Summary of methods

```r
library(tidyverse)
library(magrittr)
library(reshape2)
```

Read in results from original data and original curve N Median IQR_TAV IQR_CPE

```r
GR_original_estimates = readRDS("GR_original_estimates.RDS")
GR_original_estimates %<>% mutate(Locality = "Guana_River")

PC_original_estimates = readRDS("PC_original_estimates.RDS")
PC_original_estimates %<>% mutate(Locality = "Pellicer_Creek")

GI_EC_R2_original_estimates = readRDS("GI_EC_R2_original_estimates.RDS")
GI_EC_R2_original_estimates %<>% mutate(Locality = "Goose_Island_East_Cove_Reef_2")

GI_EC_R4_original_estimates = readRDS("GI_EC_R4_original_estimates.RDS")
GI_EC_R4_original_estimates %<>% mutate(Locality = "Goose_Island_East_Cove_Reef_4")

All_original_estimates = rbind(GR_original_estimates,PC_original_estimates,GI_EC_R2_original_estimates,GI_EC_R4_o
riginal_estimates)
```

Read in results of new curve but original data

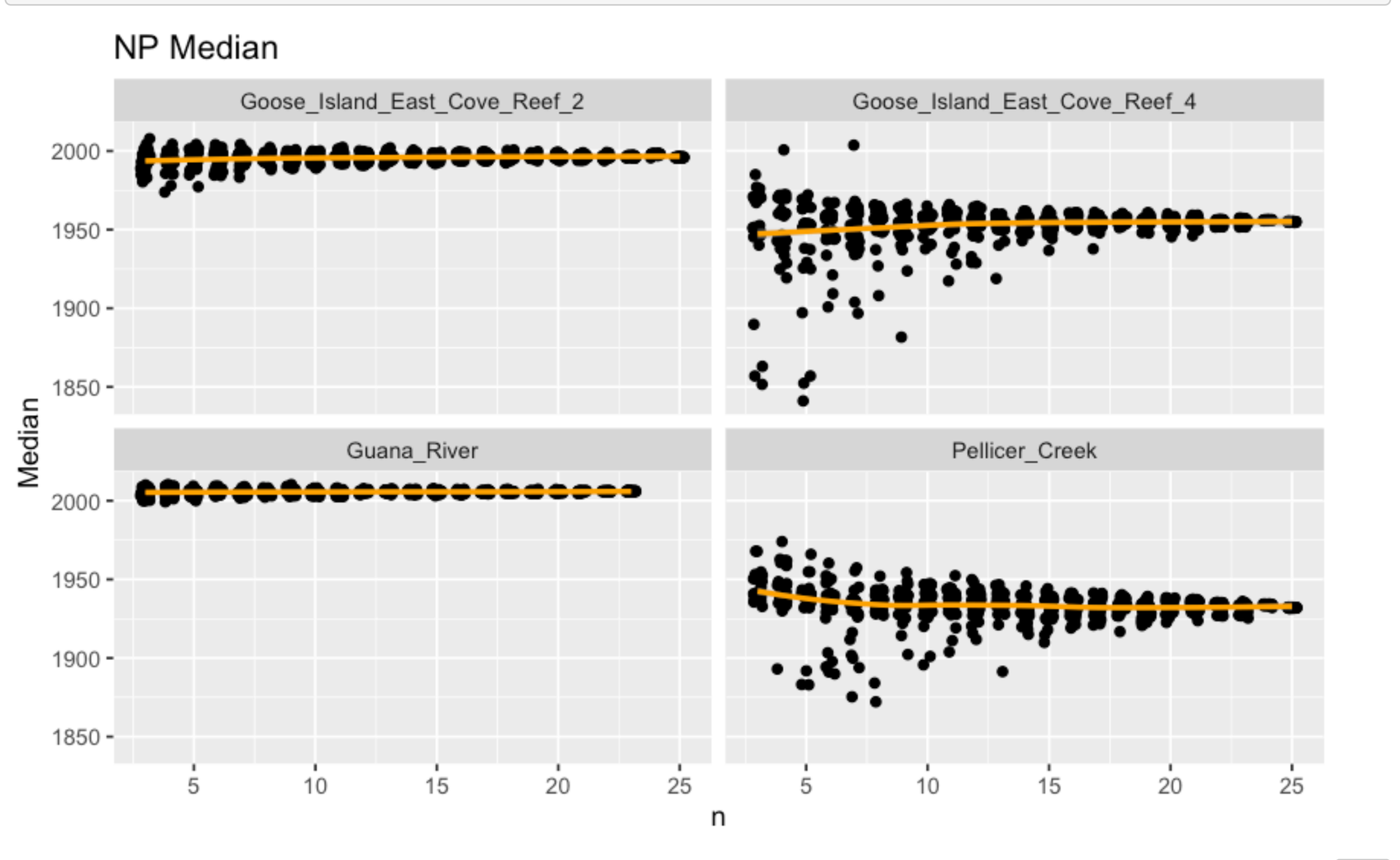
```r
Guana_River_Old_Data_New_Curve_results = readRDS("Guana_River_Old_Data_New_Curve_results.RDS")
Guana_River_Old_Data_New_Curve_results %<>% mutate(Locality = "Guana_River")

Pellicer_Creek_Old_Data_New_Curve_results = readRDS("Pellicer_Creek_Old_Data_New_Curve_results.RDS")
Pellicer_Creek_Old_Data_New_Curve_results %<>% mutate(Locality = "Pellicer_Creek")

Goose_Island_East_Cove_R2H3S1_Old_Data_New_Curve_results = readRDS("Goose_Island_East_Cove_R2H3S1_Old_Data_New_Cu
rve_results.RDS")
Goose_Island_East_Cove_R2H3S1_Old_Data_New_Curve_results %<>% mutate(Locality = "Goose_Island_East_Cove_Reef_2")

Goose_Island_East_Cove_R4H3S1_Old_Data_New_Curve_results = readRDS("Goose_Island_East_Cove_R4H3S1_Old_Data_New_Cu
rve_results.RDS")
Goose_Island_East_Cove_R4H3S1_Old_Data_New_Curve_results %<>% mutate(Locality = "Goose_Island_East_Cove_Reef_4")

All_Old_Data_New_Curve_results = rbind(Guana_River_Old_Data_New_Curve_results,Pellicer_Creek_Old_Data_New_Curve_r
esults,Goose_Island_East_Cove_R2H3S1_Old_Data_New_Curve_results,Goose_Island_East_Cove_R4H3S1_Old_Data_New_Curve_
results)
```

