

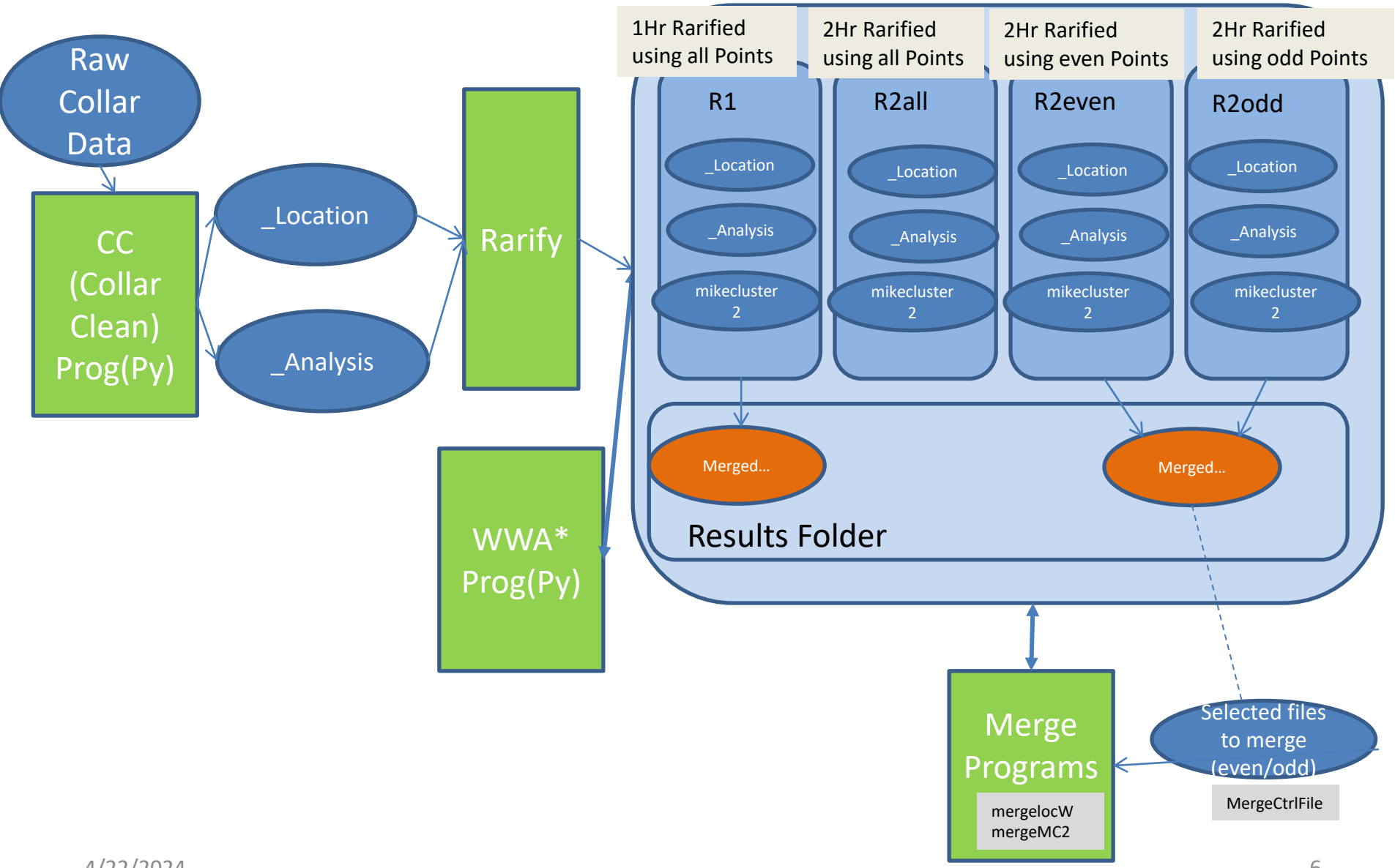
Rarify Flow



*Warren Wolf Algorithm (Cluster Analysis)

