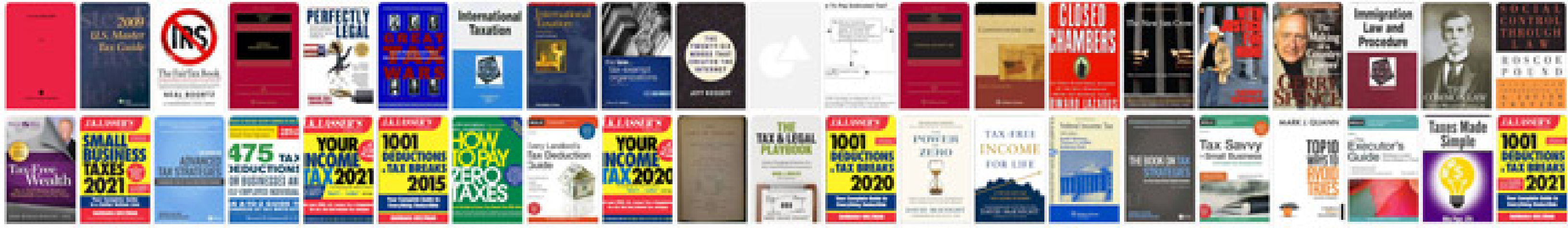

3.0 vulcan

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The Vulkan 1. This fine level of control allows developers to focus shading resources where they are needed, which ultimately increases rendering performance and quality. In December , an updated Vulkan SDK was rolled out, integrating all the components necessary for developers to easily use the new ray tracing extensions, including ray tracing validation. Together with updated Vulkan Samples , and upgraded Vulkan Guide and shipping production drivers shipping from multiple vendors, developers are now truly enabled to easily integrate Vulkan Ray Tracing into their applications. Khronos will continue delivering regular Vulkan ecosystem updates with this proven, developer-focused methodology to both meet the needs and expand the horizons of real-world applications. One of the key requests from the developer community was the ability to easily bring DirectX 12 ray tracing DXR code to Vulkan. We look forward to seeing how this technology progresses. As the Apex Engine looks to adopt and avail of the latest hardware developments, it is great to see Vulkan keeping pace and investing in support for cutting edge features like hardware accelerated ray tracing. The first product to feature raytraced effects like reflections and global illumination will be the forthcoming GPUScore benchmark. Industry-wide accepted open standards are essential for our goal. This is going to be huge! For us, the upcoming ray tracing functionality was a big motivation for why we are working on Vulkan real-time rendering already since At Crytek, the Vulkan API is playing a major part in driving advancements in this area, helping us to deliver a high-performance game-engine with outstanding visuals across different platforms and operating systems. We are pleased that Khronos is releasing vendor-independent Vulkan Ray Tracing extensions that define essential functionality for bringing real-time ray tracing to Vulkan supported applications. Similar to the rasterization domain, this extension plays a major part in our plans for offering cutting edge ray-tracing functionality in CRYENGINE, while benefiting greatly from hardware-specific implementations of each vendor. Our rendering technology serves a multitude of industries and use-cases, ranging from high-performance, real-time scenarios to high-quality GI and physical light simulation. Vulkan Ray Tracing enables us to bring hardware accelerated ray tracing into the hands of our users in a cross-platform and vendor agnostic way. This is huge! We are excited about this release from Khronos as it will pioneer future innovations that deliver extraordinary experiences for players. These advances will provide greater situational awareness across land, sea, space and cyber, leading to greater effectiveness, cost savings and risk reduction in areas such as Command and Control C2 , planning, training, maintenance and medicine. For the first time, graphics developers are able to leverage hardware ray tracing through a fully performant, cross platform and vendor agnostic API. In general we find the arrival of vendor agnostic ray tracing to be an excellent development for the industry. We are delighted with the arrival of vendor-agnostic ray tracing in Vulkan and we are excited to see how it develops. This expands the potential for both content creators and new cloud and client rendering architectures. We are excited about the possibilities this opens up for our partners and customers. Download the latest drivers for your system that now include Vulkan 1. Download demos and open source samples to take your new Vulkan API for a test drive - and get a heads up on Vulkan resources. Looking to take your project to the next level? Look no further: Here are several production ready engines that currently support Vulkan. Khronos welcomes any company creating graphics hardware or systems to implement and ship the Vulkan API. The Vulkan specification is free for anyone to download and implement. If you want to use the Vulkan name or logo on your implementation, and enjoy the protection of the Khronos Intellectual Property Framework, you can become a Vulkan Adopter. Want to create your own tools and SDKs for Vulkan? Khronos has placed an unprecedented amount of materials into open source so you can provide feedback, showcase your work, fix bugs, and extend Vulkan capabilities for the future. The Vulkan SDK provides Vulkan application developers with essential tools to accelerate the development process. Google gives you everything you need to incorporate Vulkan into your Android games and other apps where graphics performance is key. Visit the Android