Scalable PaleoGeomorphology Model (SPGM)

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Chapter 1

Namespace Index

1.1 Namespace List

Here is a list of all namespaces with brief descriptions:

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Chapter 2

Class Index

2.1 Class Hierarchy

This inheritance list is sorted roughly, but not completely, alphabetically:

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3.1 Class List

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Chapter 5

Namespace Documentation

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- namespace mem
- namespace mesh
- namespace model
- namespace parser
- namespace util

5.2 src::geometry Namespace Reference

Classes

- class VSite
- class Site
- class SiteComparator
- class Edge
- class QuadEdge
- class Triangulator

Functions

- float FABS (float a)

5.2.1 Function Documentation

5.2.1.1 float src::geometry::FABS (float *a*) [inline]

Definition at line 57 of file Topology.hh.

```
{return ((a) >= 0.0 ? (a) : -(a));}
```

5.3 src::math Namespace Reference

Classes

- class Diffusion

5.4 src::mem Namespace Reference

Classes

- class PoolAllocator
- class PoolAllocator< void >
- struct Chunk
- class MemoryPool

Functions

- template<class T >
  bool operator== (const PoolAllocator< T > &, const PoolAllocator< T > &)
- template<class T >
  bool operator!= (const PoolAllocator< T > &, const PoolAllocator< T > &)
- void InitPool ()
- void FinalisePool ()

Variables

- pthread_mutex_t mutex
- static std::vector< MemoryPool * > pools
- const int CHUNK_ARRAY_DELTA = 10
- const int INVALID = -1
- const int SUCCESS = 1
- const int FAILURE = 0
- const int TWO_EXP16 = 65535

5.4.1 Function Documentation

5.4.1.1 void src::mem::FinalisePool ( )

5.4.1.2 void src::mem::InitPool ( )

5.4.1.3 template<class T > bool src::mem::operator!= (const PoolAllocator< T > & , const PoolAllocator< T > &) [inline]

Definition at line 167 of file Allocator.hh.

```
{
    return false;
}
```

5.4.1.4 template<class T > bool src::mem::operator== (const PoolAllocator< T > & , const PoolAllocator< T > &) [inline]

Definition at line 160 of file Allocator.hh.

```
{
    return true;
}
```

5.4.2 Variable Documentation

5.4.2.1 const int src::mem::CHUNK_ARRAY_DELTA = 10

Definition at line 49 of file MemoryPool.hh.

5.4.2.2 const int src::mem::FAILURE = 0

Definition at line 52 of file MemoryPool.hh.

5.4.2.3 const int src::mem::INVALID = -1

Definition at line 50 of file MemoryPool.hh.

5.4.2.4 pthread_mutex_t src::mem::mutex

5.4.2.5 std::vector<MemoryPool*> src::mem::pools [static]

Definition at line 49 of file Allocator.hh.

5.4.2.6 const int src::mem::SUCCESS = 1

Definition at line 51 of file MemoryPool.hh.

5.4.2.7 const int src::mem::TWO_EXP16 = 65535

Definition at line 53 of file MemoryPool.hh.

5.5 src::mesh Namespace Reference

Classes

- class KdItem
- class KdNode
- class KdTree
- class RegularMesh
- class SurfaceTopology
- class SurfaceTopologyOutput

5.6 src::model Namespace Reference

Classes

- class FluvialErosion
- class FluvialErosionDeposition
- class HillSlope
- class Model
- class ModelBuilder
- class Precipitation
- class Process
- class Uplift

5.7 src::parser Namespace Reference

Classes

- class Config

Enumerations

- enum LogLevel { LOG_QUIET, LOG_ERROR, LOG_INFO, LOG_DEBUG }

Functions

- void debugBreak ()
- vector< string > split (const string &s, char delim)

Variables

- LogLevel logLevel

5.7.1 Enumeration Type Documentation

5.7.1.1 enum src::parser::LogLevel

Enumerator:

LOG_QUIET

LOG_ERROR

LOG_INFO

LOG_DEBUG

Definition at line 48 of file Log.hh.

```
{ LOG_QUIET, LOG_ERROR, LOG_INFO, LOG_DEBUG };
```

5.7.2 Function Documentation

5.7.2.1 void src::parser::debugBreak ( )

5.7.2.2 vector<string> src::parser::split (const string & *s*, char *delim*)

5.7.3 Variable Documentation

5.7.3.1 LogLevel src::parser::logLevel

5.8 src::util Namespace Reference

Classes

- class Field
- class ScalarField
- class Timer
- class TimeSeries

Chapter 6

Class Documentation

6.1 src::mem::Chunk Struct Reference

`#include <MemoryPool.hh>`

Public Attributes

- char * memory
- int numFree
- int chunkId
- char ** freeList

6.1.1 Detailed Description

Definition at line 61 of file MemoryPool.hh.

