# AQRP Monthly Technical Report

| PROJECT TITLE | Improve Cloud Modeled by WRF using COSP and Generative Adversarial Network | PROJECT # | 20-026 |
|---|---|---|---|
| PROJECT PARTICIPANTS | PI: Zheng Lu | DATE SUBMITTED | Ap. 11, 2021 |
| REPORTING PERIOD | **From:** Mar. 10, 2021 <br> **To:** Apr. 10, 2021 | REPORT # | 8 |

A Financial Status Report (FSR) and Invoice will be submitted separately from each of the Project Participants reflecting charges for this Reporting Period. I understand that the FSR and Invoice are due to the AQRP by the 15th of the month following the reporting period shown above.

---

**Detailed Accomplishments by Task for reporting period**

During this reporting period, all 2005 – 2020 WRF simulations with NAM reanalysis, the Morrison microphysics scheme, and YSU PBL scheme are finished, with exception for year 2007 (detail mentioned in below). We also run COSP package and obtained all the corresponding COSP outputs for analysis and neural network training.

We are downloading and preprocessing the NASA MODIS level2 cloud products. We are also downloading the GOES cloud and moisture imagery product (CMIP) files.

**Preliminary Analysis**
N.A.

**Data Collected**
WRF simulation outputs and COSP outputs calculated from the WRF simulations from year 2005 – 2020.

**Identify Any Problems or Issues Encountered and Proposed Solutions or Adjustments**

Many of the NAM reanalysis data for year 2007 are corrupted. Consequently, running WRF simulation for year 2007 becomes extremely slow. Here we plan to postpone running year 2007 case and proceed the machine learning task.

**Goals and Anticipated Issues for the Succeeding Reporting Period**

We plan to conduct first GAN neural network training in the next reporting period

**Detailed Analysis of the Progress of the Task Order to Date**

100% of Task 1& 2. 20% of Task 3

**Do you have any publications related to this project currently under development? If so, please provide a working title, and the journals you plan to submit to.**

☐Yes        ☒ No

**Do you have any publications related to this project currently under review by a journal? If so, what is the working title and the journal name? Have you sent a copy of the article to your AQRP Project Manager and your TCEQ Liaison?**

☐ Yes        ☒ No

**Do you have any bibliographic publications (ie: publications that cite the project) related to this project that have been published? If so, please list the reference information. List all items for the lifetime of the project.**

☐ Yes        ☒ No

**Do you have any presentations related to this project currently under development? If so, please provide working title, and the conference you plan to present it (this does not include presentations for the AQRP Workshop).**
☐ Yes        ☒ No

**Do you have any presentations related to this project that have been published? If so, please list reference information. List all items for the lifetime of the project.**

☐ Yes        ☒ No

**Have any personnel changes occurred that were not listed in the original proposal?  If so, please include a detailed description of the personnel change(s) below.**

☐ Yes        ☒ No

**Are any delays expected in the progress of the research?  If so, please include a detailed description of the potential delay below.**

☐ Yes        ☒ No

**Describe any possible concerns/issues (technical or non-technical) that AQRP should be made aware of.**

**Are you anticipating using all the available funds allocated to this project by the end date? If not, why and approximately what is the amount to be returned?**

☒ Yes        ☐ No

---

Submitted to AQRP by
[Zheng Lu]