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| **Haydel Collins** |
| **GS-0810-11** |
| **Civil Engineer (Hydraulic)** |

**Education & Certification:**

**Louisiana State University,** Baton Rouge, Louisiana, August 2017

Master’s Degree in Coastal Engineering, Thesis Option. Graduate GPA: 3.55

**Under the advisement of Dr. Clinton Willson**

**Thesis Title: Quantifying Strength of Floating Marsh & Interaction with Hydrodynamics**

Available at: <http://etd.lsu.edu/docs/available/etd-06042017-123347/>

**Louisiana State University,** Baton Rouge, Louisiana, May 2014

Bachelor’s Degree in Environmental Engineering

Dean’s List: Spring 2013, Spring 2014.

**Oglethorpe University**, Atlanta, Georgia, May 2012

Major: Dual Degree Engineering, Minor: Economics

Honors: Oglethorpe Presidential Scholarship Recipient, Honors Seminar

**The Louisiana School for Math, Science, & the Arts**, Natchitoches, Louisiana, 2009

**Licensed Engineering Intern (Louisiana). E.I. # 0033283**

**Work Experience:**

**United States Army Corps of Engineers:**

***Civil Engineer (Hydraulics),*** May 2017 – Present;

**2020 Annual Appraisal: 5 Outstanding**

**2019 Annual Appraisal: 5 Outstanding**

**2018 Annual Appraisal: 5 Outstanding**

* Served leading & supporting roles for both military engineering & civil works projects.
* Successfully brought in projects and funding from outside of the district.
* Provided technical guidance & training to entry level & senior level engineers.
* Currently publishing research in the field of CFD modeling & coastal hydraulics.
* Developed software, scripts, & models to assist fellow engineers perform work more efficiently.
* Served a 6-month detail at the Coastal Hydraulics Lab in the ERDC
* Presented multiple Lunch and Learns to fellow employees and team members
* Served in multiple flood fights, hurricane teams, & disaster relief efforts.

***Projects:***

**Military Engineering** (Supporting Engineer)

* Analyzed the hydrodynamic loads on the Improved Ribbon Bridge (IRB).
* Developed python Jupyter notebooks for analysis of the IRB shore anchoring system.
* The IRB is featured on the cover of "Engineer: The Professional Bulletin of Army Engineers" May-August 2018.
* Assisted with physical modeling for the Trident pier system at the U Maine wave facility.
* Assisted with testing a developmental Discrete Element Model called Mosaic at CRREL with Dr. Arnold Song.
* Collaborated with HR Wallingford in running 3D FSI of moored floating objects.

**South Central Coastal Louisiana** (Lead Hydraulic Engineer)

* Developed an expanded Atchafalaya River model to assess riverine flooding.
* Utilized existing hurricane data to estimate surge inundation.
* Provided technical guidance to the PDT & collaborated successfully with other branches.
* Compiled reports for AMM and presented to MVD for an IPR.
* Developed programs to automate the development of hydraulic subunits in ArcGIS.

**Proteus Development** (Lead Hydraulic Engineer)

* Created 2-D stepped spillway simulation for 1d-2d-3d guidance document for HQ.
* Currently training two senior engineers in CFD modeling with HPC’s.
* Building 3D simulation to assist in CHL’s tilting flume design effort.

**Navier-Stokes/Fluid Structure Interaction CoP** (Co-Originator)

* Assisted in developing Statements-of-Need for USACE guidance for CFD modeling.
* Received funding from USACE HQ to do validation comparison of CFD codes.
* Aiming to develop policy and guidance for USACE use of CFD models.

**Comite Diversion** (Reviewer)

* Conducted a technical review of a Delft3D-FM model for Brook’s lake area.
* Performed additional Delft3D-FM modeling scenarios for the study.
* Providing technical guidance to employee on detailed assignment.

**East Atchafalaya Backwater Study** (Lead Hydraulic Engineer)

* Wrote a PMP for the Scope of work required for the modeling study.
* Analyzing alternatives for flood protection east of the Atchafalaya river.
* Including entry level engineer and a DA intern for training purposes.

**Upper Barataria Basin** (Supporting Engineer)

* Created the 2D HEC-RAS model for the project area with rushed schedule.
* Utilized existing hurricane data to estimate surge inundation.
* Trained a senior engineer on how to model using HEC-RAS.
* Utilized personally developed software to produce synthetic rainfall events.

**HSDRRS PCCP Modeling** (Supporting Engineer)

* Developed HEC-RAS & Delft-3D models for the 17th St & London Ave pump stations.
* Ran various scenarios analyzing velocities through gate structures & near pump outflows.
* Assisted in reviewing correspondence between contractors and USACE during litigation.

