

Discrete Global Grid Systems: Status Update

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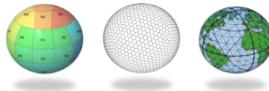
Reusable



Overview

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- The Spatial Data Problem(s)
- Discrete Global Grid Systems – A Brief Overview
- Discrete Global Grid Systems – Standards Roadmap
- OGC API – Discrete Global Grid Systems



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The Spatial Data Problem(s)

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A globe is a good physical model
of the Earth...
but difficult to fit into your pocket



c. 1506

Da Vinci (and the Mappa Mundi) paved the
way for modern cartography



We can now build and use digital globes



But... Computers are not limited to 2D



Conventional GIS puts the map
onto a computer screen



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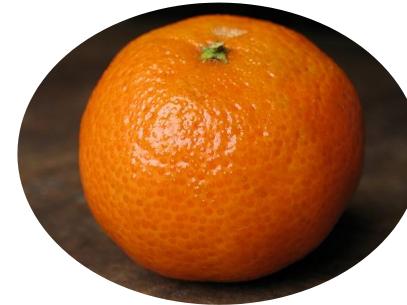
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The Spatial Data Problem(s)

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We collect spatial data in ‘Real World’
Contexts...

but we usually “flatten” the data
before we try to use it!



Global Context



Map Projection
Context



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The Spatial Data Problem(s)

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Problem

- We need to manage our assets better, cheaper and more proactively.
- Increasing the amount of data we are tracking about our assets means managing the massive growth in storage and compute resource demands.
- Just throwing more data at the issue will not solve the problem! – ***we are beyond the limit of Moore's Law.***
- There needs to be a better way to proactively manage our assets without drowning in a sea of data.

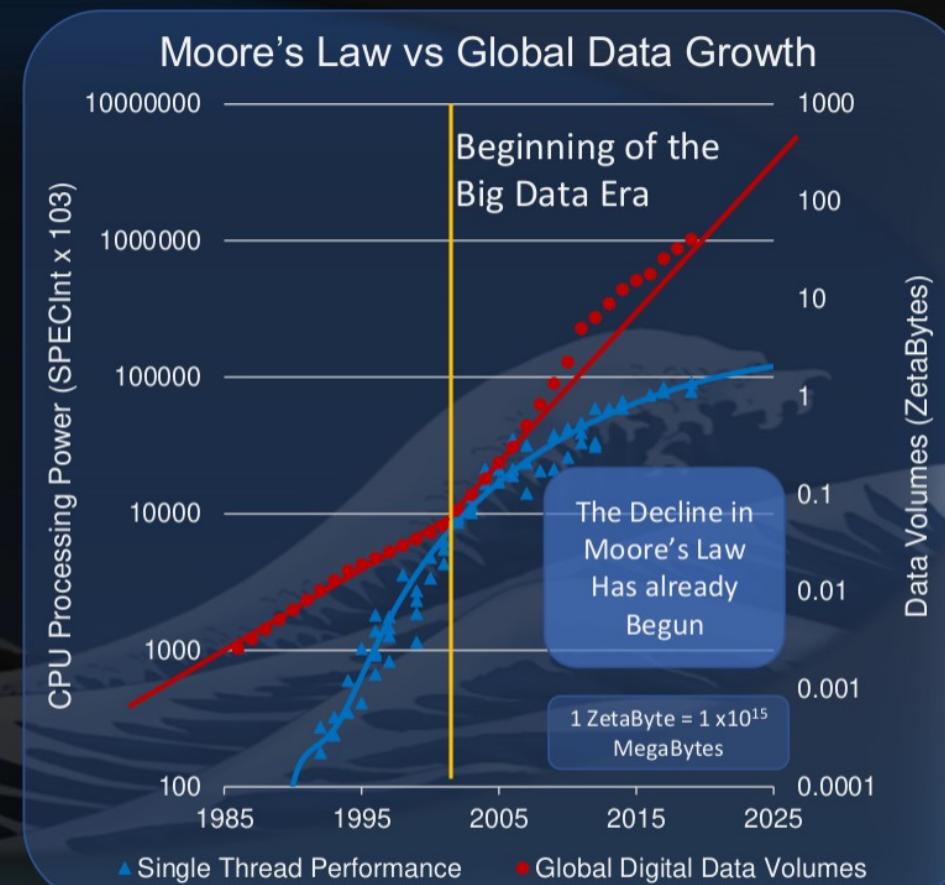


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Data from:

