NHL Goalie and Skater Heat Maps

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Introduction

In the NHL, players have their *sweet-spots*. For skaters, it can be the top of a certain circle, or right in-front of the net. For goalies, it could be where their vision is best and where they have the best angle to cut down a shot. All players have these sweet-spots, but it is difficult to analytically say where they are. By using shot location data, we can determine these locations and create models show where goalies and skaters need improvement and where they succeed.

Before we jump in, let's clean up our R environment and also load in some libraries we will be using.

```r
rm(list = ls())

library(purrr)
library(ggplot2)
```

Data Formatting

To start, we need to read in our data. Our data is formatted nicely in CSV format. We have data from the, 2015-2016 season, 2016-2017 season, 2017-2018 season, and 2018-2019 season (up to 1/7/19). This data was downloaded from MoneyPuck. Let's first start by loading in all three seasons of data:

```r
data.2015 = read.csv("data/2015.csv")
data.2016 = read.csv("data/2016.csv")
data.2017 = read.csv("data/2017.csv")
data.2018 = read.csv("data/2018.csv")
```

> Note: this will take a *relatively* long time to compute as the datasets are large. Each dataset contains all shot data (**including** playoffs).

We'll only look at regular season data. The playoffs in the NHL are a beast of their own.

```r
get.regular.season = function(data) {
    subset(data, isPlayoffGame == 0)
}

season.2015 = get.regular.season(data.2015)
season.2016 = get.regular.season(data.2016)
season.2017 = get.regular.season(data.2017)
season.2018 = get.regular.season(data.2018)
```

Now that we have our data, we can remove extraneous columns. Here is a table of what columns we are keeping, and what we are renaming them to:

Old Column	New Column
xCordAdjusted	x
yCordAdjusted	y
goal	goal
shotAngleAdjusted	angle
goalieNameForShot	goalie_name
shooterName	skater_name
game_id	game

Now, here is the R code to do this subsetting of the original dataset.

```r
get.helpful.data = function(data) {
    data.frame(x = data$xCordAdjusted,
            y = data$yCordAdjusted,
            goal = data$goal,
            angle = data$shotAngleAdjusted,
            goalie_name = data$goalieNameForShot,
            skater_name = data$shooterName,
            game = data$game_id)
}

analysis.2015 = get.helpful.data(season.2015)
analysis.2016 = get.helpful.data(season.2016)
analysis.2017 = get.helpful.data(season.2017)
analysis.2018 = get.helpful.data(season.2018)
```

Now, we have all the data we need.

Function Definitions

Generic

From our data, we can calculate some very important statistics like the following:

- Goal Percent: goals per total shots
- Save Percent: saves (total shots - goals) per total shots
- Shots per Goal: total shots per goal

Additionally, we can break up our data by game. There are some generic functions we can write to help for both goalies and skaters. Let's write them now!

```r
get.goal.percent = function(data) {
    shots = length(data$goal)
    temp = subset(data, goal == 1)
    goals = length(temp$goal)
    goals / shots
}

get.save.percent = function(data) {
    shots = length(data$goal)
    temp = subset(data, goal == 1)
    goals = length(temp$goal)
    (shots - goals) / shots
```

```
}

get.shots.per.goal = function(data) {
    shots = length(data$goal)
    temp = subset(data, goal == 1)
    goals = length(temp$goal)
    shots / goals
}
```

Note: when using `get.shots.per.goal`, if there were no goals scored, R will handle the division by zero by returning infinity. This will be problematic when graphing data. I am still working on a good solution to this problem. Earlier, I used 200 as a substitute value. However, 200 still skews graphs, which is unideal.

```
get.games = function(data) {
    unique(data$game)
}

get.single.game = function(data, game_id) {
    subset(data, game == game_id)
}

get.all.games = function(data) {
    games = get.games(data)
    Map(function(x) get.single.game(data, x), games)
}
```

Now, we can create our game by game statistic functions:

```
get.game.goal.percent = function(data) {
    gameframe = get.all.games(data)
    games.gp = map(gameframe, function(x) get.goal.percent(x))
    unlist(games.gp, use.names = FALSE)
}

get.game.save.percent = function(data) {
    gameframe = get.all.games(data)
    games.sp = map(gameframe, function(x) get.save.percent(x))
    unlist(games.sp, use.names = FALSE)
}

get.game.shots.per.goal = function(data) {
    gameframe = get.all.games(data)
    games.spg = map(gameframe, function(x) get.shots.per.goal(x))
    unlist(games.spg, use.names = FALSE)
}
```

Also, we'll need a function to get match-ups between a specific goalie and skater. Let's write that here, instead of in our goalies *and* our skaters sections.

```
get.matchup.data = function(data, goalie, skater) {
    subset(data, goalie_name == goalie & skater_name == skater)
}
```

We've now written our generic data handling functions.

Goalies

Let's first start with a function to get data for a specific goalie.

```r
get.goalie.data = function(data, name) {
    subset(data, goalie_name == name)
}
```

Skaters

Let's first start with a function to get data for a specific skater.

```r
get.skater.data = function(data, name) {
    subset(data, skater_name == name)
}
```

Graphing

Given specific data, we should be able to graph the location of shots. Let's write a function that uses ggplot to do so.

```r
graph.shot.locations = function(data, primary, secondary, name) {
    plot = ggplot(data) +
        geom_hex(aes(x = x, y = y, alpha = log(..count..)), fill = primary, color = secondary) +
        labs(title = paste(name, "Shot Locations", sep = " "), x = "X Position", y = "Y Position") +
        theme_minimal()
    plot
}
```

To see a test of what this does, let's quickly make a graph of Roberto Luongo's shots against him.

```r
luongo = get.goalie.data(analysis.2017, "Roberto Luongo")
plot = graph.shot.locations(luongo, "#041E42", "#C8102E", "Roberto Luongo")

plot
```

Roberto Luongo Shot Locations
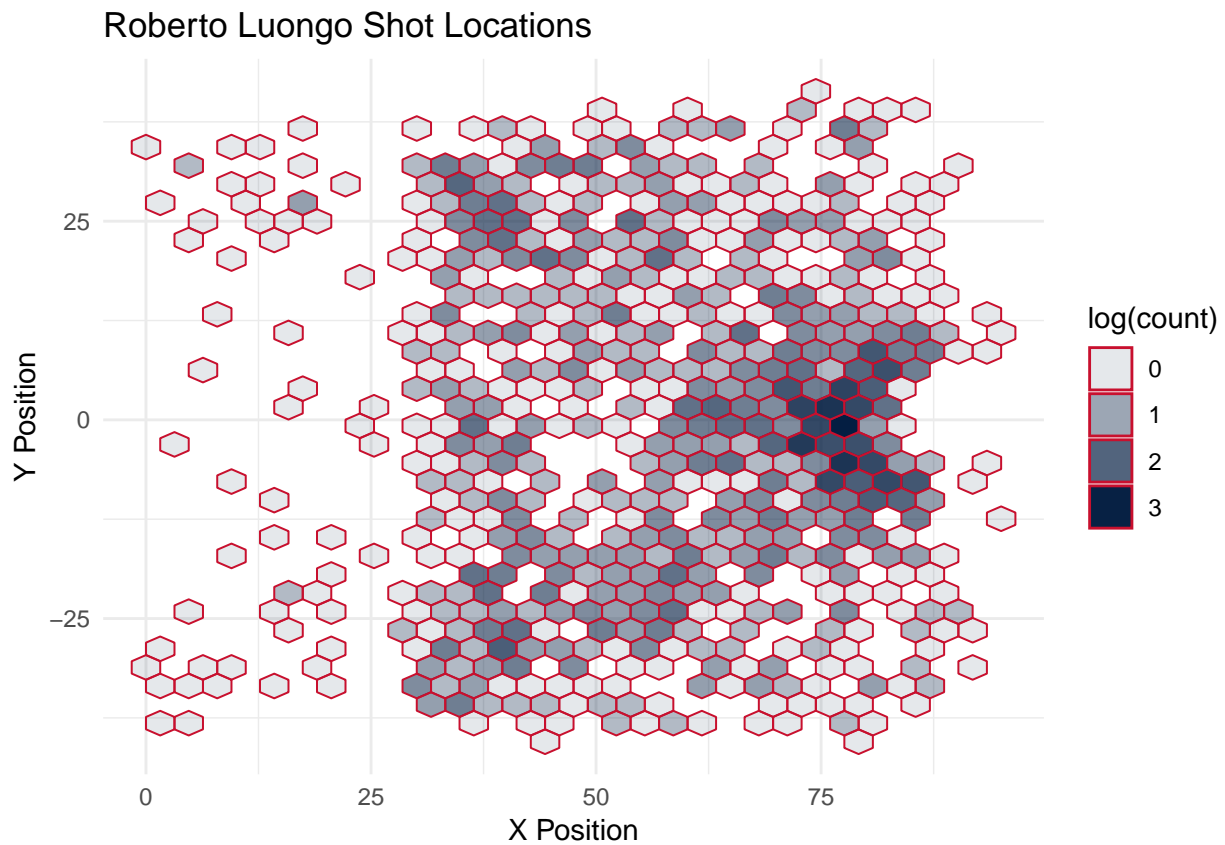
Now, let's see how it looks for a skater. Let's look at Bryan Rust.

```
rust = get.skater.data(analysis.2017, "Bryan Rust")
plot = graph.shot.locations(rust, "#000000", "#FCB514", "Bryan Rust")

plot
```

## Bryan Rust Shot Locations
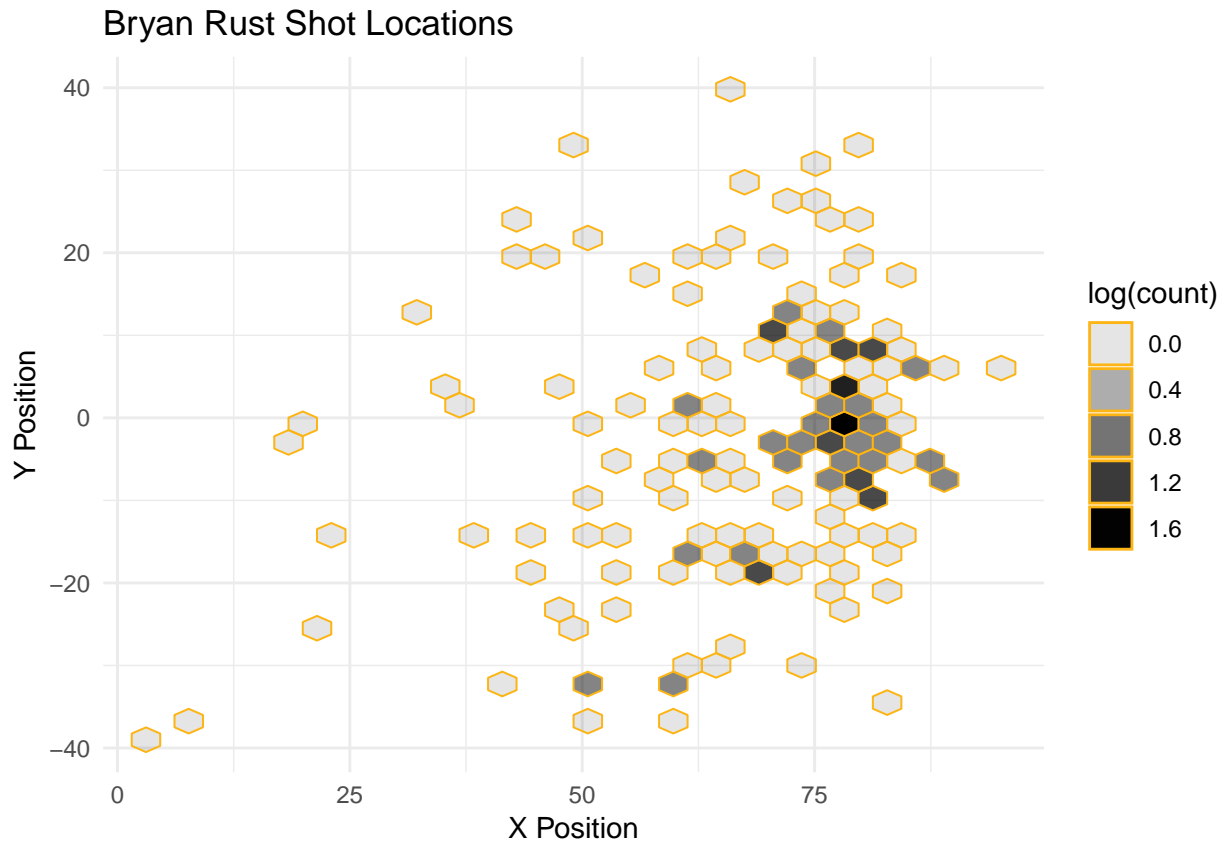
Furthermore, we should be able to graph trends in certain statistics.

```
graph.trend = function(trend, type, primary, secondary, name) {
    frame = data.frame(x = c(1:length(trend)), y = trend)
    disp = paste(name, type, "by Game", sep = " ")
    plot = ggplot(frame) +
        geom_point(aes(x = x, y = y), color = primary) +
        geom_smooth(aes(x = x, y = y), method = "lm", color = primary, fill = secondary) +
        labs(title = disp, x = "Game Played", y = type) +
        theme_minimal()
    plot
}
```

So, let's go back to Luongo and look at his save percentage per game.

```
luongo.game.sp = get.game.save.percent(luongo)
plot = graph.trend(luongo.game.sp, "Save Percentage", "#041E42", "#C8102E", "Roberto Luongo")

plot
```

Roberto Luongo Save Percentage by Game
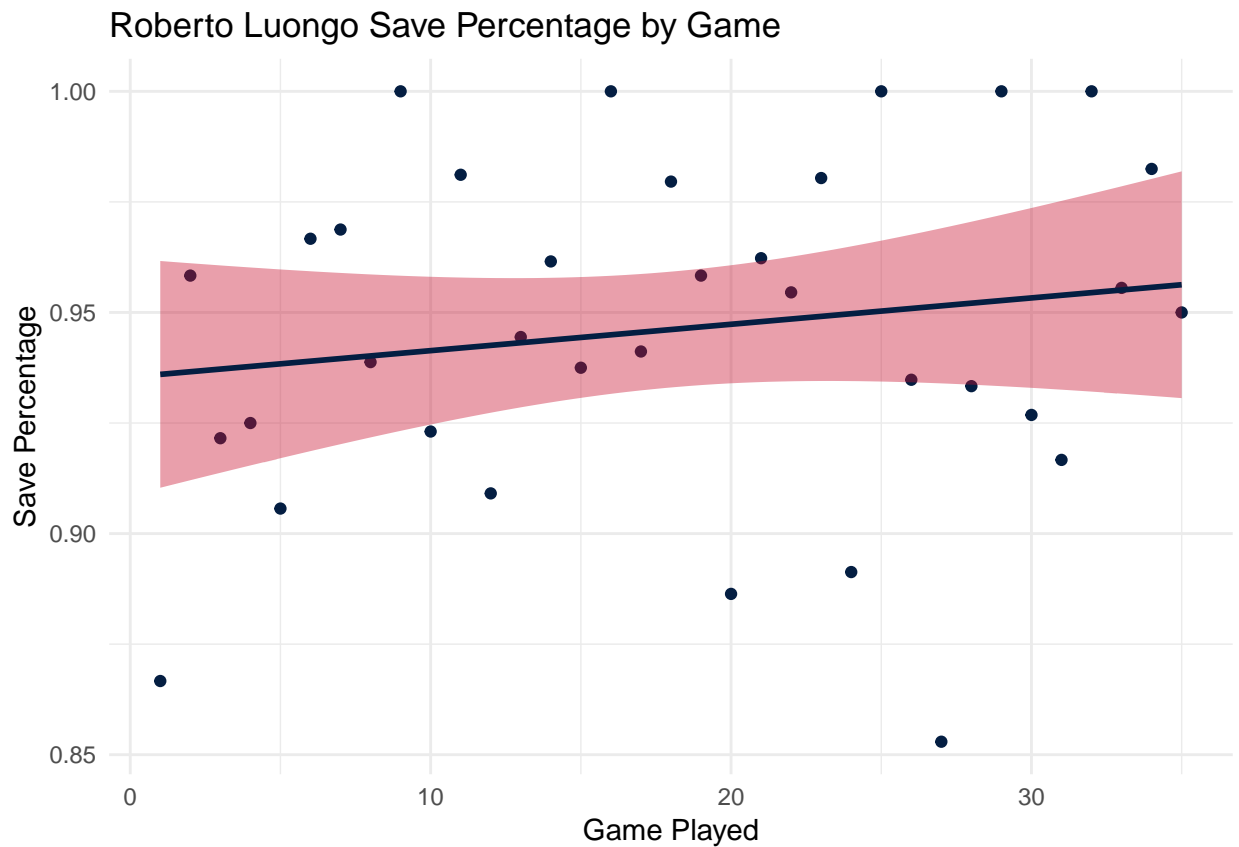
We can also see the shooter's perspective. Let's look at Rust's shooting percentage (goal percent).

```
rust.game.gp = get.game.goal.percent(rust)
plot = graph.trend(rust.game.gp, "Shooting (Goal) Percentage", "#000000", "#FCB514", "Bryan Rust")

plot
```

Bryan Rust Shooting (Goal) Percentage by Game
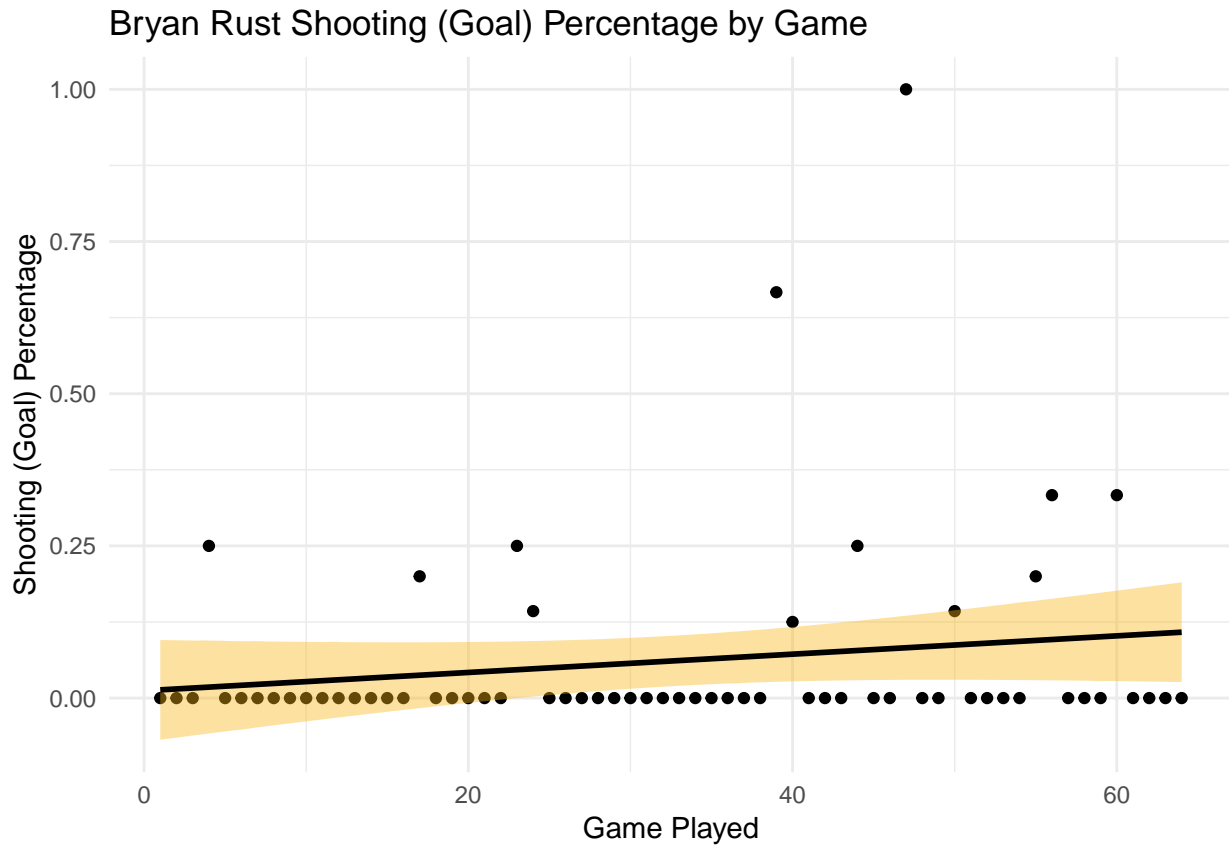
Analysis

Goalies

Matt Murray

Matt Murray is a 24 year old phenomenon who has already won 2 Stanley Cups. Let's take a look at how he's done it.

```
murray.2015 = get.goalie.data(analysis.2015, "Matt Murray")
murray.2016 = get.goalie.data(analysis.2016, "Matt Murray")
murray.2017 = get.goalie.data(analysis.2017, "Matt Murray")
murray.2018 = get.goalie.data(analysis.2018, "Matt Murray")
```

Let's start by calculating some of his stats for each season and then tabularizing.

```
murray.2015.sp = get.save.percent(murray.2015)
murray.2016.sp = get.save.percent(murray.2016)
murray.2017.sp = get.save.percent(murray.2017)
murray.2018.sp = get.save.percent(murray.2018)

murray.2015.gp = get.goal.percent(murray.2015)
murray.2016.gp = get.goal.percent(murray.2016)
murray.2017.gp = get.goal.percent(murray.2017)
murray.2018.gp = get.goal.percent(murray.2018)
```

```
murray.2015.spg = get.shots.per.goal(murray.2015)
murray.2016.spg = get.shots.per.goal(murray.2016)
murray.2017.spg = get.shots.per.goal(murray.2017)
murray.2018.spg = get.shots.per.goal(murray.2018)
```

Now, let's put it in a table:

Season	Save Percent	Goal Percent	Shots Per Goal
2015-2016	0.9460043	0.0539957	18.52
2016-2017	0.9429599	0.0570401	17.5315315
2017-2018	0.9301837	0.0698163	14.3233083
2018-2019	0.9374185	0.0625815	15.9791667

We can look at his game by game data also.

```
murray.2015.games.sp = get.game.save.percent(murray.2015)
murray.2015.games.gp = get.game.goal.percent(murray.2015)
murray.2015.games.spg = get.game.shots.per.goal(murray.2015)

murray.2016.games.sp = get.game.save.percent(murray.2016)
murray.2016.games.gp = get.game.goal.percent(murray.2016)
murray.2016.games.spg = get.game.shots.per.goal(murray.2016)

murray.2017.games.sp = get.game.save.percent(murray.2017)
murray.2017.games.gp = get.game.goal.percent(murray.2017)
murray.2017.games.spg = get.game.shots.per.goal(murray.2017)

murray.2018.games.sp = get.game.save.percent(murray.2018)
murray.2018.games.gp = get.game.goal.percent(murray.2018)
murray.2018.games.spg = get.game.shots.per.goal(murray.2018)
```
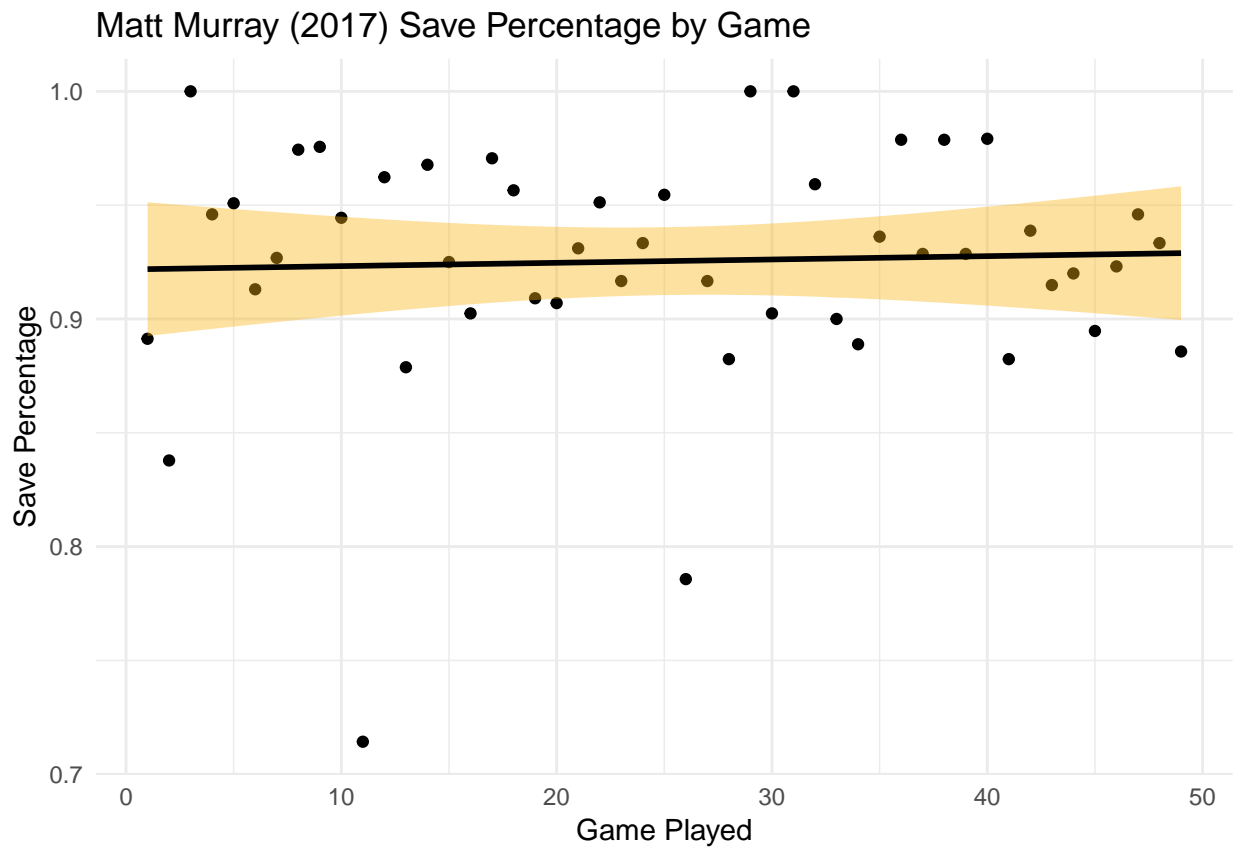
Let's look at his save percentage graphs:

```
murray.2015.sp.plot = graph.trend(murray.2015.games.sp, "Save Percentage", "#000000", "#FCB514", "Matt
murray.2015.sp.plot
```

Matt Murray (2015) Save Percentage by Game
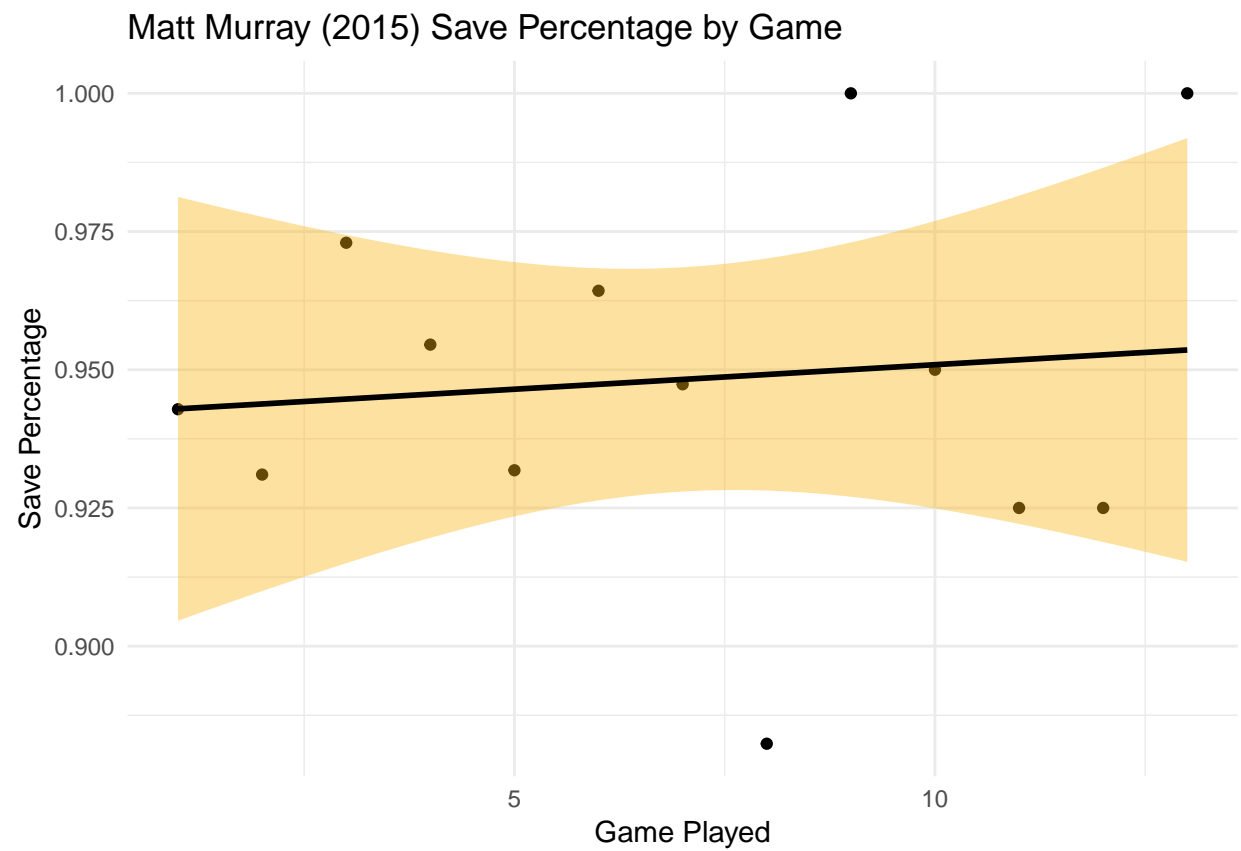
```
murray.2016.sp.plot = graph.trend(murray.2016.games.sp, "Save Percentage", "#000000", "#FCB514", "Matt M
murray.2016.sp.plot
```
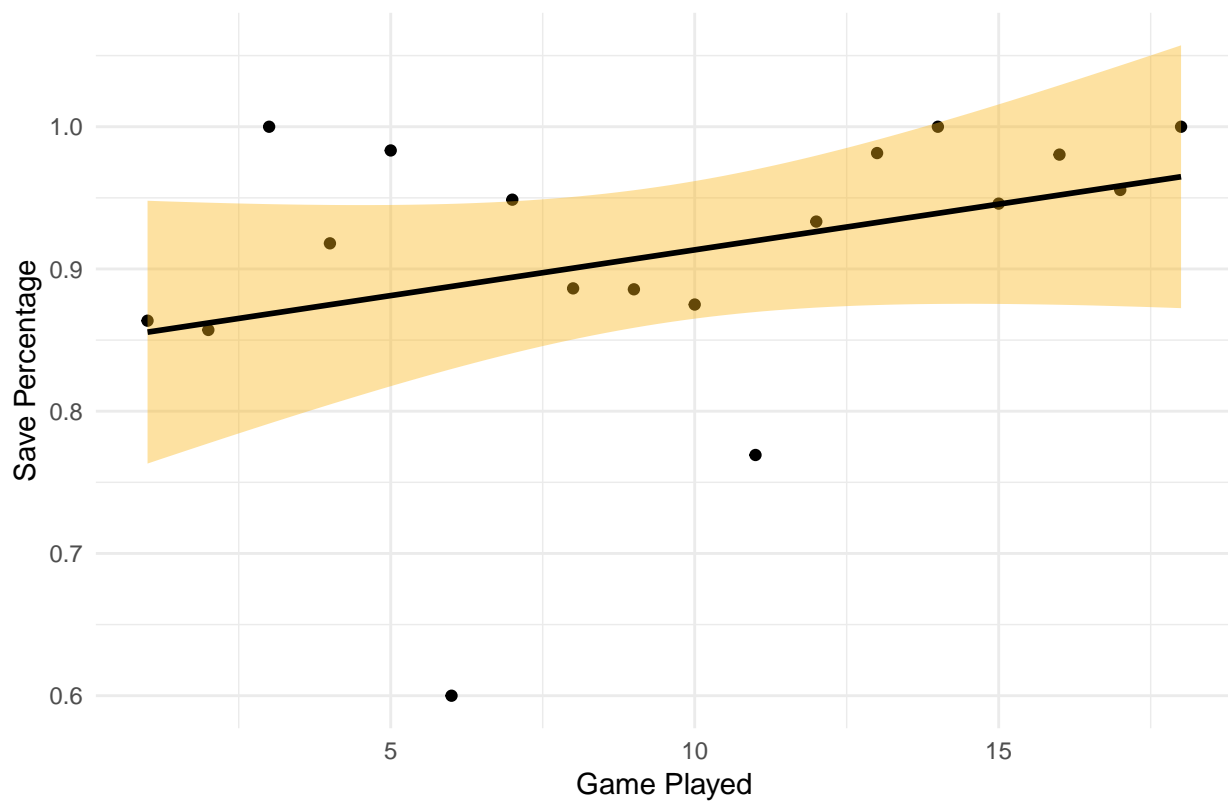
Matt Murray (2016) Save Percentage by Game
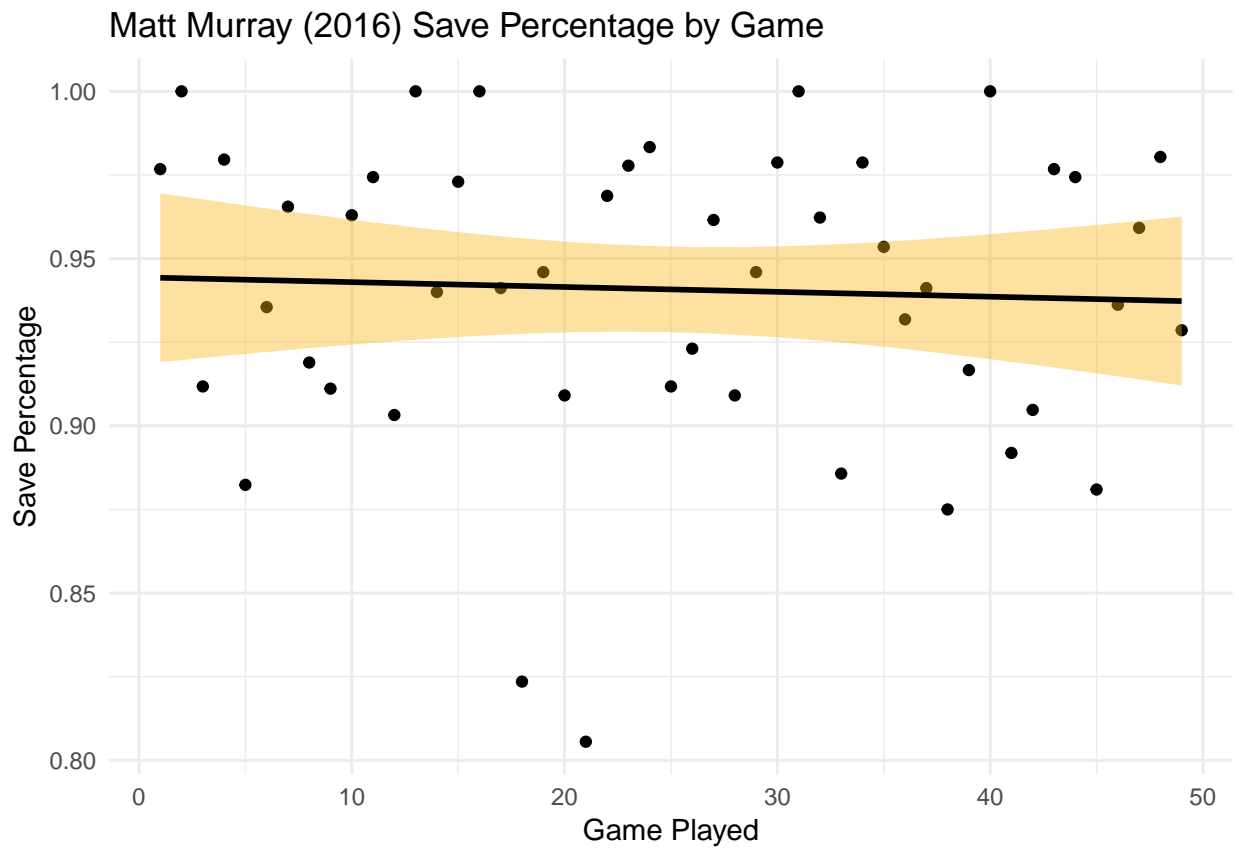

```
murray.2017.sp.plot = graph.trend(murray.2017.games.sp, "Save Percentage", "#000000", "#FCB514", "Matt M
murray.2017.sp.plot
```