Warren_wolf_algorithm.py

Directory Structure



Sample: bbbMergeCtrlFile

	A	B	C	D
1	WolfID	MergeCtrl1	MergeCtrl2	Notes
2	W01	R1	R2odd	
3	W02	R1	R2odd	
4	W03	R1	R2even	
5	W04	R1	R2odd	
6	W05	R1	R2even	
7	W06	R1	R2even	
8	W07	R1	R2even	
9	W08	R1	R2odd	
10	W09	R1	R2odd	
11	W10	R1	R2even	
12	W11	R1	R2odd	email had
13	W12	R1	R2odd	
14	W13	R1	R2odd	
15	W14	R1	R2even	
16	W15	R1	R2odd	
17	W16	R1	R2even	
18	W19	R1	R2odd	
19	W20	R1	R2even	
20	W21	R1	R2odd	
21	W22	R1	R2even	
22	W23	R1	R2odd	email did
23	W24	R1	R2even	
24	W25	R1	R2odd	
25	W26	R1	R2odd	
26	W27	R1	R2odd	
27				

This files directs two merges

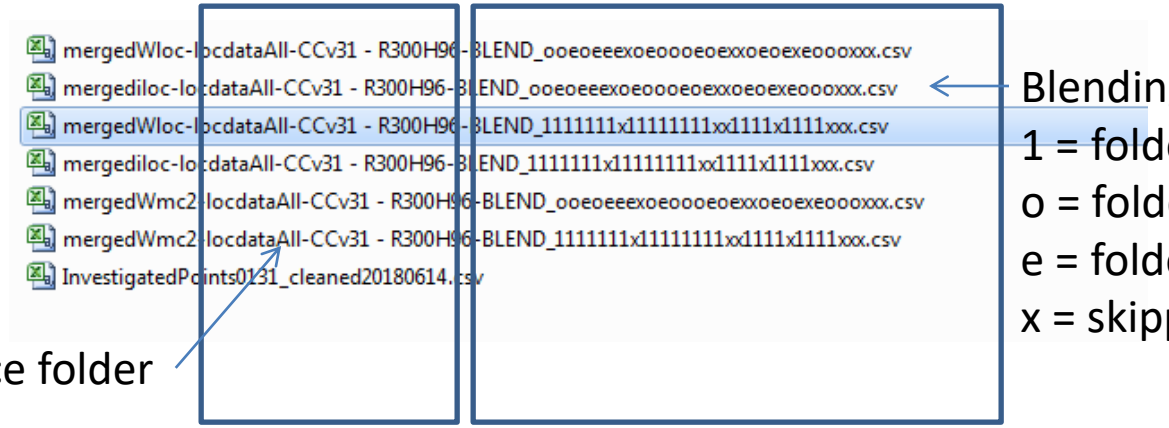
Running programs

- Mandatory: run Cluster merge first
- mergeMC2_v3.R merges mikecluster2 files

- Next: Then run Location merge
- mergelocW_v7.R merges location files

- Review and save log

Results Folder: Merge Output



Blending Tag for Wolf# [1..30]
1 = folder R1
o = folder R2odd
e = folder R2even
x = skipped Wolf#

Source folder

mergedWmc2 = merged mikecluster2
mergediloc = merged location files - Intermediate
mergedWloc = merged location files - Final