- Rydning, D.R.J.G.J., 2018. The digitization of the world from edge to core. *Framingham: International Data Corporation.*
- Hilbert, M., 2016. Enabling dBasedigital development. The data revolution. *World Development Report*, pp.244-247. and,
- K.Rupp et. al. (<https://github.com/karlrupp/microprocessor-trend-data>)

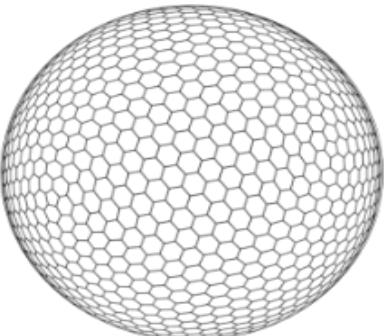
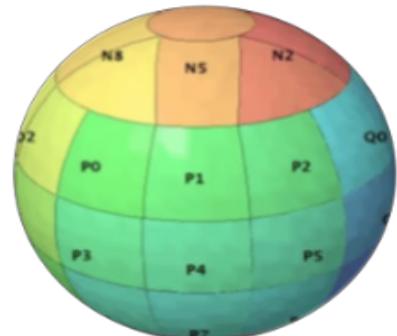
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Discrete Global Grid Systems – A Brief Overview

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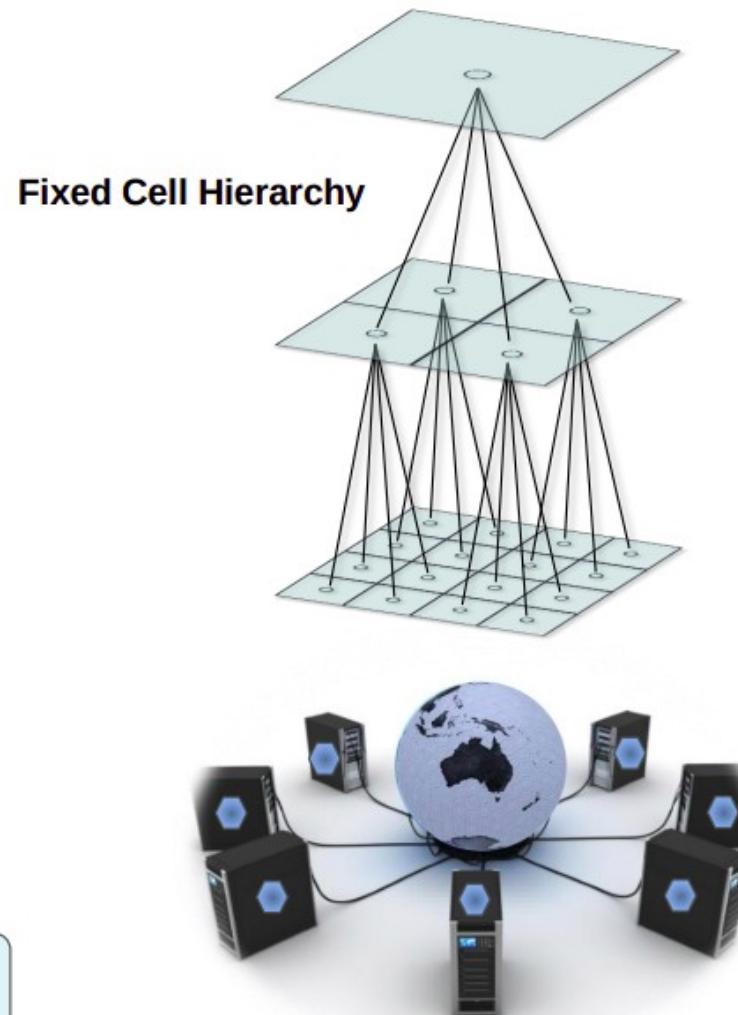