Matt Murray (2017) Save Percentage by Game


```
murray.2018.sp.plot = graph.trend(murray.2018.games.sp, "Save Percentage", "#000000", "#FCB514", "Matt
murray.2018.sp.plot
```

Matt Murray (2018) Save Percentage by Game

And now, let's take a look at his shot location data.

```
murray.2015.locations.plot = graph.shot.locations(murray.2015, "#000000", "#FCB514", "Matt Murray (2015)
murray.2015.locations.plot
```

Matt Murray (2015) Shot Locations
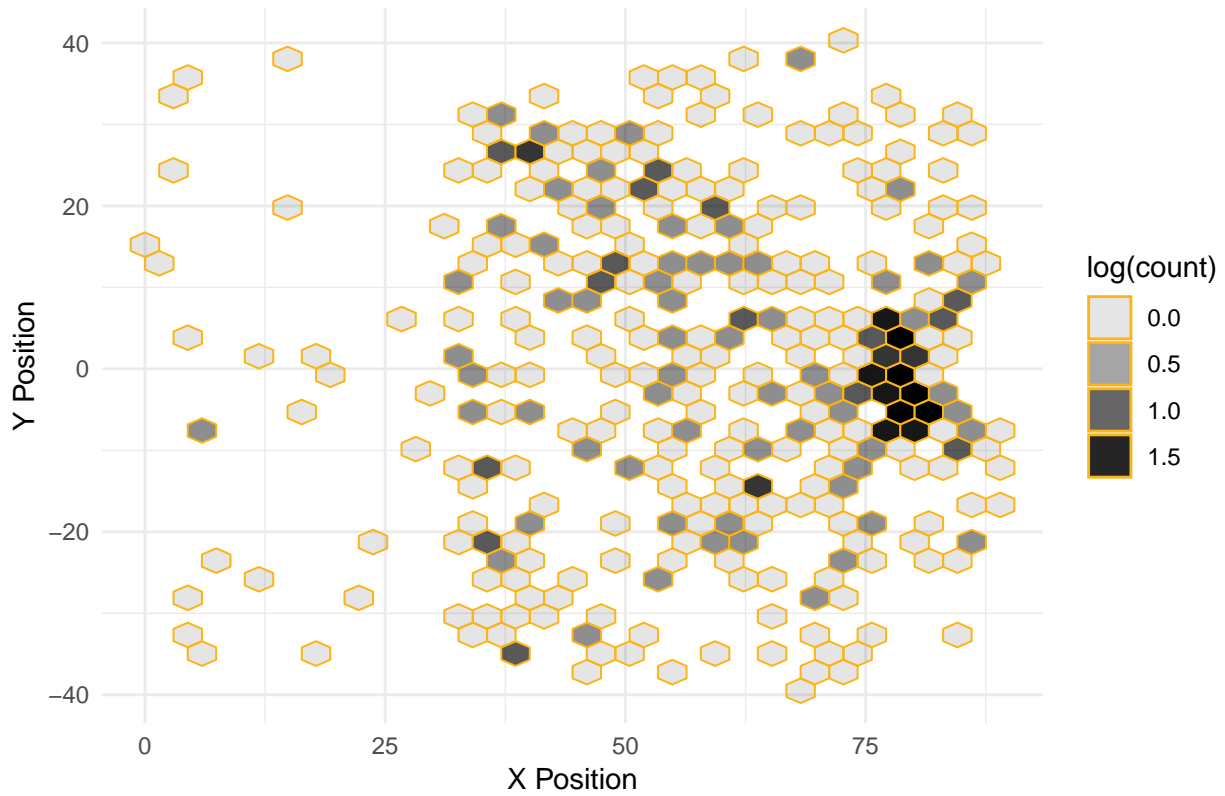

```
murray.2016.locations.plot = graph.shot.locations(murray.2016, "#000000", "#FCB514", "Matt Murray (2016)
murray.2016.locations.plot
```

Matt Murray (2016) Shot Locations
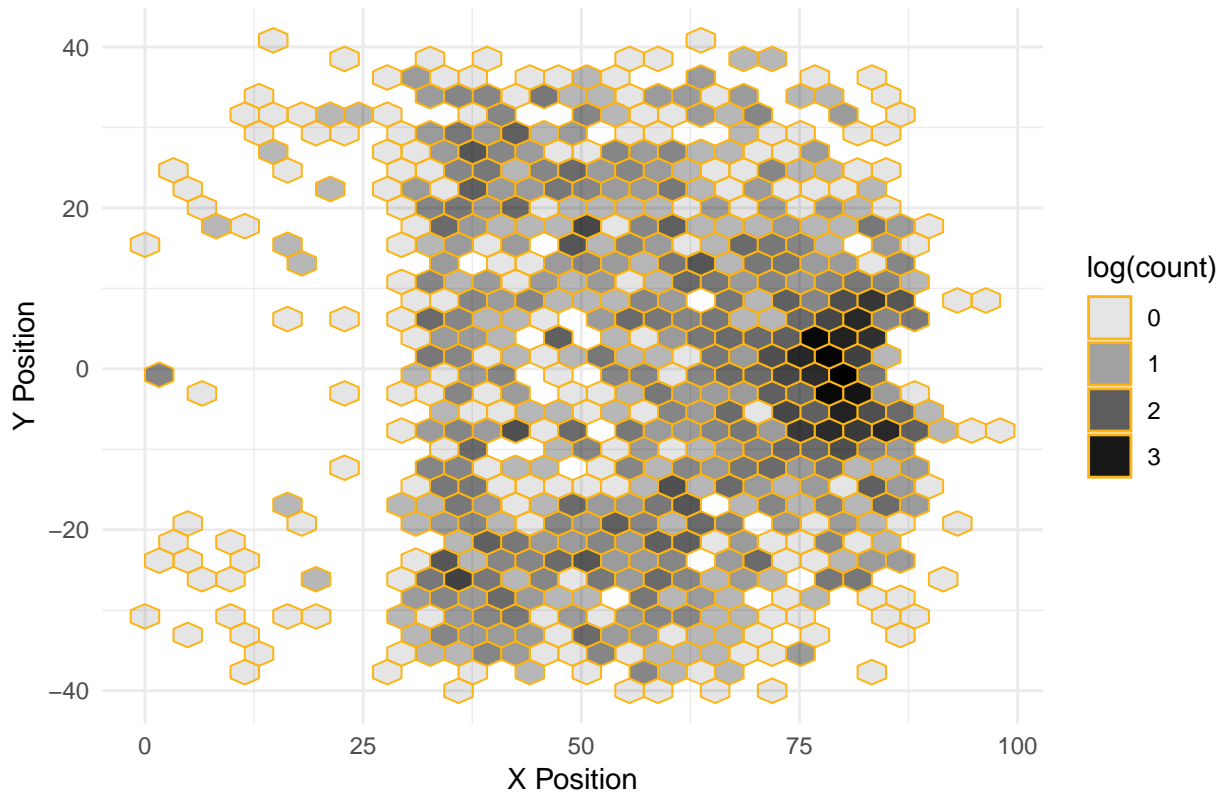

```
murray.2017.locations.plot = graph.shot.locations(murray.2017, "#000000", "#FCB514", "Matt Murray (2017)
murray.2017.locations.plot
```

Matt Murray (2017) Shot Locations


```
murray.2018.locations.plot = graph.shot.locations(murray.2018, "#000000", "#FCB514", "Matt Murray (2018)
murray.2018.locations.plot
```

Matt Murray (2018) Shot Locations
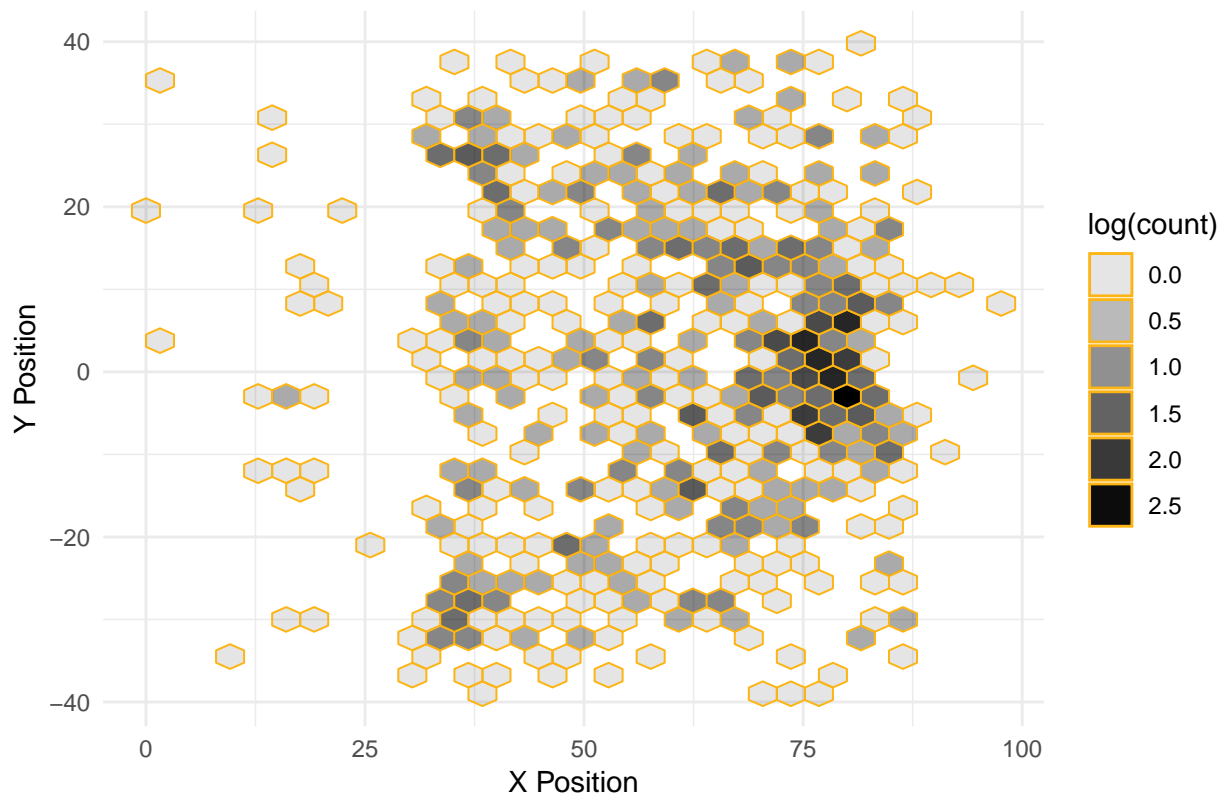
From the darkness of each hex bin, we can use that as a percent chance that Murray saved the shot. Though the darkness is not exactly the save percentage of the shots, it's the log chance of Murray seeing the shot. This log chance is a good likelihood function of Murray saving the shot. We can see that Murray's weakness is very close to him. Those shots are most likely to be tipped or deflected shots, not actual shots. We can see his weakness is the top of the circles, based on the X and Y coordinates.

From the graph, we can see that Murray has struggled with shots near the circles. Disregarding tips, it seems like that Murray is positionally sound with goals against near him. However, compared to the right wing, Murray seems weak against shots coming from the left wing side. If teams were to exploit this, it would be beneficial to shoot towards Murray's glove side from the left wing circle.

Casey DeSmith

On January 11th, Casey DeSmith inked a 3 year extension with the Penguins with an average annual value of $1.25 million. His rise to earn this paycheck started with exemplary play during the 2017-2018 season and that has carried over into this season. Let's see how he got here!

```
desmith.2017 = get.goalie.data(analysis.2017, "Casey DeSmith")
desmith.2018 = get.goalie.data(analysis.2018, "Casey DeSmith")
```

Let's start by calculating some of his stats for each season and then tabularizing.

```
desmith.2017.sp = get.save.percent(desmith.2017)
desmith.2018.sp = get.save.percent(desmith.2018)

desmith.2017.gp = get.goal.percent(desmith.2017)
desmith.2018.gp = get.goal.percent(desmith.2018)
```

```
desmith.2017.spg = get.shots.per.goal(desmith.2017)
desmith.2018.spg = get.shots.per.goal(desmith.2018)
```

Now, let's put it in a table:

Season	Save Percent	Goal Percent	Shots Per Goal
2017-2018	0.9427403	0.0572597	17.4642857
2018-2019	0.9422886	0.0577114	17.3275862

We can look at his game by game data also.

```
desmith.2017.games.sp = get.game.save.percent(desmith.2017)
desmith.2017.games.gp = get.game.goal.percent(desmith.2017)
desmith.2017.games.spg = get.game.shots.per.goal(desmith.2017)

desmith.2018.games.sp = get.game.save.percent(desmith.2018)
desmith.2018.games.gp = get.game.goal.percent(desmith.2018)
desmith.2018.games.spg = get.game.shots.per.goal(desmith.2018)
```

Let's look at his save percentage graphs:

```
desmith.2017.sp.plot = graph.trend(desmith.2017.games.sp, "Save Percentage", "#000000", "#FCB514", "Cas
desmith.2017.sp.plot
```


Casey DeSmith (2017) Save Percentage by Game
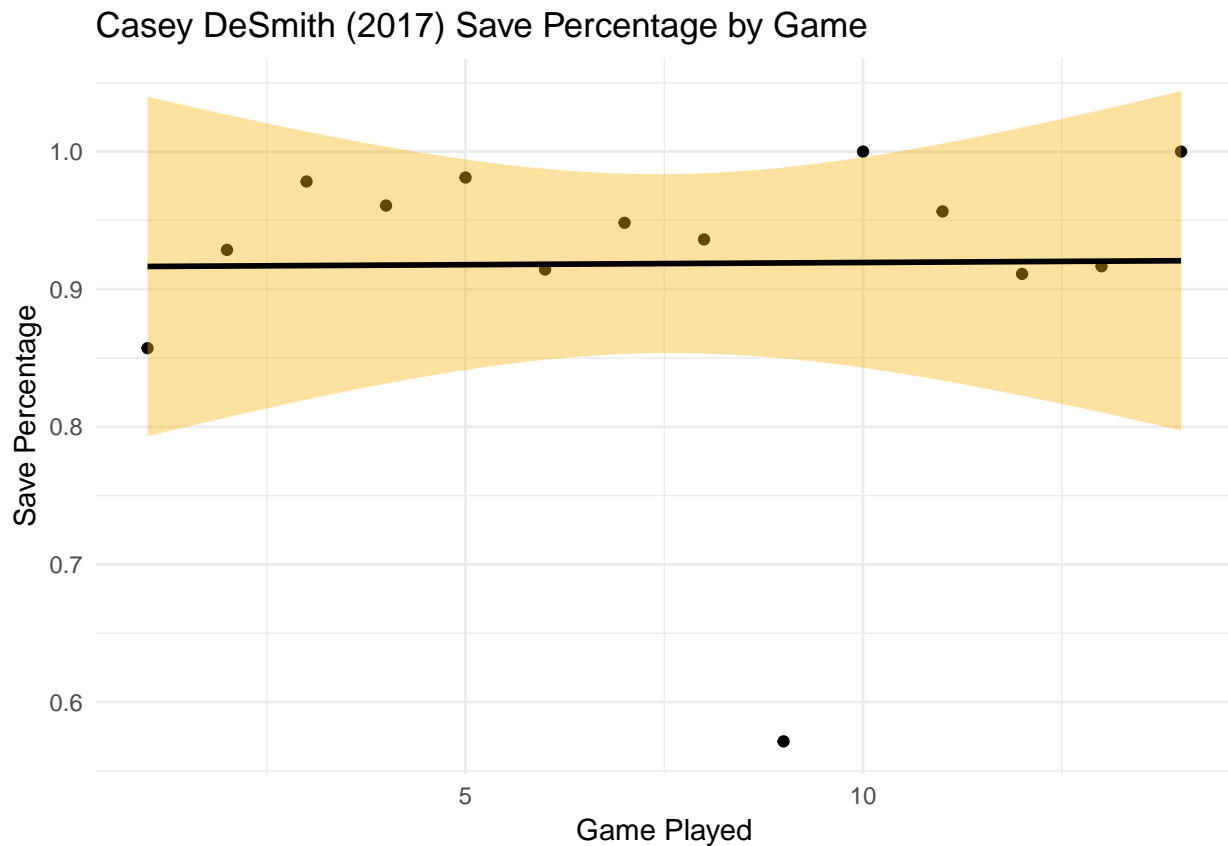
```
desmith.2018.sp.plot = graph.trend(desmith.2018.games.sp, "Save Percentage", "#000000", "#FCB514", "Cas
desmith.2018.sp.plot
```

Casey DeSmith(2018) Save Percentage by Game
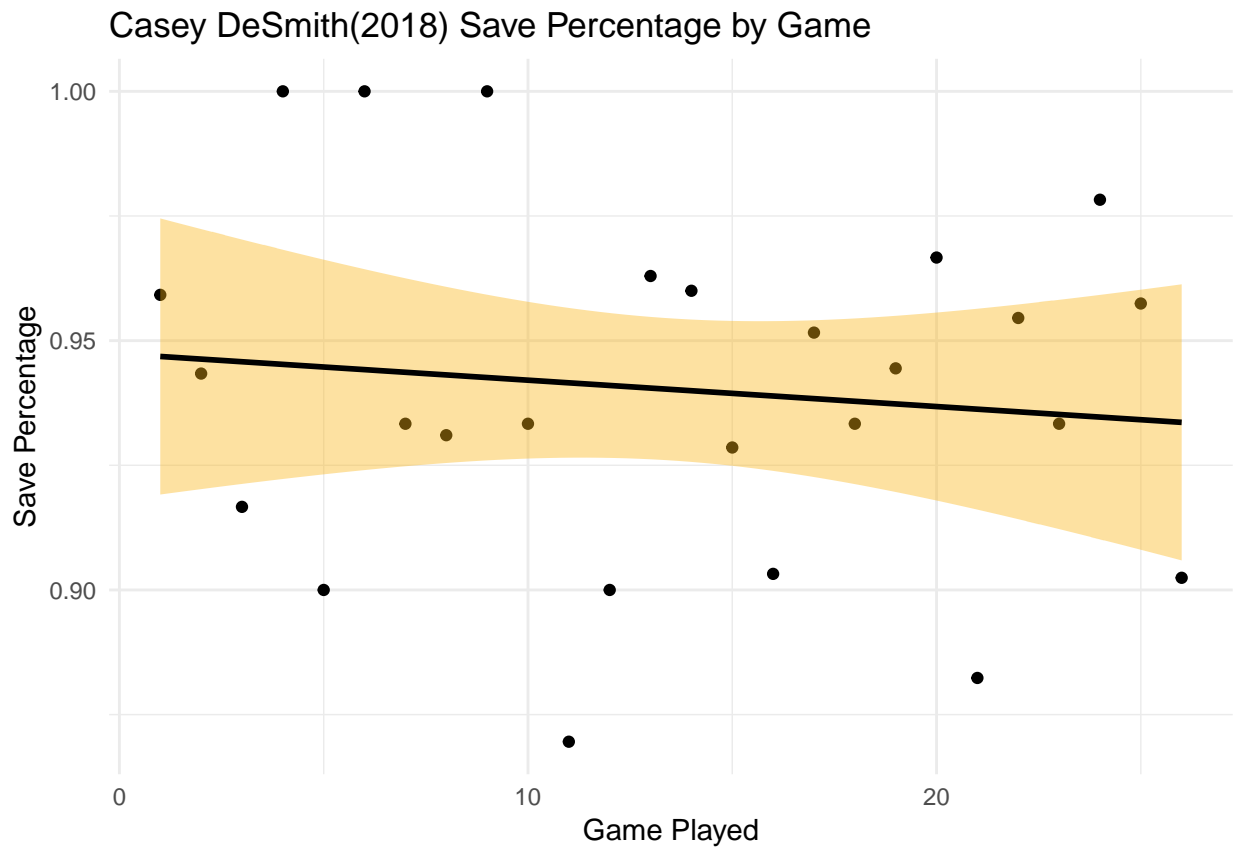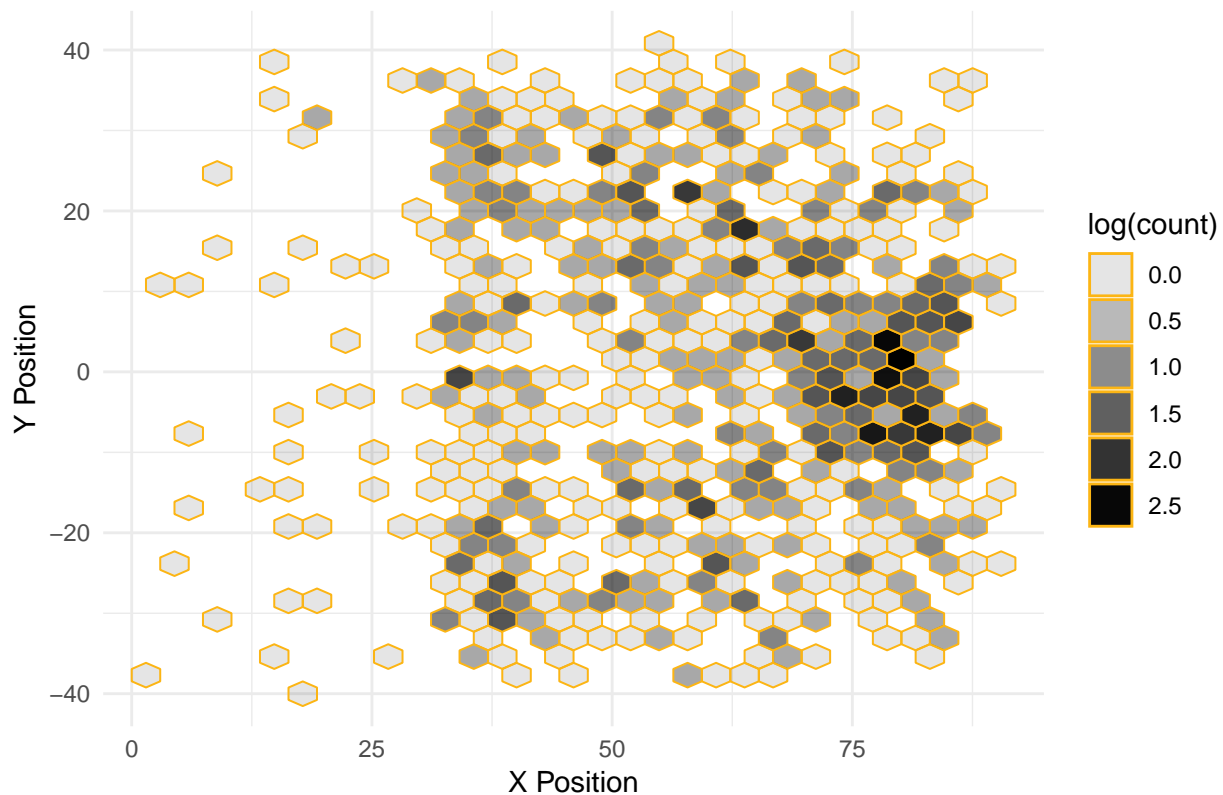
And now, let's take a look at his shot location data.

```
desmith.2017.locations.plot = graph.shot.locations(desmith.2017, "#000000", "#FCB514", "Casey DeSmith (
desmith.2017.locations.plot
```

Casey DeSmith (2017) Shot Locations
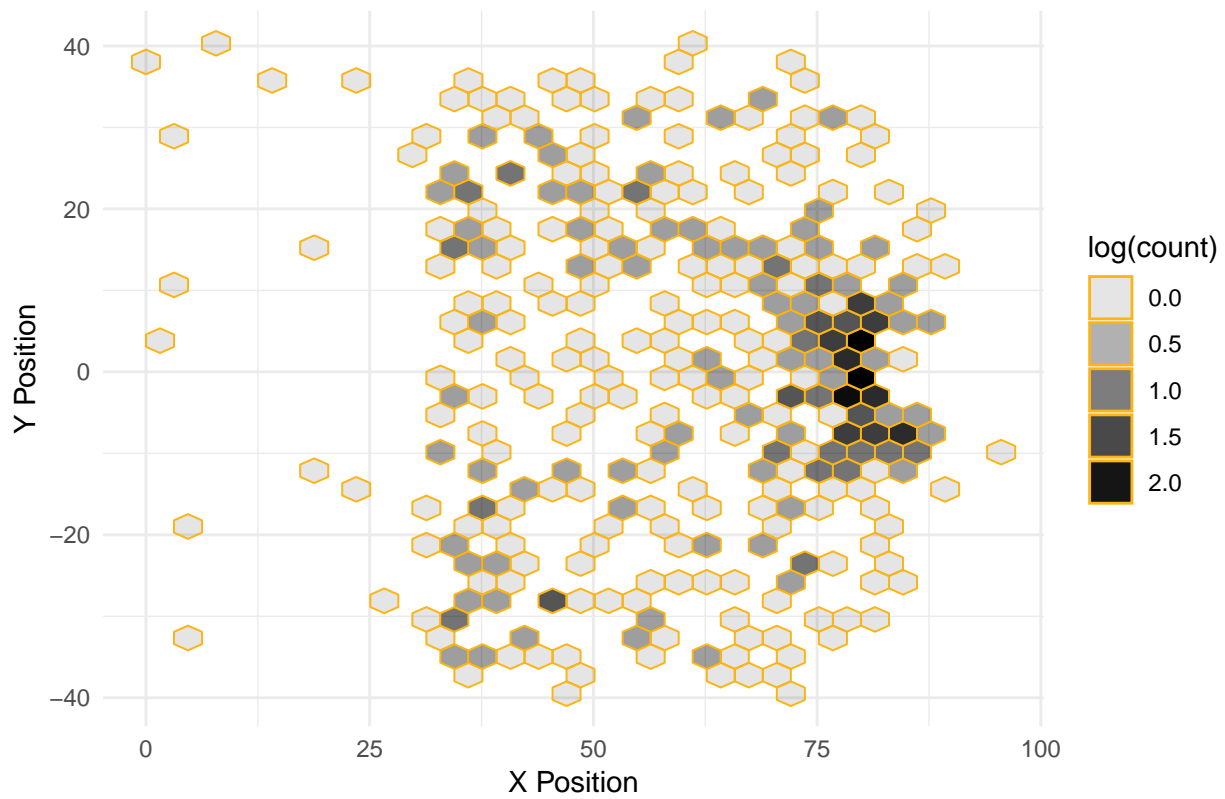
```
desmith.2018.locations.plot = graph.shot.locations(desmith.2018, "#000000", "#FCB514", "Casey DeSmith (
desmith.2018.locations.plot
```

Casey DeSmith (2018) Shot Locations

As we can see, DeSmith has played pretty phenomenally. He's earned his new extension and his play has been pretty consistent. He is the perfect complement for Matt Murray.

Marc-Andre Fleury

Before he was picked by the Vegas Golden Knights in the most recent NHL Expansion Draft, Marc-Andre Fleury was the franchise goaltender for the Pittsburgh Penguins. Drafted first overall in the 2003 NHL Entry Draft, Marc-Andre "Flower" Fleury made his NHL debut in October of 2003. Since thenm he's been the main net-protector for the Penguins (until 2017 that is). His athleticism plus is exceptionally quick reactions makes Flower a premier NHL goaltender. With 3 Stanley Cup victories (2009, 2016, and 2017), Fleury has cemented his place as a top-10 all-time goaltender. With 429 regular season wins, Fleury sits at number 9 for career regular season wins. Only two active goaltenders, Roberto Luongo and Henrik Lundqvist, sit higher above him.

Fleury has been playing phenomenally the past few season. What seems like a second-prime for the Canadian born goaltender, Fleury showed shades of his 2008-2009 season, when he led the Penguins to their third Stanley Cup

```
fleury.2015 = get.goalie.data(analysis.2015, "Marc-Andre Fleury")
fleury.2016 = get.goalie.data(analysis.2016, "Marc-Andre Fleury")
fleury.2017 = get.goalie.data(analysis.2017, "Marc-Andre Fleury")
fleury.2018 = get.goalie.data(analysis.2018, "Marc-Andre Fleury")
```

Let's start by calculating some of his stats for each season and then tabularizing.

```
fleury.2015.sp = get.save.percent(fleury.2015)
fleury.2016.sp = get.save.percent(fleury.2016)
fleury.2017.sp = get.save.percent(fleury.2017)
```

```
fleury.2018.sp = get.save.percent(fleury.2018)

fleury.2015.gp = get.goal.percent(fleury.2015)
fleury.2016.gp = get.goal.percent(fleury.2016)
fleury.2017.gp = get.goal.percent(fleury.2017)
fleury.2018.gp = get.goal.percent(fleury.2018)

fleury.2015.spg = get.shots.per.goal(fleury.2015)
fleury.2016.spg = get.shots.per.goal(fleury.2016)
fleury.2017.spg = get.shots.per.goal(fleury.2017)
fleury.2018.spg = get.shots.per.goal(fleury.2018)
```

Now, let's put it in a table:

Season	Save Percent	Goal Percent	Shots Per Goal
2015-2016	0.9427197	0.0572803	17.4580153
2016-2017	0.9314803	0.0685197	14.5943396
2017-2018	0.9475891	0.0524109	19.08
2018-2019	0.9365621	0.0634379	15.7634409

We can look at his game by game data also.

```
fleury.2015.games.sp = get.game.save.percent(fleury.2015)
fleury.2015.games.gp = get.game.goal.percent(fleury.2015)
fleury.2015.games.spg = get.game.shots.per.goal(fleury.2015)

fleury.2016.games.sp = get.game.save.percent(fleury.2016)
fleury.2016.games.gp = get.game.goal.percent(fleury.2016)
fleury.2016.games.spg = get.game.shots.per.goal(fleury.2016)

fleury.2017.games.sp = get.game.save.percent(fleury.2017)
fleury.2017.games.gp = get.game.goal.percent(fleury.2017)
fleury.2017.games.spg = get.game.shots.per.goal(fleury.2017)

fleury.2018.games.sp = get.game.save.percent(fleury.2018)
fleury.2018.games.gp = get.game.goal.percent(fleury.2018)
fleury.2018.games.spg = get.game.shots.per.goal(fleury.2018)
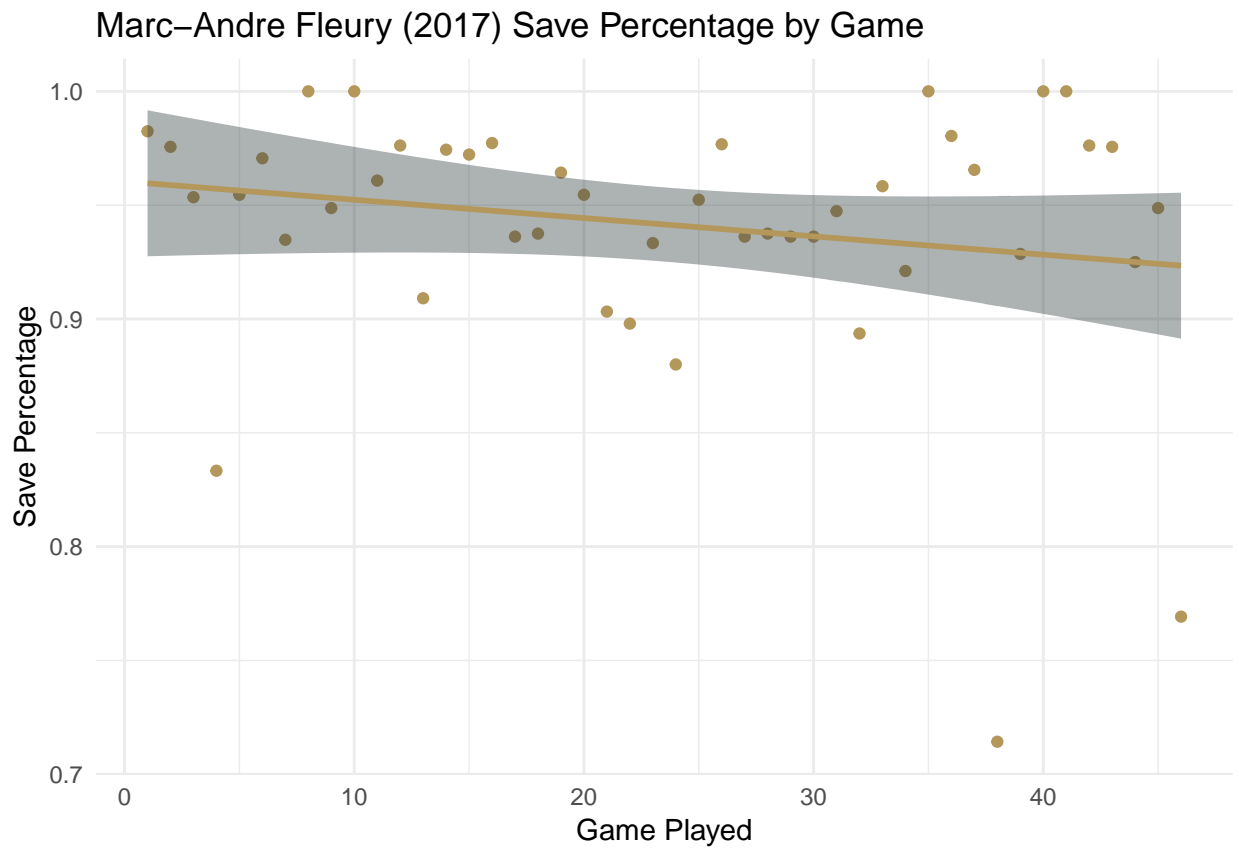```

Let's look at his save percentage graphs:

```
fleury.2015.sp.plot = graph.trend(fleury.2015.games.sp, "Save Percentage", "#000000", "#FCB514", "Marc-
fleury.2015.sp.plot
```

## Marc–Andre Fleury (2015) Save Percentage by Game
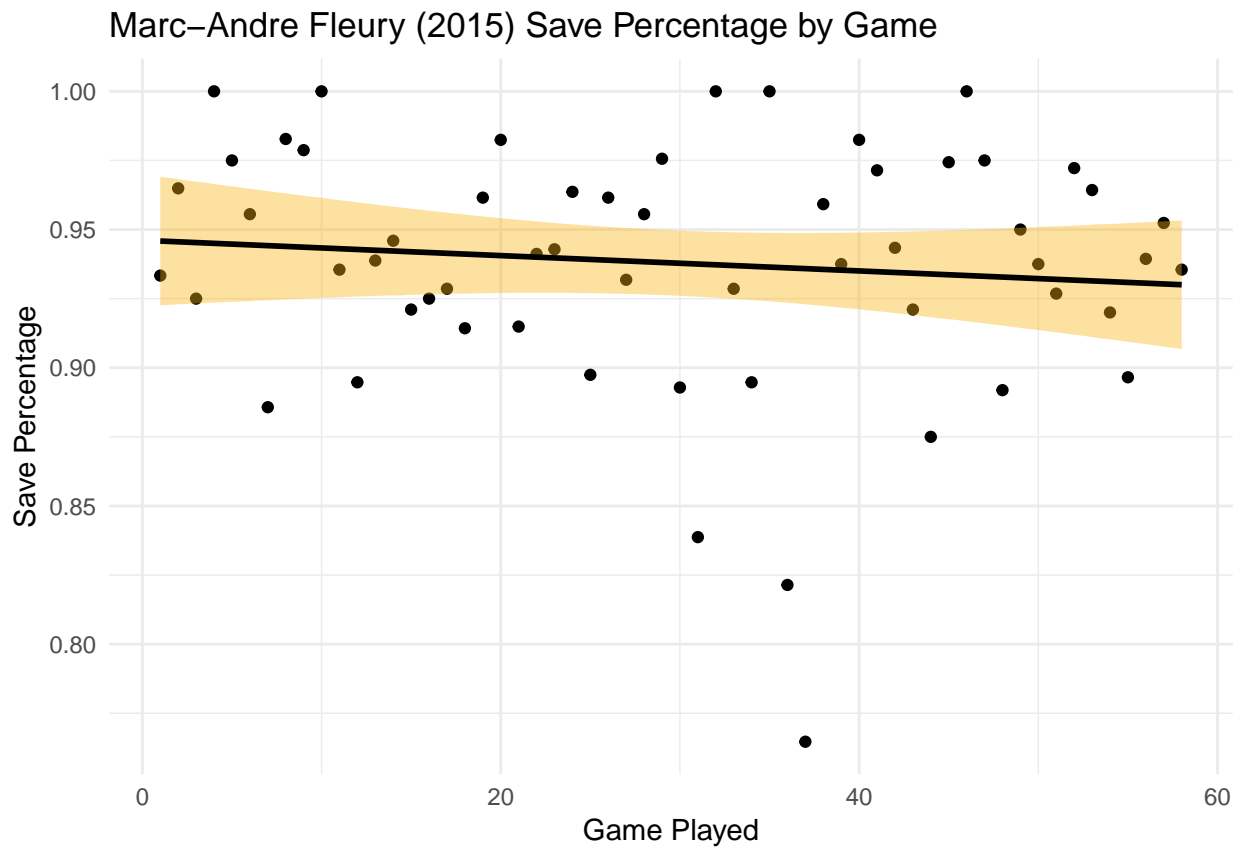


```
fleury.2016.sp.plot = graph.trend(fleury.2016.games.sp, "Save Percentage", "#000000", "#FCB514", "Marc-
fleury.2016.sp.plot
```

Marc–Andre Fleury (2016) Save Percentage by Game
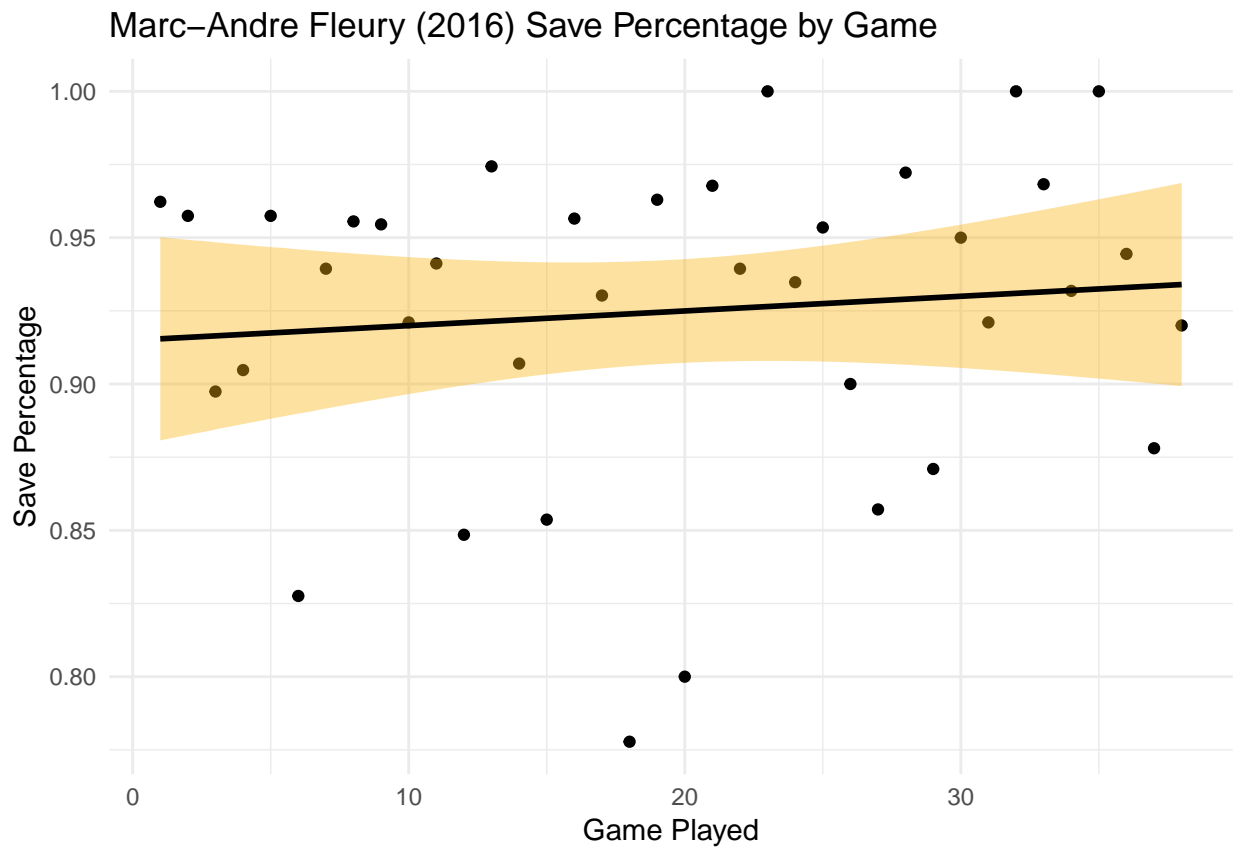

```
fleury.2017.sp.plot = graph.trend(fleury.2017.games.sp, "Save Percentage", "#B4975A", "#333F42", "Marc–
fleury.2017.sp.plot
```

## Marc–Andre Fleury (2017) Save Percentage by Game


```
fleury.2018.sp.plot = graph.trend(fleury.2018.games.sp, "Save Percentage", "#B4975A", "#333F42", "Marc-
fleury.2018.sp.plot
```

Marc–Andre Fleury (2018) Save Percentage by Game
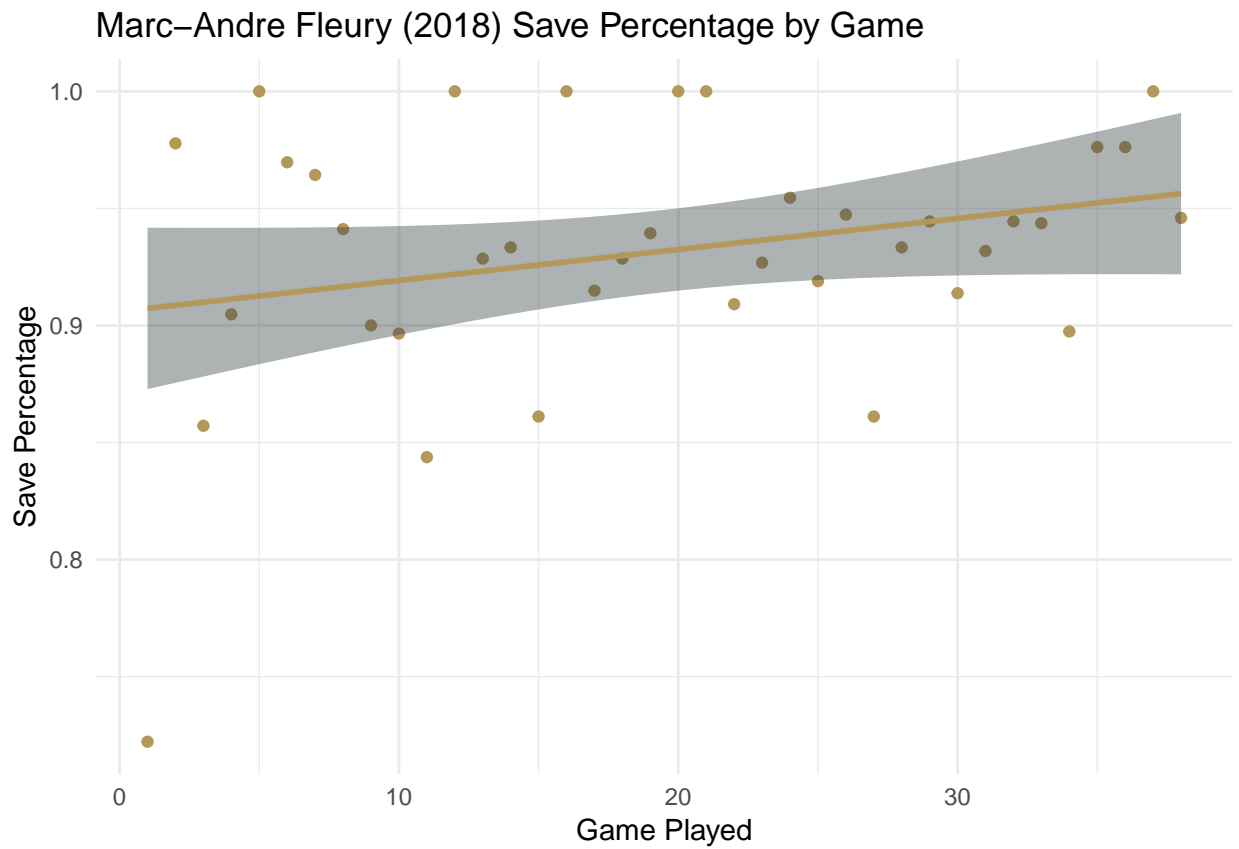
And now, let's take a look at his shot location data.

```
fleury.2015.locations.plot = graph.shot.locations(fleury.2015, "#000000", "#FCB514", "Marc-Andre Fleury
fleury.2015.locations.plot
```

Marc–Andre Fleury (2015) Shot Locations
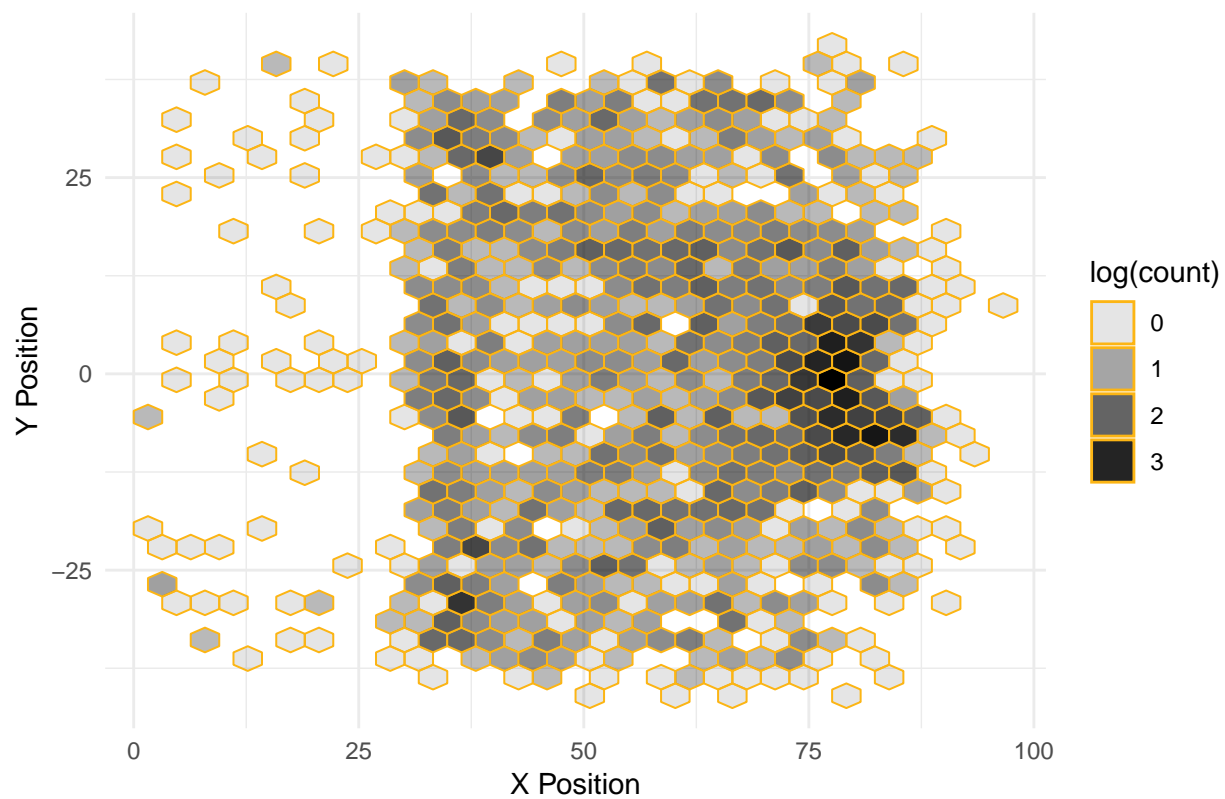

```
fleury.2016.locations.plot = graph.shot.locations(fleury.2016, "#000000", "#FCB514", "Marc-Andre Fleury
fleury.2016.locations.plot
```

Marc–Andre Fleury (2016) Shot Locations
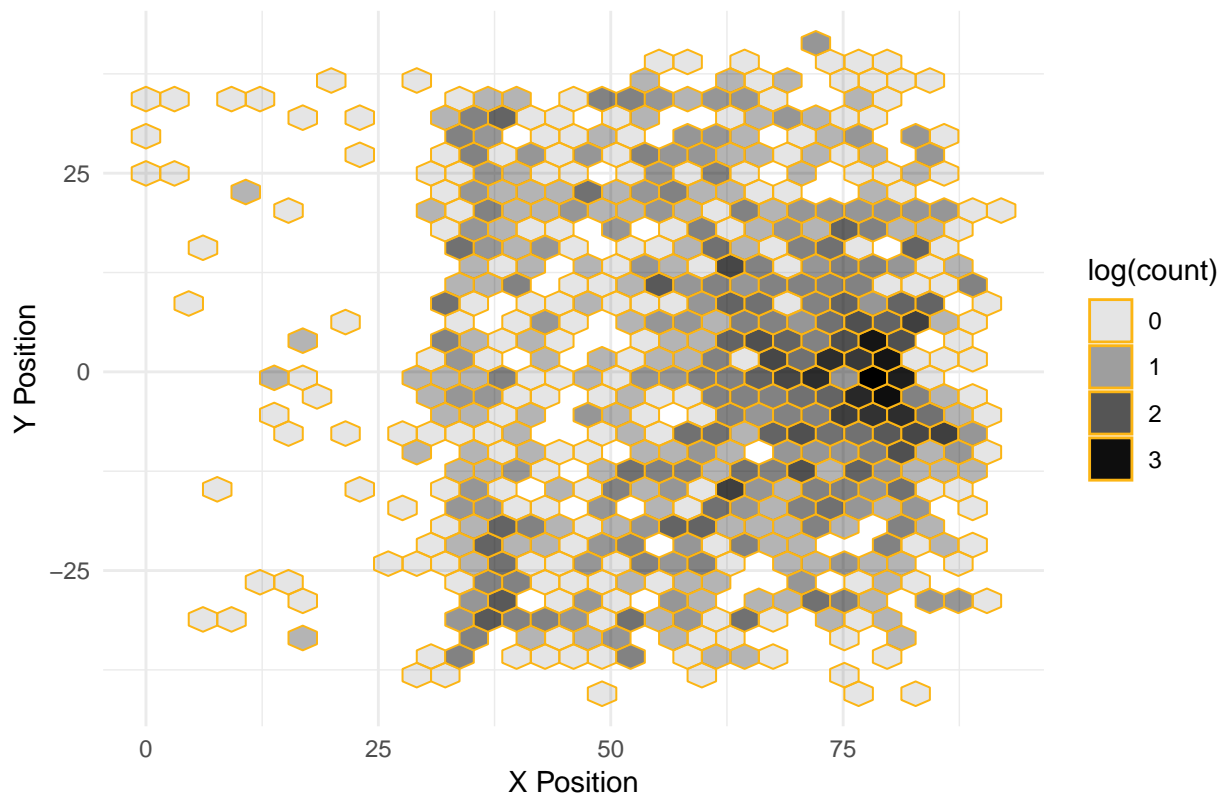
```
fleury.2017.locations.plot = graph.shot.locations(fleury.2017, "#B4975A", "#333F42", "Marc-Andre Fleury
fleury.2017.locations.plot
```

Marc–Andre Fleury (2017) Shot Locations
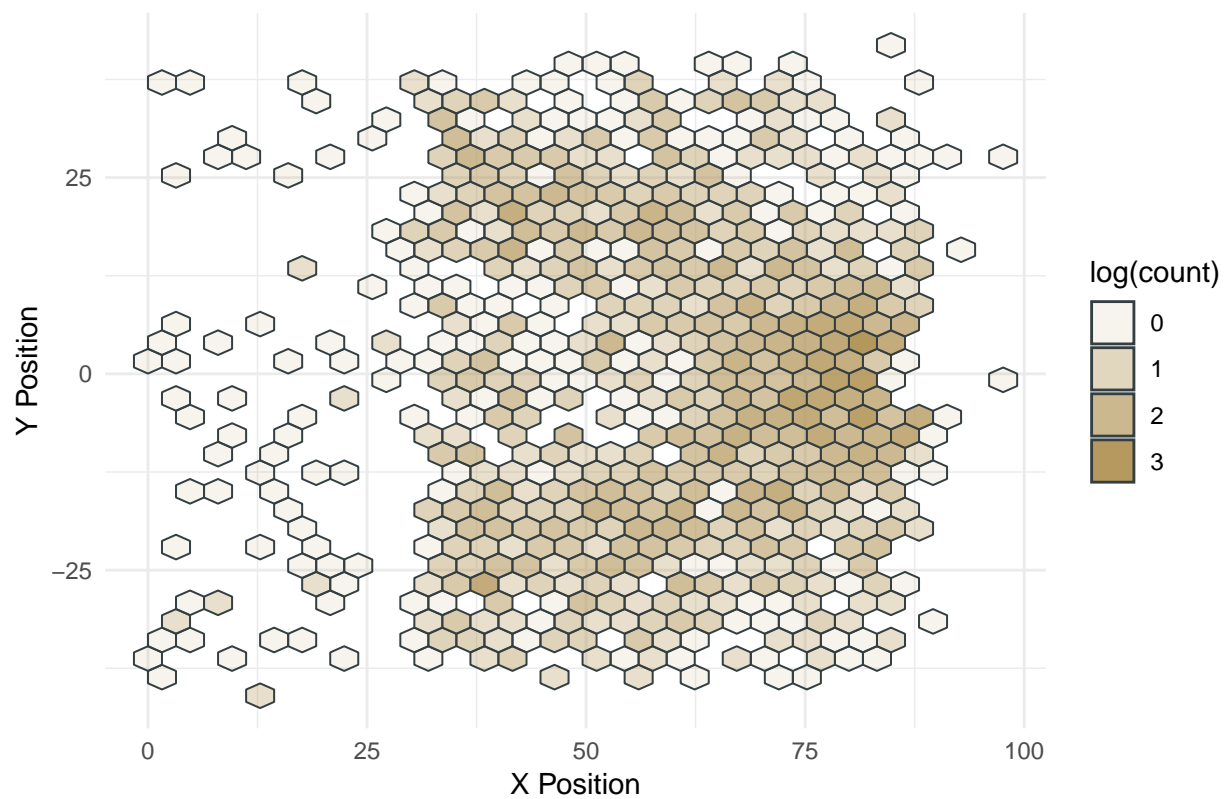
```
fleury.2018.locations.plot = graph.shot.locations(fleury.2018, "#B4975A", "#333F42", "Marc-Andre Fleury
fleury.2018.locations.plot
```

Marc–Andre Fleury (2018) Shot Locations
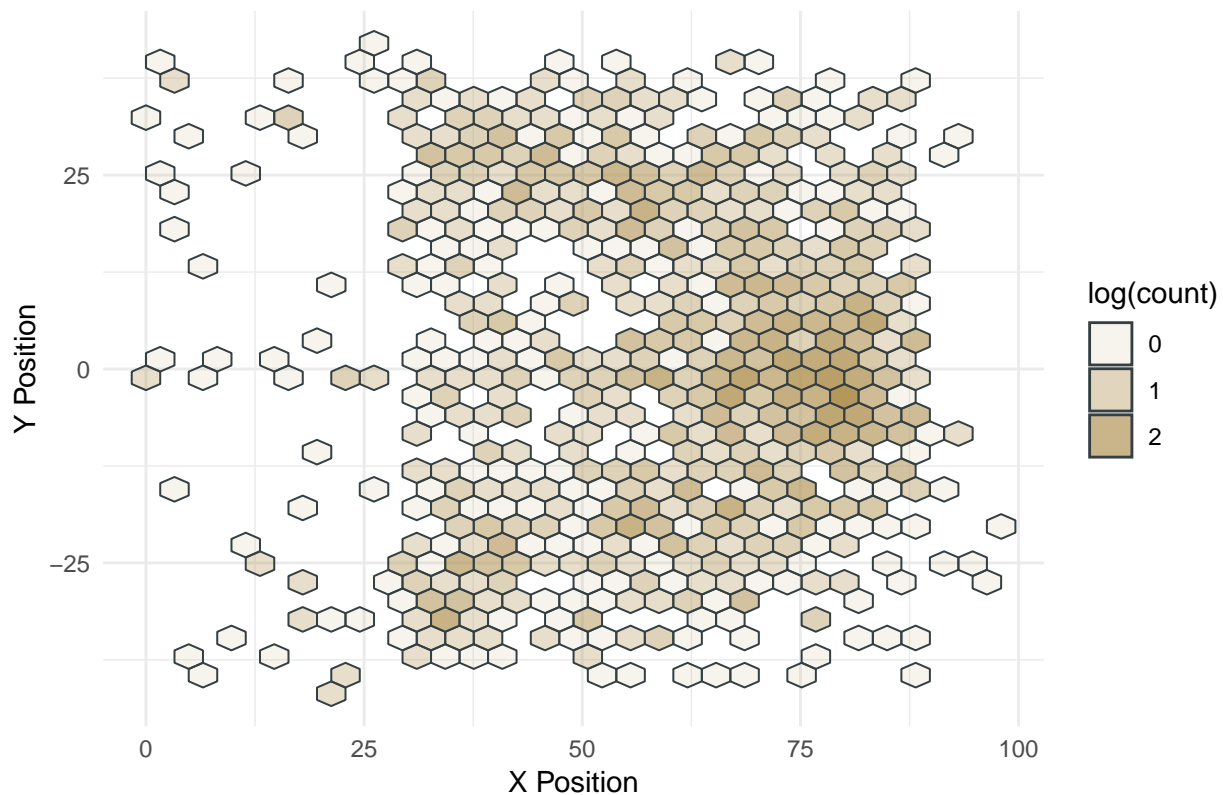
Fleury has shown exceptional consistency. For any young goaltender breaking into the league, he should be a top-role model.

Braden Holtby

After exercising his playoff demons during the 2018 Stanley Cup Playoffs, Braden Holtby has lived up to his expectations. His play has been phenomenal during both the regular season and playoffs. Let's see how he's been since 2015.

```
holtby.2015 = get.goalie.data(analysis.2015, "Braden Holtby")
holtby.2016 = get.goalie.data(analysis.2016, "Braden Holtby")
holtby.2017 = get.goalie.data(analysis.2017, "Braden Holtby")
holtby.2018 = get.goalie.data(analysis.2018, "Braden Holtby")
```

Let's start by calculating some of his stats for each season and then tabularizing.

```
holtby.2015.sp = get.save.percent(holtby.2015)
holtby.2016.sp = get.save.percent(holtby.2016)
holtby.2017.sp = get.save.percent(holtby.2017)
holtby.2018.sp = get.save.percent(holtby.2018)

holtby.2015.gp = get.goal.percent(holtby.2015)
holtby.2016.gp = get.goal.percent(holtby.2016)
holtby.2017.gp = get.goal.percent(holtby.2017)
holtby.2018.gp = get.goal.percent(holtby.2018)

holtby.2015.spg = get.shots.per.goal(holtby.2015)
```

```
holtby.2016.spg = get.shots.per.goal(holtby.2016)
holtby.2017.spg = get.shots.per.goal(holtby.2017)
holtby.2018.spg = get.shots.per.goal(holtby.2018)
```

Now, let's put it in a table:

Season	Save Percent	Goal Percent	Shots Per Goal
2015-2016	0.9448141	0.0551859	18.1205674
2016-2017	0.9476936	0.0523064	19.1181102
2017-2018	0.9348104	0.0651896	15.3398693
2018-2019	0.9345048	0.0654952	15.2682927

We can look at his game by game data also.

```
holtby.2015.games.sp = get.game.save.percent(holtby.2015)
holtby.2015.games.gp = get.game.goal.percent(holtby.2015)
holtby.2015.games.spg = get.game.shots.per.goal(holtby.2015)

holtby.2016.games.sp = get.game.save.percent(holtby.2016)
holtby.2016.games.gp = get.game.goal.percent(holtby.2016)
holtby.2016.games.spg = get.game.shots.per.goal(holtby.2016)

holtby.2017.games.sp = get.game.save.percent(holtby.2017)
holtby.2017.games.gp = get.game.goal.percent(holtby.2017)
holtby.2017.games.spg = get.game.shots.per.goal(holtby.2017)

holtby.2018.games.sp = get.game.save.percent(holtby.2018)
holtby.2018.games.gp = get.game.goal.percent(holtby.2018)
holtby.2018.games.spg = get.game.shots.per.goal(holtby.2018)
```

Let's look at his save percentage graphs:

```
holtby.2015.sp.plot = graph.trend(holtby.2015.games.sp, "Save Percentage", "#041E42", "#C8102E", "Brader
holtby.2015.sp.plot
```
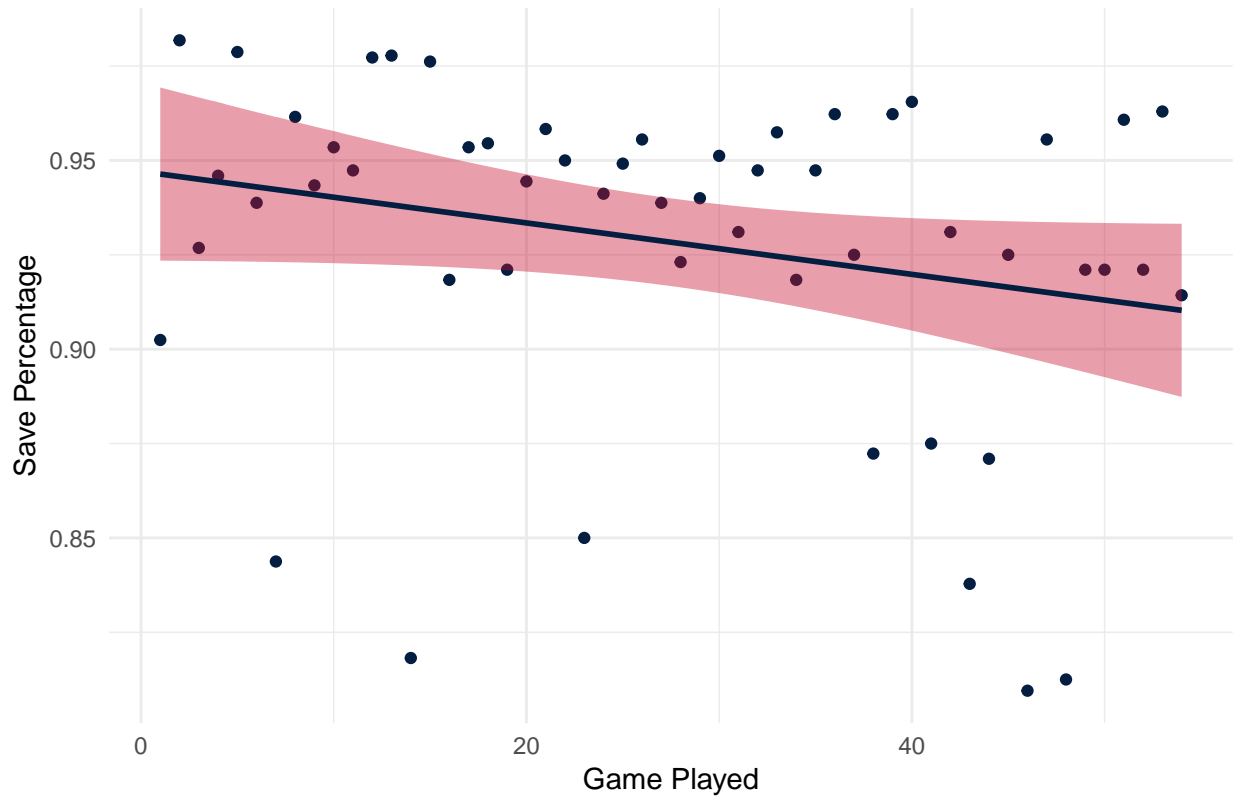
Braden Holtby (2015) Save Percentage by Game
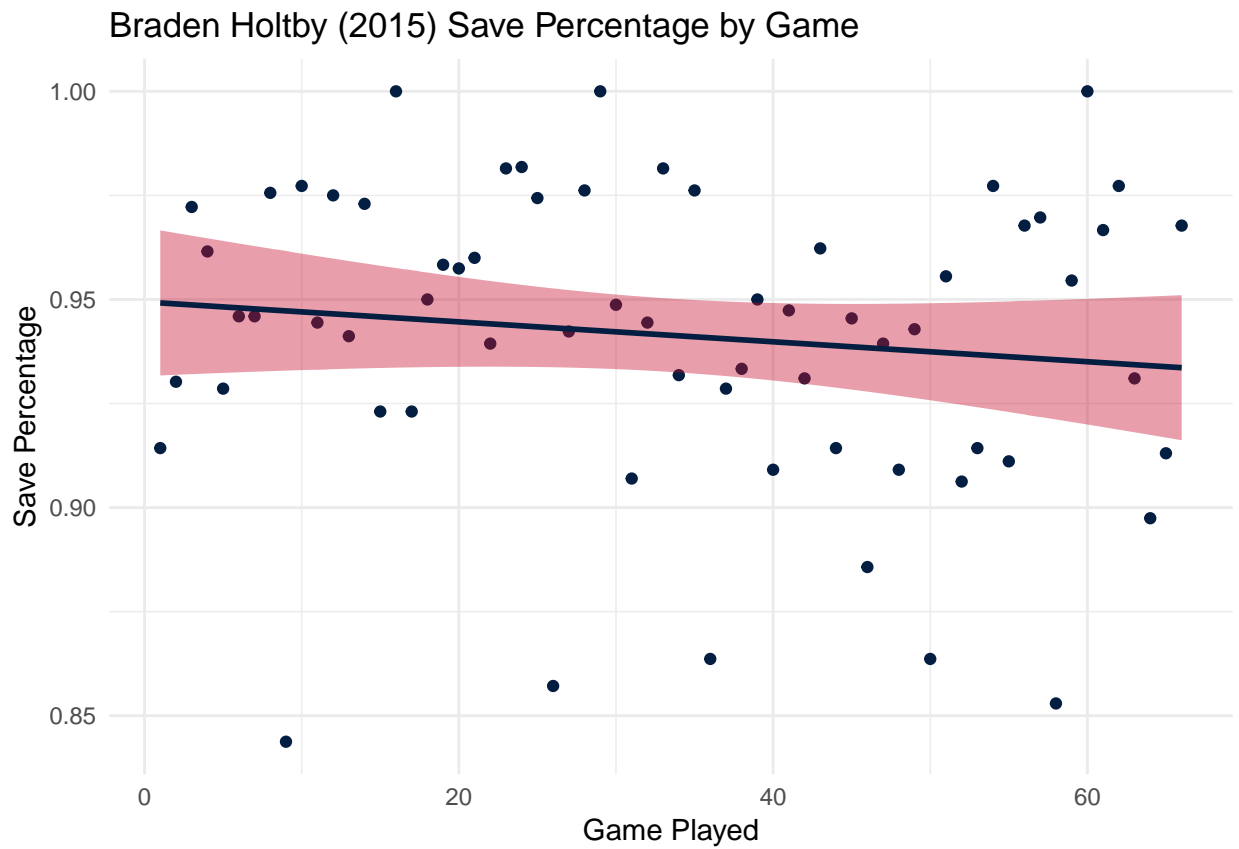