Merged Location File: Sample

X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL
Rfolder	FnameLoc	FnameClu	Findex	stepdur	CluCentID	CluFirstPt	CluLastPt	CluInnerPt	CluAwayPt	CluFirstRowID	CluLastRowID	CluInnerRowID	CluAwayRowID	
R1	Televilt_W05_GL_20160120201804	NA	1	2	NA	0	0	0	1	NA	NA	NA	732	
R1	Televilt_W05_GL_20160120201804	NA	1	2	NA	0	0	0	1	NA	NA	NA	732	
R1	Televilt_W05_GL_20160120201804	Televilt_W05_GL_20160120201804	1	2	GL_W05_20160328_120000	0	0	1	0	NA	NA	732	NA	
R1	Televilt_W05_GL_20160120201804	Televilt_W05_GL_20160120201804	1	2	GL_W05_20160329_020000	1	0	0	1	733	NA	NA	732	
R1	Televilt_W05_GL_20160120201804	Televilt_W05_GL_20160120201804	1	2	GL_W05_20160329_020000	0	0	1	1	NA	NA	733	732	
R1	Televilt_W05_GL_20160120201804	Televilt_W05_GL_20160120201804	1	2	GL_W05_20160329_020000	0	0	1	1	NA	NA	733	732	
R1	Televilt_W05_GL_20160120201804	Televilt_W05_GL_20160120201804	1	2	GL_W05_20160328_120000	0	0	1	1	NA	NA	732	733	
R1	Televilt_W05_GL_20160120201804	Televilt_W05_GL_20160120201804	1	2	GL_W05_20160328_120000	0	0	1	1	NA	NA	732	733	
R1	Televilt_W05_GL_20160120201804	Televilt_W05_GL_20160120201804	1	2	GL_W05_20160329_020000	0	0	1	1	NA	NA	733	732	
R1	Televilt_W05_GL_20160120201804	Televilt_W05_GL_20160120201804	1	2	GL_W05_20160329_020000	0	1	0	1	NA	733	NA	732	
R1	Televilt_W05_GL_20160120201804	Televilt_W05_GL_20160120201804	1	2	GL_W05_20160328_120000	0	0	1	0	NA	NA	732	NA	
R1	Televilt_W05_GL_20160120201804	Televilt_W05_GL_20160120201804	1	2	GL_W05_20160328_120000	0	0	1	0	NA	NA	732	NA	
R1	Televilt_W05_GL_20160120201804	Televilt_W05_GL_20160120201804	1	2	GL_W05_20160328_120000	0	0	1	0	NA	NA	732	NA	
R1	Televilt_W05_GL_20160120201804	Televilt_W05_GL_20160120201804	1	2	GL_W05_20160328_120000	0	0	1	0	NA	NA	732	NA	

Rfolder:	which rarification folder
FnameLoc:	source Location file
FnameClu:	source Cluster file
Findex:	which file if multiple files for a single Wolf
CluCentID:	cross reference to CentID from merged Cluster file
CluFirstPt:	1 if first point in Cluster
CluLastPt:	1 if last point in Cluster
CluInnerPt:	1 if inner point in Cluster
CluAwayPt :	>1 if first point in Cluster
CluFirstRowID:	rowID of first pt in merged Cluster file
CluLastRowID:	rowID of last pt in merged Cluster file
CluInnerRowID:	rowID of inner pt in merged Cluster file
CluAwayRowID:	rowID of away pt in merged Cluster file (only the last one found is recorded)

Main Programs:

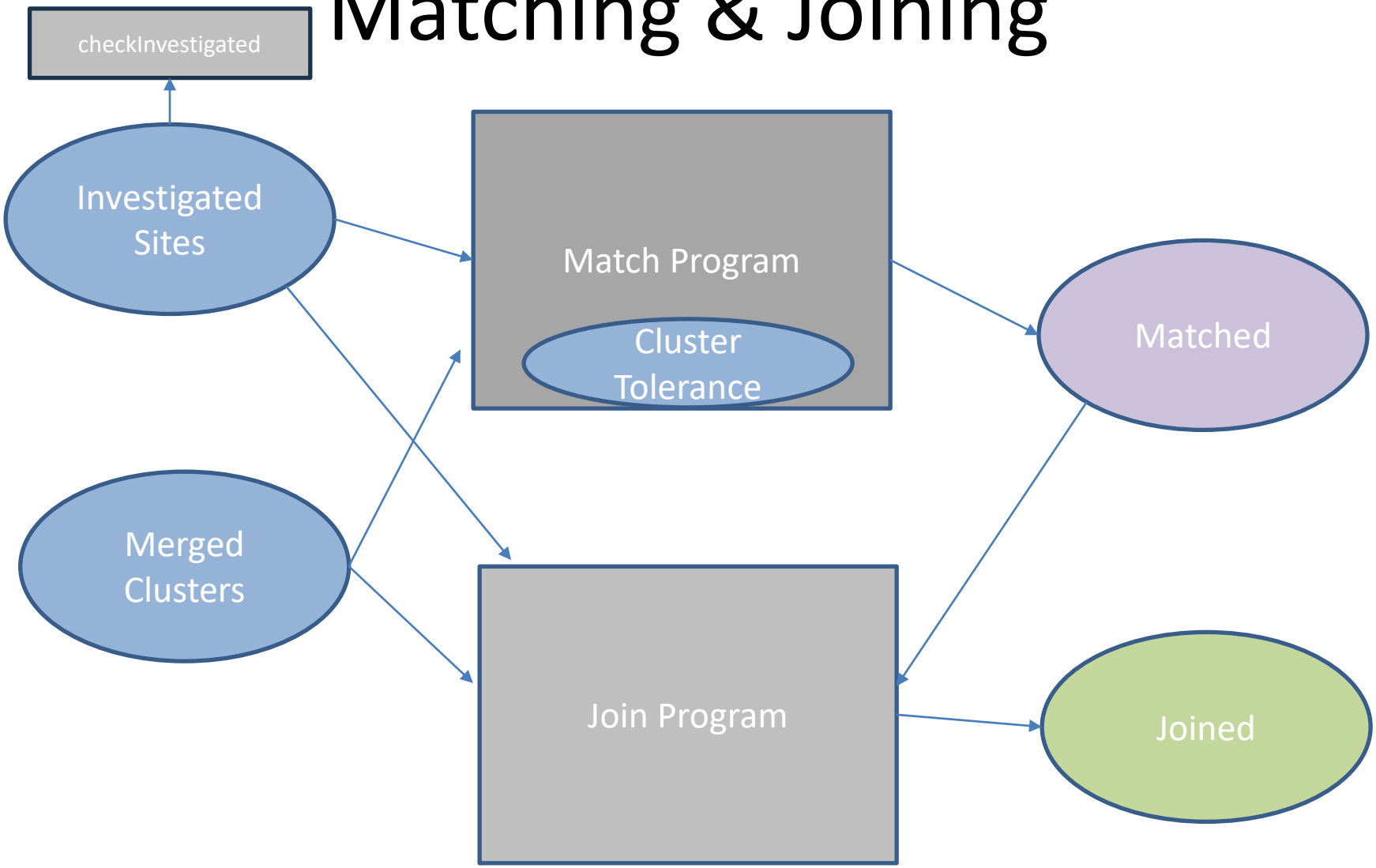
matchWsites_v8	match: generated clusters (WWA) and investigated sites
joinWsites_v2.R	join: generated clusters and investigated sites
cluMatch_v30.R	match: clusters across multiple wolves (MW)

Check Programs:

checkInvestigated_v1.R	check raw investigated site file for consistency
checkMWdata_v7.R	check for consistent multi-wolf clusters