6.1.2 Member Data Documentation

6.1.2.1 int src::mem::Chunk::chunkId

Definition at line 65 of file MemoryPool.hh.

6.1.2.2 char** src::mem::Chunk::freeList

Definition at line 66 of file MemoryPool.hh.

6.1.2.3 char* src::mem::Chunk::memory

Definition at line 63 of file MemoryPool.hh.

6.1.2.4 int src::mem::Chunk::numFree

Definition at line 64 of file MemoryPool.hh.

The documentation for this struct was generated from the following file:

- src/mem/MemoryPool.hh

6.2 src::parser::Config Class Reference

`#include <Config.hh>`

Public Member Functions

- Config (string configFile)
- ~Config ()
- string PString (string name)
- bool PBool (string name)
- double PDouble (string name)
- int PInt (string name)
- map< string, string > & GetSymbols ()
- Config * Group (string name)
- map< string, Config * > & GetGroups ()
- string GetConfigName ()

6.2.1 Detailed Description

Definition at line 72 of file Config.hh.

6.2.2 Constructor & Destructor Documentation

6.2.2.1 src::parser::Config::Config (string *configFile*)

6.2.2.2 src::parser::Config::~Config ( )

6.2.3 Member Function Documentation

6.2.3.1 string src::parser::Config::GetConfigName ( ) [inline]

Definition at line 116 of file Config.hh.

```
{return m_debugInfo;}
```

6.2.3.2 map<string, Config*>& src::parser::Config::GetGroups ( ) [inline]

Definition at line 111 of file Config.hh.

```
{
    return m_groups;
}
```

6.2.3.3 map<string, string>& src::parser::Config::GetSymbols ( ) [inline]

Definition at line 98 of file Config.hh.

```
{
    return m_symbols;
}
```

6.2.3.4 Config* src::parser::Config::Group (string *name*) [inline]

Definition at line 104 of file Config.hh.

```
{
    if(m_groups.find(name) == m_groups.end()) return NULL;
    return m_groups[name];
}
```

6.2.3.5 bool src::parser::Config::PBool (string *name*)

6.2.3.6 double src::parser::Config::PDouble (string *name*)

6.2.3.7 int src::parser::Config::PInt (string *name*)

6.2.3.8 string src::parser::Config::PString (string *name*)

The documentation for this class was generated from the following file:

- src/parser/Config.hh

6.3 src::math::Diffusion::Coord_t Struct Reference

`#include <Diffusion.hh>`

Public Member Functions

- Coord_t (float _x, float _y)

Public Attributes

- float x
- float y

6.3.1 Detailed Description

Definition at line 64 of file Diffusion.hh.

6.3.2 Constructor & Destructor Documentation

6.3.2.1 src::math::Diffusion::Coord_t::Coord_t (float _x, float _y) [inline]

Definition at line 65 of file Diffusion.hh.

```
:x(_x),y(_y){} }Coord;
```

6.3.3 Member Data Documentation

6.3.3.1 float src::math::Diffusion::Coord_t::x

Definition at line 64 of file Diffusion.hh.

6.3.3.2 float src::math::Diffusion::Coord_t::y

Definition at line 64 of file Diffusion.hh.

The documentation for this struct was generated from the following file:

- src/math/Diffusion.hh

6.4 src::math::Diffusion Class Reference

```
#include <Diffusion.hh>
```

Classes

- struct Coord_t

Public Types

- typedef struct src::math::Diffusion::Coord_t Coord
- typedef float(* ForcingFunc)(float, float, float)
- typedef float(* NeumannFunc)(float, float, float)

Public Member Functions

- Diffusion (SurfaceTopology *st, ForcingFunc f, NeumannFunc n, int nt, float dt, double tolerance, int maxIterations)
- ~Diffusion ()
- void SetIC (vector< float > *vals)
- void SetDirichlet (vector< float > *dirichlet)
- void SetCoefficient (vector< float > *coefficient)
- void GetSolution (vector< float > *result)
- void Step ()

Public Attributes

- MatrixXf m_solutions

6.4.1 Detailed Description

Definition at line 60 of file Diffusion.hh.