```
holtby.2016.sp.plot = graph.trend(holtby.2016.games.sp, "Save Percentage", "#041E42", "#C8102E", "Braden
holtby.2016.sp.plot
```
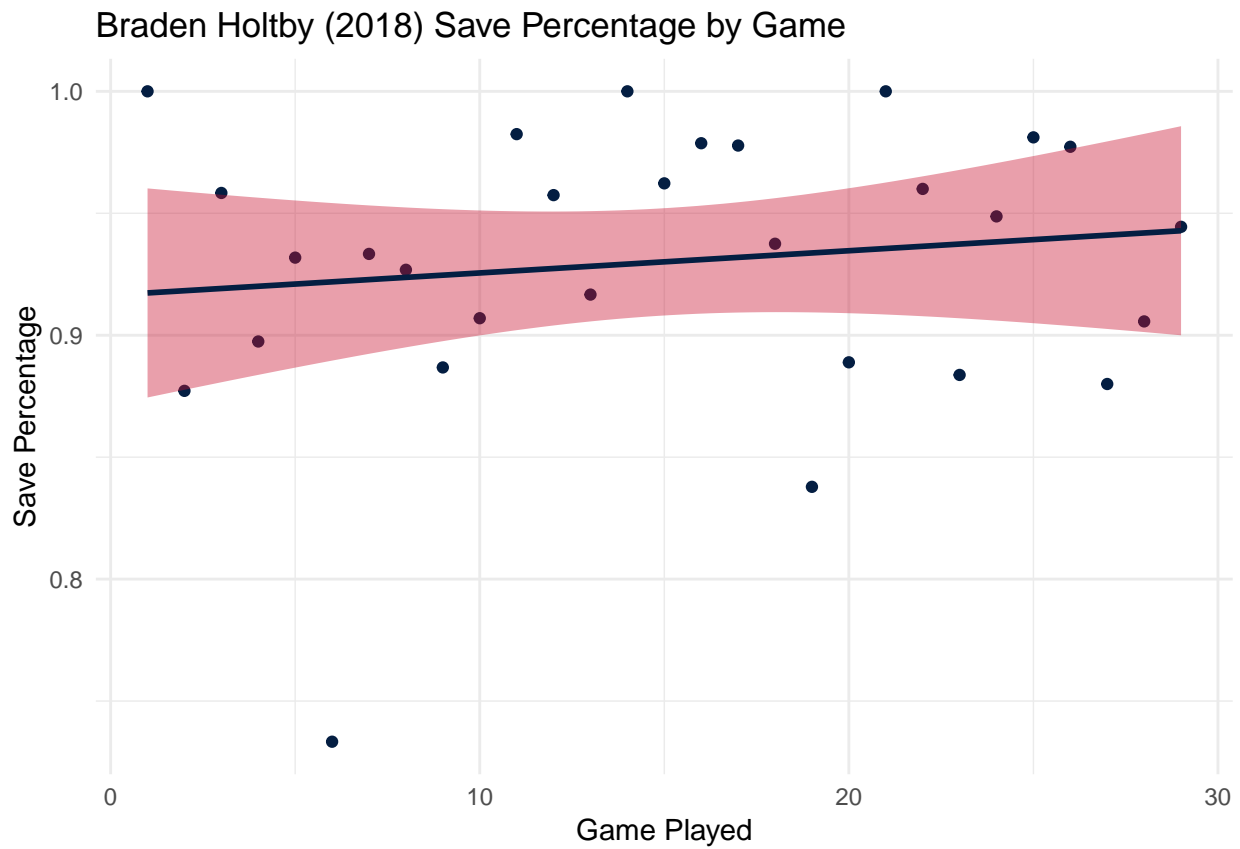
Braden Holtby (2016) Save Percentage by Game
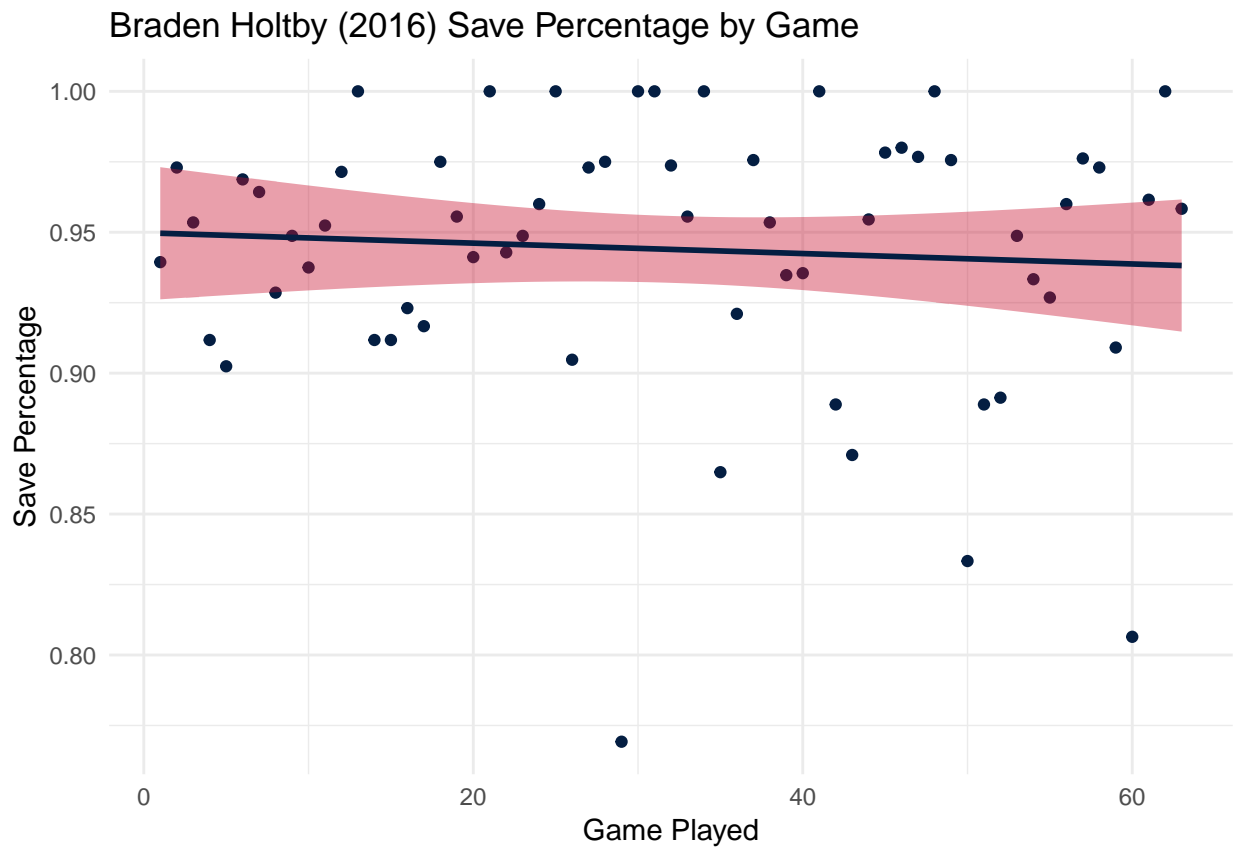
```
holtby.2017.sp.plot = graph.trend(holtby.2017.games.sp, "Save Percentage", "#041E42", "#C8102E", "Braden
holtby.2017.sp.plot
```

Braden Holtby (2017) Save Percentage by Game


```
holtby.2018.sp.plot = graph.trend(holtby.2018.games.sp, "Save Percentage", "#041E42", "#C8102E", "Braden
holtby.2018.sp.plot
```

Braden Holtby (2018) Save Percentage by Game

And now, let's take a look at his shot location data.

```
holtby.2015.locations.plot = graph.shot.locations(holtby.2015, "#041E42", "#C8102E", "Braden Holtby (20
holtby.2015.locations.plot
```

Braden Holtby (2015) Shot Locations
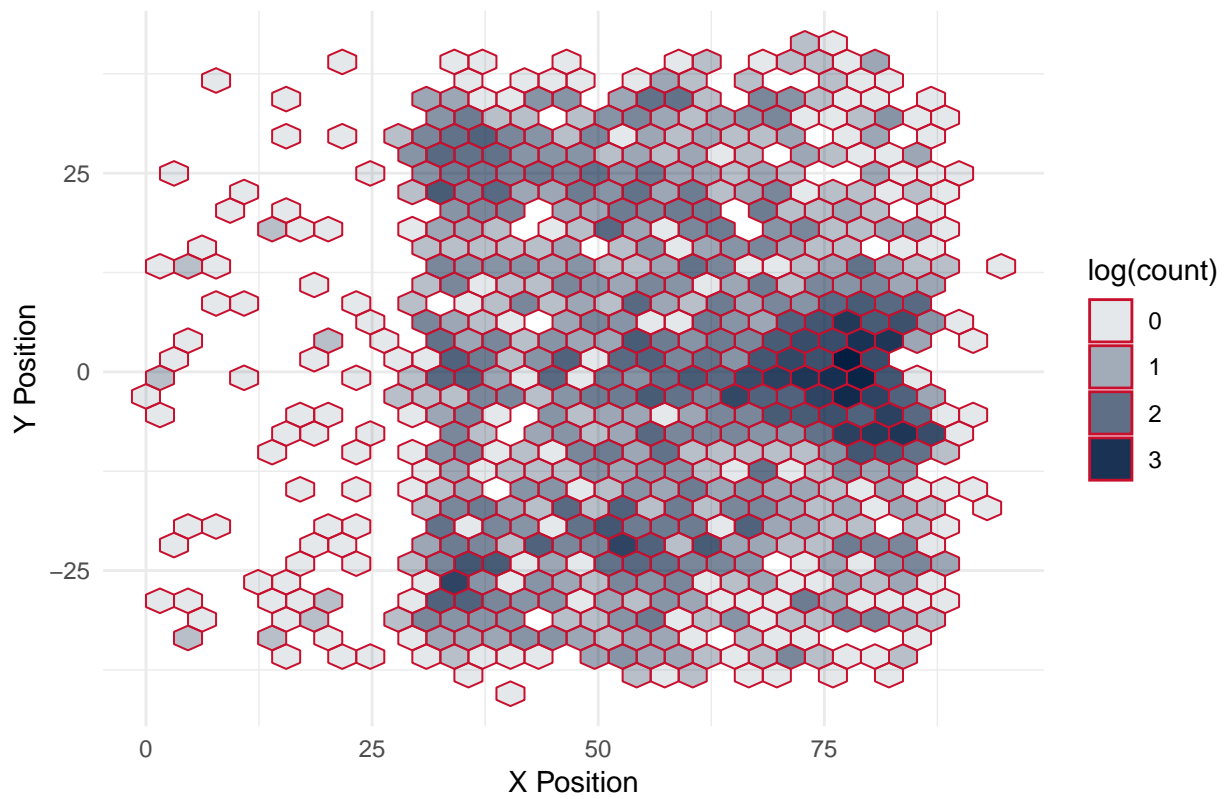

```
holtby.2016.locations.plot = graph.shot.locations(holtby.2016, "#041E42", "#C8102E", "Braden Holtby (20
holtby.2016.locations.plot
```

Braden Holtby (2016) Shot Locations
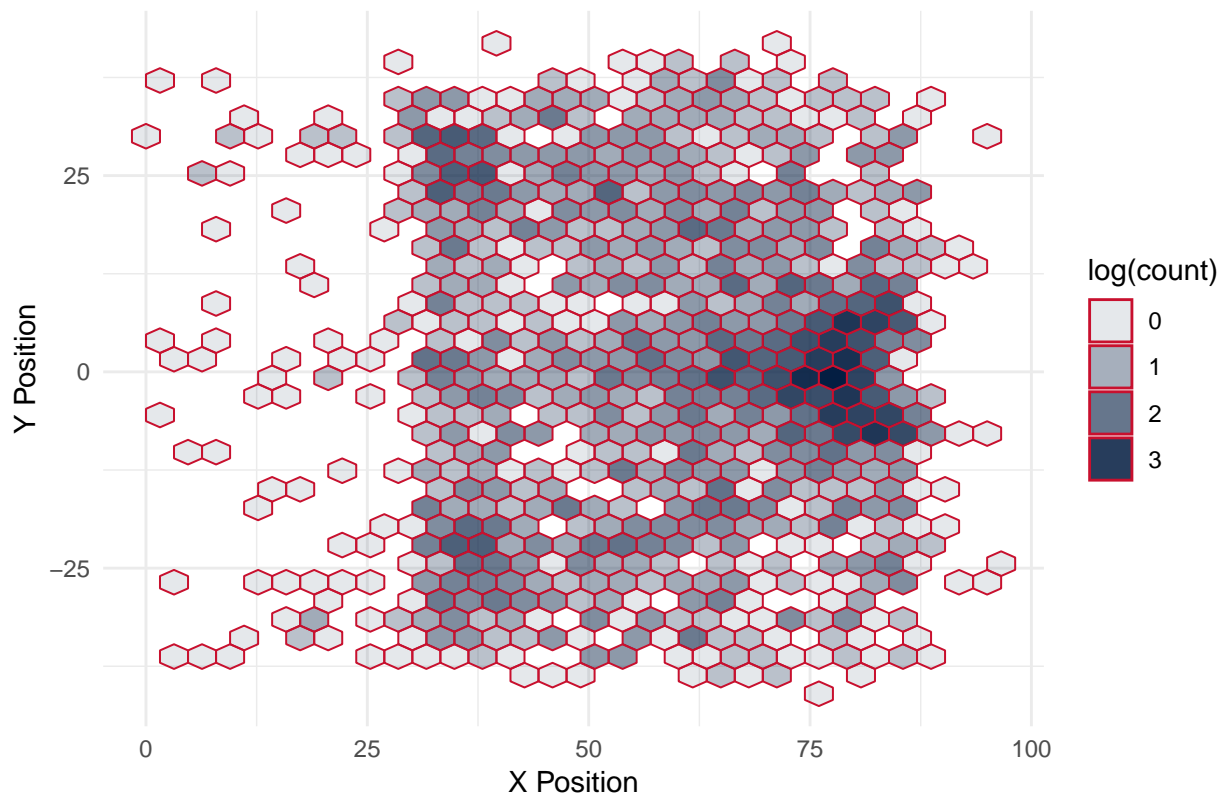

```
holtby.2017.locations.plot = graph.shot.locations(holtby.2017, "#041E42", "#C8102E", "Braden Holtby (20
holtby.2017.locations.plot
```

Braden Holtby (2017) Shot Locations
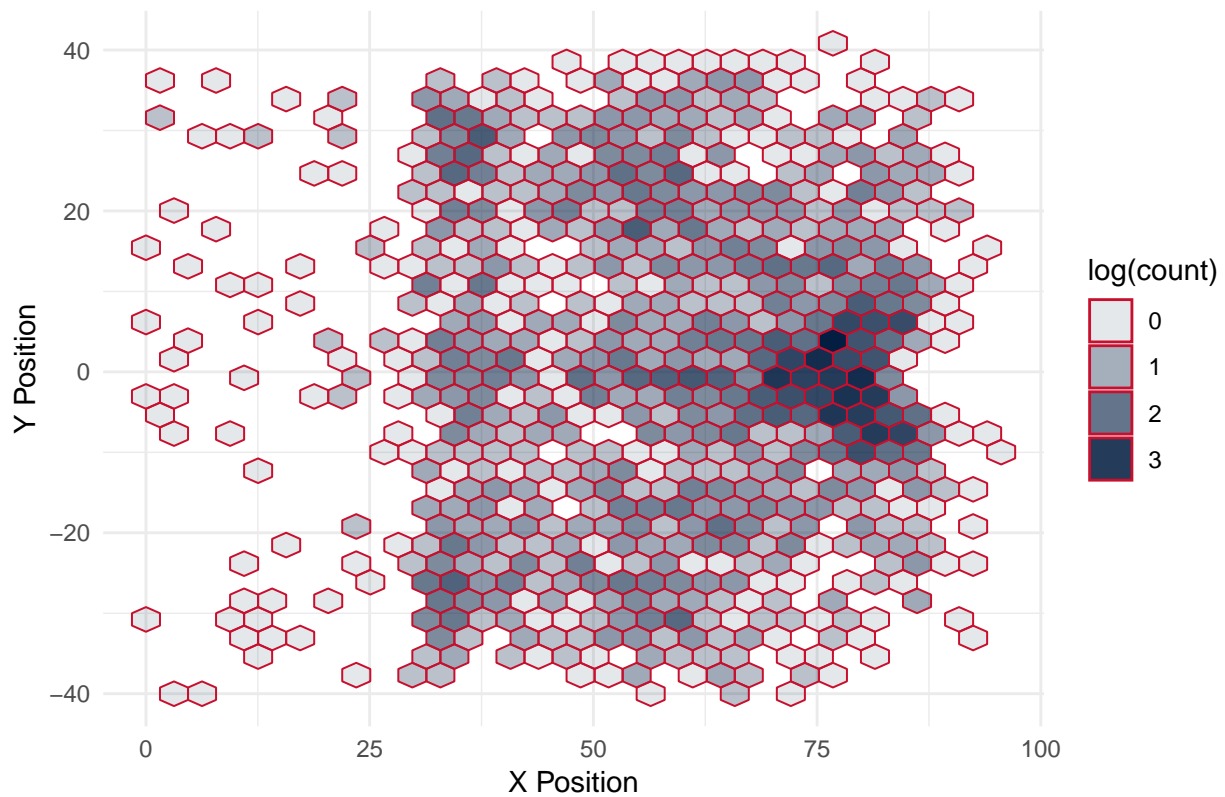

```
holtby.2018.locations.plot = graph.shot.locations(holtby.2018, "#041E42", "#C8102E", "Braden Holtby (20
holtby.2018.locations.plot
```

Braden Holtby (2018) Shot Locations
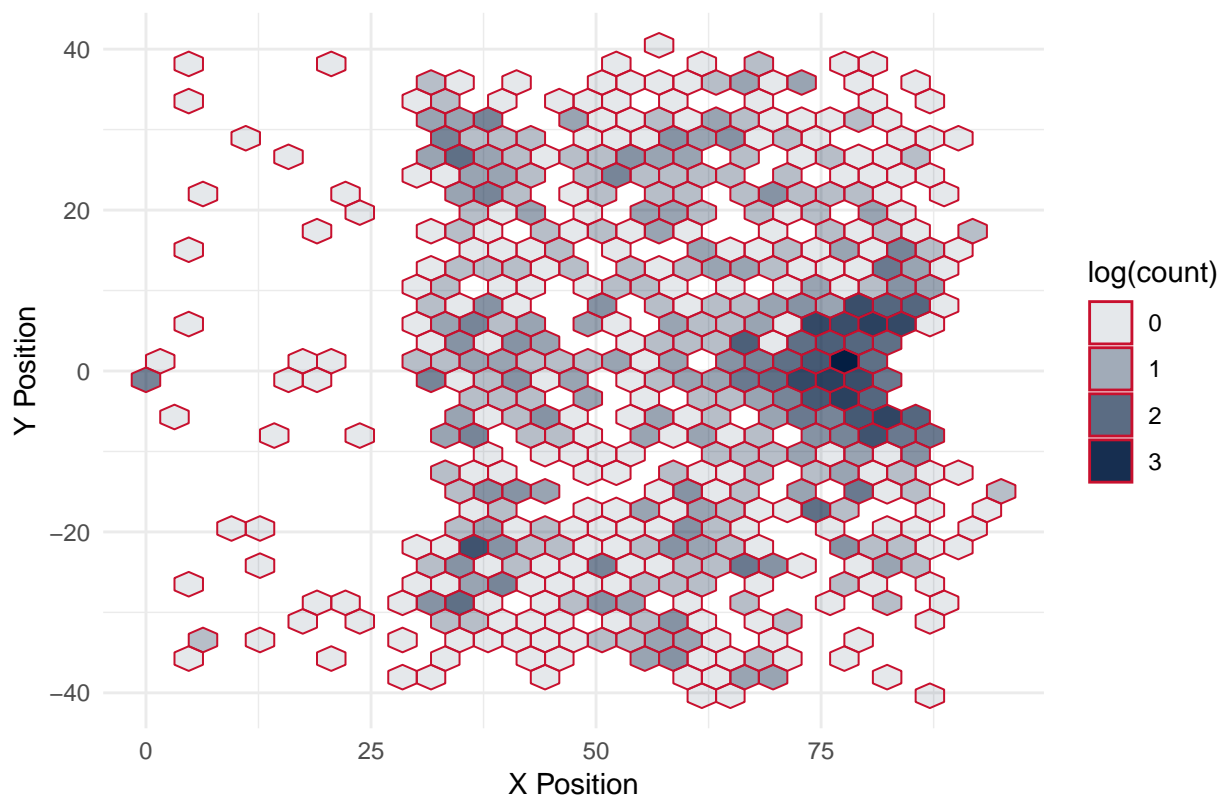
Holtby has had the trend of playing poorly near the end of the season. However, it seems like Holtby is currently going against his negative trend this season. His main weakness seems to be shots from the left circle. This is probably aimed towards his glove hand, which is significantly weaker than his positional play.

John Gibson

Hailing from Pittsburgh Pennsylvania, John Gibson is the 25-year-old starter for the Anaheim Ducks. In his 6 years in the NHL, Gibson has played a total of 221 games, starting 213 games. In his career, Gibson boasts a 2.37 GAA and 92.2% save percentage. Let's start by looking at his growth per season.

```
gibson.2015 = get.goalie.data(analysis.2015, "John Gibson")
gibson.2016 = get.goalie.data(analysis.2016, "John Gibson")
gibson.2017 = get.goalie.data(analysis.2017, "John Gibson")
gibson.2018 = get.goalie.data(analysis.2018, "John Gibson")
```

Let's start by calculating some of his stats for each season and then tabularizing.

```
gibson.2015.sp = get.save.percent(gibson.2015)
gibson.2016.sp = get.save.percent(gibson.2016)
gibson.2017.sp = get.save.percent(gibson.2017)
gibson.2018.sp = get.save.percent(gibson.2018)

gibson.2015.gp = get.goal.percent(gibson.2015)
gibson.2016.gp = get.goal.percent(gibson.2016)
gibson.2017.gp = get.goal.percent(gibson.2017)
gibson.2018.gp = get.goal.percent(gibson.2018)
```

```
gibson.2015.spg = get.shots.per.goal(gibson.2015)
gibson.2016.spg = get.shots.per.goal(gibson.2016)
gibson.2017.spg = get.shots.per.goal(gibson.2017)
gibson.2018.spg = get.shots.per.goal(gibson.2018)
```

Now, let's put it in a table:

Season	Save Percent	Goal Percent	Shots Per Goal
2015-2016	0.9439319	0.0560681	17.835443
2016-2017	0.9456901	0.0543099	18.412844
2017-2018	0.948018	0.051982	19.2374101
2018-2019	0.9442356	0.0557644	17.9325843

We can look at his game by game data also.
```
gibson.2015.games.sp = get.game.save.percent(gibson.2015)
gibson.2015.games.gp = get.game.goal.percent(gibson.2015)
gibson.2015.games.spg = get.game.shots.per.goal(gibson.2015)

gibson.2016.games.sp = get.game.save.percent(gibson.2016)
gibson.2016.games.gp = get.game.goal.percent(gibson.2016)
gibson.2016.games.spg = get.game.shots.per.goal(gibson.2016)

gibson.2017.games.sp = get.game.save.percent(gibson.2017)
gibson.2017.games.gp = get.game.goal.percent(gibson.2017)
gibson.2017.games.spg = get.game.shots.per.goal(gibson.2017)

gibson.2018.games.sp = get.game.save.percent(gibson.2018)
gibson.2018.games.gp = get.game.goal.percent(gibson.2018)
gibson.2018.games.spg = get.game.shots.per.goal(gibson.2018)
```
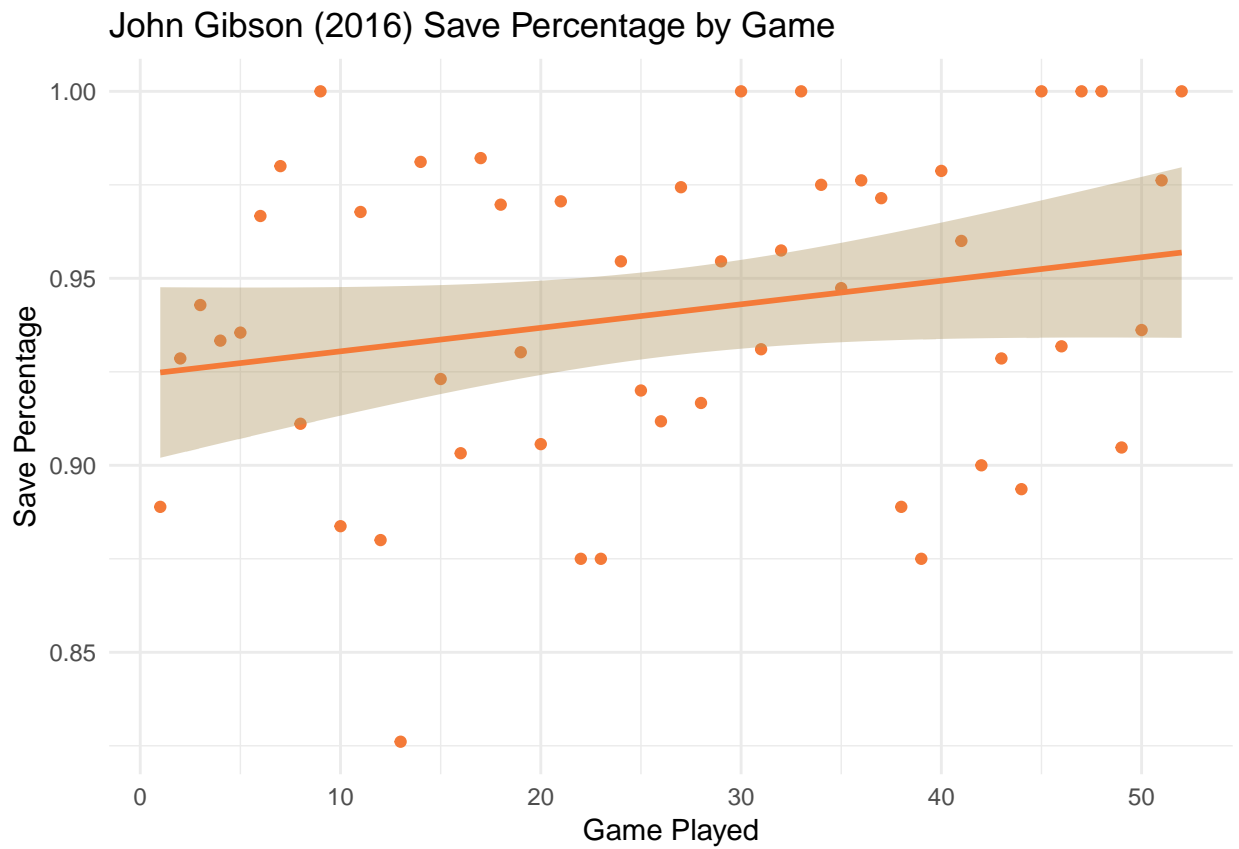
Let's look at his save percentage graphs:
```
gibson.2015.sp.plot = graph.trend(gibson.2015.games.sp, "Save Percentage", "#F47A38", "#B09862", "John (
gibson.2015.sp.plot
```
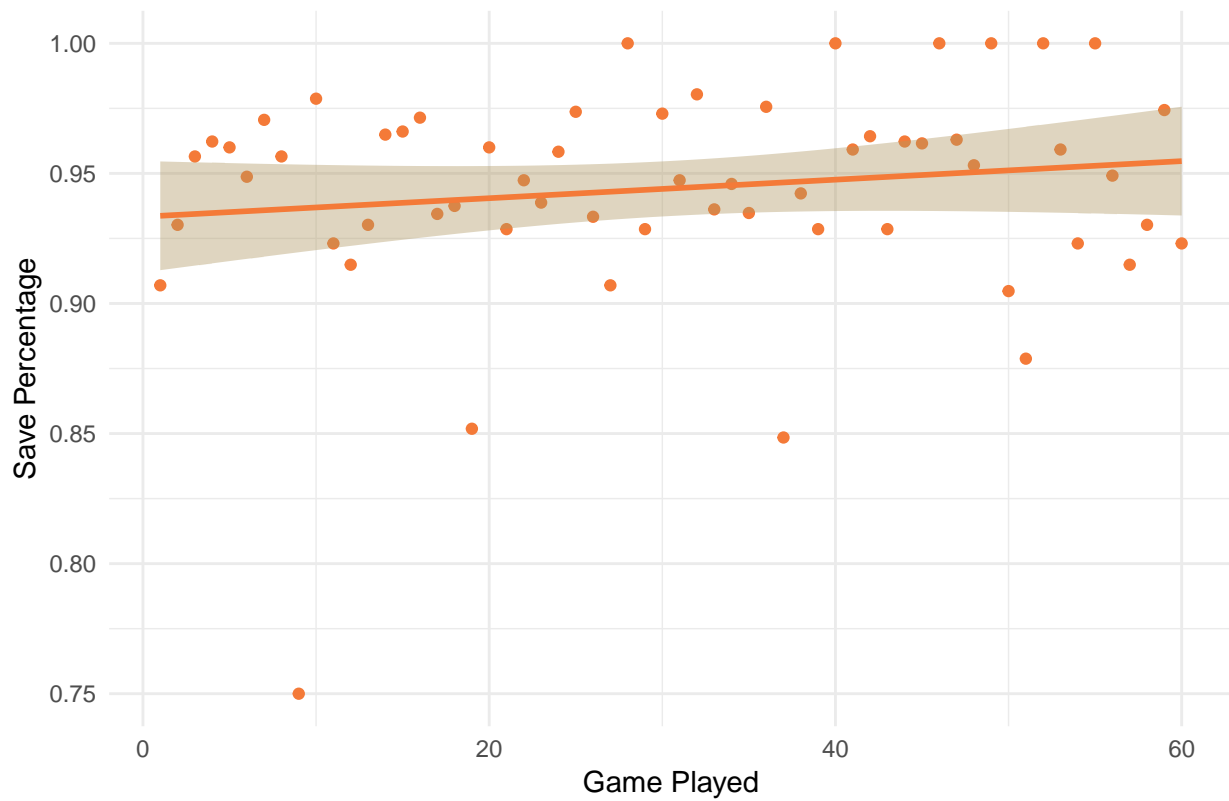
John Gibson (2015) Save Percentage by Game
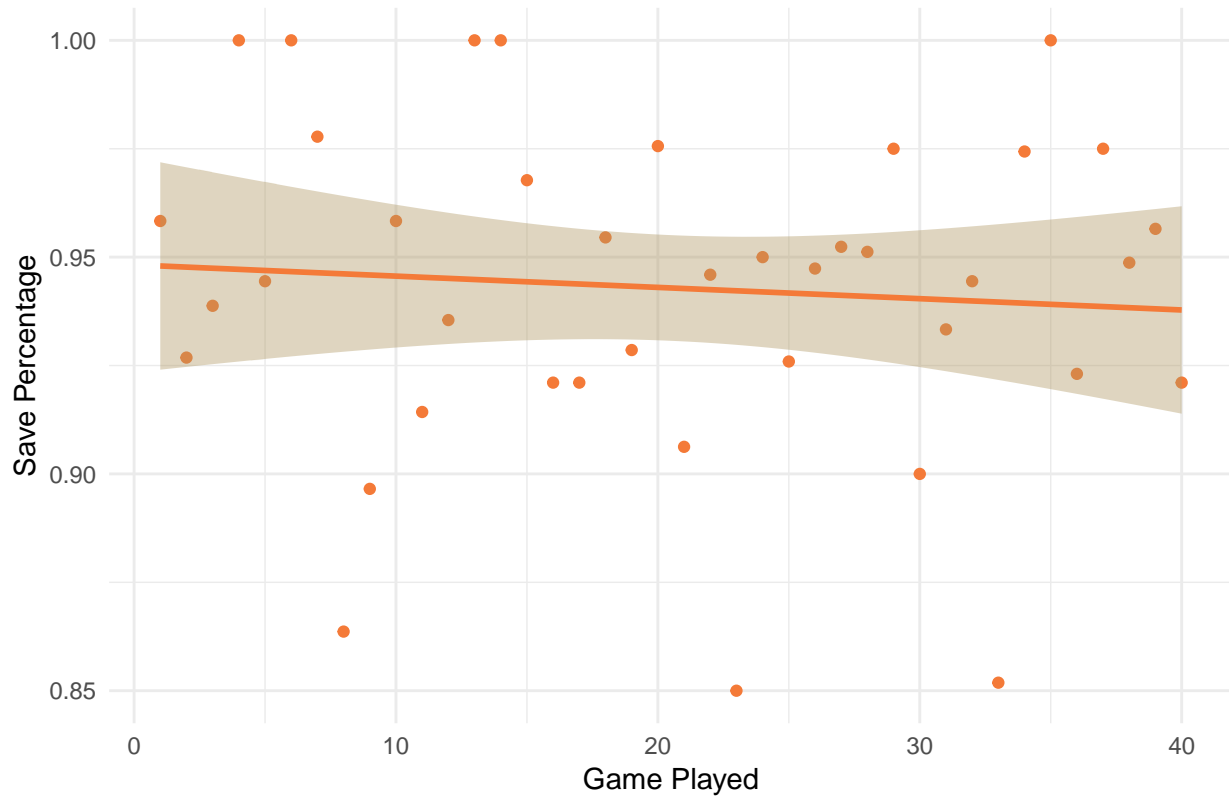

```
gibson.2016.sp.plot = graph.trend(gibson.2016.games.sp, "Save Percentage", "#F47A38", "#B09862", "John
gibson.2016.sp.plot
```
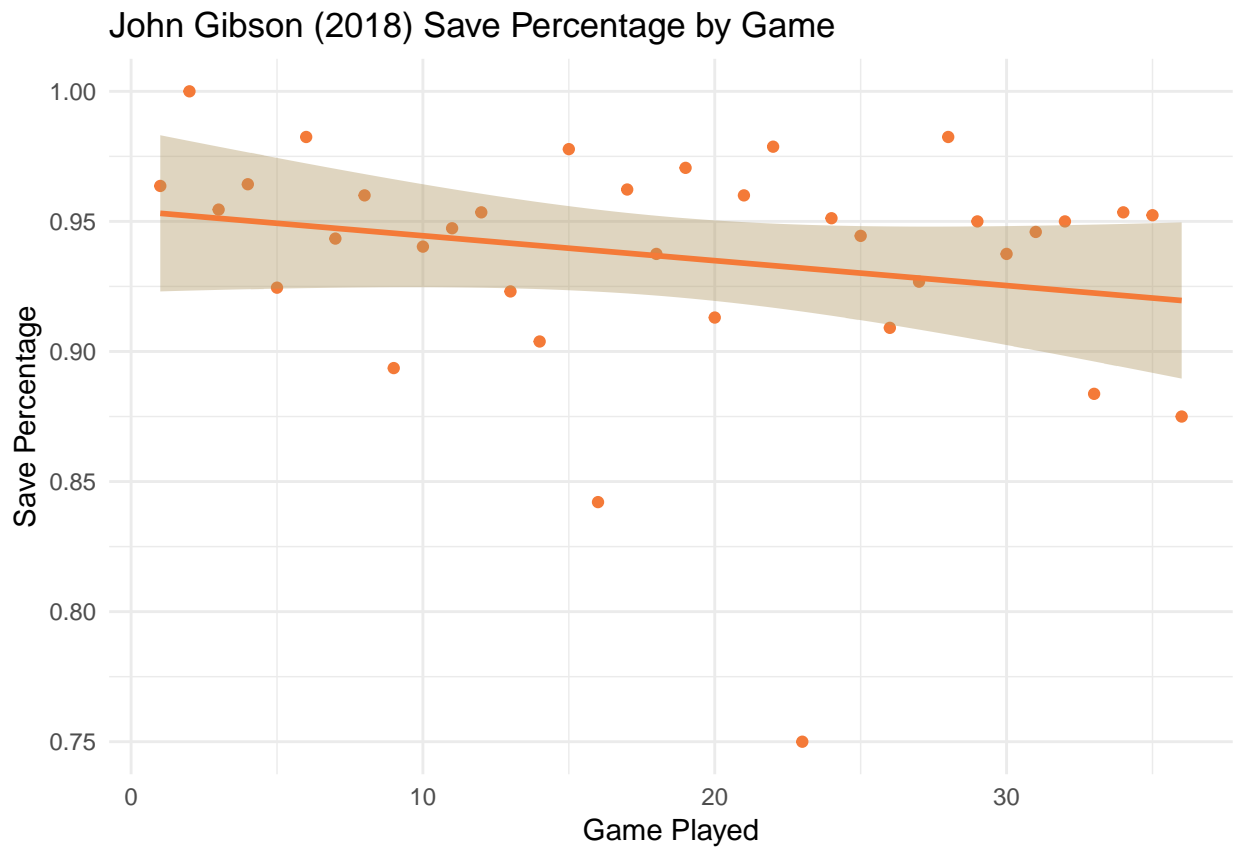
John Gibson (2016) Save Percentage by Game


```
gibson.2017.sp.plot = graph.trend(gibson.2017.games.sp, "Save Percentage", "#F47A38", "#B09862", "John (
gibson.2017.sp.plot
```

John Gibson (2017) Save Percentage by Game


```
gibson.2018.sp.plot = graph.trend(gibson.2018.games.sp, "Save Percentage", "#F47A38", "#B09862", "John (
gibson.2018.sp.plot
```

John Gibson (2018) Save Percentage by Game

And now, let's take a look at his shot location data.