5. MATCHING

Matching & Joining

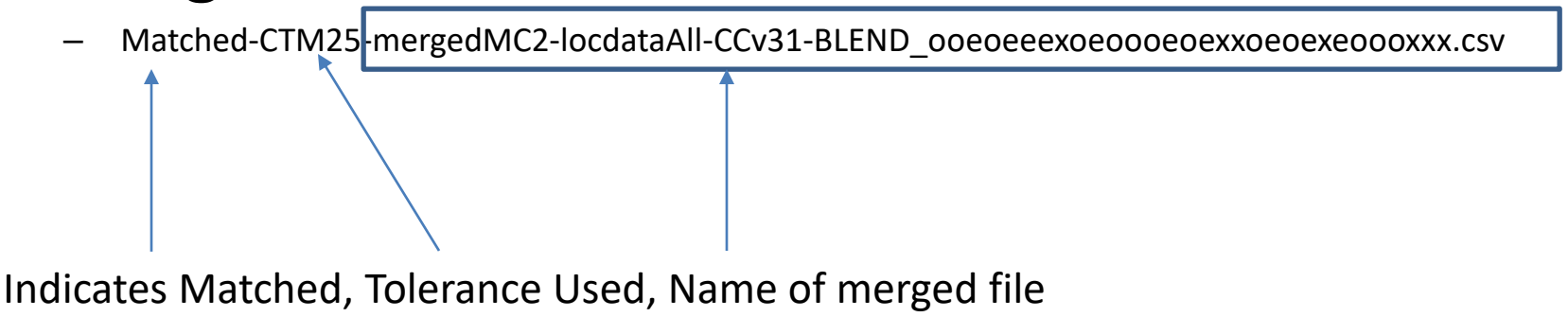


Matching

- The match program takes several inputs
  - Edit the program before running
- #
- # Cluster Tolerance (tolerance in meters added to buffer)
- cluster_tolerance = 5
- cluster_tolerance = 0
- #
- # Investigation File
- investFile = "InvestigatedPoints0131_cleaned20180614.csv"
- #
- # Merged MikeCluster2 File"
- groupFile = "mergedMC2-locdataAll-CCv31-BLEND_1111111x11111111xx1111x1111xxx.csv"
- #
- # Results Directory
- resultsDir = "locdataAll-CCv31/Results"

Match File

- Run the program (matchWsites_v8.R)
- Check the results folder, should see a file along the lines of:
  - Matched-CTM25-mergedMC2-locdataAll-CCv31-BLEND_ooeoeeexoeoooeoexxoeoexeoooxxx.csv

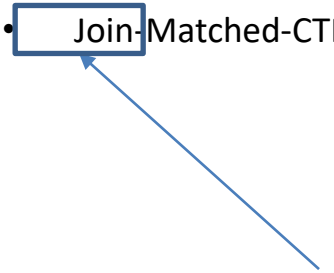


Joining

- The join program takes several inputs
  - Edit the program before running
- ##### Change the following names as required #####
- #
- # Results directory   to use
- # Investigation file to use
- # Merged Cluster file to use
- # Cluster Tolerance to use to create name for Matched file
- #
- # Results Directory
- resultsDir = "locdataAll-CCv31/Results"
- #
- # Investigation File
- investFile = "InvestigatedPoints0131_cleaned20180614.csv"
- #
- # Merged MikeCluster2 File
- groupFile = "mergedMC2-locdataAll-CCv31-BLEND_ooeoeeexoeoooeoexxoeoexeoooxxx.csv"
- #
- # Cluster Tolerance (tolerance in meters added to buffer)
- #
- cluster_tolerance = 0
- #cluster_tolerance = 25