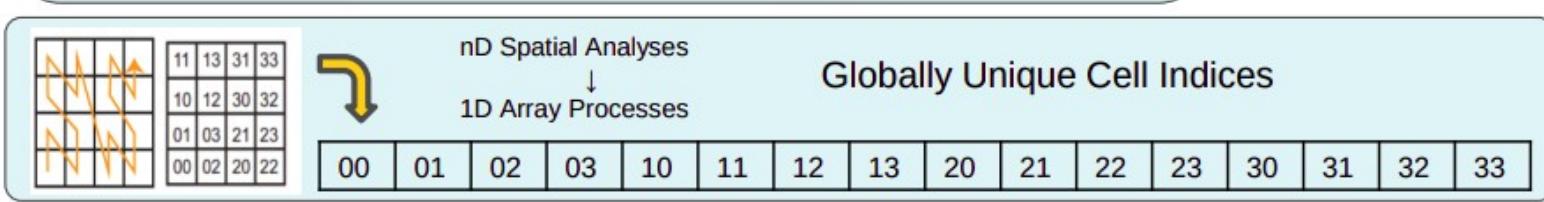
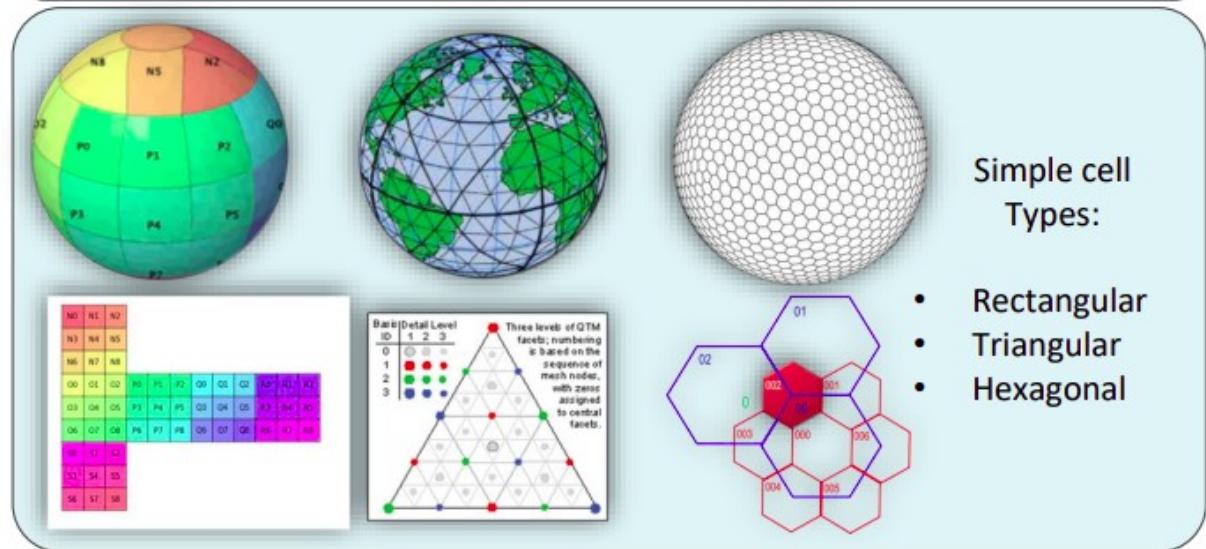
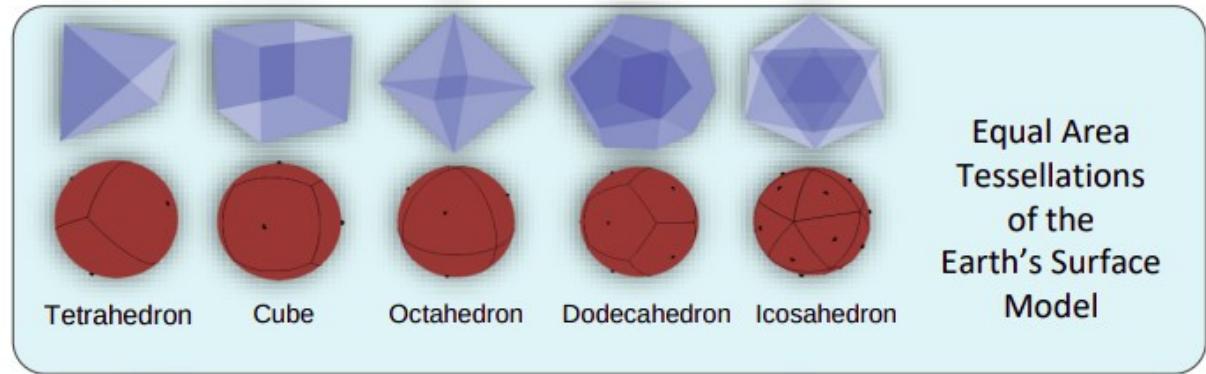
- A DGGS is a Digital Earth reference model
- DGGS are designed to be information grid systems, not navigational grid systems
- OGC defines a DGGS as:
- “...a *spatial reference system* that uses a *hierarchical tessellation of cells* to partition and address the globe. DGGS are characterized by the properties of their cell structure, geo-encoding, quantization strategy and associated mathematical functions.”