```
gibson.2015.locations.plot = graph.shot.locations(gibson.2015, "#F47A38", "#B09862", "John Gibson (2015)
gibson.2015.locations.plot
```

John Gibson (2015) Shot Locations


```
gibson.2016.locations.plot = graph.shot.locations(gibson.2016, "#F47A38", "#B09862", "John Gibson (2016
gibson.2016.locations.plot
```

John Gibson (2016) Shot Locations


```
gibson.2017.locations.plot = graph.shot.locations(gibson.2017, "#F47A38", "#B09862", "John Gibson (2017)
gibson.2017.locations.plot
```

John Gibson (2017) Shot Locations


```
gibson.2018.locations.plot = graph.shot.locations(gibson.2018, "#F47A38", "#B09862", "John Gibson (2018)
gibson.2018.locations.plot
```

John Gibson (2018) Shot Locations
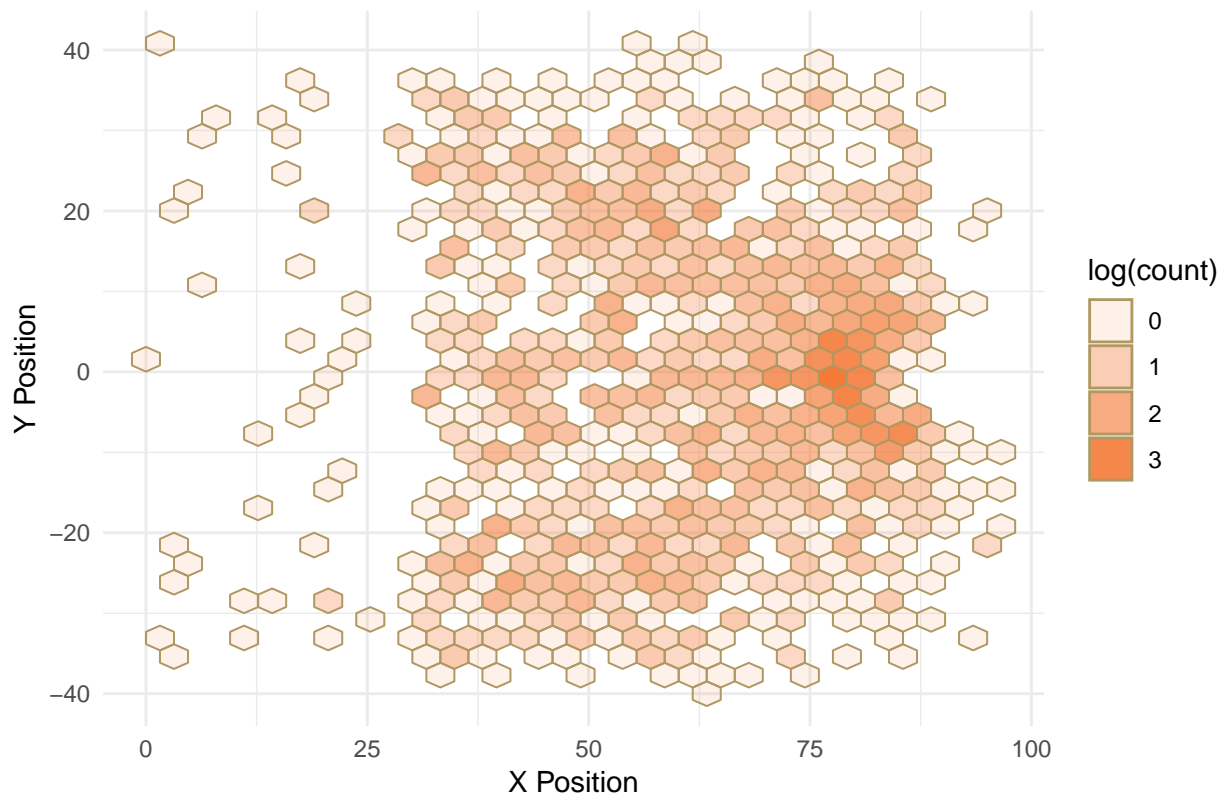
Skaters

Sidney Crosby

Already regarded as being in the top 5 all-time greatest NHL players, Sidney Crosby has been playing like an MVP for every single season he's been in the league. Let's look at his past few seasons in more detail.

```
crosby.2015 = get.skater.data(analysis.2015, "Sidney Crosby")
crosby.2016 = get.skater.data(analysis.2016, "Sidney Crosby")
crosby.2017 = get.skater.data(analysis.2017, "Sidney Crosby")
crosby.2018 = get.skater.data(analysis.2018, "Sidney Crosby")
```

Let's get some of his stats.

```
crosby.2015.sp = get.save.percent(crosby.2015)
crosby.2015.game.sp = get.game.save.percent(crosby.2015)
crosby.2016.sp = get.save.percent(crosby.2016)
crosby.2016.game.sp = get.game.save.percent(crosby.2016)
crosby.2017.sp = get.save.percent(crosby.2017)
crosby.2017.game.sp = get.game.save.percent(crosby.2017)
crosby.2018.sp = get.save.percent(crosby.2018)
crosby.2018.game.sp = get.game.save.percent(crosby.2018)

crosby.2015.gp = get.goal.percent(crosby.2015)
crosby.2015.game.gp = get.game.goal.percent(crosby.2015)
crosby.2016.gp = get.goal.percent(crosby.2016)
crosby.2016.game.gp = get.game.goal.percent(crosby.2016)
```

```
crosby.2017.gp = get.goal.percent(crosby.2017)
crosby.2017.game.gp = get.game.goal.percent(crosby.2017)
crosby.2018.gp = get.goal.percent(crosby.2018)
crosby.2018.game.gp = get.game.goal.percent(crosby.2018)

crosby.2015.spg = get.shots.per.goal(crosby.2015)
crosby.2015.game.spg = get.game.shots.per.goal(crosby.2015)
crosby.2016.spg = get.shots.per.goal(crosby.2016)
crosby.2016.game.spg = get.game.shots.per.goal(crosby.2016)
crosby.2017.spg = get.shots.per.goal(crosby.2017)
crosby.2017.game.spg = get.game.shots.per.goal(crosby.2017)
crosby.2018.spg = get.shots.per.goal(crosby.2018)
crosby.2018.game.spg = get.game.shots.per.goal(crosby.2018)
```

Here's a table of his data.

Season	Save Percent	Goal Percent	Shots per Goal
2015-2016	0.8947368	0.1052632	9.5
2016-2017	0.8646154	0.1353846	7.3863636
2017-2018	0.914956	0.085044	11.7586207
2018-2019	0.8689655	0.1310345	7.6315789

Let's take a look at his heatmaps.

```
crosby.2015.locations.plot = graph.shot.locations(crosby.2015, "#000000", "#FCB514", "Sidney Crosby (20
crosby.2015.locations.plot
```
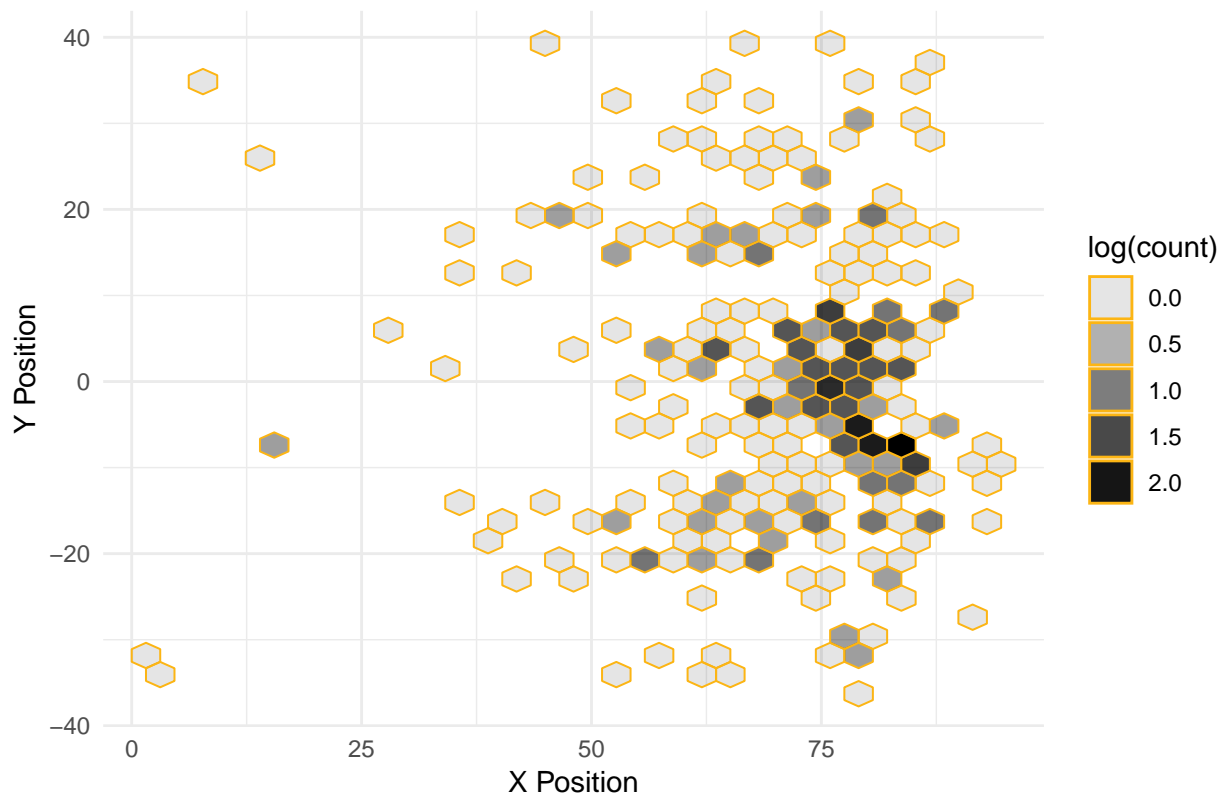

Sidney Crosby (2015) Shot Locations
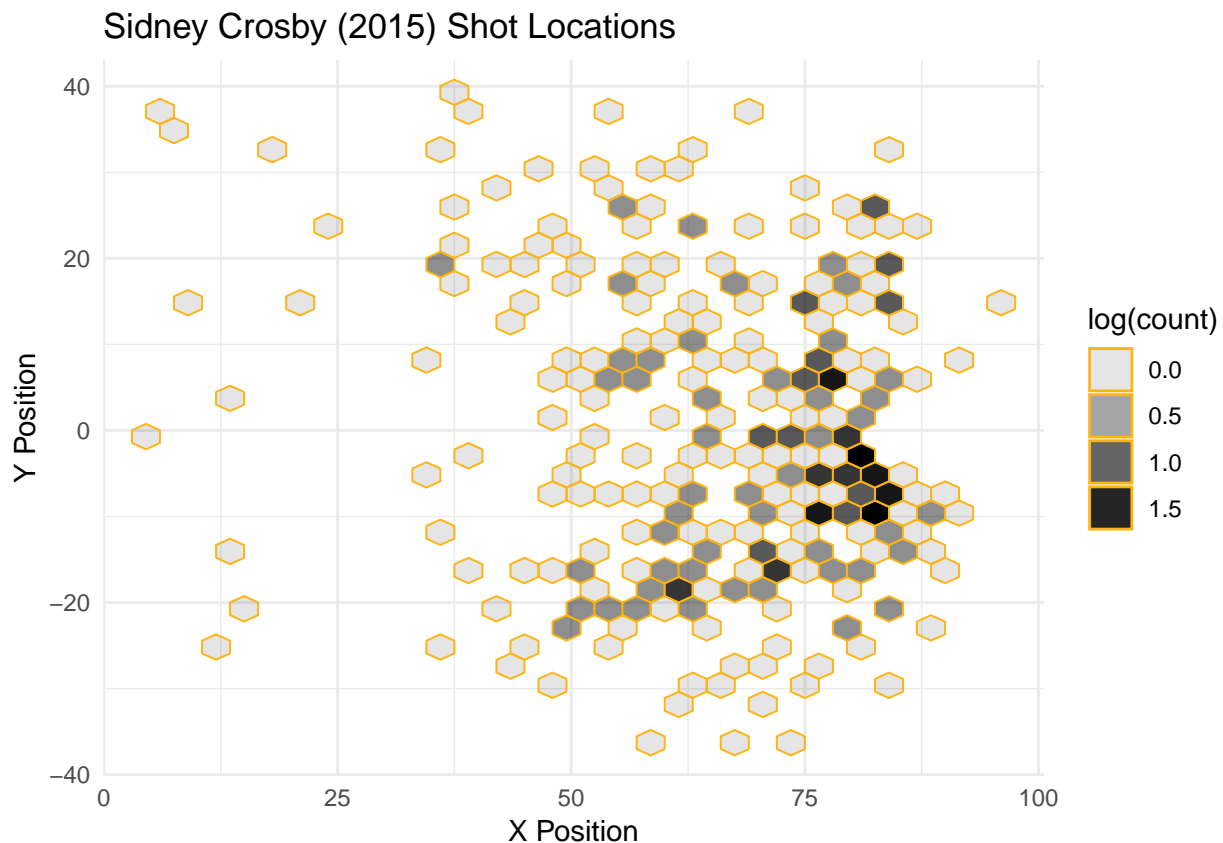
```
crosby.2016.locations.plot = graph.shot.locations(crosby.2016, "#000000", "#FCB514", "Sidney Crosby (20
crosby.2016.locations.plot
```

Sidney Crosby (2016) Shot Locations
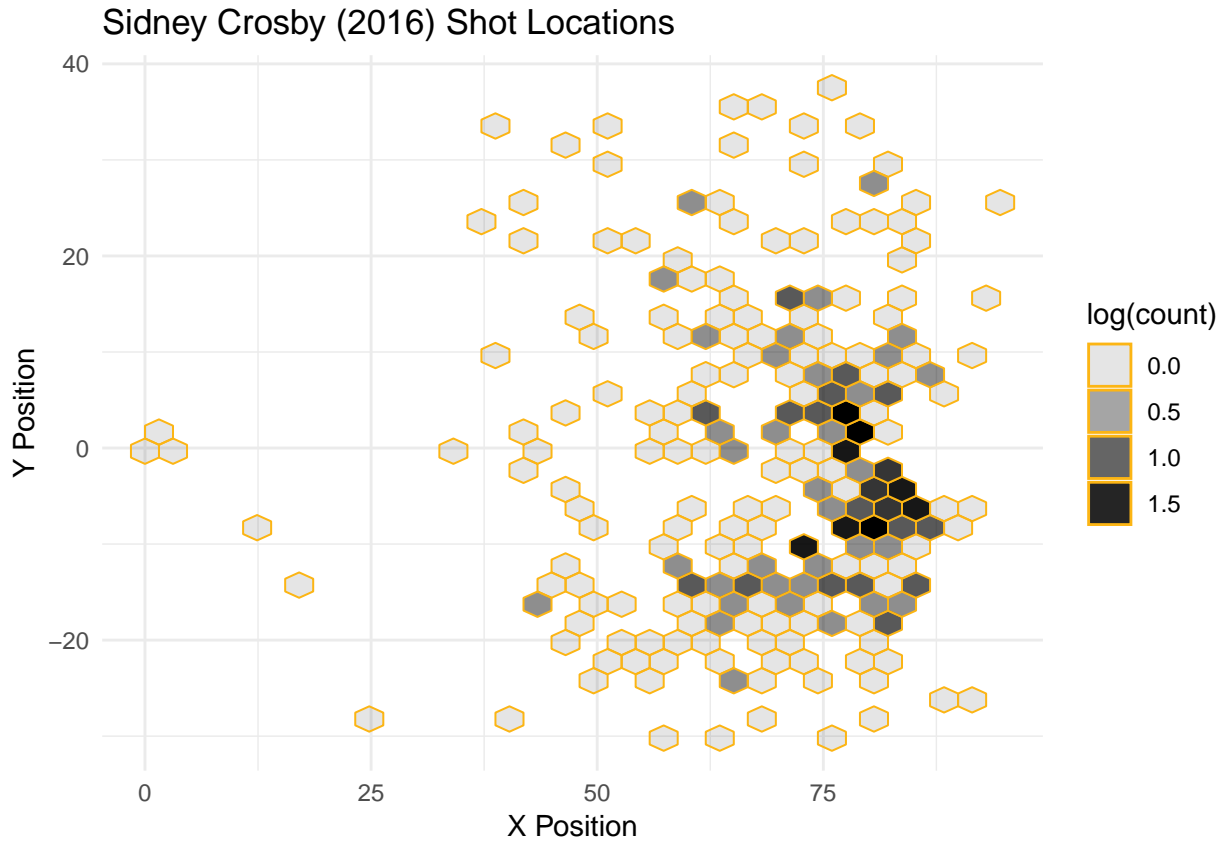

```
crosby.2017.locations.plot = graph.shot.locations(crosby.2017, "#000000", "#FCB514", "Sidney Crosby (20
crosby.2017.locations.plot
```

Sidney Crosby (2017) Shot Locations


```
crosby.2018.locations.plot = graph.shot.locations(crosby.2018, "#000000", "#FCB514", "Sidney Crosby (20
crosby.2018.locations.plot
```

Sidney Crosby (2018) Shot Locations
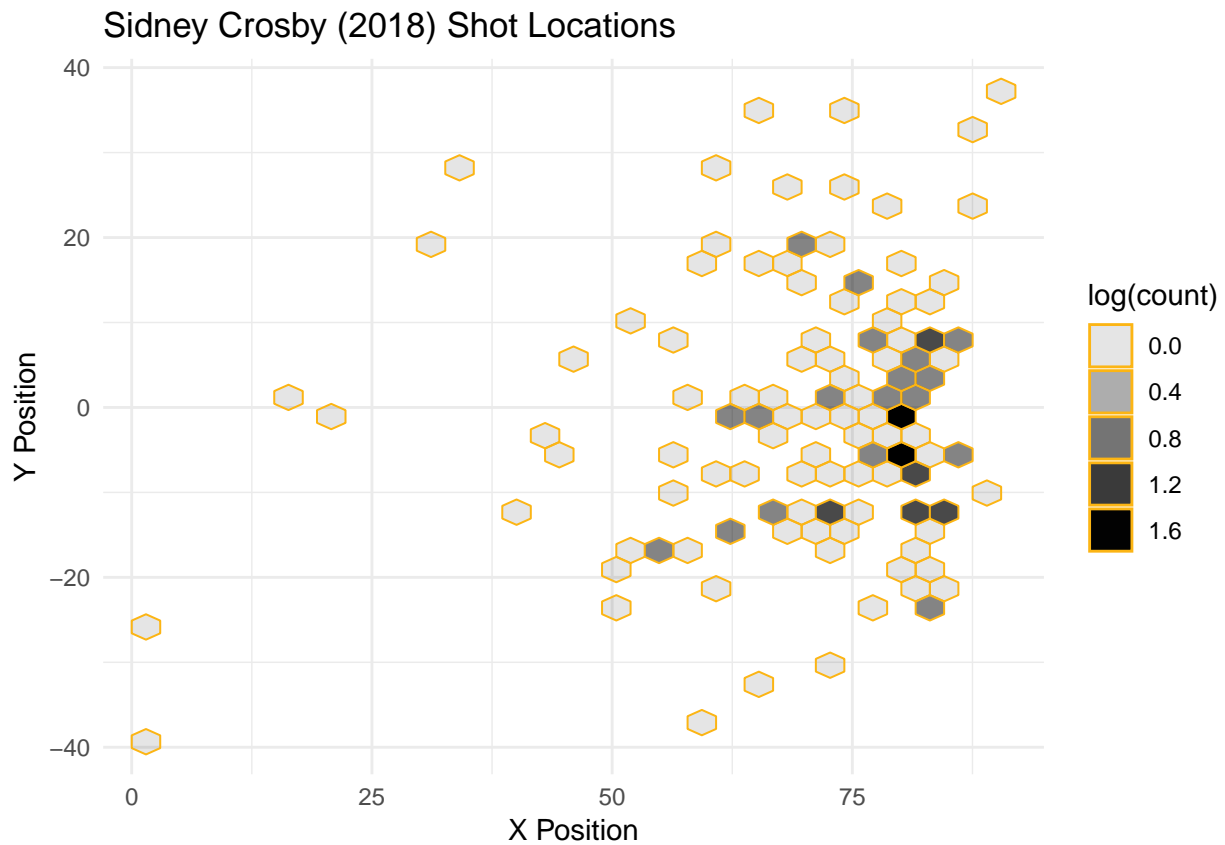
From this, we can see that Sidney Crosby has a lot of success around the net. Let's look at this goal percentage per game now.

```
crosby.2015.gp.plot = graph.trend(crosby.2015.game.gp, "Shooting (Goal) Percentage", "#000000", "#FCB514
crosby.2015.gp.plot
```

Sidney Crosby (2015) Shooting (Goal) Percentage by Game
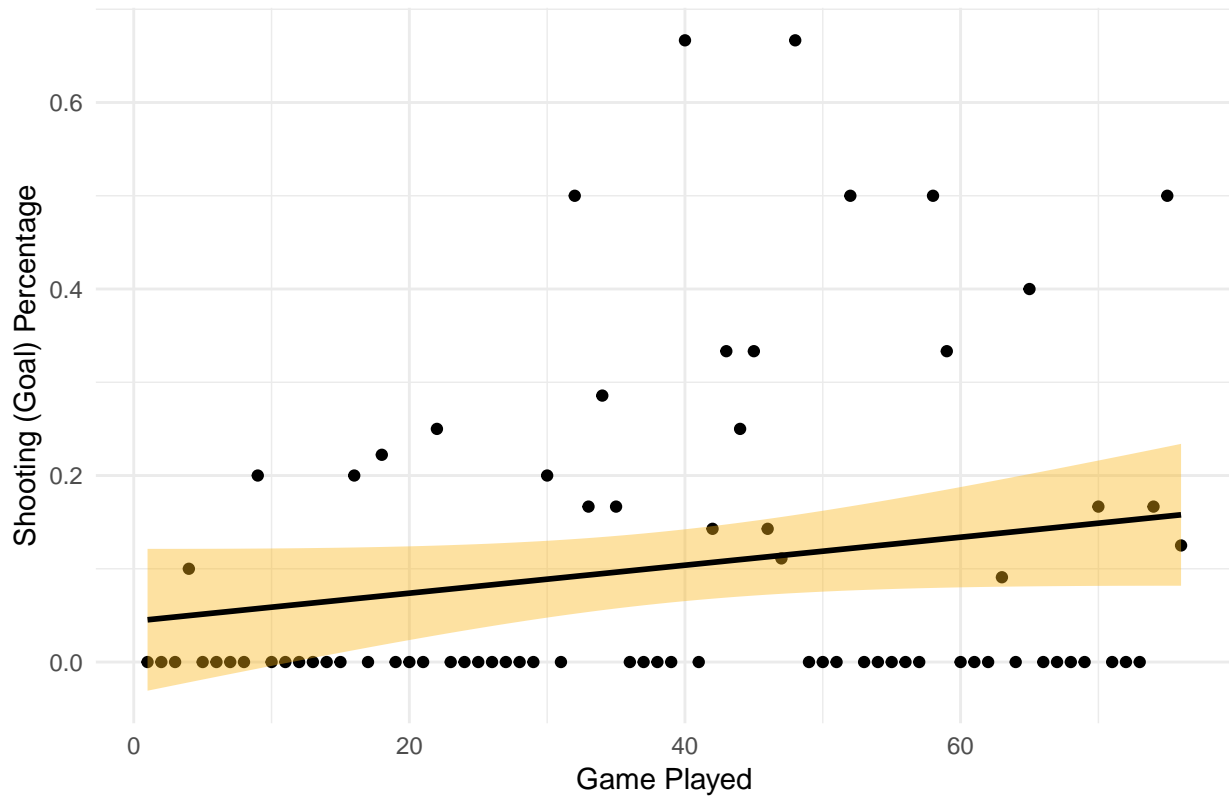

```
crosby.2016.gp.plot = graph.trend(crosby.2016.game.gp, "Shooting (Goal) Percentage", "#000000", "#FCB51
crosby.2016.gp.plot
```

Sidney Crosby (2016) Shooting (Goal) Percentage by Game
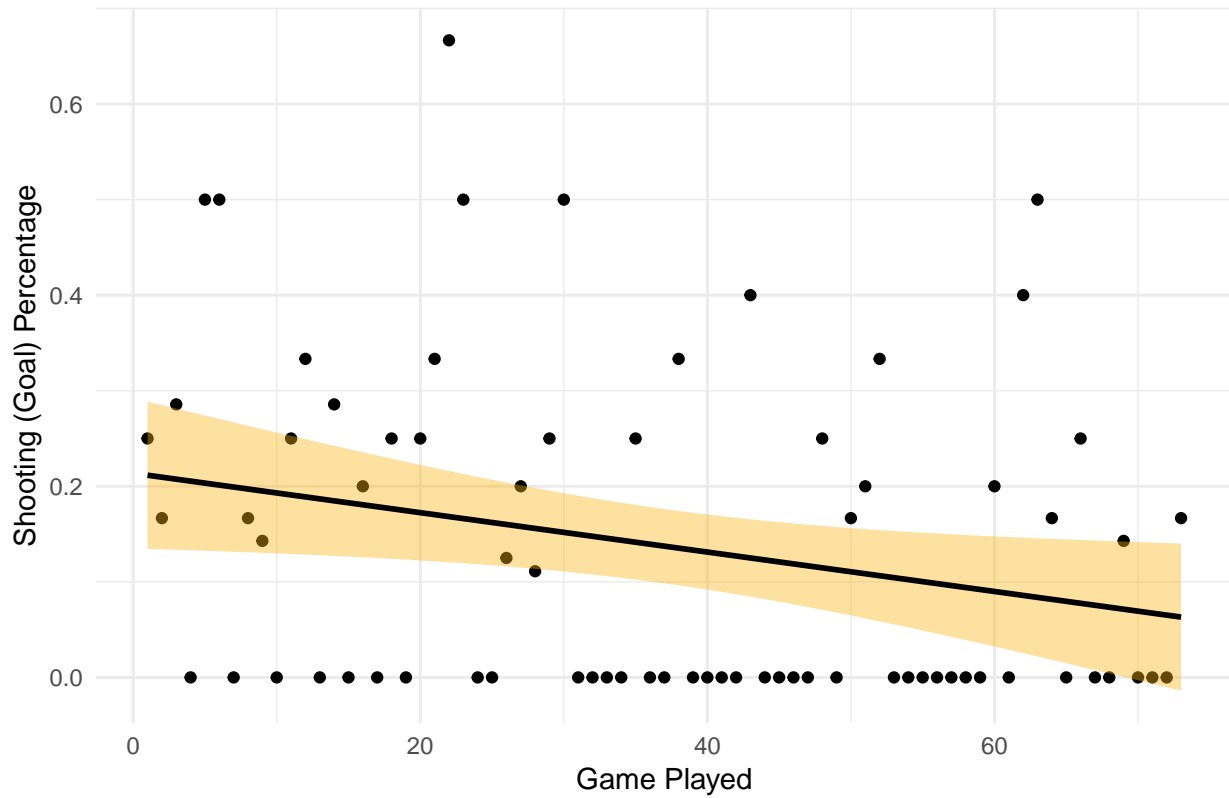
```
crosby.2017.gp.plot = graph.trend(crosby.2017.game.gp, "Shooting (Goal) Percentage", "#000000", "#FCB514
crosby.2017.gp.plot
```

Sidney Crosby (2017) Shooting (Goal) Percentage by Game
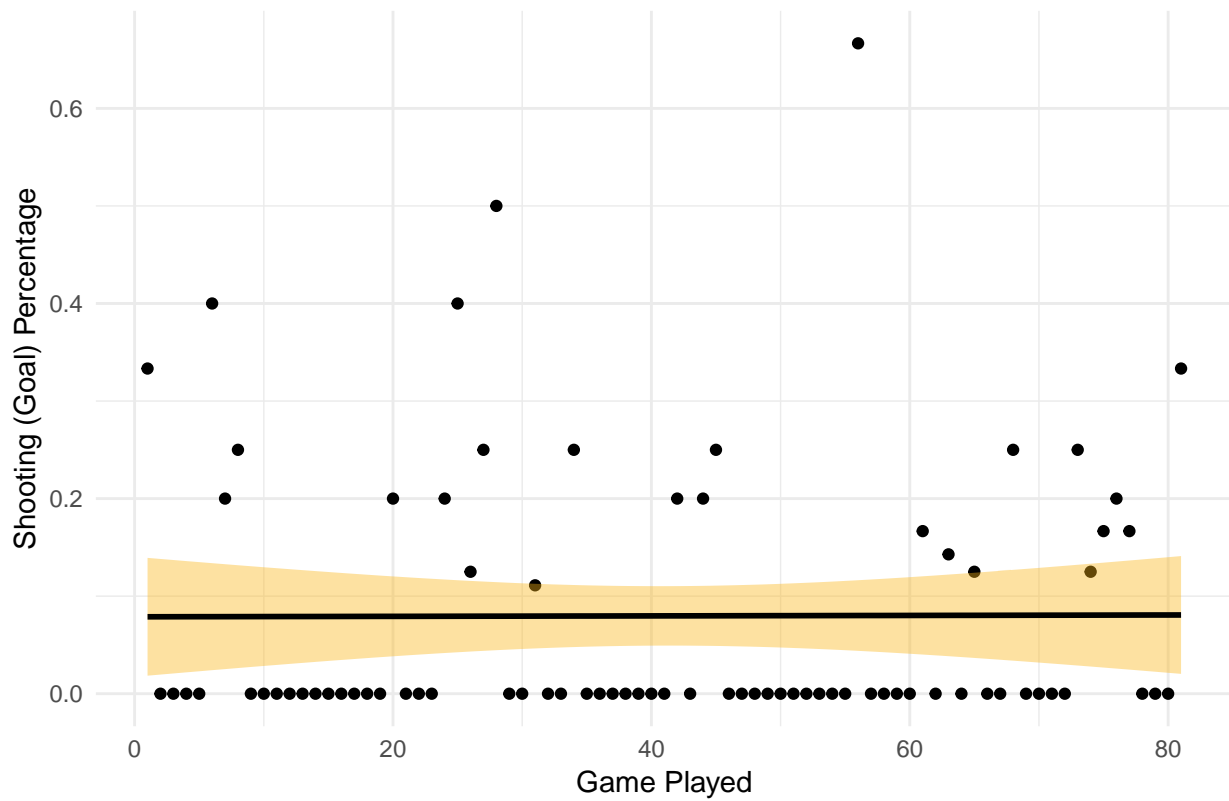

```
crosby.2018.gp.plot = graph.trend(crosby.2018.game.gp, "Shooting (Goal) Percentage", "#000000", "#FCB51
crosby.2018.gp.plot
```

Sidney Crosby (2018) Shooting (Goal) Percentage by Game
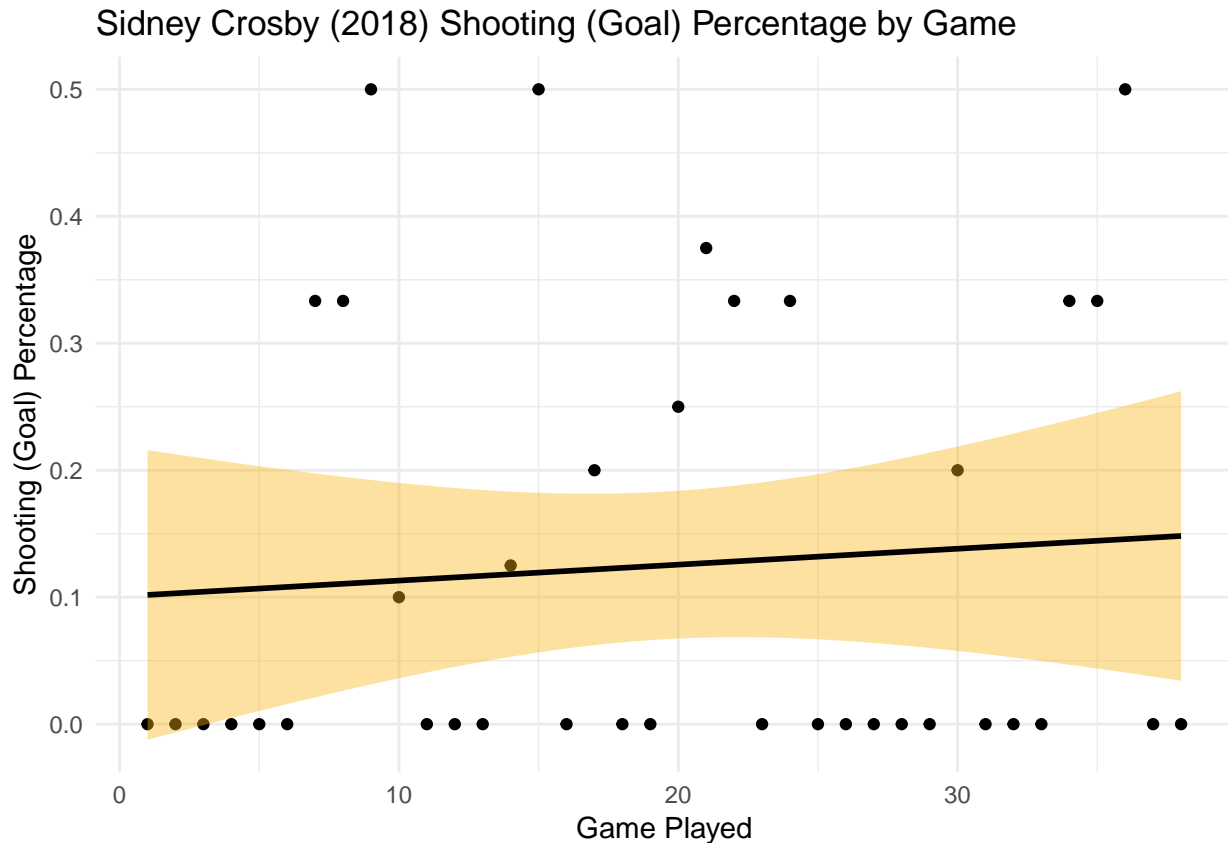
Evgeni Malkin

A clear elite first line center, Evgeni Malkin has played behind Sidney Crosby his entire career. However, instead of fussing out this, he puts up first line center numbers every year. Let's see how he's done it his previous few years.

