

# Rediscretizing Tracks

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*August 16, 2016*

These analyses now consider all five releases, both Phase 1 (spatial) and Phase 2 (survival)

## Rediscretization of Tracks

- Using primary and secondary filtered data to rediscretize tracks for further analysis
- Tracks have been split into bursts where successive positions were separated by  $> 50\text{m}$
- this threshold can be altered in “Final\_Filtering.Rmd” if desired
- Before redistributing, remove bursts with  $< 10$  positions (too few to rediscretize in adehabitatLT)
- After, recalculated migration speed between positions

```
options(digits=20) #keep
red7 <- readRDS("Maestros/AllFish_FiltSec4Bursts.RData") # single object, named red7

dim(red7) # 102571 detections
```

```
## [1] 102571      16
```

```
length(unique(red7$id)) # 641 unique fish
```

```
## [1] 641
```

```
length(unique(red7$burst)) # 1161 unique bursts
```

```
## [1] 1161
```

```
ndetects.fish = summarize(group_by(red7, id), ndet = n())
mean(ndetects.fish$ndet) # 160.0 per fish
```

```
## [1] 160.01716068642745
```

```
range(ndetects.fish$ndet) # ranges from 3 - 578
```

```
## [1] 3 578
```

```
ndetects.burst = summarize(group_by(red7, burst), ndet = n())
mean(ndetects.burst$ndet) # 88.3 per fish
```

```
## [1] 88.347114556416884
```

```
range(ndetects.burst$ndet) # ranges from 3 - 578
```

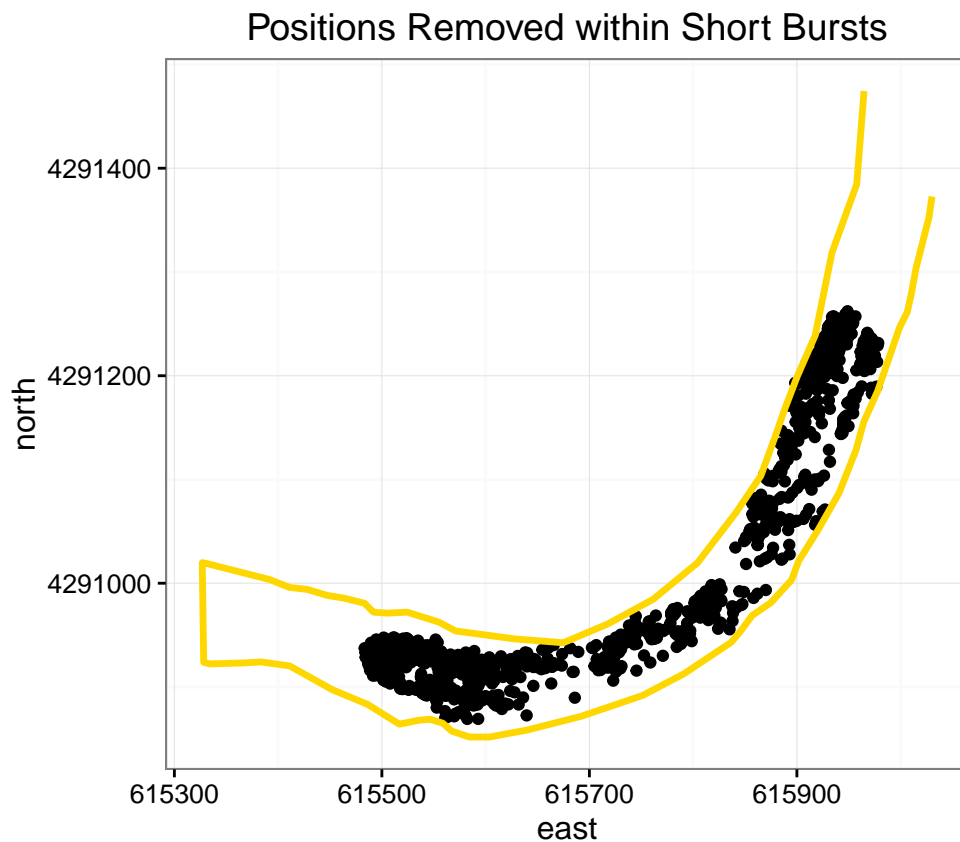
```
## [1] 3 578
```

```
max(red7$spd_mps, na.rm=T) # 67.6 mps
```

```
## [1] 67.643759819729937
```

```
## [1] 217
```

```
## [1] 1153
```



```
# discretize in space
redlt.ssr dz = (redisltraj(red8.ltraj, u=27, type="space", nnew=50))
# u=25 is the smallest distance where the code will work, when ran with rel 1&2
# u=27 is the smallest distance where the code will work, when ran with rel 1-5

# convert back to dataframe
red8.ssr dz = ld(redlt.ssr dz)
red8.ssr dz=red8.ssr dz[order(red8.ssr dz$id, red8.ssr dz$date),]

# recalculate migration speed
red8.ssr dz$spd_mps = red8.ssr dz$dist / red8.ssr dz$dt

dim(red8.ssr dz) # 12257 detections after discretization
```

```
## [1] 12257    15
```

```
length(unique(red8.ssrz$id)) # 634
```

```
## [1] 634
```

```
ndetects.discr = summarize(group_by(red8.ssrz, id), ndet = n())  
mean(ndetects.discr$ndet) # 19.3 per fish
```

```
## [1] 19.332807570977916
```

```
range(ndetects.discr$ndet) # ranges from 2 - 27
```

```
## [1] 2 27
```

```
max(red8.ssrz$spd_mps, na.rm=T) # 20.5 mps
```

```
## [1] 20.493890001065925
```