Read in results of Heaton's Nonparametric method

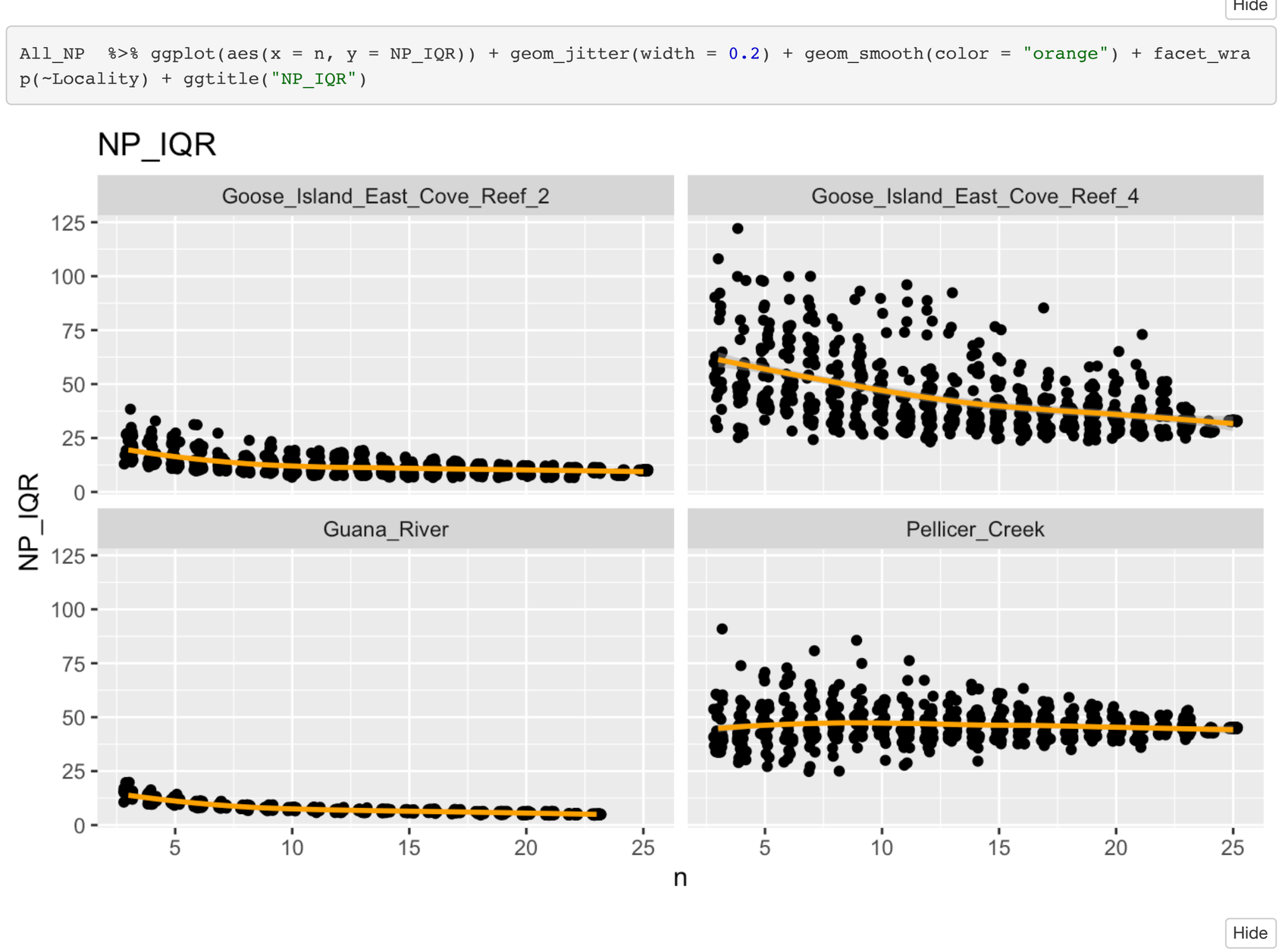
```r
Guana_River = readRDS("GR_All_NP_results.RDS")
Guana_River %<>% mutate(Locality = "Guana_River")

Pellicer_Creek = readRDS("PC_All_NP_results.RDS")
Pellicer_Creek %<>% mutate(Locality = "Pellicer_Creek")

Goose_Island_East_Cove_Reef_2 = readRDS("GI_EC_R2_All_NP_results.RDS")
Goose_Island_East_Cove_Reef_2 %<>% mutate(Locality = "Goose_Island_East_Cove_Reef_2")

Goose_Island_East_Cove_Reef_4 = readRDS("GI_EC_R4_All_NP_results.RDS")
Goose_Island_East_Cove_Reef_4 %<>% mutate(Locality = "Goose_Island_East_Cove_Reef_4")

All_NP = rbind(Guana_River,Pellicer_Creek,Goose_Island_East_Cove_Reef_2,Goose_Island_East_Cove_Reef_4)
```

Do some summary plots of the nonparametric methods

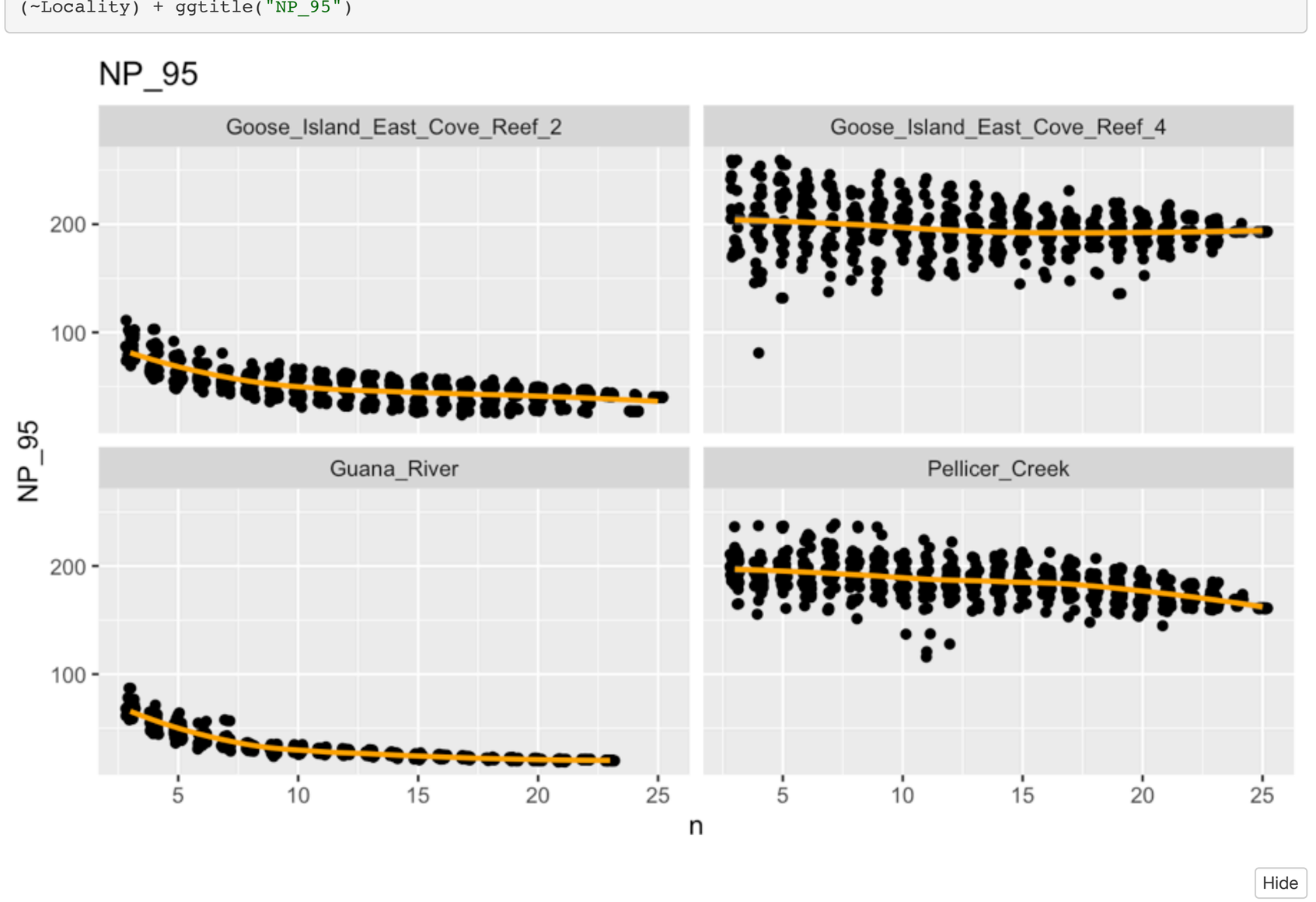
```r
All_NP  %>% ggplot(aes(x = n, y = Median)) + geom_jitter(width = 0.2) + geom_smooth(color = "orange") + facet_wra
p(~Locality)  + ggtitle("NP Median")
```