```
malkin.2015 = get.skater.data(analysis.2015, "Evgeni Malkin")
malkin.2016 = get.skater.data(analysis.2016, "Evgeni Malkin")
malkin.2017 = get.skater.data(analysis.2017, "Evgeni Malkin")
malkin.2018 = get.skater.data(analysis.2018, "Evgeni Malkin")
```

Let's get some of his stats.

```
malkin.2015.sp = get.save.percent(malkin.2015)
malkin.2015.game.sp = get.game.save.percent(malkin.2015)
malkin.2016.sp = get.save.percent(malkin.2016)
malkin.2016.game.sp = get.game.save.percent(malkin.2016)
malkin.2017.sp = get.save.percent(malkin.2017)
malkin.2017.game.sp = get.game.save.percent(malkin.2017)
malkin.2018.sp = get.save.percent(malkin.2018)
malkin.2018.game.sp = get.game.save.percent(malkin.2018)

malkin.2015.gp = get.goal.percent(malkin.2015)
malkin.2015.game.gp = get.game.goal.percent(malkin.2015)
malkin.2016.gp = get.goal.percent(malkin.2016)
malkin.2016.game.gp = get.game.goal.percent(malkin.2016)
malkin.2017.gp = get.goal.percent(malkin.2017)
```

```
malkin.2017.game.gp = get.game.goal.percent(malkin.2017)
malkin.2018.gp = get.goal.percent(malkin.2018)
malkin.2018.game.gp = get.game.goal.percent(malkin.2018)

malkin.2015.spg = get.shots.per.goal(malkin.2015)
malkin.2015.game.spg = get.game.shots.per.goal(malkin.2015)
malkin.2016.spg = get.shots.per.goal(malkin.2016)
malkin.2016.game.spg = get.game.shots.per.goal(malkin.2016)
malkin.2017.spg = get.shots.per.goal(malkin.2017)
malkin.2017.game.spg = get.game.shots.per.goal(malkin.2017)
malkin.2018.spg = get.shots.per.goal(malkin.2018)
malkin.2018.game.spg = get.game.shots.per.goal(malkin.2018)
```

Here's a table of his data.

| Season	Save Percent	Goal Percent	Shots per Goal
2015-2016	0.8767123	0.1232877	8.1111111
2016-2017	0.8674699	0.1325301	7.5454545
2017-2018	0.8622951	0.1377049	7.2619048
2018-2019	0.9064748	0.0935252	10.6923077

Let's take a look at his heatmaps.

```
malkin.2015.locations.plot = graph.shot.locations(malkin.2015, "#000000", "#FCB514", "Evgeni Malkin (20
malkin.2015.locations.plot
```


Evgeni Malkin (2015) Shot Locations
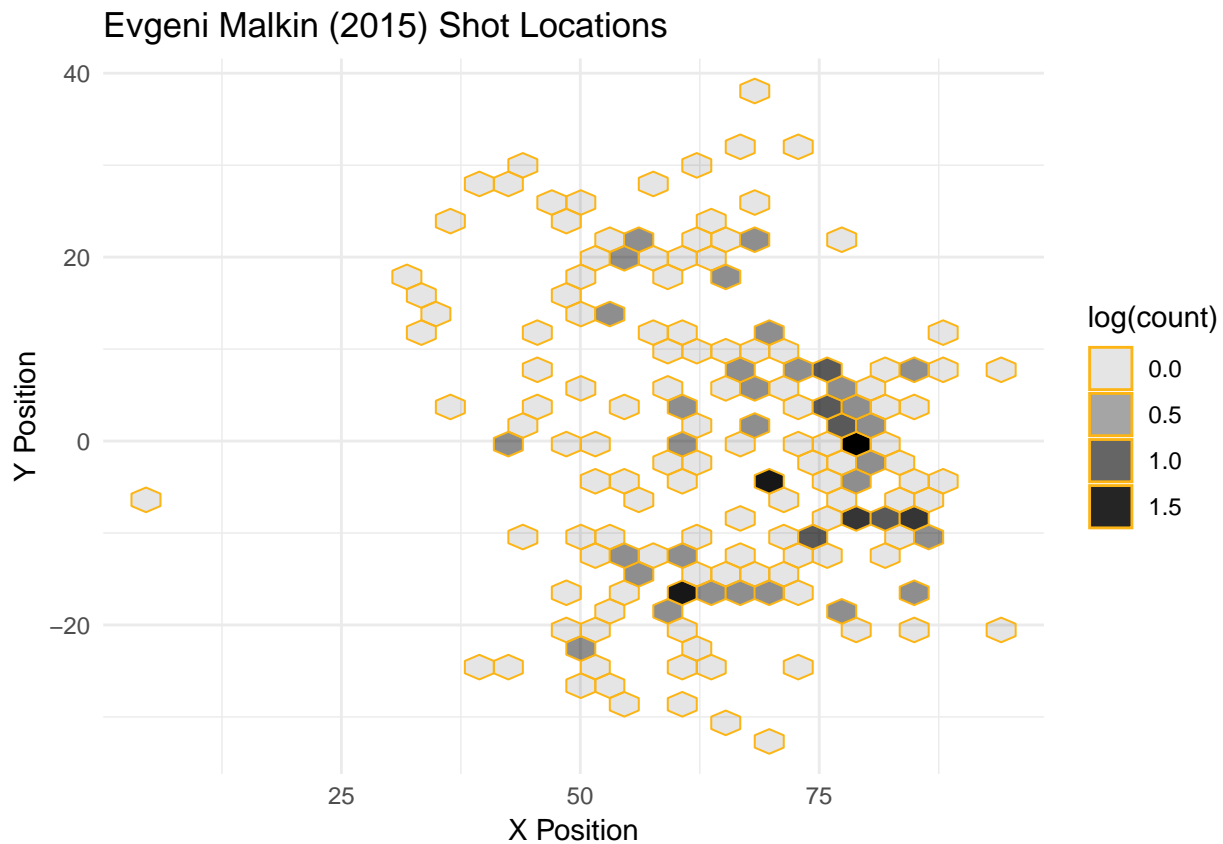
```
malkin.2016.locations.plot = graph.shot.locations(malkin.2016, "#000000", "#FCB514", "Evgeni Malkin (20
malkin.2016.locations.plot
```

Evgeni Malkin (2016) Shot Locations
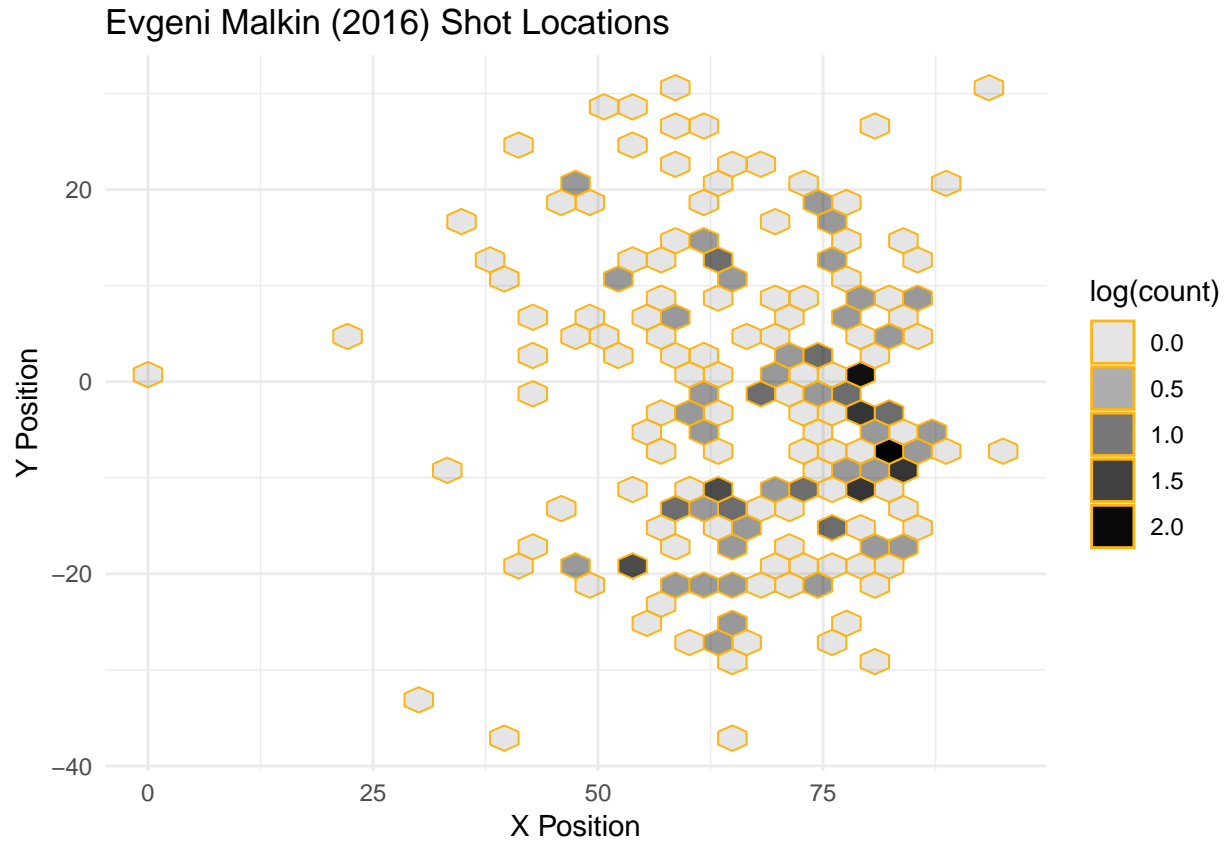

```
malkin.2017.locations.plot = graph.shot.locations(malkin.2017, "#000000", "#FCB514", "Evgeni Malkin (20
malkin.2017.locations.plot
```

Evgeni Malkin (2017) Shot Locations


```
malkin.2018.locations.plot = graph.shot.locations(malkin.2018, "#000000", "#FCB514", "Evgeni Malkin (20
malkin.2018.locations.plot
```

Evgeni Malkin (2018) Shot Locations
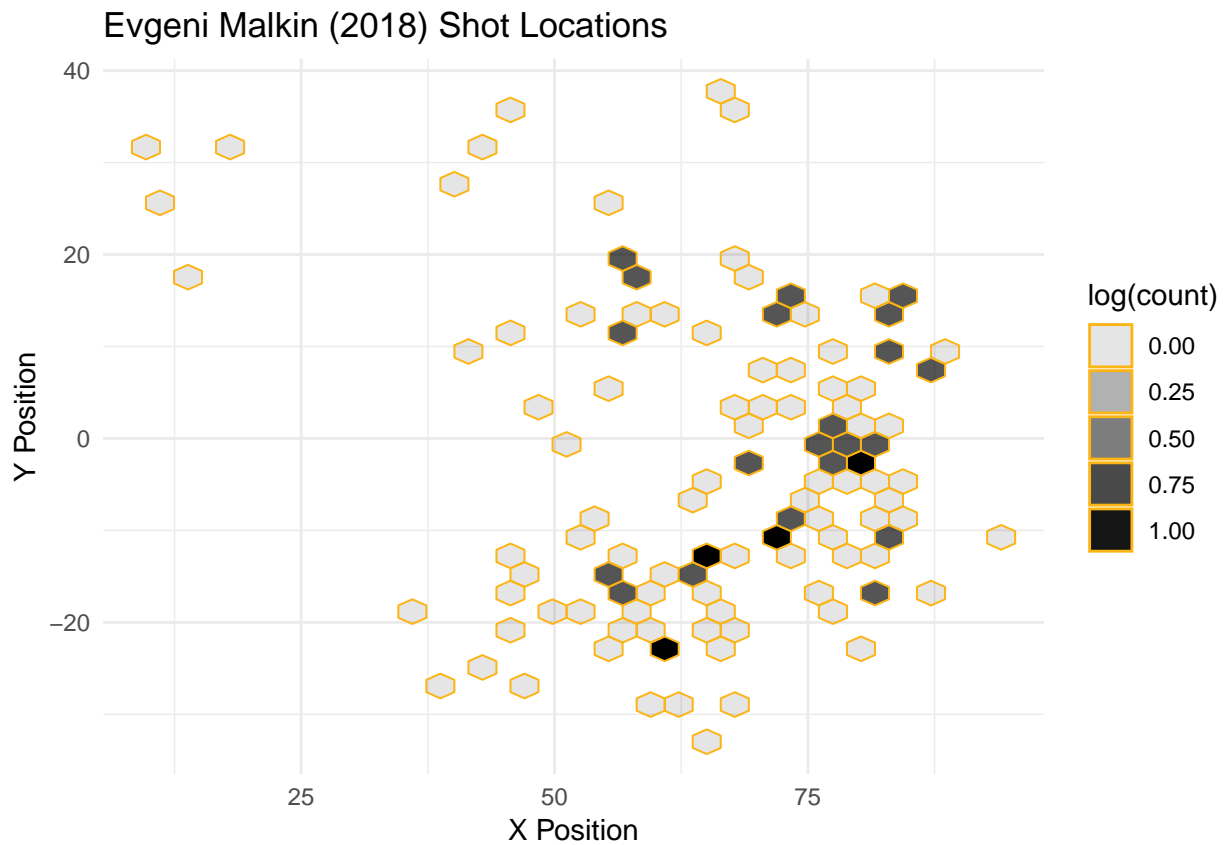
Let's look at this goal percentage per game now.

```
malkin.2015.gp.plot = graph.trend(malkin.2015.game.gp, "Shooting (Goal) Percentage", "#000000", "#FCB514
malkin.2015.gp.plot
```
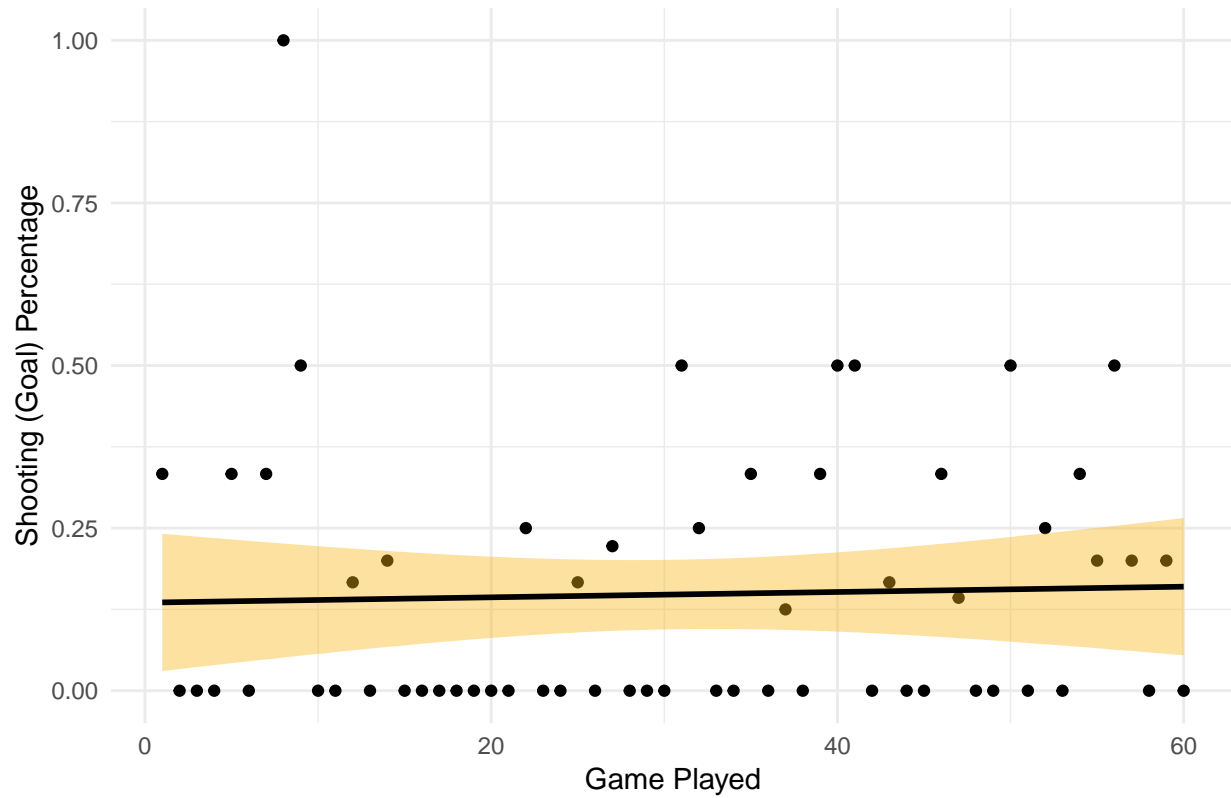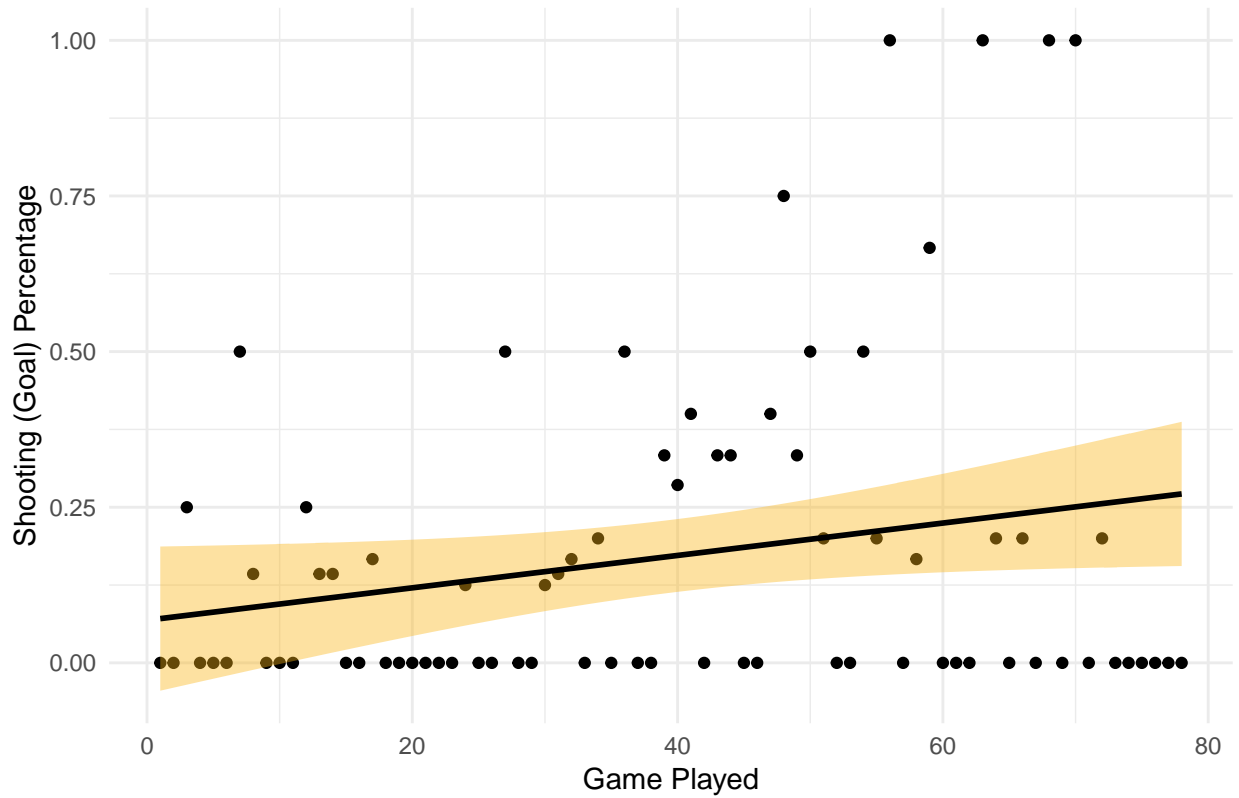
Evgeni Malkin (2015) Shooting (Goal) Percentage by Game
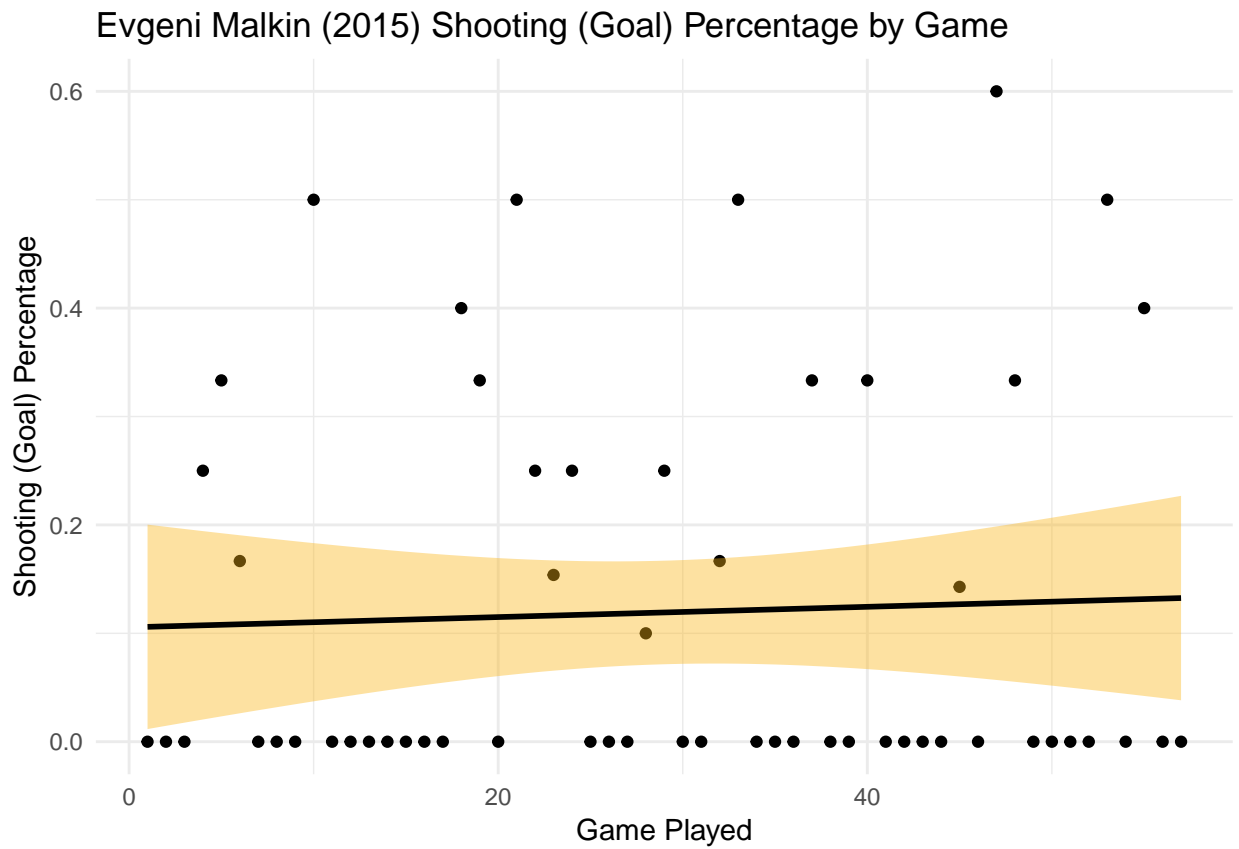
```
malkin.2016.gp.plot = graph.trend(malkin.2016.game.gp, "Shooting (Goal) Percentage", "#000000", "#FCB51
malkin.2016.gp.plot
```

# Evgeni Malkin (2016) Shooting (Goal) Percentage by Game


```
malkin.2017.gp.plot = graph.trend(malkin.2017.game.gp, "Shooting (Goal) Percentage", "#000000", "#FCB514
malkin.2017.gp.plot
```

Evgeni Malkin (2017) Shooting (Goal) Percentage by Game


```
malkin.2018.gp.plot = graph.trend(malkin.2018.game.gp, "Shooting (Goal) Percentage", "#000000", "#FCB51
malkin.2018.gp.plot
```

Evgeni Malkin (2018) Shooting (Goal) Percentage by Game
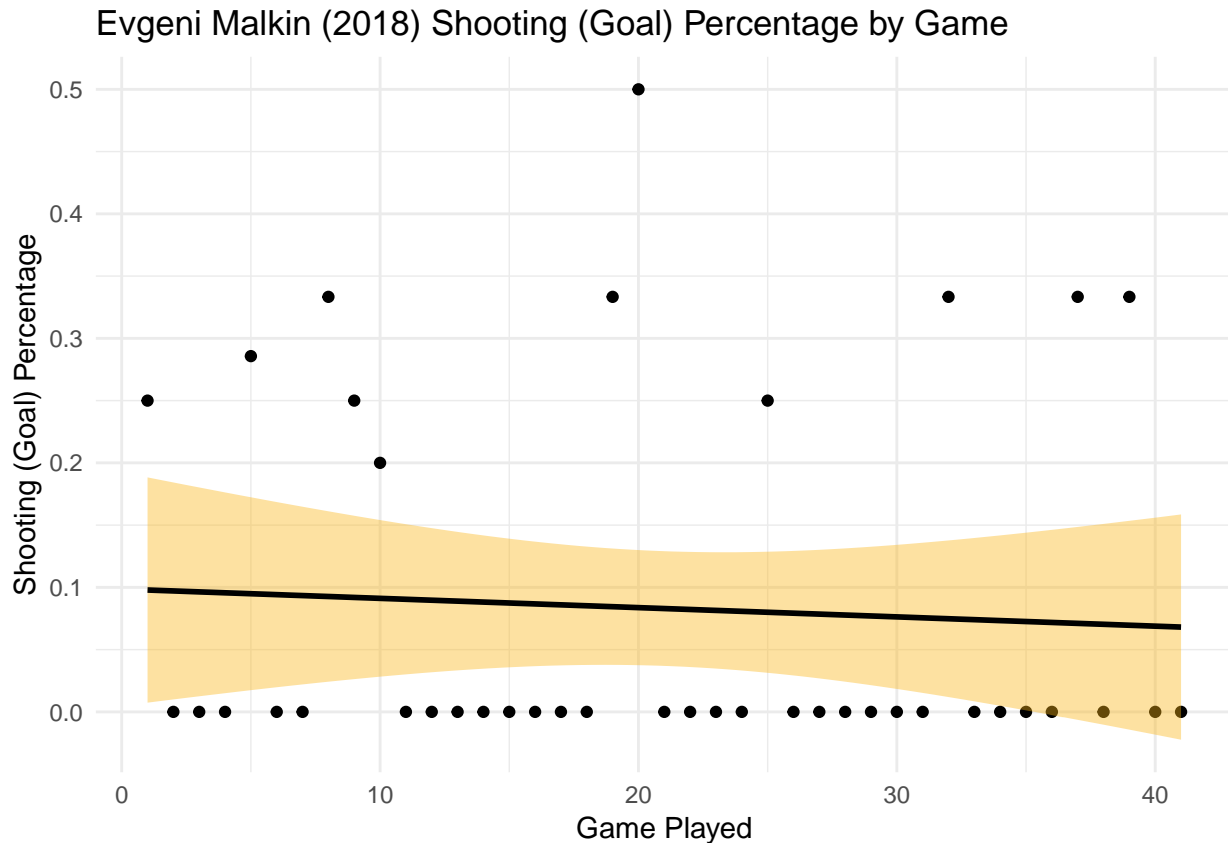
Alex Ovechkin

Alexander Ovechkin's style of play is simply eletric. With an extremely hard and accurate slap shot mixed in with a deadly quick wrist shot, Ovechkin is a scoring machine. The Russian-born winger has cemented himself as one of the best Russians to ever play in the NHL.

```
ovechkin.2015 = get.skater.data(analysis.2015, "Alex Ovechkin")
ovechkin.2016 = get.skater.data(analysis.2016, "Alex Ovechkin")
ovechkin.2017 = get.skater.data(analysis.2017, "Alex Ovechkin")
ovechkin.2018 = get.skater.data(analysis.2018, "Alex Ovechkin")
```

Let's get some of his stats.

```
ovechkin.2015.sp = get.save.percent(ovechkin.2015)
ovechkin.2015.game.sp = get.game.save.percent(ovechkin.2015)
ovechkin.2016.sp = get.save.percent(ovechkin.2016)
ovechkin.2016.game.sp = get.game.save.percent(ovechkin.2016)
ovechkin.2017.sp = get.save.percent(ovechkin.2017)
ovechkin.2017.game.sp = get.game.save.percent(ovechkin.2017)
ovechkin.2018.sp = get.save.percent(ovechkin.2018)
ovechkin.2018.game.sp = get.game.save.percent(ovechkin.2018)

ovechkin.2015.gp = get.goal.percent(ovechkin.2015)
ovechkin.2015.game.gp = get.game.goal.percent(ovechkin.2015)
ovechkin.2016.gp = get.goal.percent(ovechkin.2016)
ovechkin.2016.game.gp = get.game.goal.percent(ovechkin.2016)
ovechkin.2017.gp = get.goal.percent(ovechkin.2017)
```

```
ovechkin.2017.game.gp = get.game.goal.percent(ovechkin.2017)
ovechkin.2018.gp = get.goal.percent(ovechkin.2018)
ovechkin.2018.game.gp = get.game.goal.percent(ovechkin.2018)

ovechkin.2015.spg = get.shots.per.goal(ovechkin.2015)
ovechkin.2015.game.spg = get.game.shots.per.goal(ovechkin.2015)
ovechkin.2016.spg = get.shots.per.goal(ovechkin.2016)
ovechkin.2016.game.spg = get.game.shots.per.goal(ovechkin.2016)
ovechkin.2017.spg = get.shots.per.goal(ovechkin.2017)
ovechkin.2017.game.spg = get.game.shots.per.goal(ovechkin.2017)
ovechkin.2018.spg = get.shots.per.goal(ovechkin.2018)
ovechkin.2018.game.spg = get.game.shots.per.goal(ovechkin.2018)
```

Here's a table of his data.

| Season	Save Percent	Goal Percent	Shots per Goal
2015-2016	0.9111901	0.0888099	11.26
2016-2017	0.9274725	0.0725275	13.7878788
2017-2018	0.9068441	0.0931559	10.7346939
2018-2019	0.8823529	0.1176471	8.5

Let's take a look at his heatmaps.