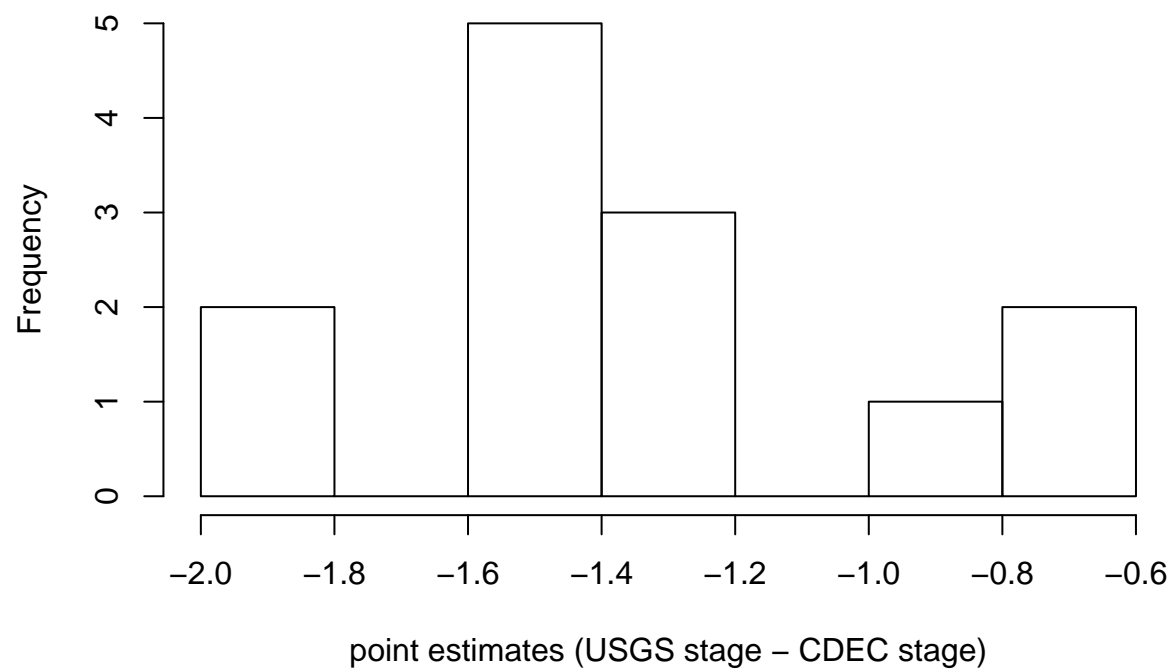
Add covariates (release event, river stage) back into dataframe to possibly use later \*Compared un-QAQCed data on river stage from CDEC station (no discharge available) with USGS measured values

Save the discretized object to RData

Note: In 2015 I removed tracks which had < 10 positions after spatial discretization. However, this year's analysis is slightly different since I'm working with bursts -> we should have already controlled for sparse tracks (i.e., those where interpolation might be inappropriate). Plus, above I've removed any burst with < 10 positions. Therefore, I'm imposing no additional filtering after discretization.