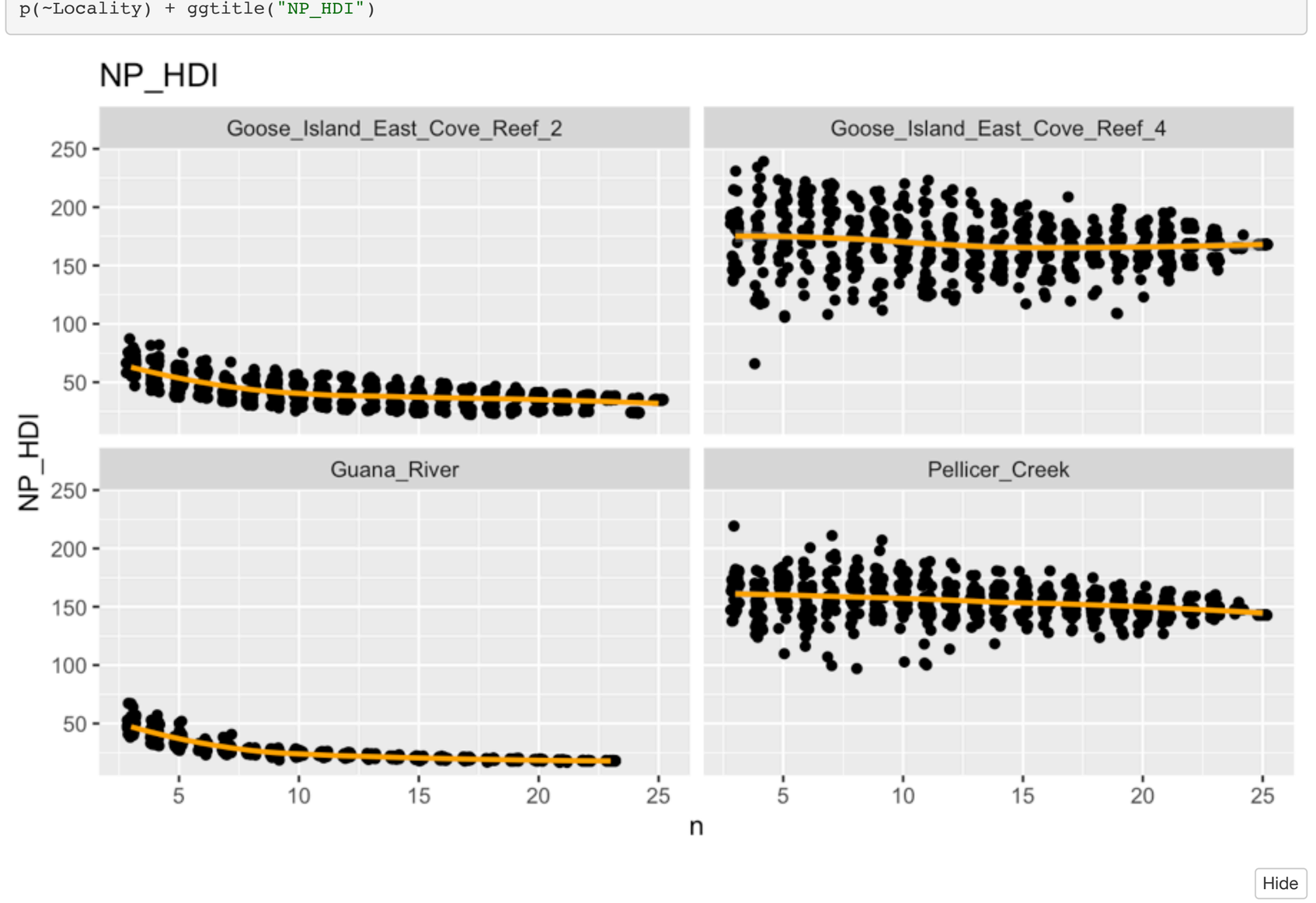

```r
All_NP  %>% ggplot(aes(x = n, y = NP_IQR)) + geom_jitter(width = 0.2) + geom_smooth(color = "orange") + facet_wra
p(~Locality) + ggtitle("NP_IQR")
```



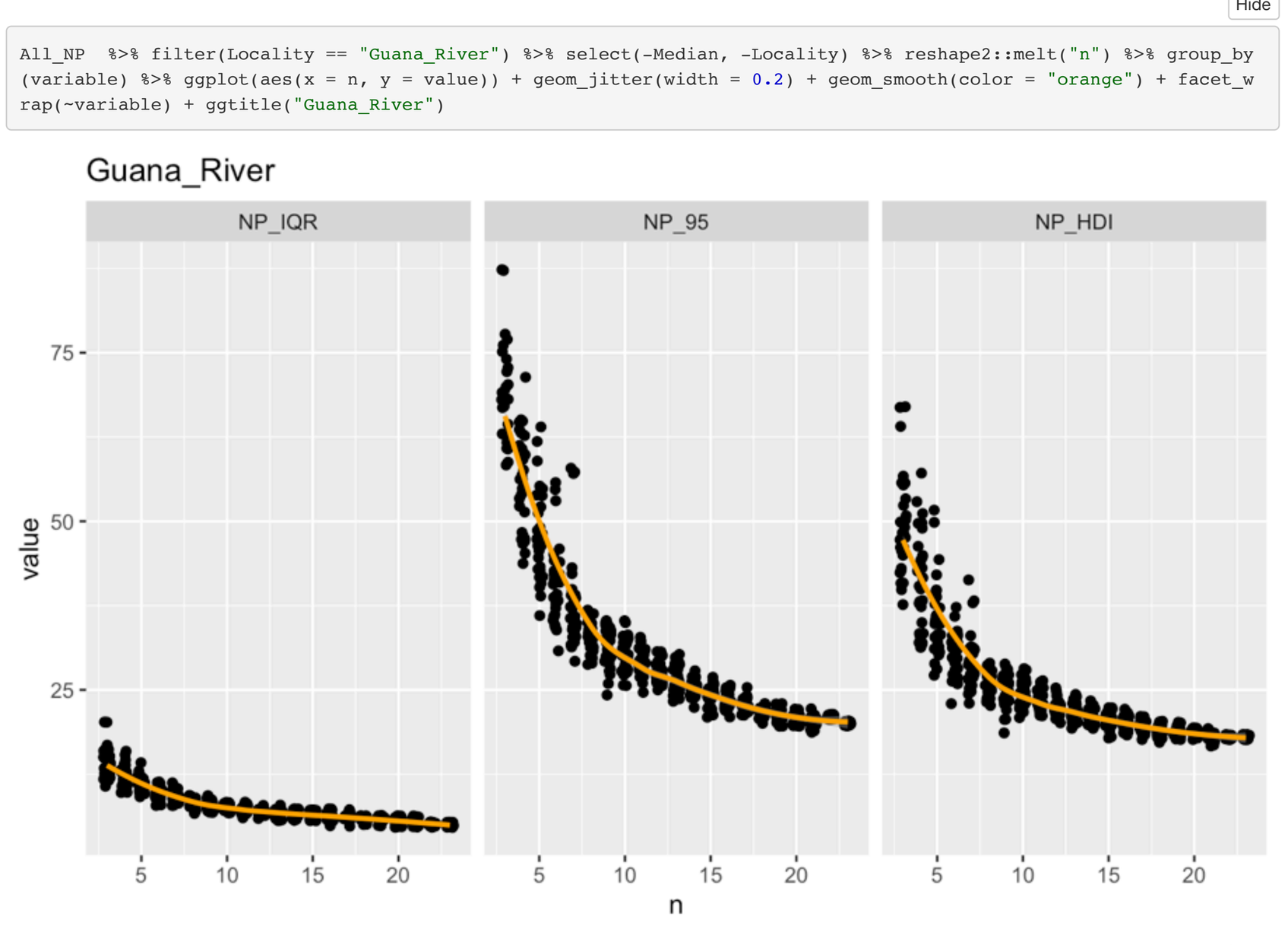

```r
All_NP  %>% ggplot(aes(x = n, y = NP_95)) + geom_jitter(width = 0.2) + geom_smooth(color = "orange") + facet_wrap
(~Locality) + ggtitle("NP_95")
```