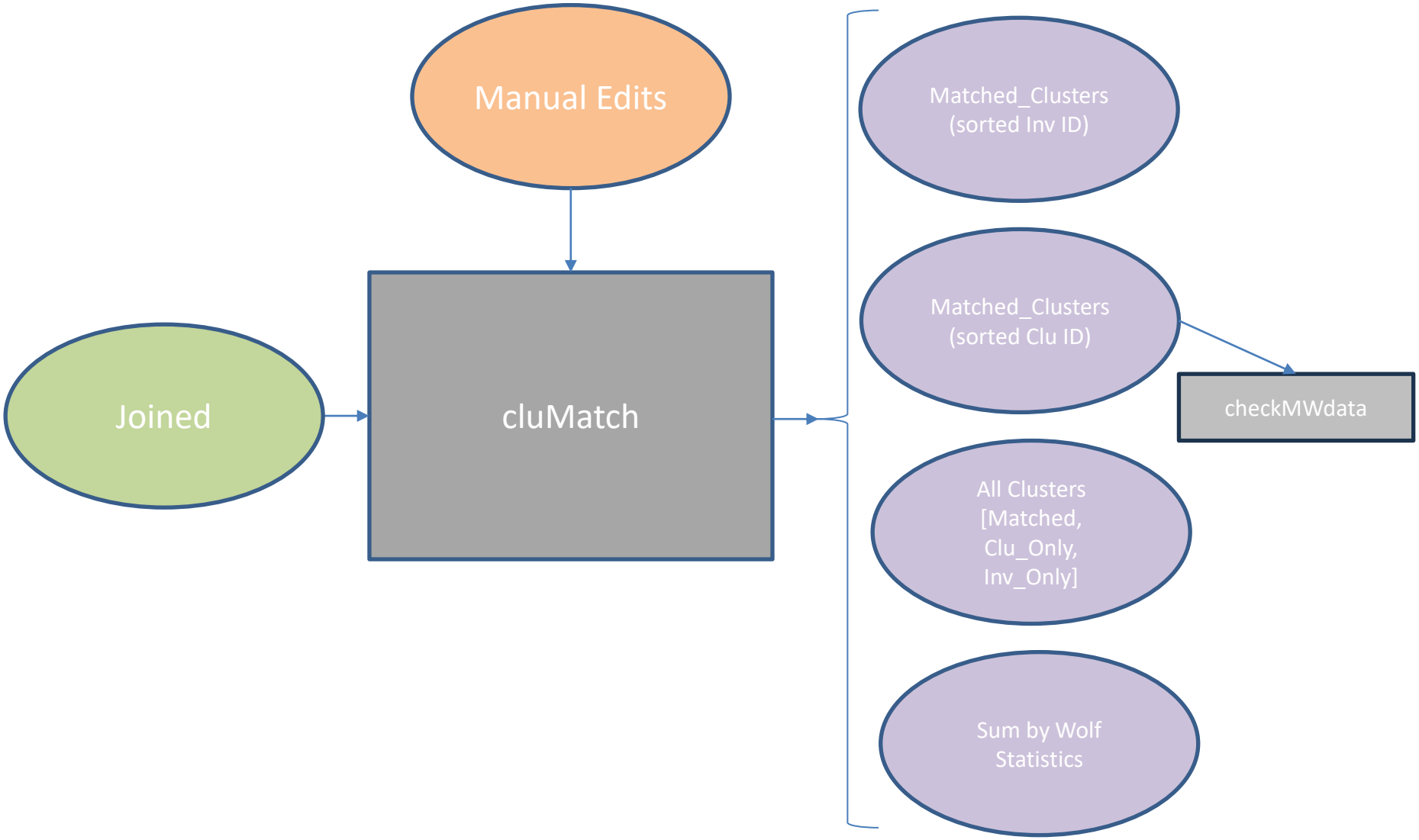
Join File

- Run the program (joinWsites_v2.R)
- Check the results folder, should see a file along the lines of:
- Join-Matched-CTM25-mergedMC2-locdataAll-CCv31-BLEND_ooeoeeexoeoooeoexxoeoexeoooxxx.csv



Indicates the Join of the Matched file with the Merged Cluster and Investigated Sites

Multi-Wolf Cluster Matching



Backup

(for Reference Only)

Step Duration Checks

- Each species has a set of valid Step Durations which are checked with the round(step_duration) function.

