USA and Canada United Weather System

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1   Overview

The USA and Canada United Weather System seeks to store usable weather data from the National Weather Service (NWS), Meteorological Service of Canada (MSC), and Environment and Climate Change Canada (ECCC) . I seek to do this the use of 2 API's from the NWS and MSC. This will allow API's to be accessed seamlessly and easily so that storms and other weather phenomena that cross the border can be easily tracked.

2   System Overview

My data will be coming from the NWS API and the OGC API. The data comes in the form of JSON schemas in both cases but the schemas are not necessarily compatible. Much of the work of this project will be building my own schemas and converting the schemas to my own schemas. There will be a lot of data, probably on the level of gigabytes as I will be converting historical data as well and storing it. I will be doing batch updating for historical data as well as once hourly updates for live data.

I will be interacting with 3 layers of the stack primarily: Storage, Data Stores, and Querying. For storage, I will be using Microsoft Azure. For data stores I will be using JSON Schemas as mentioned above and I will be using Microsoft SQL via Azure for querying.

3   Literature Review

1. JSON Schemas [2] As mentioned above, a large part of the work for this project will be converting the given JSON schemas to my own universal schemas. As such consulting the JSON Schemas documentation was a given. 2. National Weather Service API [5] These are the docs for the NWS API I will be using. Ss mentioned earlier, all responses come in the form of JSON Schemas that I will need to reference to make my own. 3. Open Geospatial Consortium API [1] These are the Docs for the OGC API I will be using for Canadian weather data. As mentioned earlier, all responses come in the form of JSON Schemas

Figure 1: Data Flow Diagram

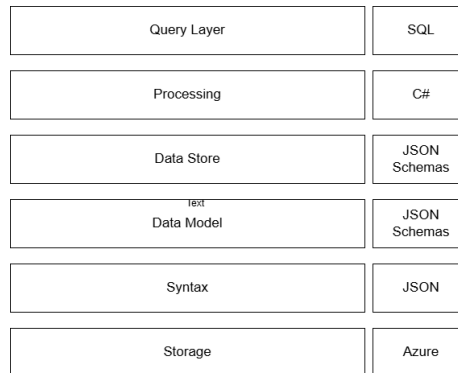| Query Layer	SQL
Processing	C#
Data Store	JSON Schemas
Text Data Model	JSON Schemas
Syntax	JSON
Storage	Azure

Figure 2: Architecture Diagram

that I will need to reference to make my own. 4. Azure documentation [3] I will be using Azure to store my data before and after it has been processed. These docs will help guide me as I learn Microsoft Azure 5. Microsoft SQL documentation [4] I will be using Microsoft SQL for my querying. I actually have some experience with SQL and will need to learn any changes made with Microsoft SQL.

4   Github Link

https://github.com/NBorchuck/USA-and-Canada-United-Weather-System

References

[1] Open Geospatial Consortium. Ogc api technical doc, 2026.

[2] JSON-Schema.org. welcome, 2026.

[3] Microsoft. Azure documentation, 2026.

[4] Microsoft. Microsoft sql documentation, 2026.

[5] National Weather Service. Api web service, 2026.