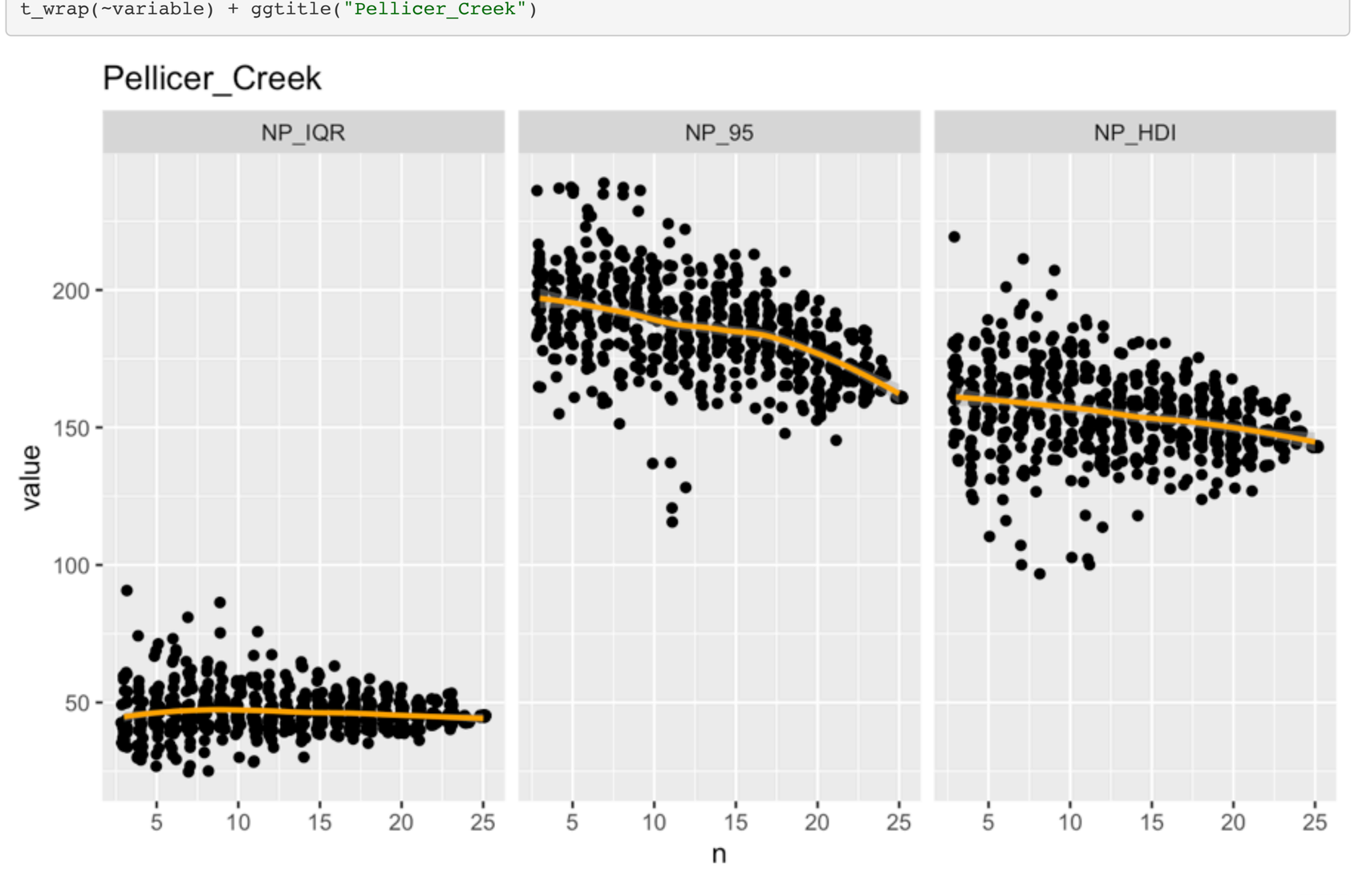

```r
All_NP  %>% ggplot(aes(x = n, y = NP_HDI)) + geom_jitter(width = 0.2) + geom_smooth(color = "orange") + facet_wra
p(~Locality) + ggtitle("NP_HDI")
```



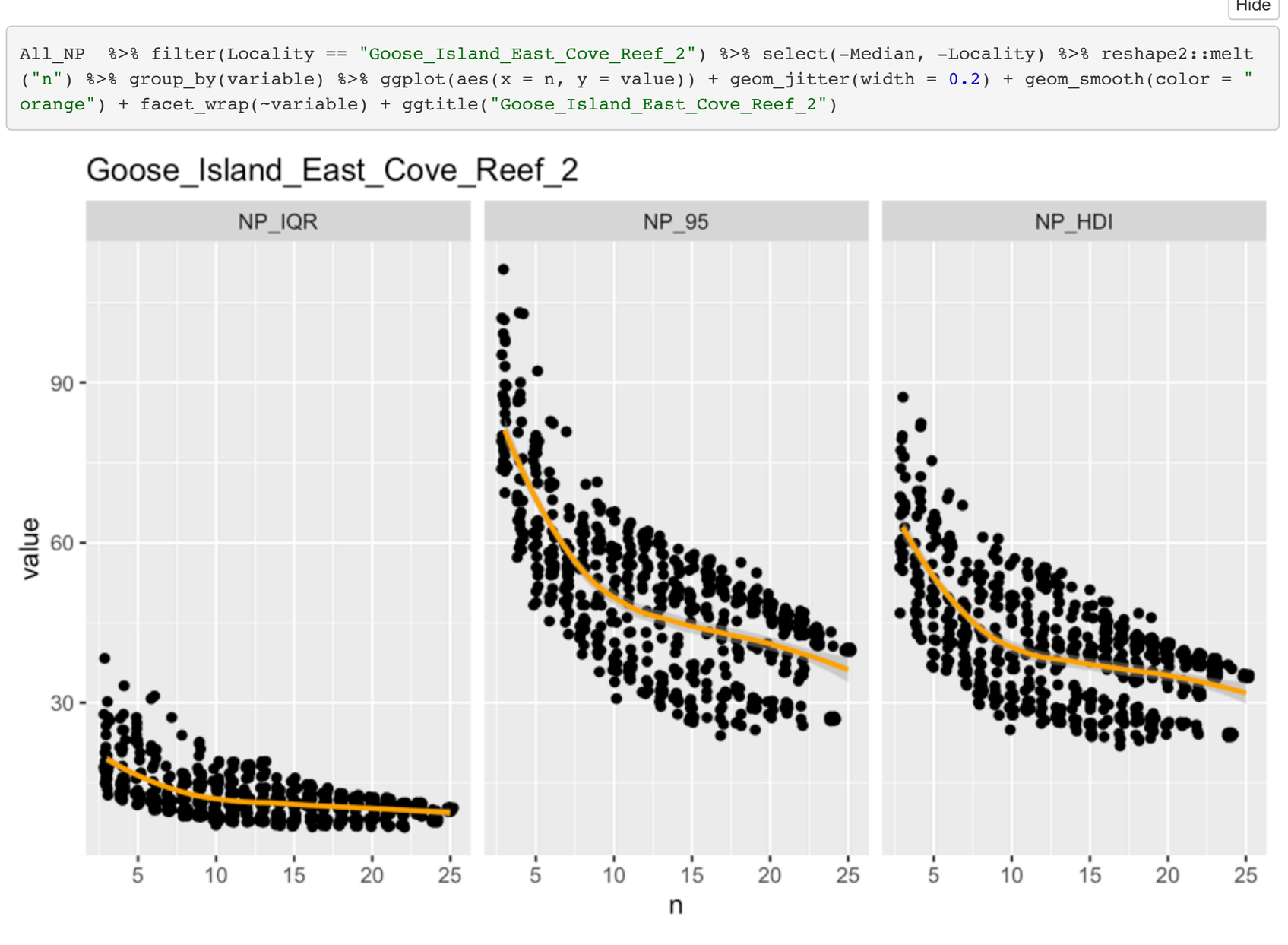

```r
All_NP  %>% filter(Locality == "Guana_River") %>% select(-Median, -Locality) %>% reshape2::melt("n") %>% group_by
(variable) %>% ggplot(aes(x = n, y = value)) + geom_jitter(width = 0.2) + geom_smooth(color = "orange") + facet_w
rap(~variable) + ggtitle("Guana_River")
```