developer website to download the API, samples, and documentation: resources to help you hit the ground running. Vulkan Portability enables Vulkan applications to be reliably deployed across diverse platforms through the ongoing development of standardized queries for available layered API functionality, ensuring all provided functionality is conformance tested, and providing development layers for the Vulkan SDK including on macOS. Toggle navigation. Industry Forged Vulkan is a new generation graphics and compute API that provides high-efficiency, cross-platform access to modern GPUs used in a wide variety of devices from PCs and consoles to mobile phones and embedded platforms. Vulkan 1. Industry Support for Vulkan Ray Tracing. Hyungmin Yoon. Engines Looking to take your project to the next level? Get Involved! Help Us Evolve the Vulkan Ecosystem Khronos has placed an unprecedented amount of materials into open source so you can provide feedback, showcase your work, fix bugs, and extend Vulkan capabilities for the

future. Develop for Android. Learn moreâ€¦. Related Discussions [BUG] "validation layers requested, but not available! Vulcan v3. There are 66 data files in standardized netCDF version 4 format associated with this dataset. This includes a set of 33 files for each of the two geographic areas: the contiguous United States and Alaska. Each file contains 6 time steps, one for each year in - Figure 1. Source: Figure 3 a in Gurney et al. Gurney, K. Liang, R. Patarasuk, Y. Song, J. Huang, and G. The Vulcan version 3. Data are gridded annually on a 1-km grid for the years to These data are annual sums of hourly estimates. For each uncertainty level, there are 10 individual sector files and one total file. These data are designed to be used as emission estimates in atmospheric transport modeling, policy, mapping, and other data analyses and applications. The NACP is supported by a number of different federal agencies. The Vulcan Version 3. These netCDF files contain parameter and spatial metadata within the file header following Climate and Forecast metadata convention version 1. See descriptions below. The Vulcan v3. Better understanding both the FFCO 2 emissions and the net biosphere carbon exchange improves projections of climate change through more reliable estimation of climate-carbon feedback. It can also be used in direct policymaking by offering more granular detail on FFCO 2 emission processes and magnitudes. The uncertainty of the Vulcan results are estimated by attempting to capture key input parameter variation. This is accomplished by completing a simulation with key input parameters e. These two additional simulations estimated total annual domain FFCO2 emissions as Two separate techniques are used to test the general quality of the Vulcan v3. At the whole contiguous US spatial scale and annual temporal scale, the Vulcan results were within 1. Following are brief descriptions of the data sources and processing methods employed to create the Vulcan v3. A bibliography for the data sources is provided at the end of this section. For details and descriptions of uncertainty calculations please refer to Gurney et al. Emissions of FFCO 2 from the residential, commercial, industrial, nonroad, commercial marine vessels, airport, and rail sectors were derived from the CO emissions reporting within the U. Distribution of the sources to space and time utilize numerous federal datasets outlined in Table 1. Further details are provided in the following methods sub-sections. Table 1. Data sources used to derive the Vulcan v3. A bibliography for the sources is provided at the end of this section. Where the CO 2 emissions for a process n e. The self-reported CO EF values are assessed for reliability and replaced by a default value if the self-reported value is less than 0. The general approach follows: where the total emissions, TE , associated with a building of type, n , using fuel, f , in a block-group, bg , is equal to the product of the total floor area, TFA , and the energy use intensity, EUI , of buildings in a census division, cd. Each point emission record is also associated with an SCC which is used to retrieve the needed CO and CO 2 EFs to enact the same procedure outlined in the description of the nonpoint source processing. These temporal surrogates are comprised of three cyclic time profiles diurnal, weekly, monthly specific to SCC that are combined to generate hourly SCC-specific time fractions for an entire calendar year. Records which do not have an SCC match are distributed as a constant hourly emission. Overlap exists between these three data sources described above which is corrected according to the prioritization in the order listed