RGVFlood Pre-Development Plan

Release 0.1.1

Andrew N.S. Ernest, Ph.D., P.E., BCEE, D.WRE
Christopher B. Fuller, Ph.D.
William Kirkey, Ph.D. **Peter Kirkey,**
Linda Navarro, **Ivan Santos-Chavez,**
Carlos Reyes

Jan 10, 2022

TABLE OF CONTENTS

CHAPTER

ONE

INTRODUCTION

The predevelopment plan introduces RGVFlood, the handle and internet domain name (RGVFlood.com) used to define the LRGV instantiation of REON.cc.

CHAPTER

TWO

COMPONENTS

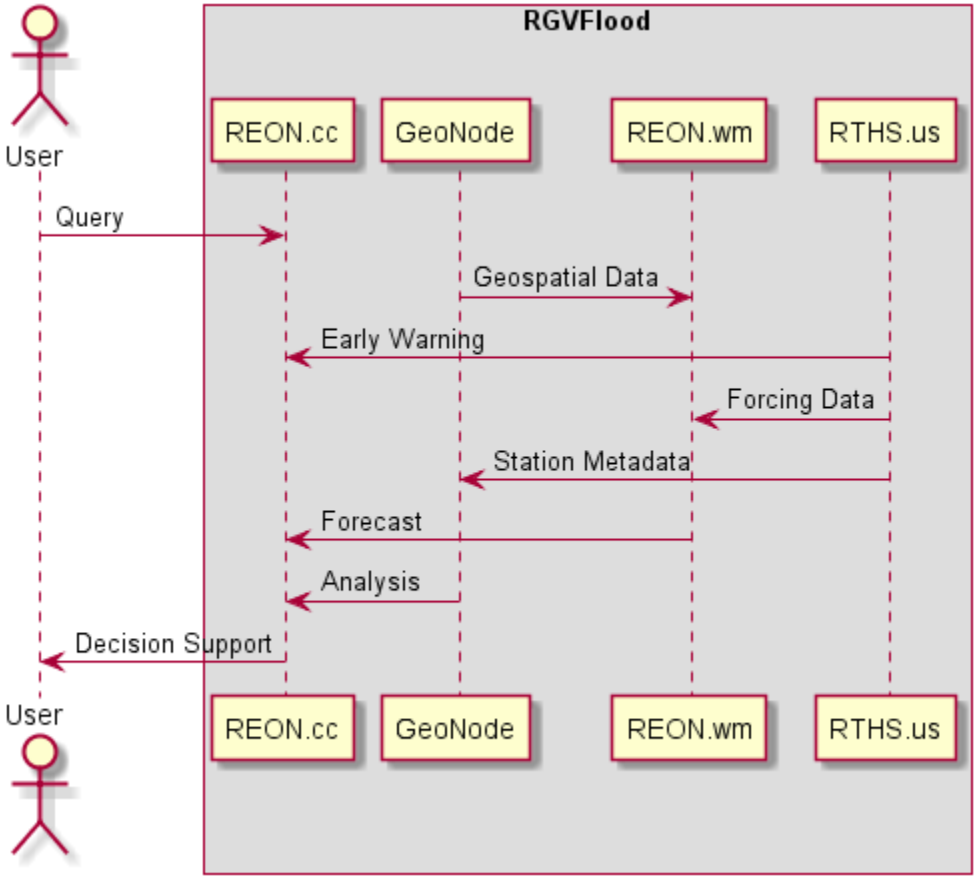

Fig. 1: Components of the RGVFlood Platform

RGVFlood Instantiation of REON cyberinfrastructure specific to LRGV

Primary User Interaction Through REON.cc for decision support

REON.cc Framework of REON analytic & decision support applications

GeoNode Geospatial content management server, serving & storing geospatial and RTHS station metadata

REON/WM Ecosystem of hydrologic, hydraulic & stormwater forecast models, pulling geospatial data from GeoNode and forcing data from RTHS.us

RTHS.us RTHS Network Server, serving forcing data, station metadata and flood early warning information