6.4.2 Member Typedef Documentation

6.4.2.1 typedef struct src::math::Diffusion::Coord_t src::math::Diffusion::Coord

6.4.2.2 typedef float(* src::math::Diffusion::ForcingFunc)(float, float, float)

Definition at line 67 of file Diffusion.hh.

6.4.2.3 typedef float(* src::math::Diffusion::NeumannFunc)(float, float, float)

Definition at line 68 of file Diffusion.hh.

6.4.3 Constructor & Destructor Documentation

6.4.3.1 src::math::Diffusion::Diffusion (SurfaceTopology * *st*, ForcingFunc *f*, NeumannFunc *n*, int *nt*, float *dt*, double *tolerance*, int *maxIterations*)

6.4.3.2 src::math::Diffusion::~Diffusion ( )

6.4.4 Member Function Documentation

6.4.4.1 void src::math::Diffusion::GetSolution (vector< float > * *result*)

6.4.4.2 void src::math::Diffusion::SetCoefficient (vector< float > * *coefficient*)

6.4.4.3 void src::math::Diffusion::SetDirichlet (vector< float > * *dirichlet*)

6.4.4.4 void src::math::Diffusion::SetIC (vector< float > * *vals*)

6.4.4.5 void src::math::Diffusion::Step ( )

6.4.5 Member Data Documentation

6.4.5.1 MatrixXf src::math::Diffusion::m_solutions

Definition at line 82 of file Diffusion.hh.

The documentation for this class was generated from the following file:

- src/math/Diffusion.hh

6.5 src::geometry::Edge Class Reference

`#include <Topology.hh>`

Public Member Functions

- Edge ()
- Edge * Rot ()
- Edge * Tor ()
- Edge * Sym ()
- Edge * Onext ()
- Edge * Oprev ()
- Edge * Dnext ()
- Edge * Dprev ()
- Edge * Lnext ()
- Edge * Lprev ()
- Edge * Rnext ()
- Edge * Rprev ()
- Site * Org ()
- Site * Dest ()
- VSite * VOrg ()
- VSite * VDest ()
- QuadEdge * Qedge ()
- void Onext_Set (Edge *e)
- void Org_Set (Site *s)
- void Dest_Set (Site *s)
- void VOrg_Set (VSite *vs)
- void VDest_Set (VSite *vs)

Friends

- class QuadEdge

6.5.1 Detailed Description

Definition at line 258 of file Topology.hh.

6.5.2 Constructor & Destructor Documentation

6.5.2.1 src::geometry::Edge::Edge ( ) [inline]

Definition at line 267 of file Topology.hh.

```
{ m_data[0] = m_data[1] = 0; }
```

6.5.3 Member Function Documentation

6.5.3.1 Site* src::geometry::Edge::Dest ( ) [inline]

Definition at line 297 of file Topology.hh.

```
{ return Sym()->Org(); }
```

6.5.3.2 void src::geometry::Edge::Dest_Set (Site * *s*) [inline]

Definition at line 310 of file Topology.hh.

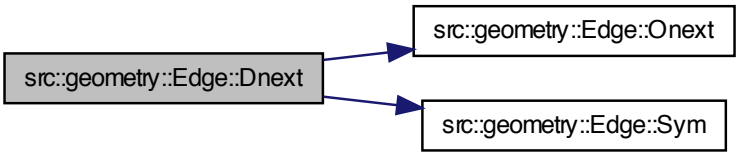
```
{ Sym()->Org_Set(s); }
```

6.5.3.3 Edge* src::geometry::Edge::Dnext ( ) [inline]

Definition at line 283 of file Topology.hh.

```
{ return Sym()->Onext()->Sym(); }
```

Here is the call graph for this function:

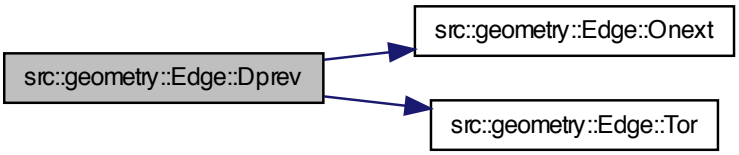


6.5.3.4 Edge* src::geometry::Edge::Dprev ( ) [inline]

Definition at line 285 of file Topology.hh.

```
{ return Tor()->Onext()->Tor(); }
```

Here is the call graph for this function:

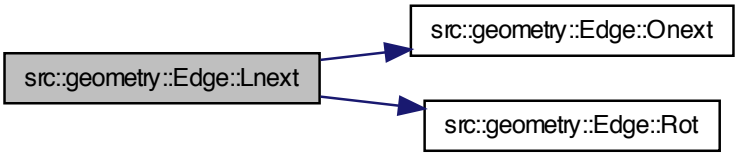


6.5.3.5 Edge* src::geometry::Edge::Lnext ( ) [inline]

Definition at line 287 of file Topology.hh.

```
{ return Tor()->Onext()->Rot(); }
```