```
ovechkin.2015.locations.plot = graph.shot.locations(ovechkin.2015, "#041E42", "#C8102E", "Alex Ovechkin
ovechkin.2015.locations.plot
```


Alex Ovechkin (2015) Shot Locations
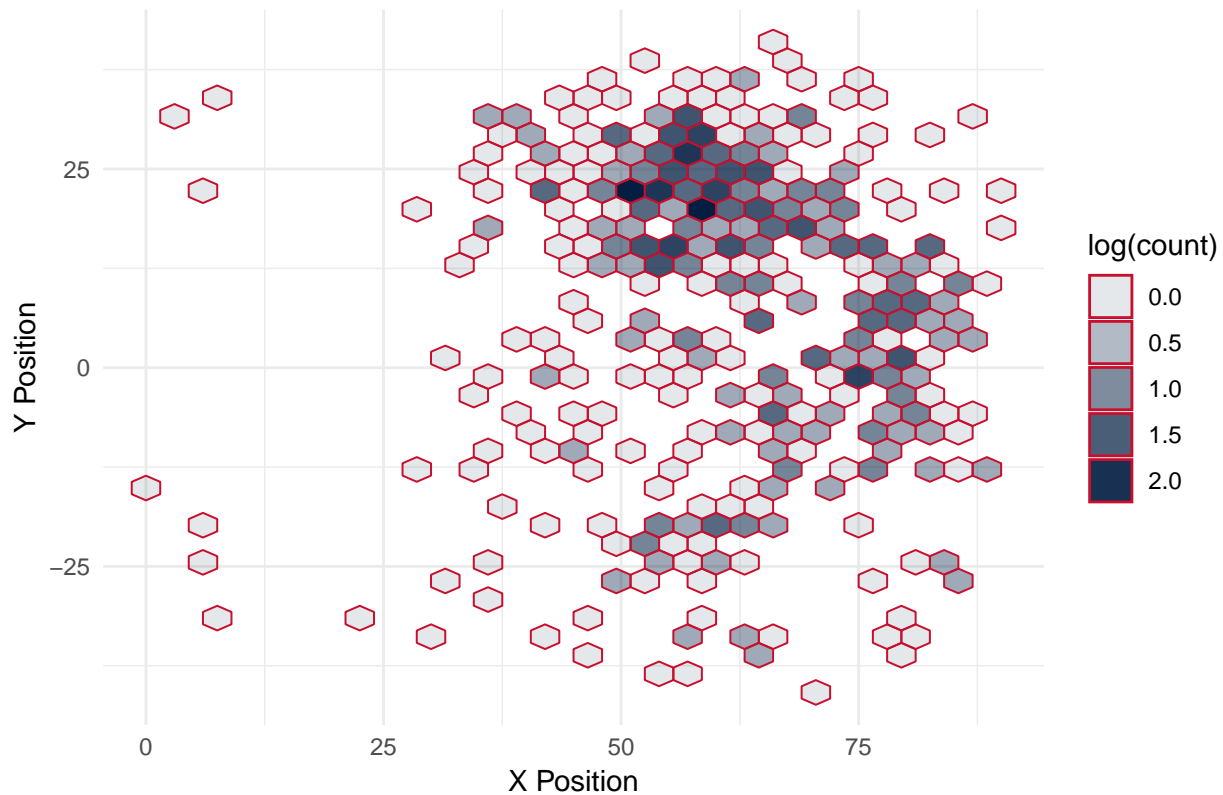
```
ovechkin.2016.locations.plot = graph.shot.locations(ovechkin.2016, "#041E42", "#C8102E", "Alex Ovechkin
ovechkin.2016.locations.plot
```
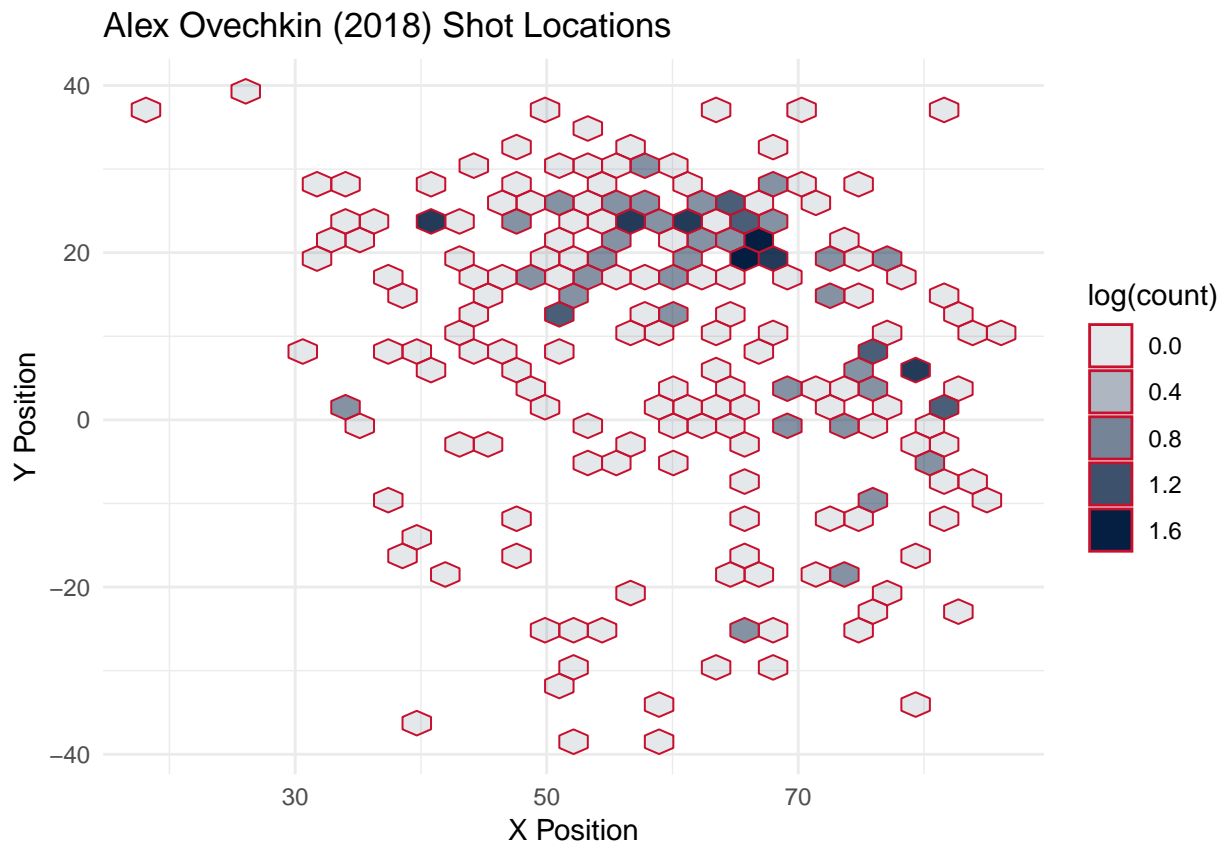

Alex Ovechkin (2016) Shot Locations
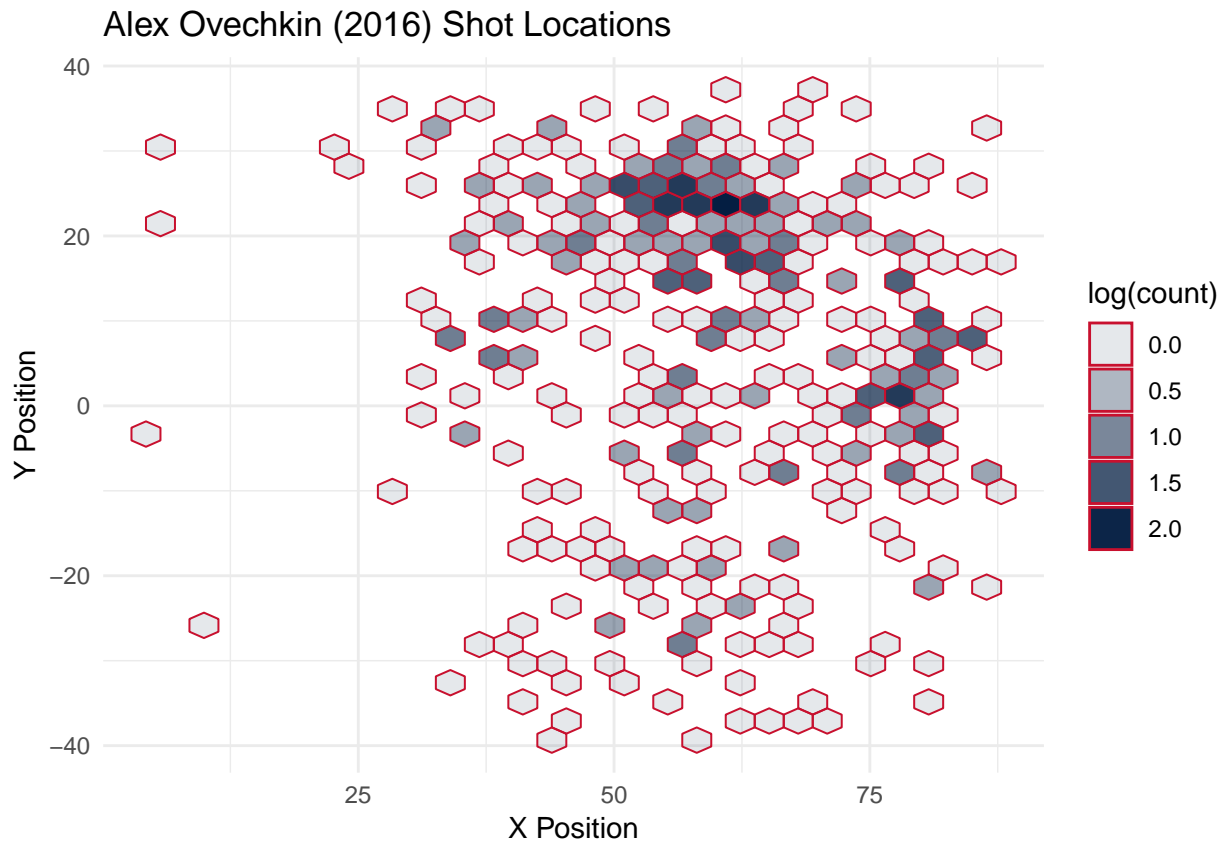
```
ovechkin.2017.locations.plot = graph.shot.locations(ovechkin.2017, "#041E42", "#C8102E", "Alex Ovechkin
ovechkin.2017.locations.plot
```

Alex Ovechkin (2017) Shot Locations


```
ovechkin.2018.locations.plot = graph.shot.locations(ovechkin.2018, "#041E42", "#C8102E", "Alex Ovechkin
ovechkin.2018.locations.plot
```

Alex Ovechkin (2018) Shot Locations

Let's look at this goal percentage per game now.

```
ovechkin.2015.gp.plot = graph.trend(ovechkin.2015.game.gp, "Shooting (Goal) Percentage", "#041E42", "#C8
ovechkin.2015.gp.plot
```
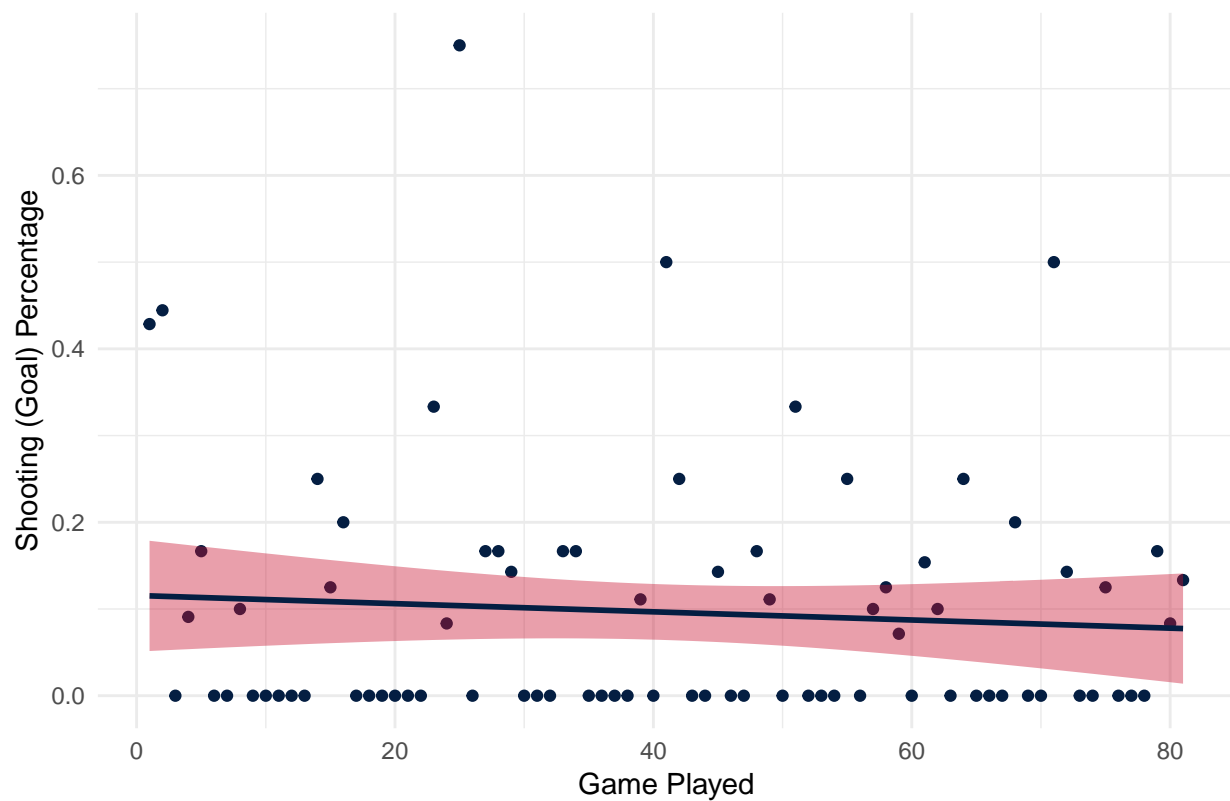
Alex Ovechkin (2015) Shooting (Goal) Percentage by Game
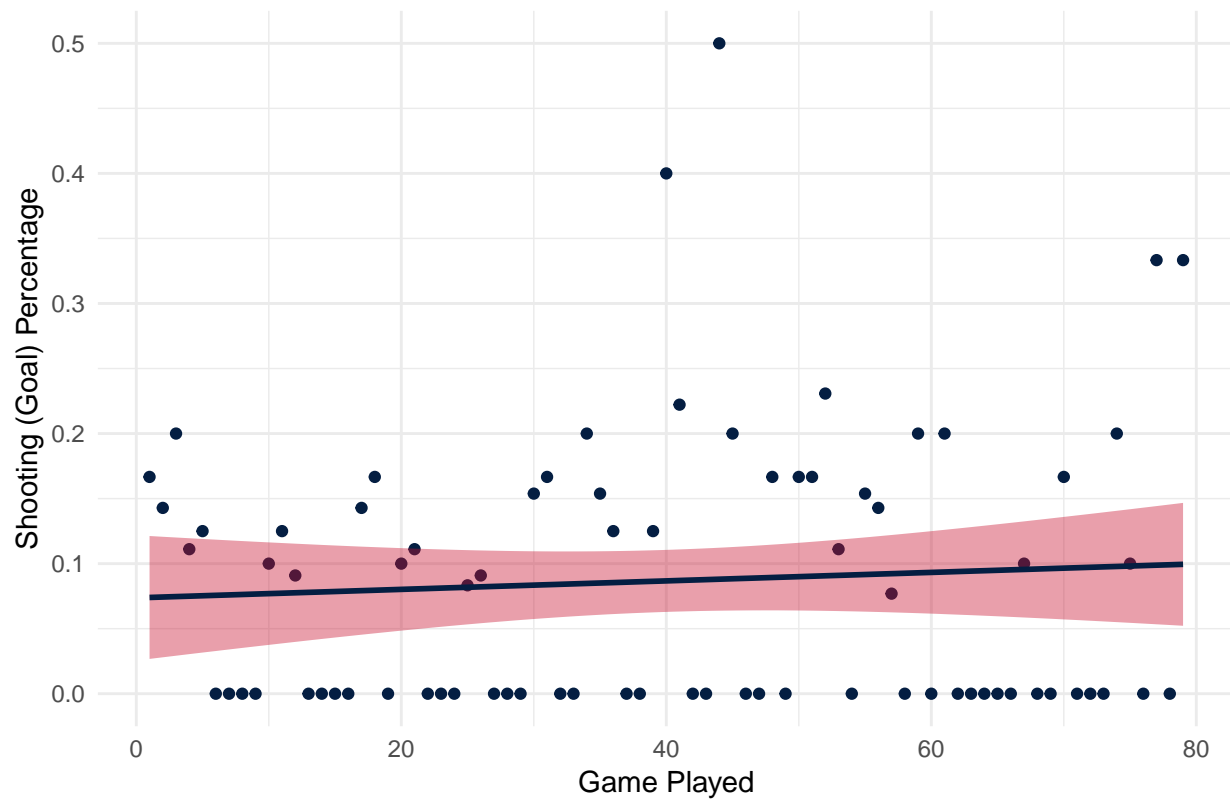

```
ovechkin.2016.gp.plot = graph.trend(ovechkin.2016.game.gp, "Shooting (Goal) Percentage", "#041E42", "#C8
ovechkin.2016.gp.plot
```

Alex Ovechkin (2016) Shooting (Goal) Percentage by Game
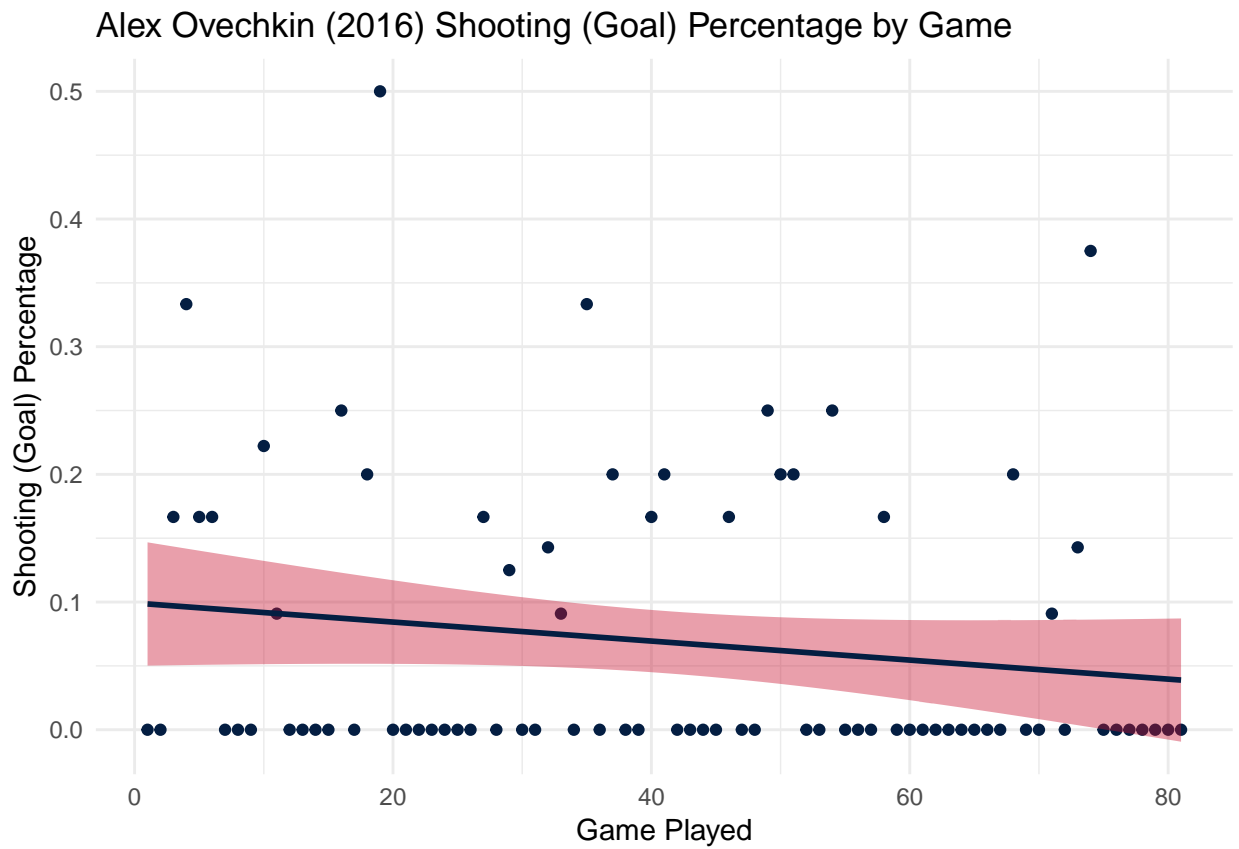
```
ovechkin.2017.gp.plot = graph.trend(ovechkin.2017.game.gp, "Shooting (Goal) Percentage", "#041E42", "#C8
ovechkin.2017.gp.plot
```

Alex Ovechkin (2017) Shooting (Goal) Percentage by Game


```
ovechkin.2018.gp.plot = graph.trend(ovechkin.2018.game.gp, "Shooting (Goal) Percentage", "#041E42", "#C8
ovechkin.2018.gp.plot
```

Alex Ovechkin (2018) Shooting (Goal) Percentage by Game
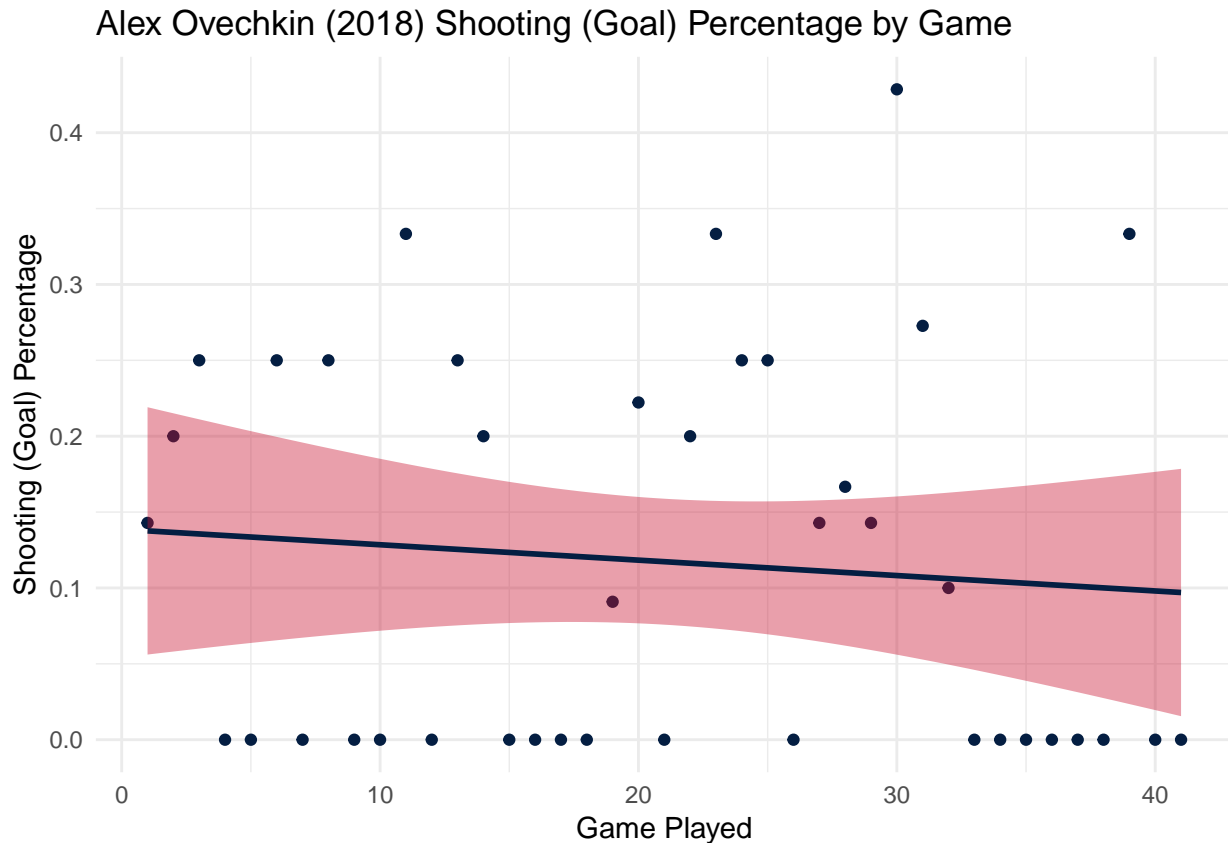
Jake Guentzel

Jake Guentzel has been an elite farm-system talent for the Penguins.

```
guentzel.2016 = get.skater.data(analysis.2016, "Jake Guentzel")
guentzel.2017 = get.skater.data(analysis.2017, "Jake Guentzel")
guentzel.2018 = get.skater.data(analysis.2018, "Jake Guentzel")
```

Let's get some of his stats.

```
guentzel.2016.sp = get.save.percent(guentzel.2016)
guentzel.2016.game.sp = get.game.save.percent(guentzel.2016)
guentzel.2017.sp = get.save.percent(guentzel.2017)
guentzel.2017.game.sp = get.game.save.percent(guentzel.2017)
guentzel.2018.sp = get.save.percent(guentzel.2018)
guentzel.2018.game.sp = get.game.save.percent(guentzel.2018)

guentzel.2016.gp = get.goal.percent(guentzel.2016)
guentzel.2016.game.gp = get.game.goal.percent(guentzel.2016)
guentzel.2017.gp = get.goal.percent(guentzel.2017)
guentzel.2017.game.gp = get.game.goal.percent(guentzel.2017)
guentzel.2018.gp = get.goal.percent(guentzel.2018)
guentzel.2018.game.gp = get.game.goal.percent(guentzel.2018)

guentzel.2016.spg = get.shots.per.goal(guentzel.2016)
guentzel.2016.game.spg = get.game.shots.per.goal(guentzel.2016)
guentzel.2017.spg = get.shots.per.goal(guentzel.2017)
```

```
guentzel.2017.game.spg = get.game.shots.per.goal(guentzel.2017)
guentzel.2018.spg = get.shots.per.goal(guentzel.2018)
guentzel.2018.game.spg = get.game.shots.per.goal(guentzel.2018)
```

Here's a table of his data.

Season	Save Percent	Goal Percent	Shots per Goal
2016-2017	0.8518519	0.1481481	6.75
2017-2018	0.9079498	0.0920502	10.8636364
2018-2019	0.875	0.125	8

From this data, we can see that Guentzel isn't a sniper; instead he is a volume shooter. Let's take a look at his heatmaps.

```
guentzel.2016.locations.plot = graph.shot.locations(guentzel.2016, "#000000", "#FCB514", "Jake Guentzel
guentzel.2016.locations.plot
```
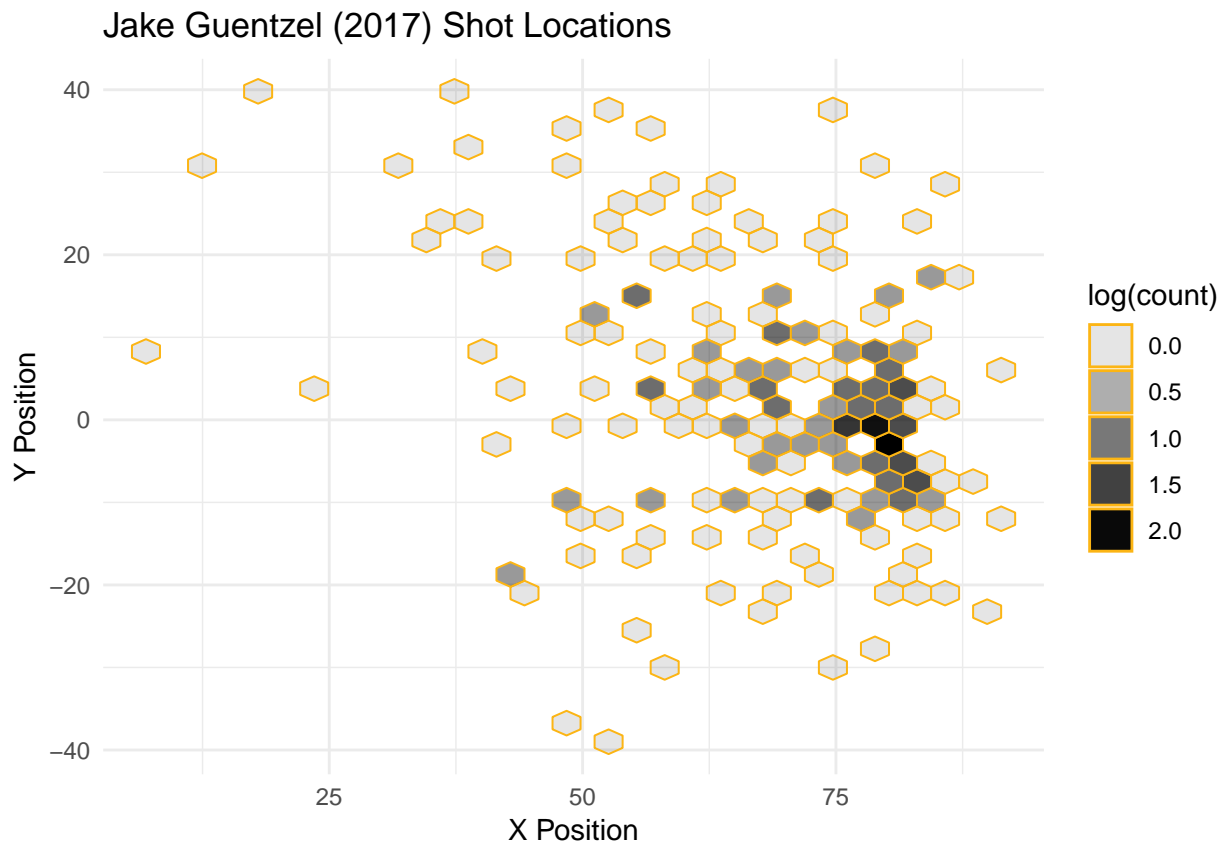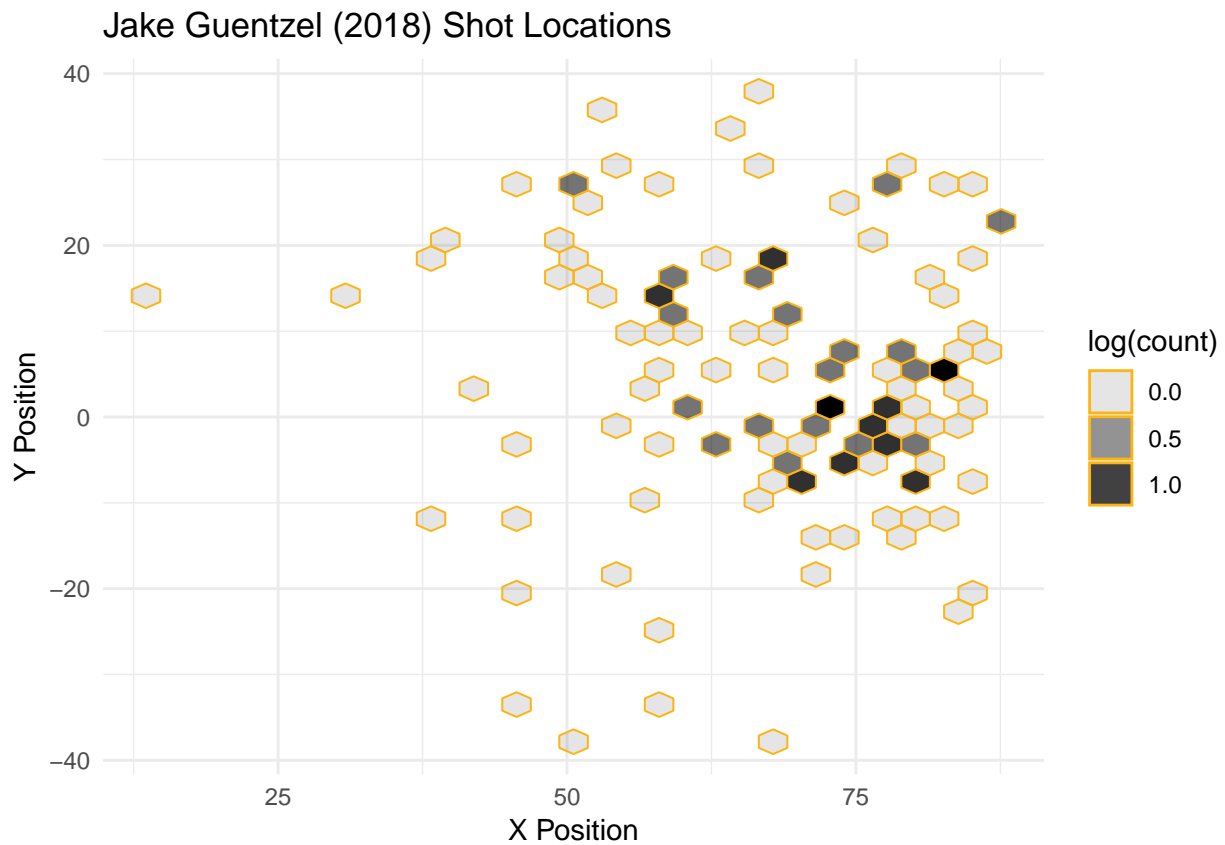

Jake Guentzel (2016) Shot Locations
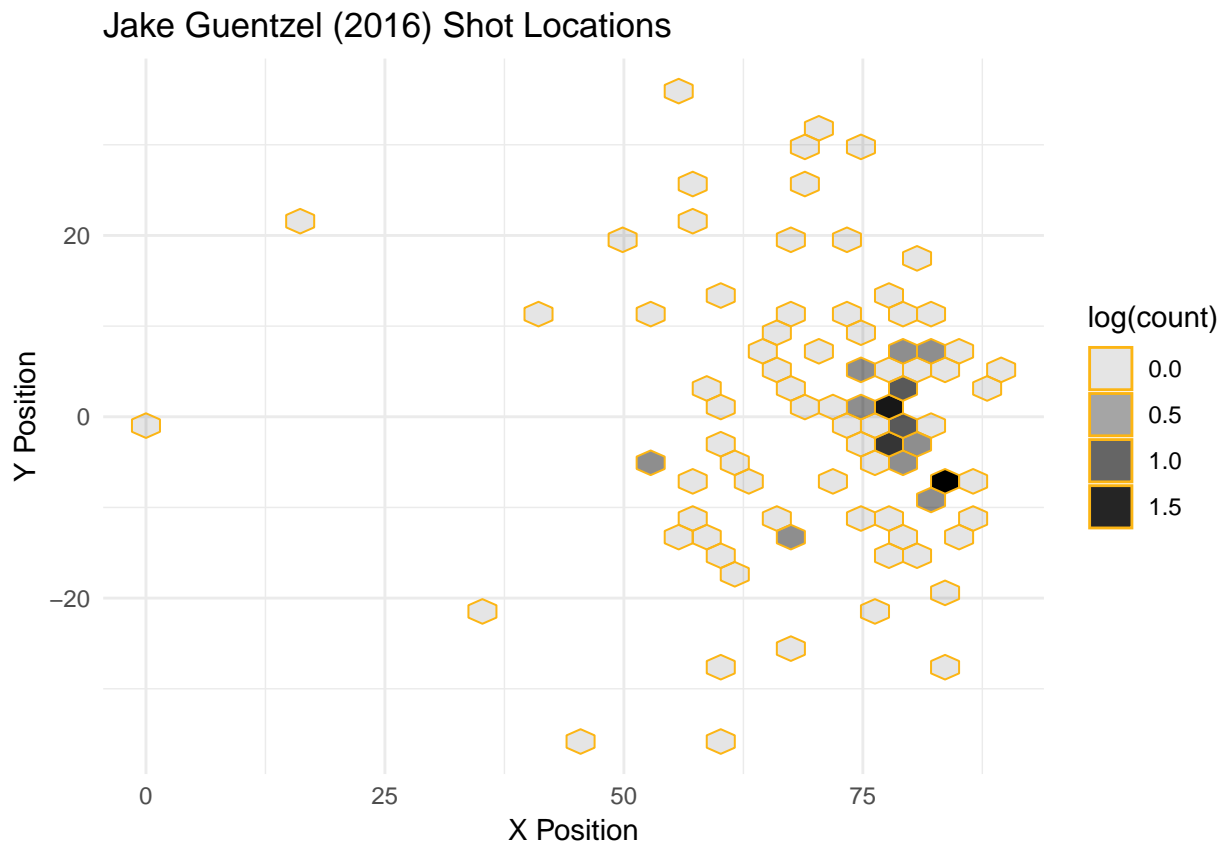
```
guentzel.2017.locations.plot = graph.shot.locations(guentzel.2017, "#000000", "#FCB514", "Jake Guentzel
guentzel.2017.locations.plot
```

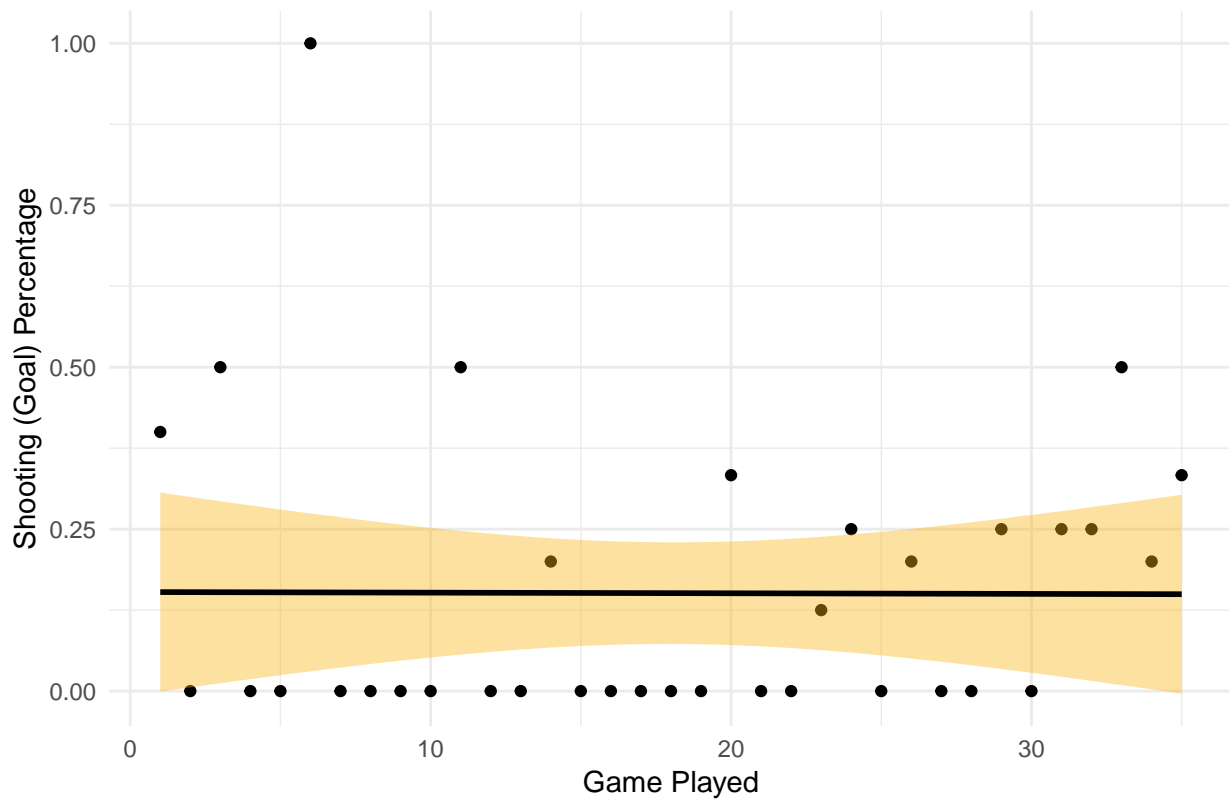# Jake Guentzel (2017) Shot Locations