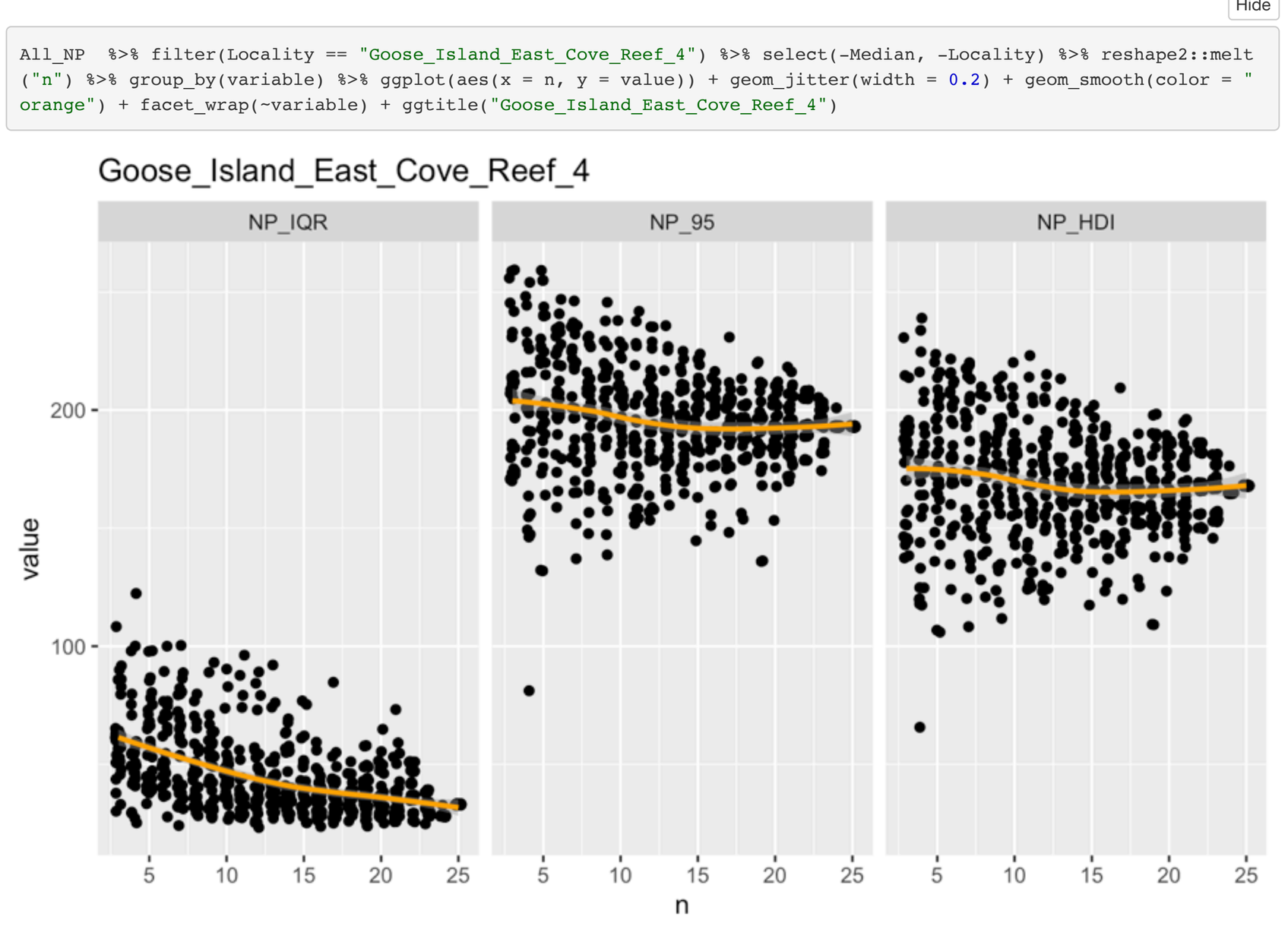

```r
All_NP  %>% filter(Locality == "Pellicer_Creek") %>% select(-Median, -Locality) %>% reshape2::melt("n") %>% group
_by(variable) %>% ggplot(aes(x = n, y = value)) + geom_jitter(width = 0.2) + geom_smooth(color = "orange") + face
t_wrap(~variable) + ggtitle("Pellicer_Creek")
```




```r
All_NP  %>% filter(Locality == "Goose_Island_East_Cove_Reef_2") %>% select(-Median, -Locality) %>% reshape2::melt
("n") %>% group_by(variable) %>% ggplot(aes(x = n, y = value)) + geom_jitter(width = 0.2) + geom_smooth(color = "
orange") + facet_wrap(~variable) + ggtitle("Goose_Island_East_Cove_Reef_2")
```