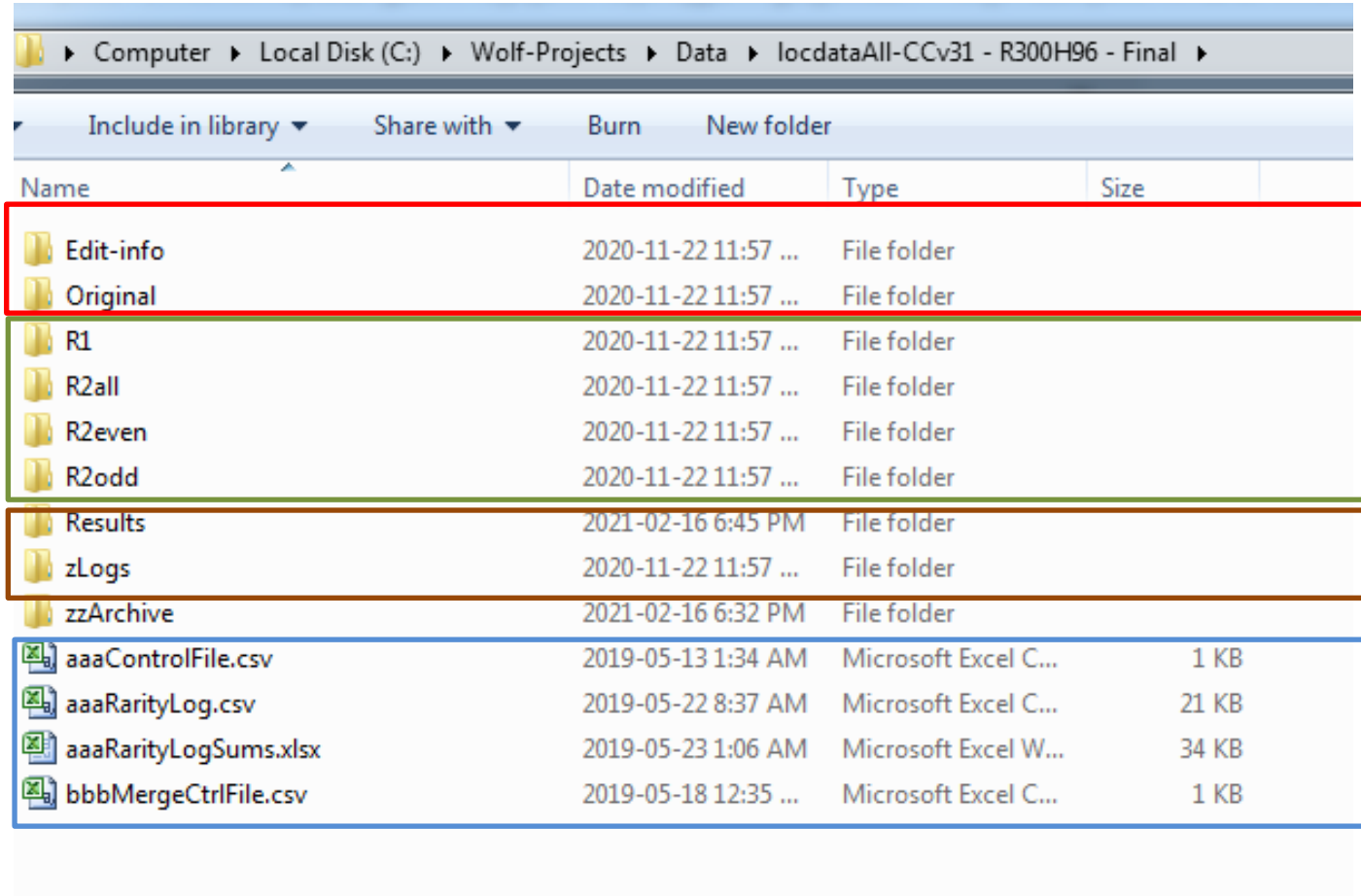
- Wolf – Valid Step Durations (hours) = (1, 2)
  - 0.5 < step_duration <= 2.5

- Deer – Valid Step Durations (hours) = (0.3, 2, 4)
  - 0.25 < step_duration < 0.35 ➔ rarified to 1 hour
  - 1.50 < step_duration <= 2.50
  - 3.50 < step_duration <= 4.50