```
guentzel.2018.locations.plot = graph.shot.locations(guentzel.2018, "#000000", "#FCB514", "Jake Guentzel
guentzel.2018.locations.plot
```

Jake Guentzel (2018) Shot Locations

From this, we can see that Jake Guentzel has a lot of success around the net. Let's look at this goal percentage per game now.
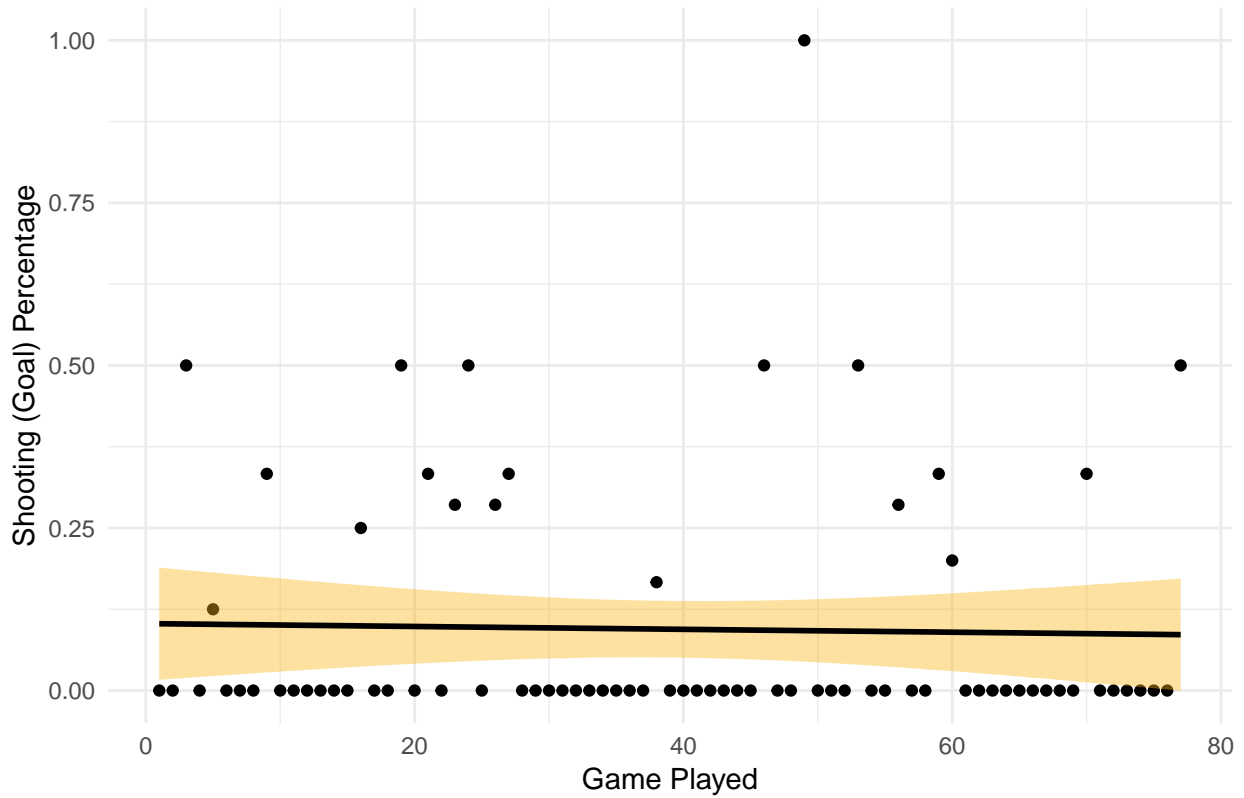
```
guentzel.2016.gp.plot = graph.trend(guentzel.2016.game.gp, "Shooting (Goal) Percentage", "#000000", "#F(
guentzel.2016.gp.plot
```

Jake Guentzel (2016) Shooting (Goal) Percentage by Game


```
guentzel.2017.gp.plot = graph.trend(guentzel.2017.game.gp, "Shooting (Goal) Percentage", "#000000", "#F(
guentzel.2017.gp.plot
```

Jake Guentzel (2017) Shooting (Goal) Percentage by Game

```
guentzel.2018.gp.plot = graph.trend(guentzel.2018.game.gp, "Shooting (Goal) Percentage", "#000000", "#F0...
guentzel.2018.gp.plot
```

Jake Guentzel (2018) Shooting (Goal) Percentage by Game
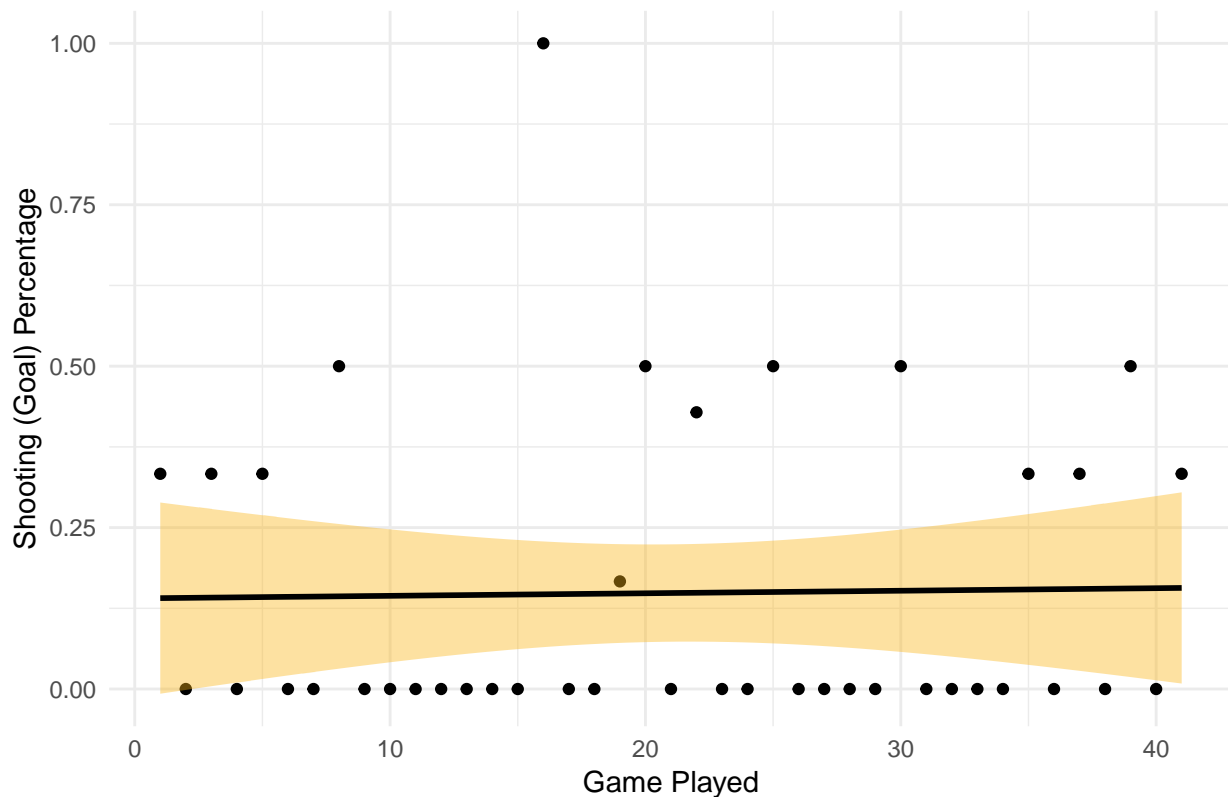
Erik Karlsson

A Norris Trophy caliber defensemen, Erik Karlsson helped redefined the modern defender. His exceptional speed as well as his quick passing ability has him as a franchise talent.

```
karlsson.2015 = get.skater.data(analysis.2015, "Erik Karlsson")
karlsson.2016 = get.skater.data(analysis.2016, "Erik Karlsson")
karlsson.2017 = get.skater.data(analysis.2017, "Erik Karlsson")
karlsson.2018 = get.skater.data(analysis.2018, "Erik Karlsson")
```

Let's get some of his stats.

```
karlsson.2015.sp = get.save.percent(karlsson.2015)
karlsson.2015.game.sp = get.game.save.percent(karlsson.2015)
karlsson.2016.sp = get.save.percent(karlsson.2016)
karlsson.2016.game.sp = get.game.save.percent(karlsson.2016)
karlsson.2017.sp = get.save.percent(karlsson.2017)
karlsson.2017.game.sp = get.game.save.percent(karlsson.2017)
karlsson.2018.sp = get.save.percent(karlsson.2018)
karlsson.2018.game.sp = get.game.save.percent(karlsson.2018)

karlsson.2015.gp = get.goal.percent(karlsson.2015)
karlsson.2015.game.gp = get.game.goal.percent(karlsson.2015)
karlsson.2016.gp = get.goal.percent(karlsson.2016)
karlsson.2016.game.gp = get.game.goal.percent(karlsson.2016)
karlsson.2017.gp = get.goal.percent(karlsson.2017)
karlsson.2017.game.gp = get.game.goal.percent(karlsson.2017)
```

```
karlsson.2018.gp = get.goal.percent(karlsson.2018)
karlsson.2018.game.gp = get.game.goal.percent(karlsson.2018)

karlsson.2015.spg = get.shots.per.goal(karlsson.2015)
karlsson.2015.game.spg = get.game.shots.per.goal(karlsson.2015)
karlsson.2016.spg = get.shots.per.goal(karlsson.2016)
karlsson.2016.game.spg = get.game.shots.per.goal(karlsson.2016)
karlsson.2017.spg = get.shots.per.goal(karlsson.2017)
karlsson.2017.game.spg = get.game.shots.per.goal(karlsson.2017)
karlsson.2018.spg = get.shots.per.goal(karlsson.2018)
karlsson.2018.game.spg = get.game.shots.per.goal(karlsson.2018)
```

Here's a table of his data.

| Season	Save Percent	Goal Percent	Shots per Goal
2015-2016	0.9578947	0.0421053	23.75
2016-2017	0.9495549	0.0504451	19.8235294
2017-2018	0.9695946	0.0304054	32.8888889
2018-2019	0.9850746	0.0149254	67

Let's take a look at his heatmaps.

```
karlsson.2015.locations.plot = graph.shot.locations(karlsson.2015, "#E31837", "#C69214", "Erik Karlsson
karlsson.2015.locations.plot
```


Erik Karlsson (2015) Shot Locations
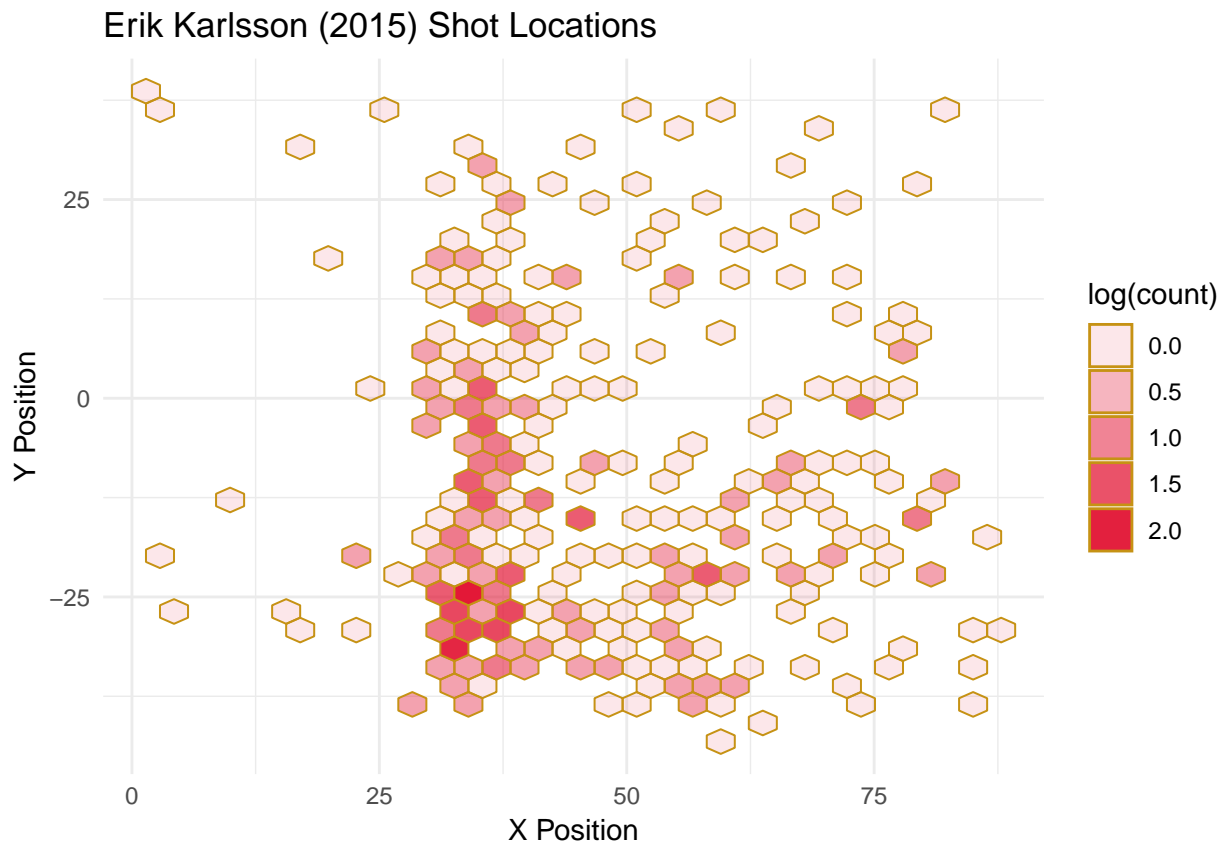
```
karlsson.2016.locations.plot = graph.shot.locations(karlsson.2016, "#E31837", "#C69214", "Erik Karlsson
karlsson.2016.locations.plot
```

Erik Karlsson (2016) Shot Locations
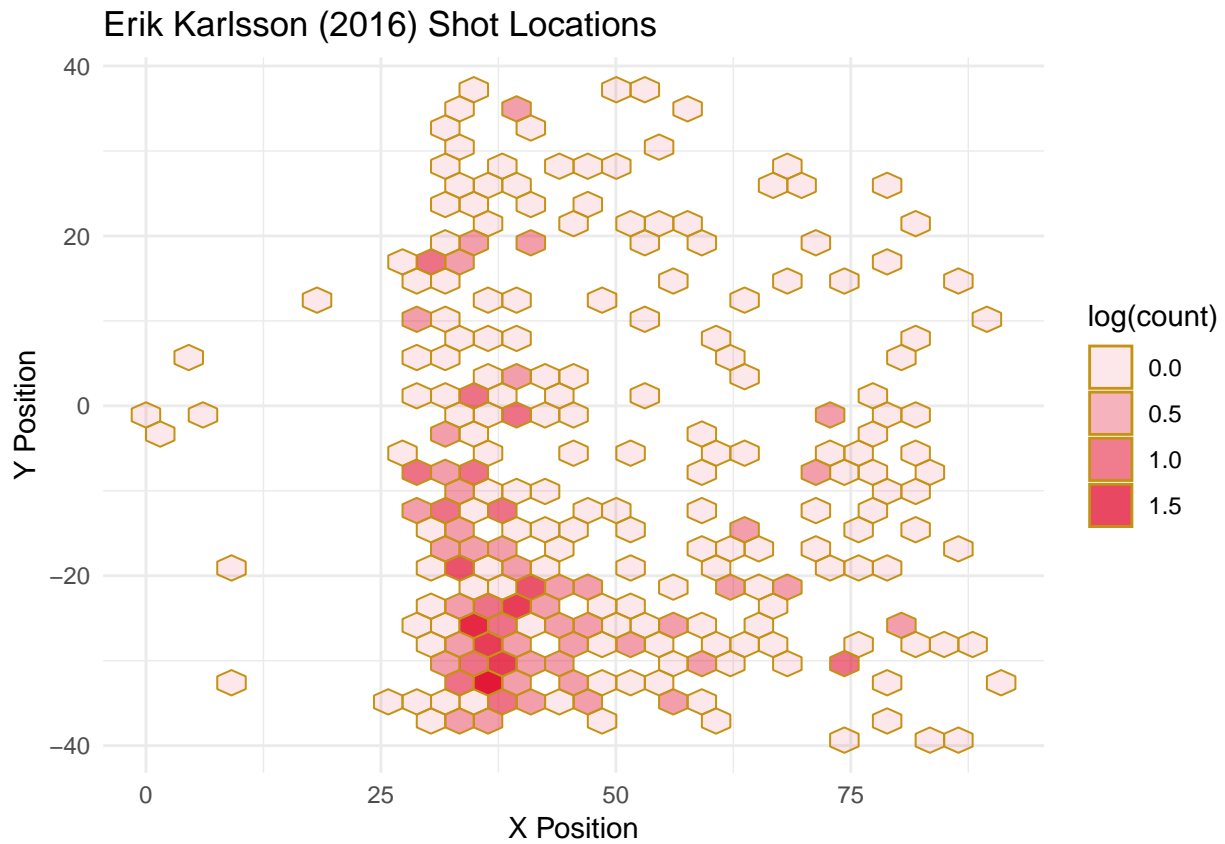

```
karlsson.2017.locations.plot = graph.shot.locations(karlsson.2017, "#E31837", "#C69214", "Erik Karlsson
karlsson.2017.locations.plot
```

Erik Karlsson (2017) Shot Locations


```
karlsson.2018.locations.plot = graph.shot.locations(karlsson.2018, "#006D75", "#EA7200", "Erik Karlsson
karlsson.2018.locations.plot
```

Erik Karlsson (2018) Shot Locations
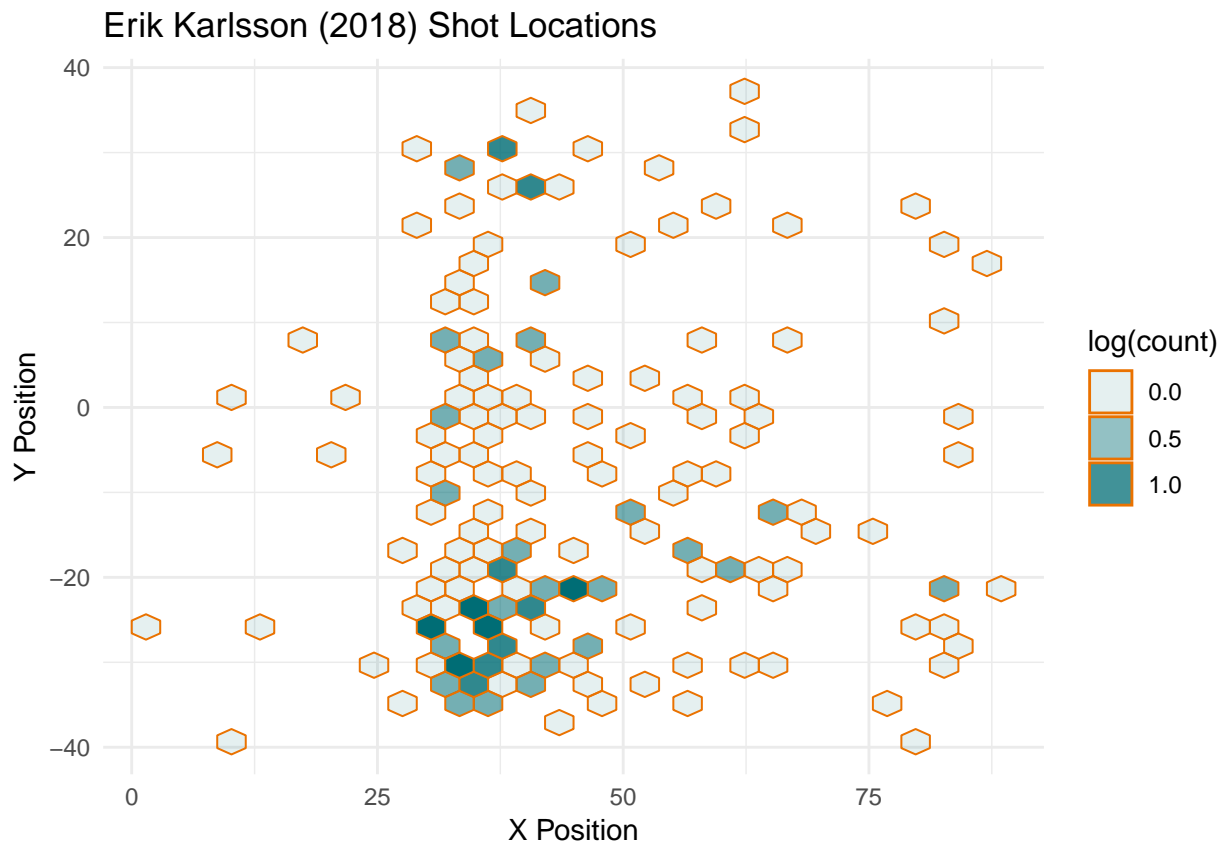
Let's look at this goal percentage per game now.

```
karlsson.2015.gp.plot = graph.trend(karlsson.2015.game.gp, "Shooting (Goal) Percentage", "#E31837", "#C0
karlsson.2015.gp.plot
```

Erik Karlsson (2015) Shooting (Goal) Percentage by Game
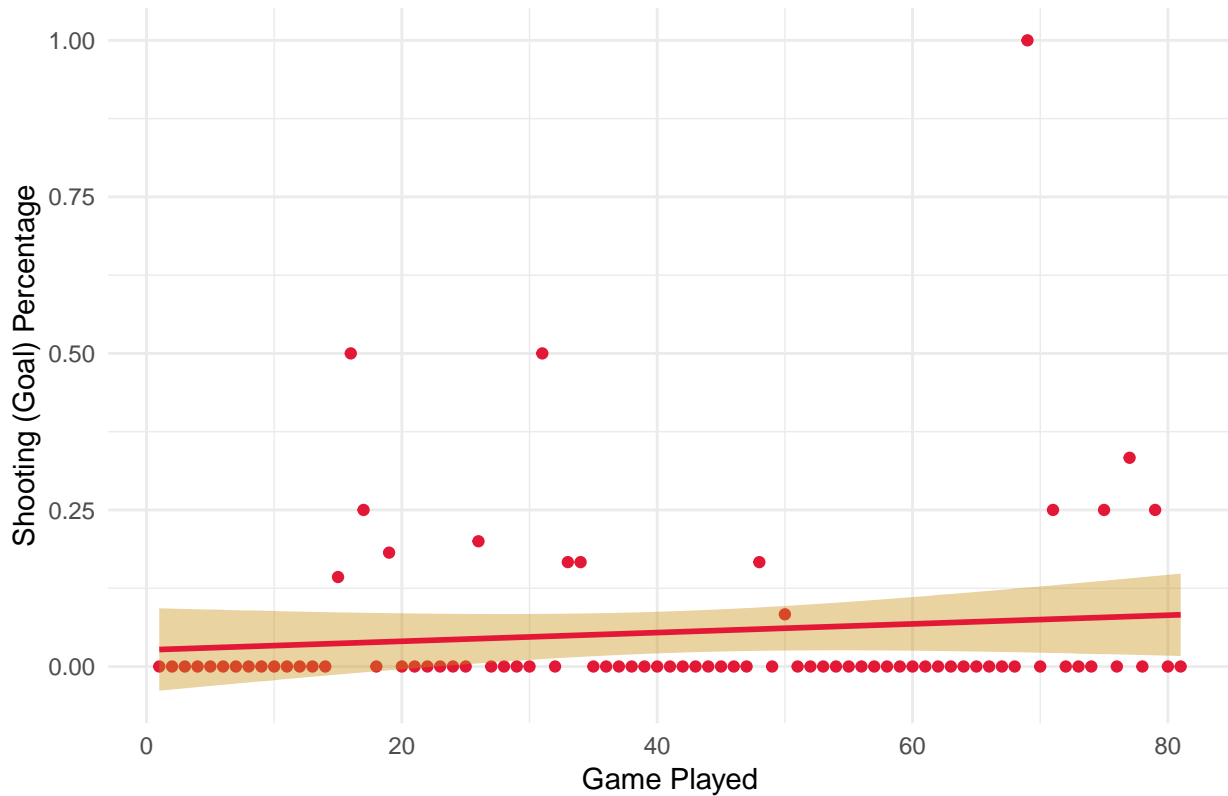
```
karlsson.2016.gp.plot = graph.trend(karlsson.2016.game.gp, "Shooting (Goal) Percentage", "#E31837", "#C(
karlsson.2016.gp.plot
```
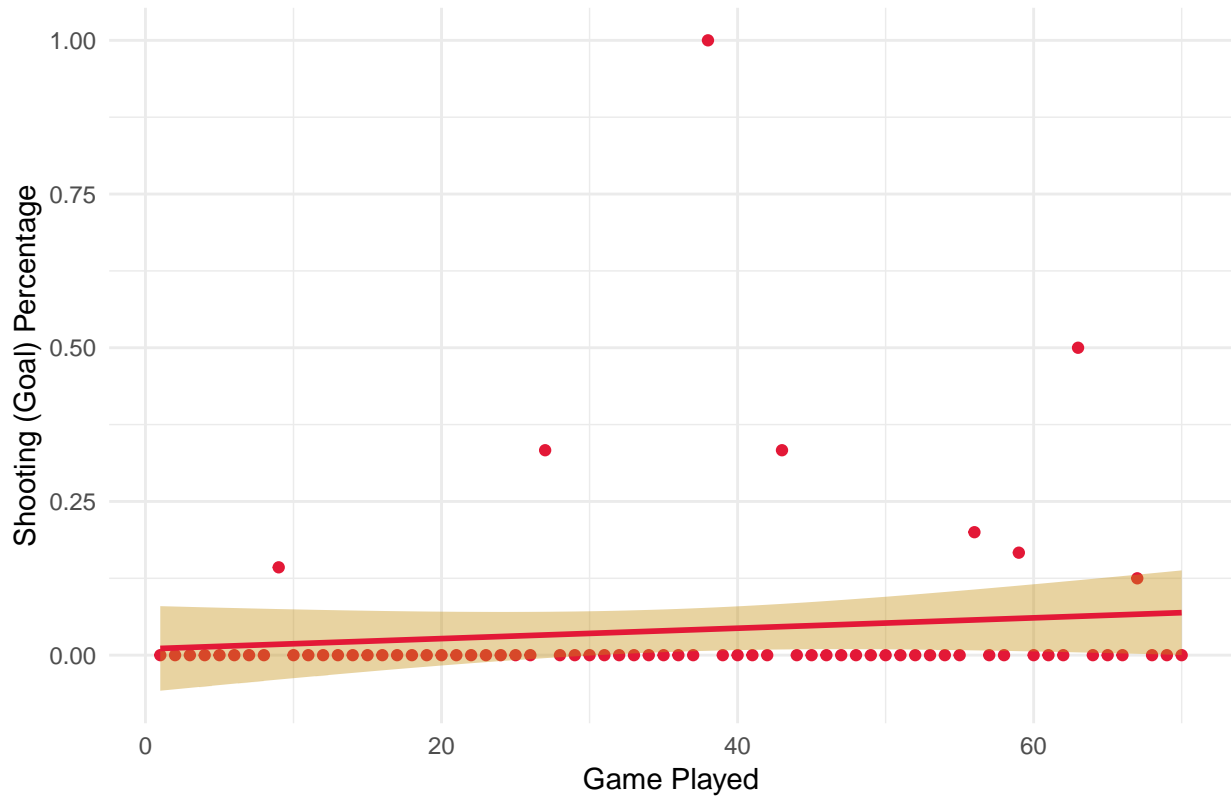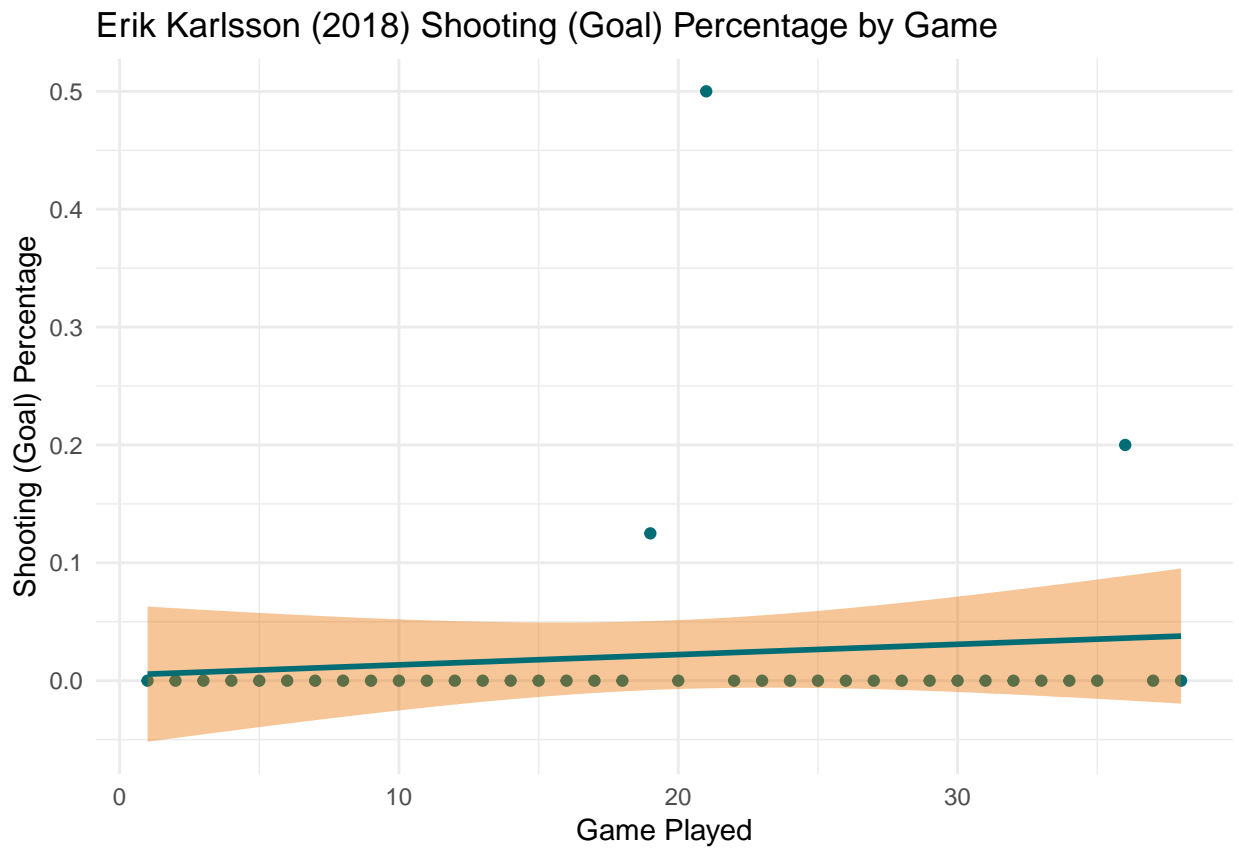
Erik Karlsson (2016) Shooting (Goal) Percentage by Game
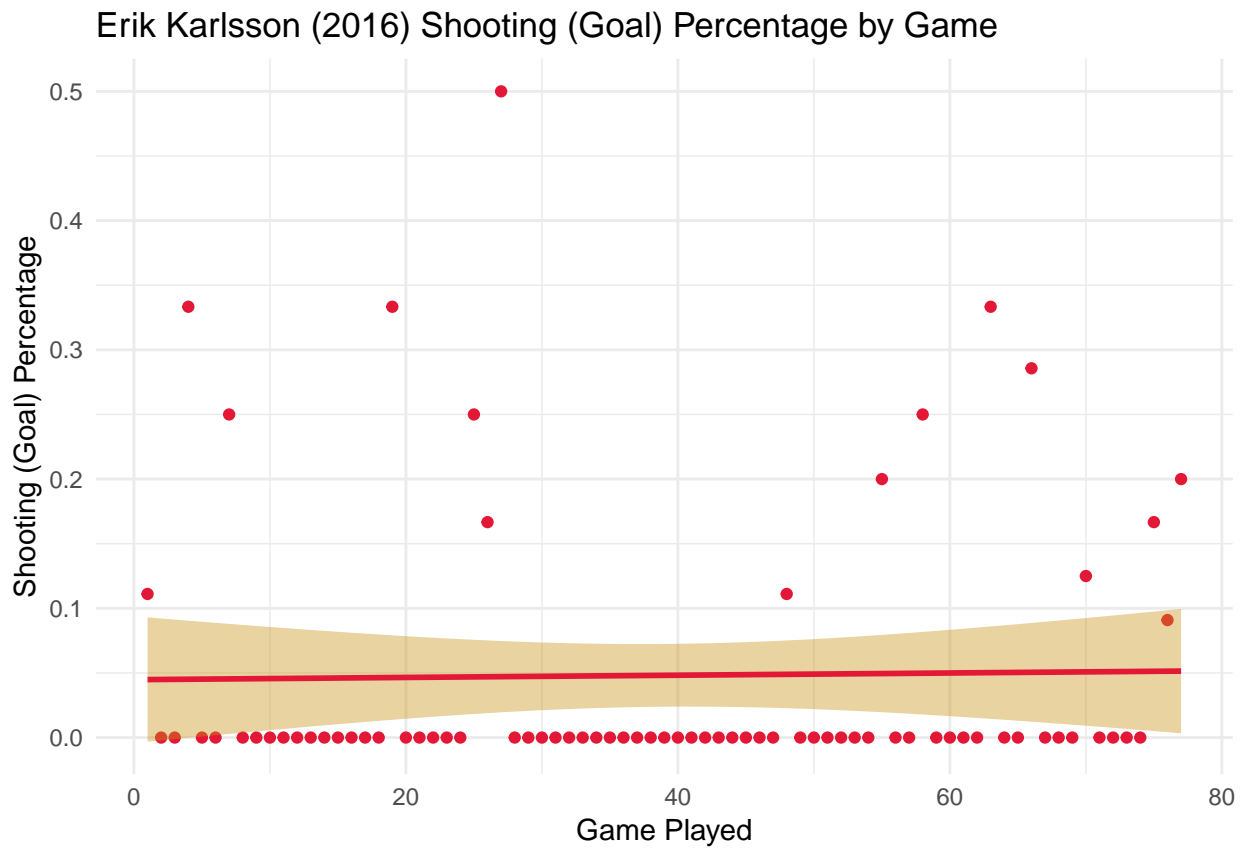

```
karlsson.2017.gp.plot = graph.trend(karlsson.2017.game.gp, "Shooting (Goal) Percentage", "#E31837", "#C(
karlsson.2017.gp.plot
```

Erik Karlsson (2017) Shooting (Goal) Percentage by Game


```
karlsson.2018.gp.plot = graph.trend(karlsson.2018.game.gp, "Shooting (Goal) Percentage", "#006D75", "#E
karlsson.2018.gp.plot
```

Erik Karlsson (2018) Shooting (Goal) Percentage by Game

Kris Letang