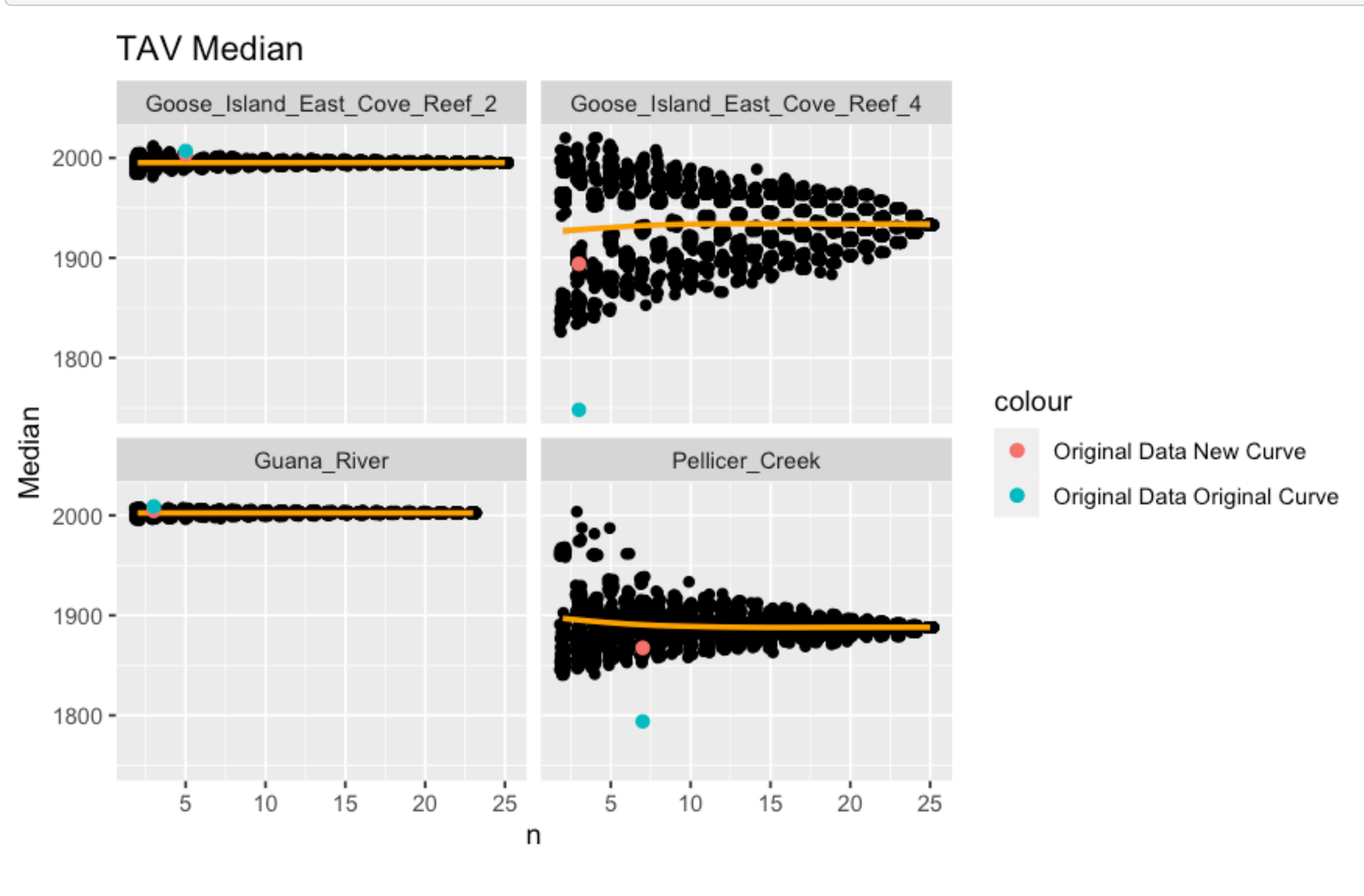

```r
All_NP  %>% filter(Locality == "Goose_Island_East_Cove_Reef_4") %>% select(-Median, -Locality) %>% reshape2::melt
("n") %>% group_by(variable) %>% ggplot(aes(x = n, y = value)) + geom_jitter(width = 0.2) + geom_smooth(color = "
orange") + facet_wrap(~variable) + ggtitle("Goose_Island_East_Cove_Reef_4")
```



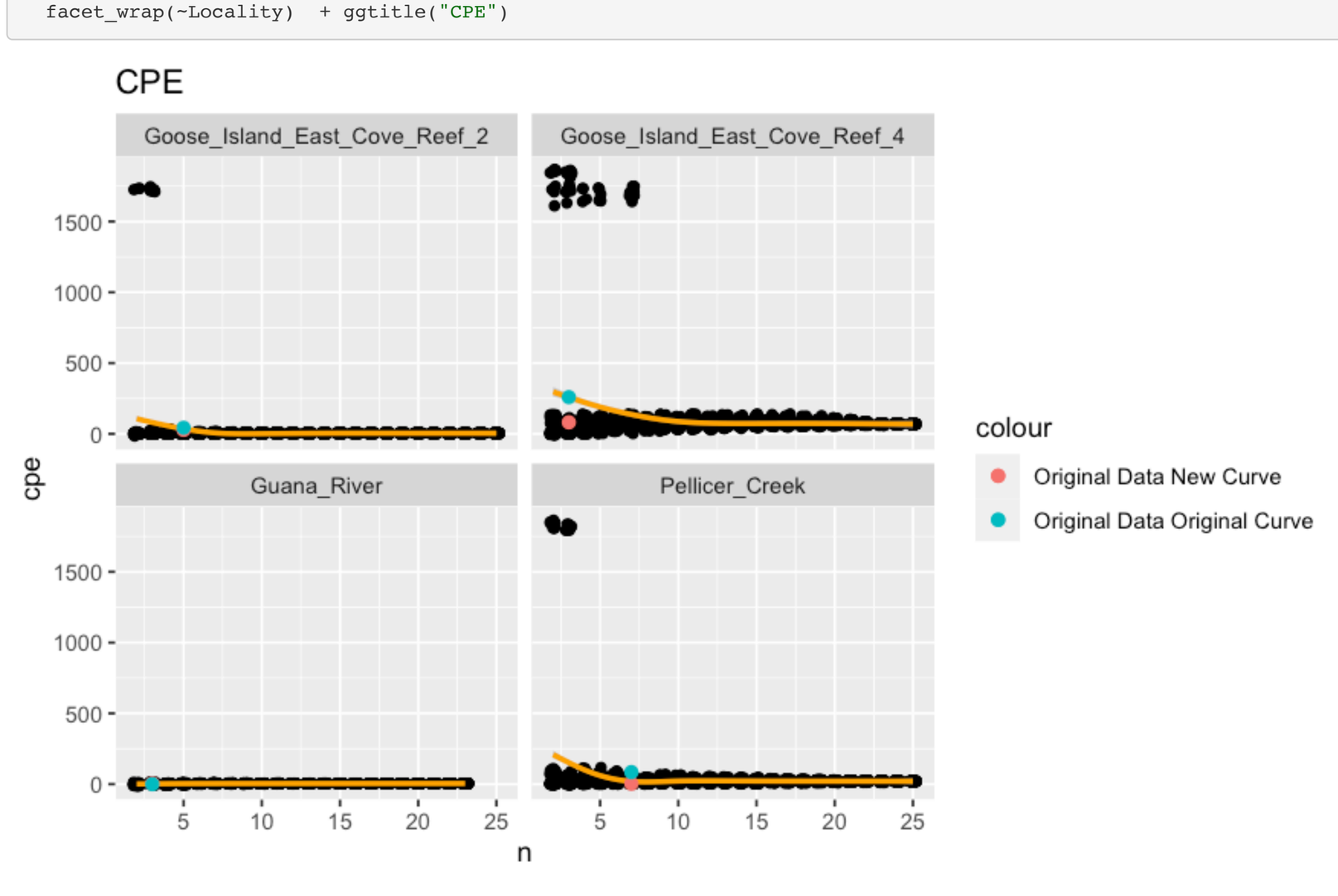
Read in the ad hoc results

```r
Guana_River_R3H1S1_results = readRDS("Guana_River_R3H1S1_results.RDS")
Guana_River_R3H1S1_results %<>% mutate(Locality = "Guana_River")

Pellicer_Creek_R3H2S2_results = readRDS("Pellicer_Creek_R3H2S2_results.RDS")
Pellicer_Creek_R3H2S2_results %<>% mutate(Locality = "Pellicer_Creek")

Goose_Island_East_Cove_R2H3S1_results = readRDS("Goose_Island_East_Cove_R2H3S1_results.RDS")
Goose_Island_East_Cove_R2H3S1_results %<>% mutate(Locality = "Goose_Island_East_Cove_Reef_2")

Goose_Island_East_Cove_R4H3S1_results = readRDS("Goose_Island_East_Cove_R4H3S1_results.RDS")
Goose_Island_East_Cove_R4H3S1_results %<>% mutate(Locality = "Goose_Island_East_Cove_Reef_4")

All_ad_hoc_results = rbind(Guana_River_R3H1S1_results,Pellicer_Creek_R3H2S2_results,Goose_Island_East_Cove_R2H3S1
_results,Goose_Island_East_Cove_R4H3S1_results)
```