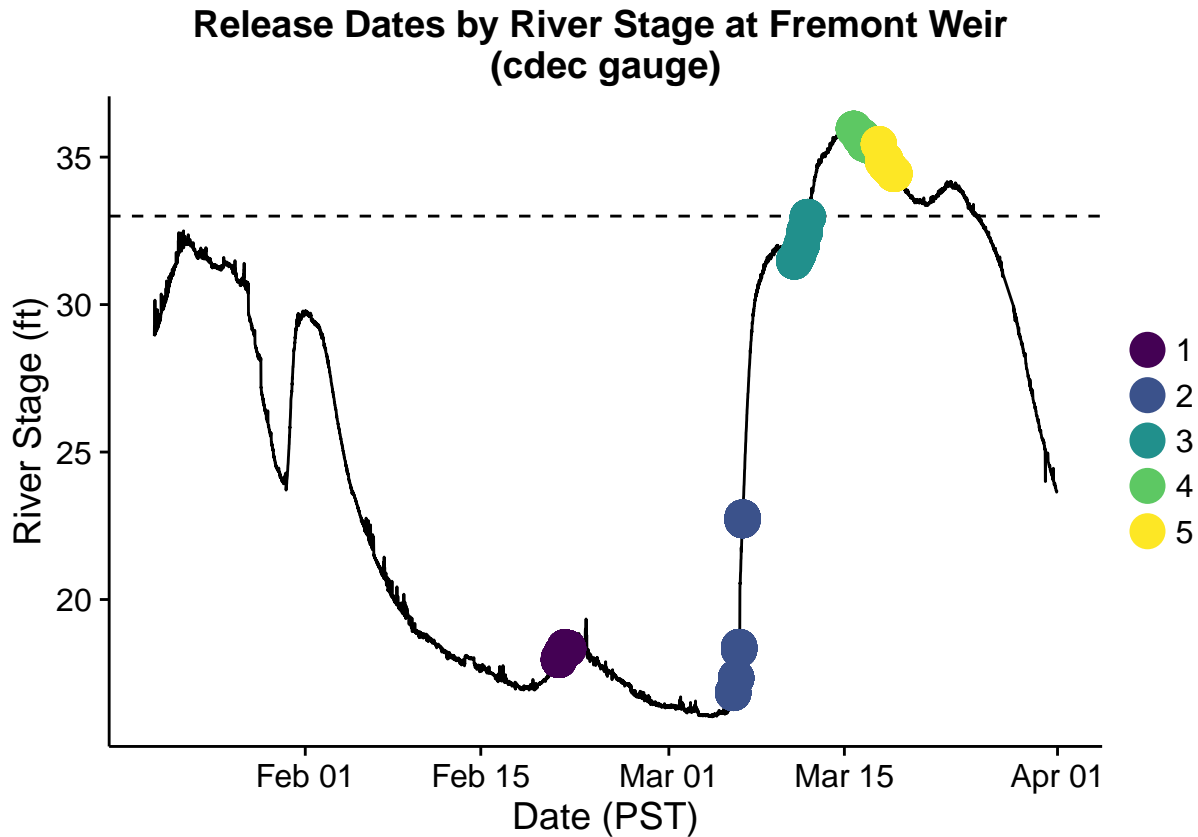
```
## [1] -1.2699999999999957 -1.26000000000000156 -1.28000000000000114  
## [4] -0.85000000000000142 -0.7899999999999915 -1.839999999999986  
## [7] -1.8799999999999901 -1.5799999999999829 -1.5599999999999872  
## [10] -1.40999999999999659 -1.4299999999999972 -1.4499999999999574  
## [13] -0.71000000000000085 NA
```

## compare spot measures from USGS to continuous gage of CDEC



```
## [1] -1.3315384615384609
```

```
## [1] 0.36812240160590887
```



writes discretized dataset to file: “Maestros/RediscSpat\_27m.RData”

And finally, output the general metrics about the remaining dataset

```
dim(red8.ssr dz) # 12257 detections after discretization
```

```
## [1] 12257    22
```

```
length(unique(red8.ssr dz$id)) # 634
```

```
## [1] 634
```

```
ndetects.discr = summarize(group_by(red8.ssr dz, id), ndet = n())
mean(ndetects.discr$ndet) # 19.3 per fish
```

```
## [1] 19.332807570977916
```

```
range(ndetects.discr$ndet) # ranges from 2-27
```

```
## [1] 2 27
```

```
max(red8.ssr dz$spd_mps, na.rm=T) # 20.49 mps
```

```
## [1] 20.493890001065925
```