above. Some manual corrections are performed to the geocoordinates of both the CAMD and EIA electricity production data, as a result of searching in Google Earth or via alternative online information resources e. A hierarchy was employed given that there was overlap between the two datasets. This was performed at the unit level given that a single facility might have individual power units reporting to CAMD and another only reporting to the EIA. Where overlap did exist at this scale, preference was made to retain the CAMD data. Further details and rationale can be found in Gurney et al. County-scale FFCO 2 emissions for all US states are spatially assigned to road segments via a road basemap that best represents the entirety of the road surface occupied by onroad vehicles. Inverse Distance Weighted IDW interpolation was performed for each of the four temporal road classes separately, and only for grid cells that are occupied by roads of that road class. The two inputs are the gap-filled CCS traffic data, and the locations of road segments for each of the four road classes. As with the onroad sector, California presents a special case. There were instances in which nonroad FFCO 2 emissions could not be associated with a spatial entity due to missing data. These emissions are spatialized by first aggregating all the unassociated sub-county emission elements to the county scale for a given spatial shape e. The airports are geocoded to the airport location in the NEI though some manual adjustments have been made to the original coordinates using manual inspection in Google Earth. Temporal distribution of the FFCO 2 airport emissions use a series of datasets. Emissions related to the railroad sector were reported as a mixture of nonpoint and point emissions and hence, these were managed separately but combined when represented as spatial entities. The CO emissions were converted to FFCO 2 following the procedures outlined in the nonpoint and the point sections, respectively. The point source railroad emissions are associated with rail yards and related geo-specific locales and are placed in space according to the provided latitude and longitude. A large number of railroad emission records have no railroad segment match and are spatialized using freight statistics described in supplementary material. The CMV emissions encompass maneuvering, hoteling, cruise and reduced speed zone travel and are specific to geographically located ports and shipping lanes that extend 12 nautical miles from the US shoreline. The CMV sector has no data allowing for the designation of hourly time structure. This approach succeeded in locating all facilities present in the PCA document. The cement sector has no data allowing for the designation of hourly time structure. Energy Information Administration. Department of Energy, Washington D. Hirsch, J. Environmental Protection Agency, December. Office of Air Quality Planning and Standards. Department of the Interior, U. Geological Survey. December Basu S. Lehman, J. Miller, A. Andrews, C. Sweeney, K. Gurney, X. Xu, J. Southon, P. Skip to main content. Advanced Data Search. DOI Search Page. Referred to as FFCO2, the emissions from Vulcan are categorized into 10 source sectors including; residential, commercial, industrial, electricity production, onroad, nonroad, commercial marine vessel, airport, rail, and cement. Related Publication: Gurney, K. Missing values are represented by Data Sources Emissions of FFCO 2 from the residential, commercial, industrial, nonroad, commercial marine vessels, airport, and rail sectors were derived from the CO emissions reporting within the U. Emissions Factors Model b.

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Federal Emergency Management Agency e. Continuous Count Stations f. Clean Air Markets Division g. Quick Energy Simulation Tool j. Source Classification Code k. Point sources commercial, industrial Each point emission record is also associated with an SCC which is used to retrieve the needed CO and CO 2 EFs to enact the same procedure outlined in the description of the nonpoint source processing. Electricity production Overlap exists between these three data sources described above which is corrected according to the prioritization in the order listed above. Onroad County-scale FFCO 2 emissions for all US states are spatially assigned to road segments via a road basemap that best represents the entirety of the road surface occupied by onroad vehicles. Commercial Marine Vessels CMV The CMV emissions encompass maneuvering, hoteling, cruise and reduced speed zone travel and are specific to geographically located ports and shipping lanes that extend 12 nautical miles from the US shoreline.