- Moose – Valid Step Durations (hours) = (2)
  - 1.5 < step_duration <= 2.5

- Elk – Valid Step Durations (hours) = (2)
  - 1.5 < step_duration <= 2.5

Sample Directory Structure I



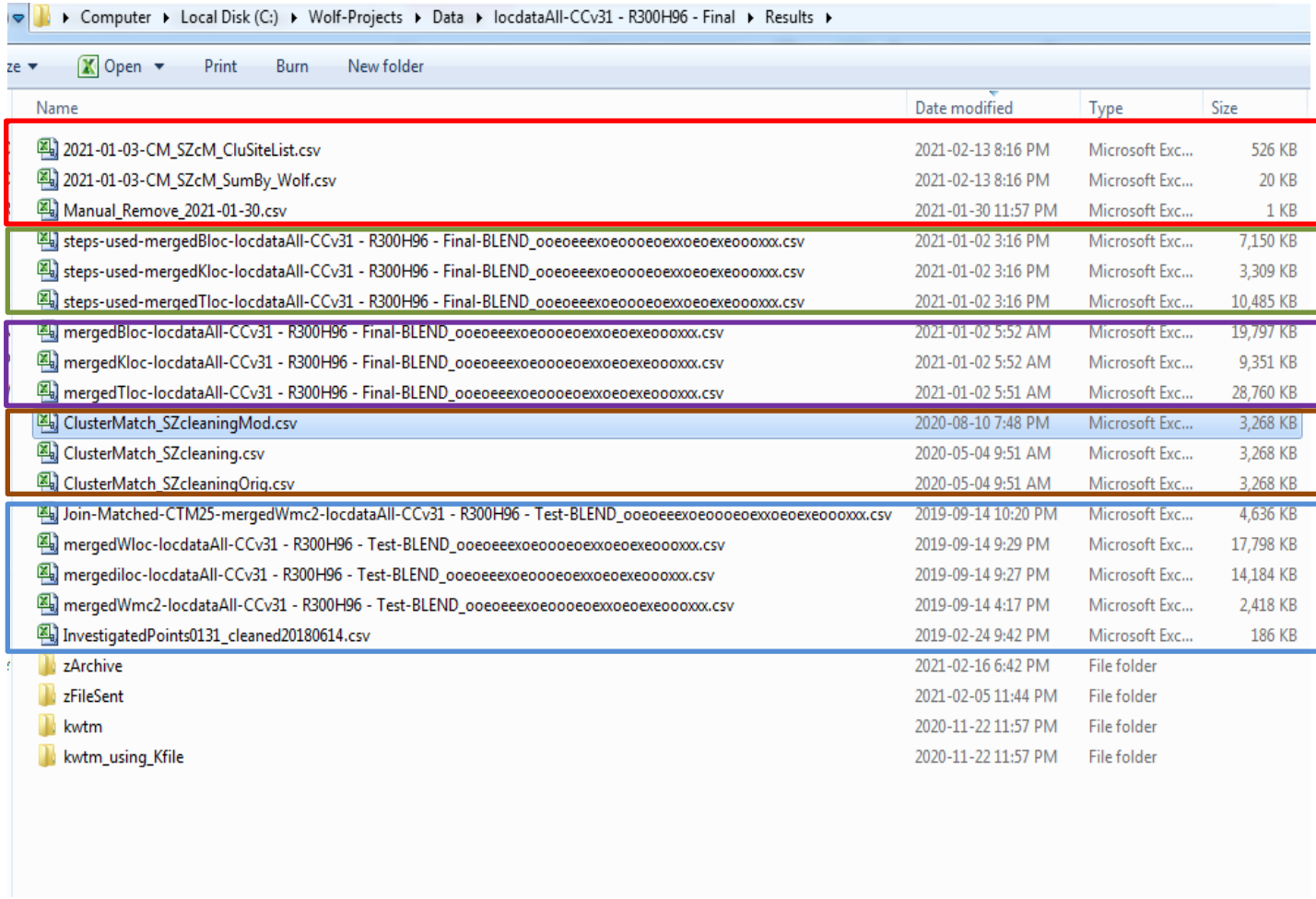
- Original files
- After cc_v31

- Rarified Files
- R1
- R2all, R2even and r2odd

- All Results

- Control file for rarification

Sample Directory Structure II



- Common Clusters
- Step files
- Between kills, Kill, Total
- Location files (ttk, etc.)
- K = Kill Locations
- ClusterMatch_ SZcleaningMod is used
- Original Join-Match and blended location and cluster files