**Zydeco Ridge Wave Study** (Supporting Engineer)

* Assisted in conducting wave study for borrow pit in Lake Pontchartrain.
* Developed wind conditions for use in AdCIRC + SWAN simulations.
* Ran models on HPC’s and post processed figures using Matlab.
* Provided full documented report on entire modeling effort.

**Additional Projects** (Guidance and support role)

* Produced historic rainfall hydrographs for Houston Delft-3D model and WLSP.
* Providing Delft-3D training for Port Of New Orleans Deepening Study.
* Assisting Water Management with HEC-RAS model of the Atchafalaya Basin.

***Developmental Works and Innovation:***

**SLaMM** (Co-Developer)

* Worked with coworkers on developing a district wide HEC-RAS model.
* Presented work for branch lunch & learn and ED management.
* Have consistently updated model with new details after projects are completed.

**Synthetic rainfall time series generator (**Developer**)**

* Python script that will produce a rainfall hydrograph given duration, AEP, & Lat-Lon.
* This has been used on WSLP, SCCL, & UBB.

**National historic rainfall time series generator (**Co**-**Developer**)**

* Matlab script that will return rainfall hydrograph for any duration and any Lat-Lon.
* Full database of historic national rainfall is being incrementally built on the H&H server.
* This has been used on WSLP, SCCL, UBB, & Houston.

**LSU Department of Civil & Environmental Engineering:**

***Research Assistant,*** September 2014 – December 2016

* Conducted Louisiana Board of Regents funded eco-hydraulics thesis research.
* Constructed 3-D hydraulic models with ANSYS FLUENT & Delft 3D-FLOW.
* Utilized LSU’s High Performance Computing (HPC) resources for CFD simulations.
* Implemented 2-D, 3-D, & coupled CFD-FEA models involving FSI.
* Designed & tested tensile strength measuring device for material stress-strain analyses.

***Fluid Mechanics Lab Instructor,*** August 2016 – December 2016

* Course instructor for 75 undergraduate Civil Engineering students.
* Lectured on numerous fluid dynamics concepts requiring advanced knowledge.
* Prepared students with rigorous technical writing & scientific presentation exercises.

***Teaching Assistant,*** August 2015 – May 2016

* Tutor & grader for 150+ Civil Engineering students for Fluid Mechanics Lecture CE 2200.
* Provided weekly office hours for students in need of assistance on assignments.

**Conestoga, Rovers & Associates (Now GHD):**

***Engineering Student Worker Internship,*** November 2012 – June 2014

* Coordinated with Professional Engineers & managers on various civil engineering projects.
* Reviewed design landfill drainage networks for clients such as Chevron & Valero.
* Created reliable & reusable pipe flow calculation programs for employees.

**Research & Publications:**

***International Journal for Numerical Methods in Fluids,*** Co-Author 2019

* *An unstructured finite element model for incompressible two-phase flow based on a monolithic conservative level set method*

***COPRI Conference,*** Co-Author 2019

* *Advanced wave generation systems for numerical modelling of coastal structures*

***CHL Research Seminar,*** Vicksburg, MSAugust 2019

* Gave talk on various CFD applications involving Proteus.

***American Geophysical Union Fall Conference,*** San Francisco, CA. December 2016

* Eco-Hydraulics Session Poster Presentation on Hydraulic flow interaction with floating marsh.

***State of the Coast,*** New Orleans, LA. May 2016

* Gave talk presenting thesis research to expert audience of scientific professionals.

***International Assoc. for Hydro-Environmental Engineering Research*** The Hague, NEDJuly 2015

* Attended conference & completed weeklong engineering workshop at TU Delft.

***LSU Graduate Student Research Conference.*** Baton Rouge, LA. March 2016

***WERC Engineering Competition*** Las Cruces, NM. April 2014

* Presented capstone design bench scale model of electrolysis based struvite extraction system.

**Relevant Technical Skills:**

**Programming Languages:**

Python 2.7, Python 3.7, Matlab.

**2D Modeling Software:**

HEC-RAS, Delft-3D FLOW, Delft-3D FlexMesh, SWAN, SMS.

**3D Modeling Software:**

Proteus, ANSYS Fluent, ANSYS Mechanical, ANSYS AQWA.

**High Performance Computing:**

Systems: Excalibur, Topaz, Onyx, SuperMikeII, Garnet.

OS: Linux, Ubuntu

**Other**:

ArcGIS.

**Awards:**

* Achievement Medal for Civilian Service: PCCP 2019, Col Clancy.
* Achievement Medal for Civilian Service: Debris Team Puerto Rico 2018, Col Clancy.
* Certificate and Medal of completion: ERDC U 2018, Dr. David Pittman.
* Medal Award for Excellence: ERDC U 2018, Col Clancy.
* Certificate of Completion: Hurricane Nate Reponse 2017, Col Clancy.
* Certificate of Completion: Flood Fight 2017, Col Clancy.