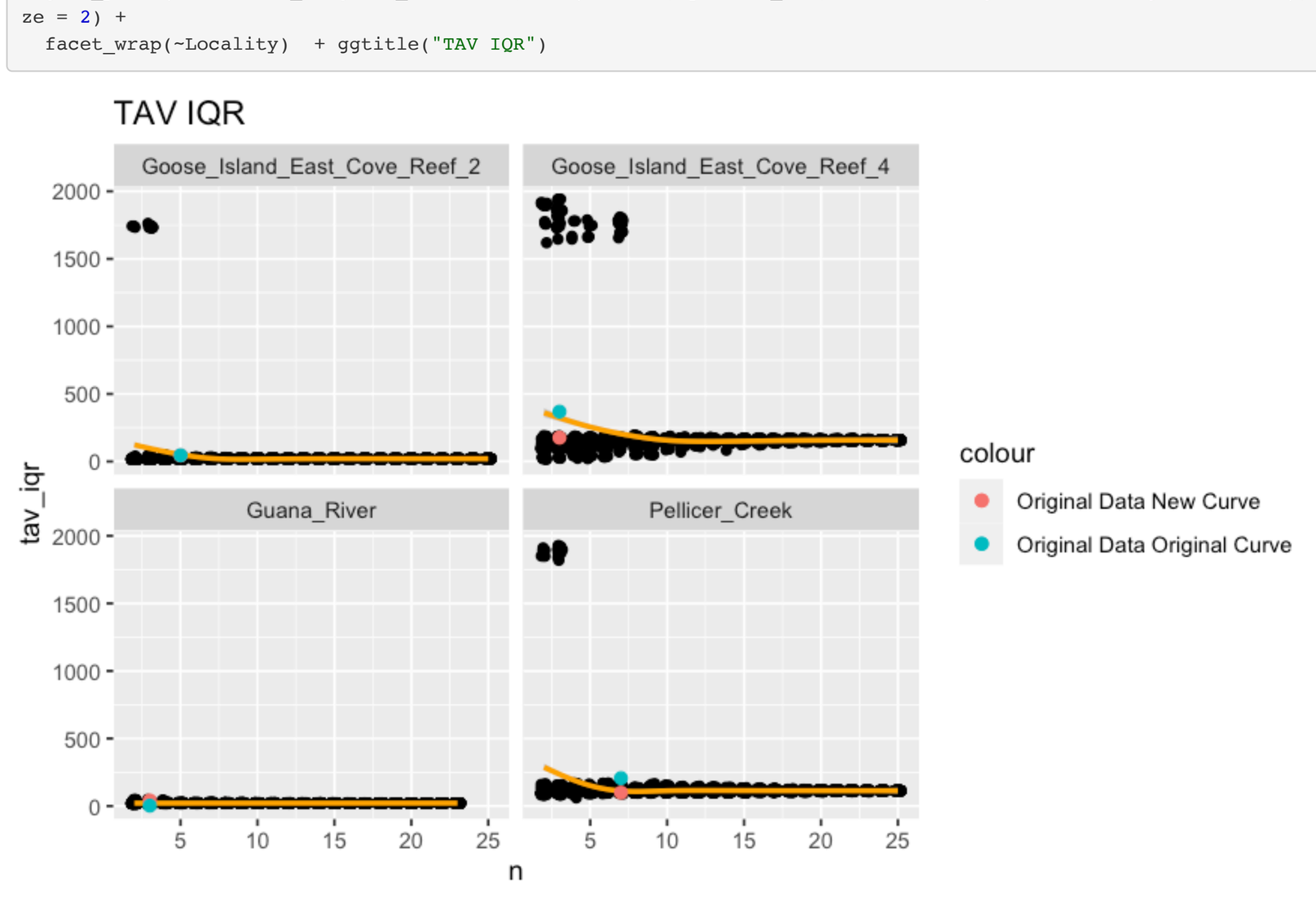
```r
All_ad_hoc_results %>% filter(Median <= 2023) %>% ggplot(aes(x = n, y = Median)) + geom_jitter(width = 0.2) + geo
m_smooth(color = "orange") +
  geom_point(data = All_Old_Data_New_Curve_results, aes( x  = n, y = Median, color = "Original Data New Curve"),
size = 2) +
  geom_point(data = All_original_estimates, aes( x  = N, y = Median, color = "Original Data Original Curve"), siz
e = 2) +
  facet_wrap(~Locality)  + ggtitle("TAV Median")
```



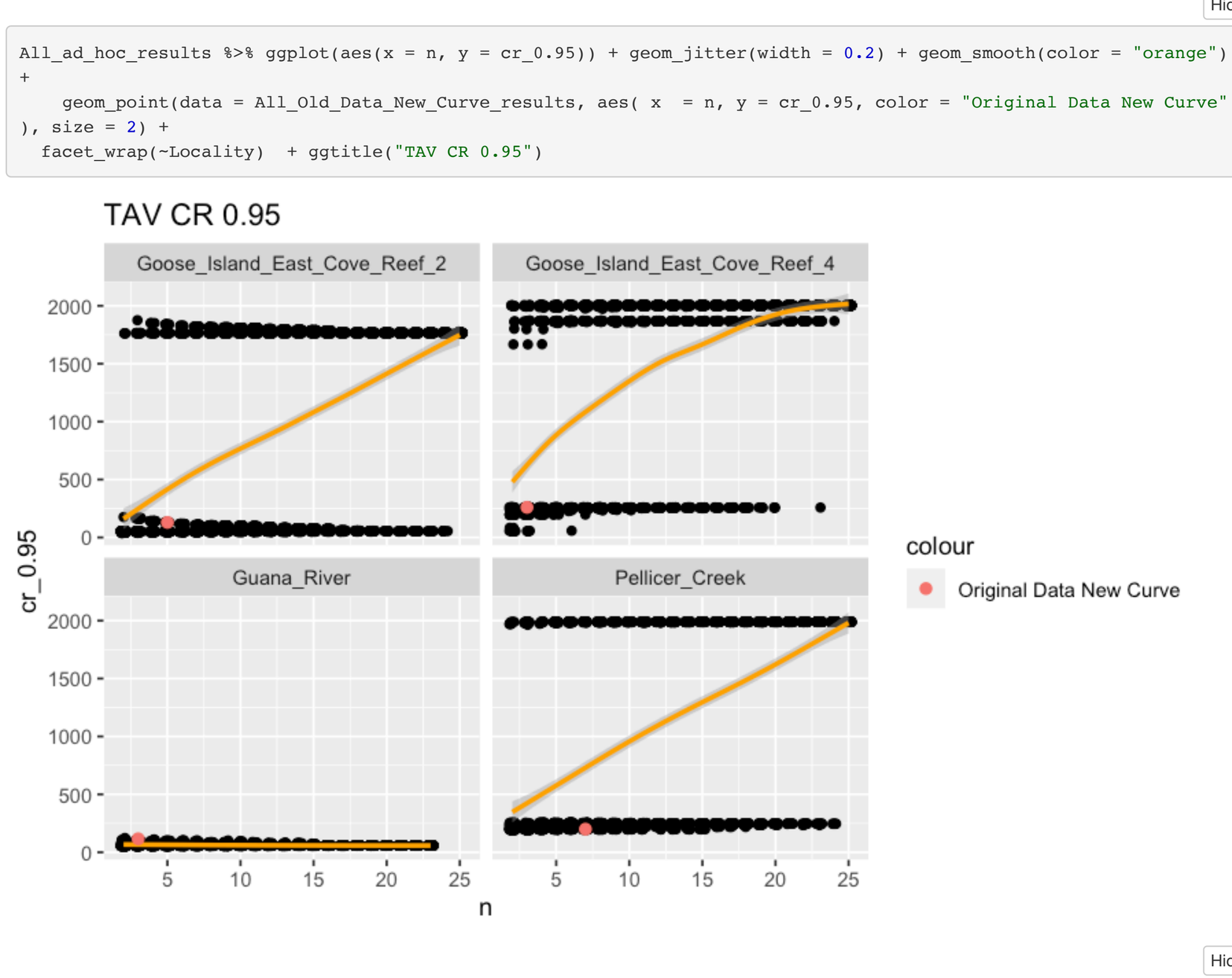

```r
All_ad_hoc_results %>% ggplot(aes(x = n, y = cpe)) + geom_jitter(width = 0.2) + geom_smooth(color = "orange") +
    geom_point(data = All_Old_Data_New_Curve_results, aes( x  = n, y = cpe, color = "Original Data New Curve"), s
ize = 2) +
  geom_point(data = All_original_estimates, aes( x  = N, y = IQR_CPE, color = "Original Data Original Curve"), si
ze = 2) +
  facet_wrap(~Locality)  + ggtitle("CPE")
```



