FISH SPAWN APIS

CARPE DIEM #FISHACKATHON

CARPE DIEM APIS

- A set of APIs available over the web
- Register domain: https://asian.fishspawnapi.us
- Serverless Software - hosted on AWS Cloud
- Code hosted on github (fishspawnapi)
  - https://github.com/fishhelper/fishspawnapi

ARCHITECTURE GOALS

- Software that implements the equations and workflow defined in the fishackathon problem specification
- APIs accept and return JSON
- Permit real time processing
- Build on a cloud platform that enables future capability enhancements

INVASIVE SPECIES APIS

- https://asian.fishspawnapi.us
  - GDD
  - Predict Stream Length
  - Spawn Prediction
  - Get Stream Length Prediction Graph
  - Get Velocity Graph
  - Get Species
  - Get Locations

- Java coded posted on github - https://github.com/fishhelper/fishspawnapi/tree/master/src/main/java/us/fishhelp/lambda

API - GDD

- https://asian.fishspawnapi.us/prod/gdd

Description: Compute the GDD15 (Growth Degree Days) from a set of temperature readings

HTTP Method: POST

Example JSON Input:

```
{
   "history" : [ { "mint" : "15.2", "maxt" : "16.2"}, { "mint" : "15.4", "maxt" : "16.8"}]
}
```

Example JSON Output:

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Playground URL - https://41kegxaak0.execute-api.us-east-1.amazonaws.com/prod/gdd

API – PREDICT STREAM LENGTH

- https://asian.fishspawnapi.us/prod/predictstreamlength

Description: Generate a stream spawn length prediction

HTTP Method: POST

Example JSON Input:


```
{
  "fishname": "C. IDELLA",
  "velocity": "0.5",
  "meanAverageWaterTemperature": "15"
}
```


Example JSON Output:

"494.2967933359299"

Playground URL - https://41kegxaak0.execute-api.us-east-1.amazonaws.com/prod/predictstreamlength

API – SPAWN PREDICTION

- https://asian.fishspawnapi.us/prod/spawnprediction

Description: Predict likelihood of an invasive species spawn

HTTP Method: POST

Example JSON Input:


```
{
  "gdd": "903",
  "meanWaterTemperature": "17.4",
  "spawnLengthPrediction": "149.5",
  "unimpoundedStreamLength" : "200",
  "flowSpike" : "0.8"
}
```


Example JSON Output:


```
"HIGHLY_SUITABLE"
```


Playground URL - https://41kegxaak0.execute-api.us-east-1.amazonaws.com/prod/predictstreamlength

API – GET VELOCITY GRAPH

- https://asian.fishspawnapi.us/prod/getvelocitygraphdata

Description: Compute stream velocity graph data points for a station location.

HTTP Method: POST

Example JSON Input:

{ "locationName": "SPRING CREEK NORTH”, "startDate": "2016-04-24”, "dischargeData": ["1.0", "1.1", "1.2", "1.3”]}

Example JSON Output:

{ "velocityData": [
{ "velocity": "0.5202", "date": "Sun Apr 24 00:00:00 UTC 2016" },
{ "velocity": "0.5551220000000001", "date": "Mon Apr 25 00:00:00 UTC 2016" },
{ "velocity": "0.589468", "date": "Tue Apr 26 00:00:00 UTC 2016" },
{ "velocity": "0.6232380000000001", "date": "Wed Apr 27 00:00:00 UTC 2016”}],
"startDate": "Sun Apr 24 00:00:00 UTC 2016”, "endDate": "Wed Apr 27 00:00:00 UTC 2016”,
"locationName": "SPRING CREEK NORTH }

Playground URL - https://41kegxaak0.execute-api.us-east-1.amazonaws.com/prod/getvelocitygraphdata

API – GET STREAM LENGTH GRAPH

- https://asian.fishspawnapi.us/prod/streamlengthgraphdata

Description: Compute stream spawn length graph data at a great lakes station for a one invasive species.

HTTP Method: POST

Example JSON Input:

{ "location": "Spring Creek North", "species": "C. IDELLA"}

Example JSON Output:

{ "location": "Spring Creek North", "species": "C. IDELLA",
"streamLengthGraphData": [
{ "streamLength": "587.004139826431", "date": "2016-04-20" },
{ "streamLength": "453.2968926278043", "date": "2016-04-21" },
{ "streamLength": "317.2380525591089", "date": "2016-04-22" },
{ "streamLength": "422.9840700788119", "date": "2016-04-23" },
{ "streamLength": "351.8225056276606", "date": "2016-04-24" }]}

Playground URL - https://41kegxaak0.execute-api.us-east-1.amazonaws.com/prod/streamlengthgraphdata

API – GET SPECIES

- https://asian.fishspawnapi.us/prod/getspecies

Description: Provide a list of invasive species known to service

HTTP Method: Get

Example JSON Output:

{ "species": [

{ "name": "C. idella”, "id": 0 },

{ "name": "H. molitrix”, "id": 1 }]

}

Playground URL - https://41kegxaak0.execute-api.us-east-1.amazonaws.com/prod/getspecies

API – GET LOCATIONS

- https://asian.fishspawnapi.us/prod/getlocations

Description: Provide a list of known Great Lakes area Canadian river stations

HTTP Method: Get

Example JSON Output:

{[

{ "id": "0", "name": "Spring Creek North" },

{ "id": "1", "name": "Don at Glenshields" },

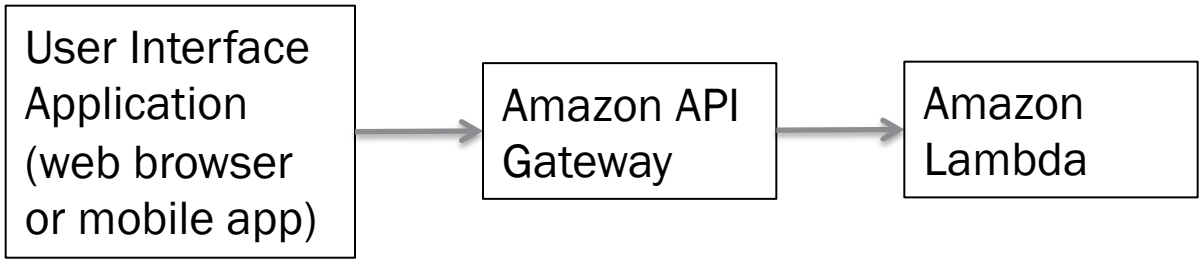
{ "id": "2", "name": "Krosno Creek" }

]}

Playground URL - https://41kegxaak0.execute-api.us-east-1.amazonaws.com/prod/getlocation

APPLICATION ARCHITECTURE

Current Hackathon App Model



FUTURE WORK

- Add APIs to acquire data from Canadian invasive species datasources
- Add APIs to store historical temperature and discharge data into a DynamoDB
- Add APIs to add fish species to the system
- Add APIs to add locations to the sytem
- Add APIs to notify users upon likelihood events
- Add APIs to accept temperature and flow data from satellite systems through the cloud based Amazon Kinesis

APPLICATION ARCHITECTURE

Future Work Model