CHAPTER

THREE

COMPONENT INTERACTIONS

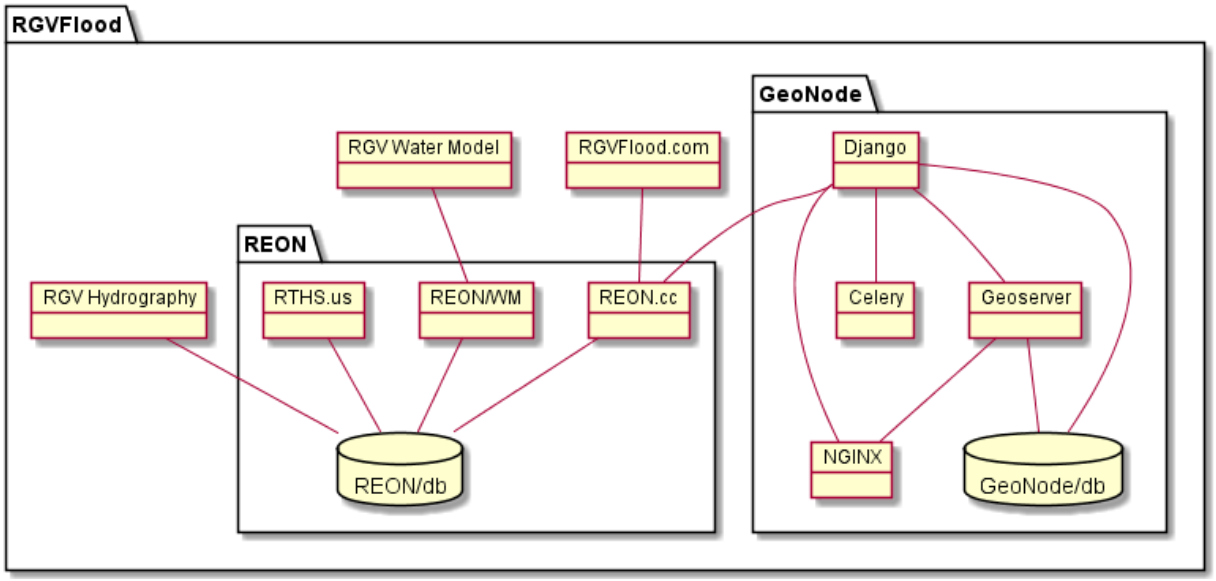

Fig. 1: RGVFlood Component Interactions

RGV Hydrography Hydrologic data specific to the LRGV. Includes national & state level data, along with locally collected data as well as local forcings from RTHS.us. Data stored in REON PostgreSQL database

RGV Water Model REON/WM driven by RGV Hydrography and tuned using local forcings

RGVFlood.com User interface to REON.cc tuned to the specific needs of the LRGV users.

RTHS.us RTHS Network Server, serving forcing data, station metadata and flood early warning information.

REON/WM Ecosystem of hydrologic, hydraulic & stormwater forecast models.

REON.cc Framework of REON analytic & decision support applications, pulling data through the GeoNode Django interface as needed.

REON/db PostgreSQL with PostGIS extensions database server storing REON specific data for RTHS, REON/WM & REON.cc data.

Django Python web framework upon which GeoNode is built.

NGINX High performance web server used to serve GeoNode components.

Celery A task scheduling and messaging application used to maximize parallel task processing.

GeoServer Geospatial data server for sharing to GeoNode and end-users directly.

GeoNode/db PostgreSQL with PostGIS extensions database server storing GeoNode Django and GeoServer data.

CHAPTER

FOUR

USE CASES

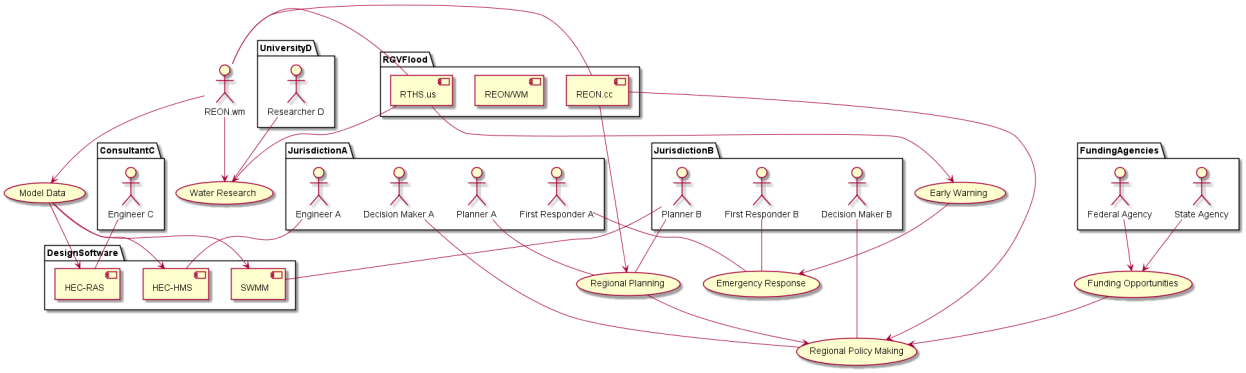

Fig. 1: RGVFlood Use Cases

Decision Makers Elected officials responsible for regional policy making and recruitment of state & federal funds.

Planners Jurisdictional and multi-jurisdictional planners needing to make both operational and strategic decisions in coordination with Elected officials.

Federal Agencies Agencies such as FEMA and NWS that provide financial and technical resources for flood response, recovery & resiliency planning.

State Agencies Agencies such as TGLO and TWDB that provide financial and technical resources for flood response, recovery & resiliency planning.

First Responders Emergency Management Agencies and First Responders utilizing Early Warning information generated by the RTHS stations themselves, or from REON.cc utilizing higher order analytics.

Engineers Both public sector and private sector engineers, relying on the REON/WM Tier II (HEC-RAS), Tier III (HEC-HMS) & Tier IV (SWMM) supported models for design development or review.

Researchers Research engineers and hydrologists are likely use the REON/WM WRF-Hydro instance directly, along with real time data from RTHS.us.