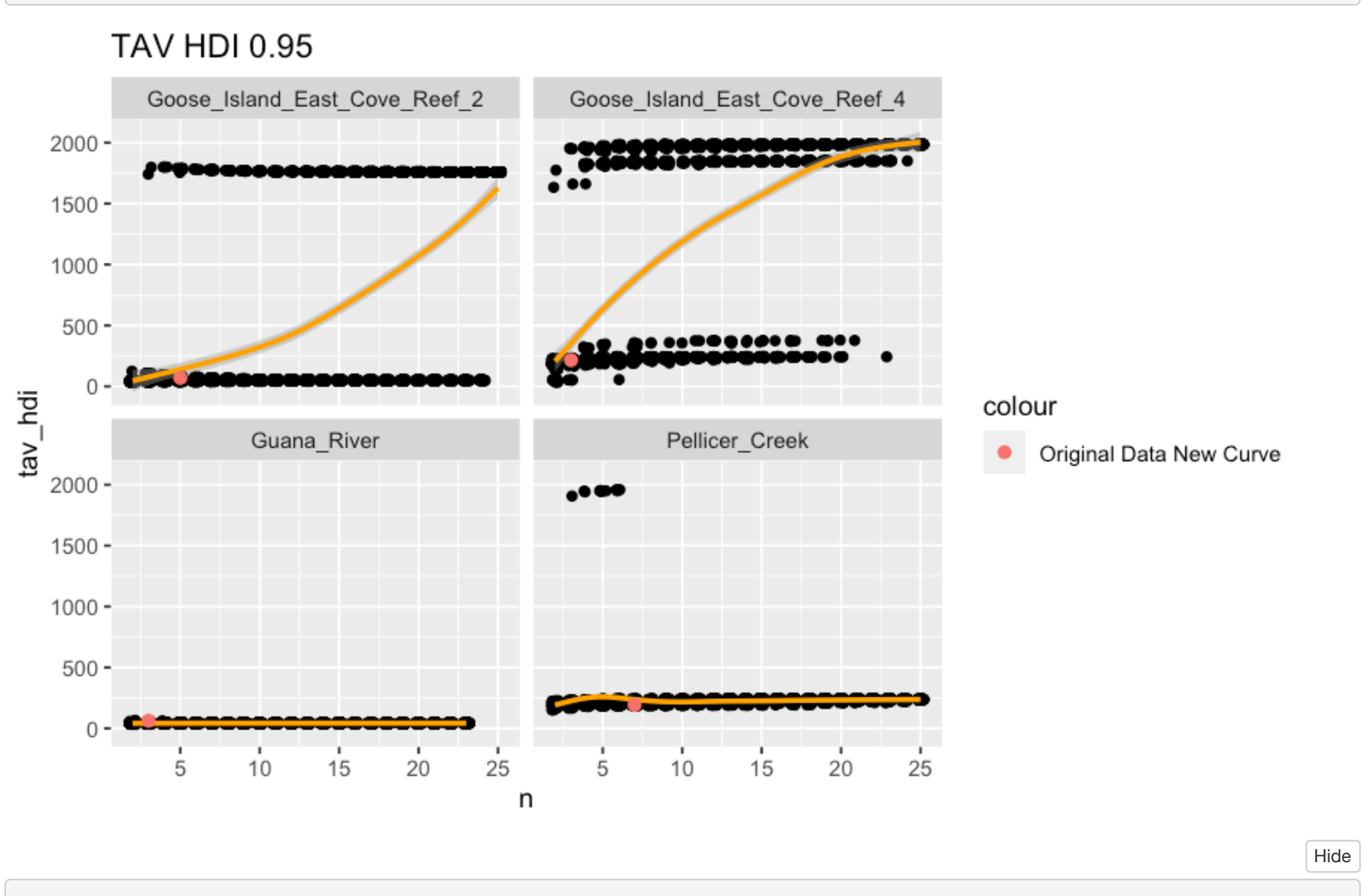

```r
All_ad_hoc_results %>% ggplot(aes(x = n, y = tav_iqr)) + geom_jitter(width = 0.2) + geom_smooth(color = "orange")
+
    geom_point(data = All_Old_Data_New_Curve_results, aes( x  = n, y = tav_iqr, color = "Original Data New Curve"
), size = 2) +
  geom_point(data = All_original_estimates, aes( x  = N, y = IQR_TAV, color = "Original Data Original Curve"), si
ze = 2) +
  facet_wrap(~Locality)  + ggtitle("TAV IQR")
```




```r
All_ad_hoc_results %>% ggplot(aes(x = n, y = cr_0.95)) + geom_jitter(width = 0.2) + geom_smooth(color = "orange")
+
    geom_point(data = All_Old_Data_New_Curve_results, aes( x  = n, y = cr_0.95, color = "Original Data New Curve"
), size = 2) +
  facet_wrap(~Locality)  + ggtitle("TAV CR 0.95")
```




```r
All_ad_hoc_results %>% ggplot(aes(x = n, y = tav_hdi)) + geom_jitter(width = 0.2) + geom_smooth(color = "orange")
+
    geom_point(data = All_Old_Data_New_Curve_results, aes( x  = n, y = tav_hdi, color = "Original Data New Curve"
), size = 2) +
  facet_wrap(~Locality)  + ggtitle("TAV HDI 0.95")
```




```r
All_ad_hoc_results %>% ggplot(aes(x = n, y = hdi_of_hdi)) + geom_jitter(width = 0.2) + geom_smooth(color = "orang
e") +
    geom_point(data = All_Old_Data_New_Curve_results, aes( x  = n, y = hdi_of_hdi, color = "Original Data New Cur
ve"), size = 2) +
  facet_wrap(~Locality)  + ggtitle("TAV HDI (0.5) of HDI (0.5)")
```