Discrete Global Grid Systems – A Brief Overview

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Discrete Global Grid Systems – Standards Roadmap

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- OGC Abstract Specification – Topic 21, v2.0 [OGC 20-040r3]
- ISO 19170-1:2021
 - **Part 1:** Core Reference system and Operations and Equal Area Earth Reference System [OGC 20-040r3]
 - **Part 2:** Equal Volume Earth Reference System
 - **Part 3:** Spatio-Temporal Discrete Global Grid System
 - **Part 4:** Axis-aligned Discrete Global Grid System
 - OGC API DGGS



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OGC API - Discrete Global Grid Systems

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- ISO 19170-1:2021
 - Defines the DGGS Reference System and Core Topological Functions
- But how do we access DGGS infrastructures and the data they contain?
- OGC APIs (or more generally Open APIs) provide a structured and modular way to discover and share data across the web
- Conventional spatial data infrastructures can be serviced via OGC API Features, Coverages, Tiles, Maps, etc...
- DGGS infrastructures can take advantage of these APIs too.
- But, in doing so we lose direct access to the DGGS topological functions.



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OGC API - Discrete Global Grid Systems

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- A High Level view of OGC API DGGS
- <https://github.com/opengeospatial/ogcapi-discrete-global-grid-systems>
- Swagger.io view
- Conformance Classes
 - **Core/Common**
 - /
 - /api
 - /api/all-collections
 - /api/dggs



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- Conformance Classes – Cont.

- **Data Collections**

- /collections
 - /collections/{collectionId}

- **DGGS Definition**

- /dggs
 - /dggs/{dggsRSID}
 - /dggs/{dggsRSID}/zones/{zonallD}
 - /collections/{collectionId}/dggs
 - /collections/{collectionId}/dggs/{dggsRSID}
 - /collections/{collectionId}/dggs/{dggsRSID}/zones/{zonallD}

- Conformance Classes – Cont.

- **DGGS Data Retrieval**

- `/dggs/{dggsRSID}/data`
 - `/dggs/{dggsRSID}/zones/{zonalID}/data`
 - `/collections/{collectionId}/dggs/{dggsRSID}/data`
 - `/collections/{collectionId}/dggs/{dggsRSID}/zones/{zonalID}/data`

- **DGGS Zone Query**

- `/dggs/{dggsRSID}/zones`
 - `/collections/{collectionId}/dggs/{dggsRSID}/zones`

- Work currently underway to validate and refine the OGC API DGGS Definition Document and draft the OGC API DGGS Standard Specification.

Space Partitions Code Sprint

ghobona edited this page 5 days ago · 34 revisions

16th OGC API Code Sprint

Hosted by:



Topics

This Sprint will focus on all parts of [OGC API - Discrete Global Systems \(DGGS\)](#), [OGC API - Tiles](#), [OGC API - Coverages](#), and [OGC API - Environmental Data Retrieval \(EDR\)](#). Each of these candidate and approved Standards provide a web interface to access some kind of partitioning of space. For OGC API - DGGS it's a hierarchical tessellation of cells; for OGC API - Tiles it's a pyramid of tiles; for OGC API - Coverages it's an homogeneous space/time collection; and for OGC API - EDR it's a sampleable collection of environmental resources. If you are new to Code Sprints, please check the [mentor streams below](#).

Period and location

The code sprint will take place from 10th to 12th of May, 2022.

OGC



Thank You!



Contact info@ogc.org to schedule a meeting for an in-depth discussion with OGC staff and join our community today!



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