Here is the call graph for this function:



6.5.3.6 Edge* src::geometry::Edge::Lprev ( ) [inline]

Definition at line 289 of file Topology.hh.

```
{ return Onext()->Sym(); }
```

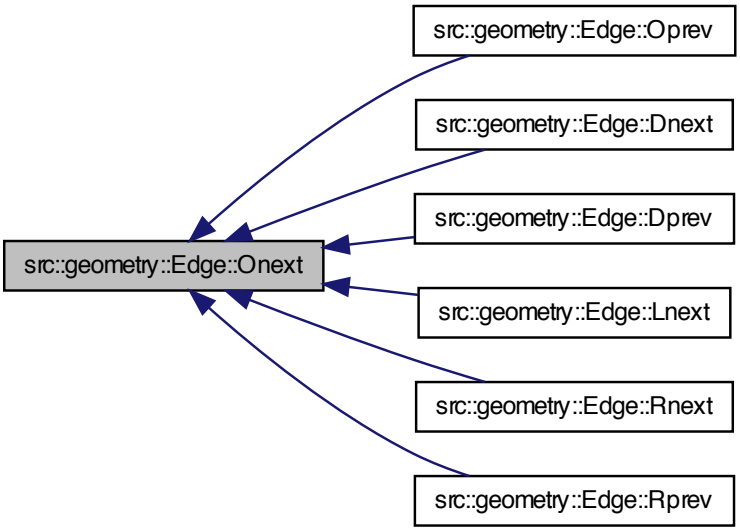
Here is the call graph for this function:

6.5.3.7 Edge* src::geometry::Edge::Onext ( ) [inline]

Definition at line 279 of file Topology.hh.

```
{ return m_next; }
```

Here is the caller graph for this function:



6.5.3.8 void src::geometry::Edge::Onext_Set (Edge * *e*) [inline]

Definition at line 308 of file Topology.hh.

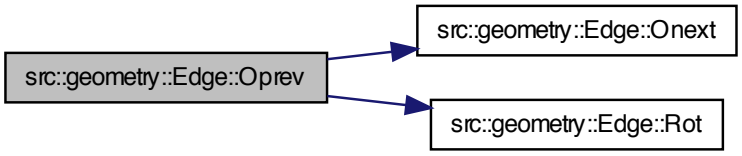
```
{ m_next = e; }
```

6.5.3.9 Edge* src::geometry::Edge::Oprev ( ) [inline]

Definition at line 281 of file Topology.hh.

```
{ return Rot()->Onext()->Rot(); }
```

Here is the call graph for this function:



6.5.3.10 Site* src::geometry::Edge::Org ( ) [inline]

Definition at line 295 of file Topology.hh.

```
{ return (Site*)m_data[0]; }
```

6.5.3.11 void src::geometry::Edge::Org_Set (Site * *s*) [inline]

Definition at line 309 of file Topology.hh.

```
{ m_data[0] = s; }
```

6.5.3.12 QuadEdge* src::geometry::Edge::Qedge ( ) [inline]

Definition at line 303 of file Topology.hh.

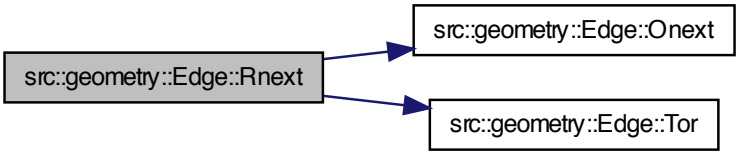
```
{ return (QuadEdge *)(this - m_num); }
```

6.5.3.13 Edge* src::geometry::Edge::Rnext ( ) [inline]

Definition at line 291 of file Topology.hh.

```
{ return Rot()->Onext()->Tor(); }
```

Here is the call graph for this function:

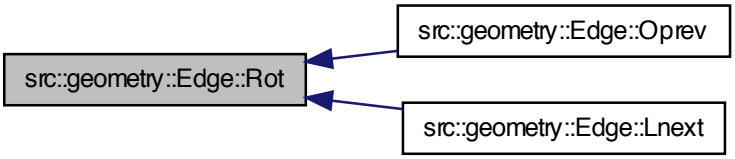


6.5.3.14 Edge* src::geometry::Edge::Rot ( ) [inline]

Definition at line 273 of file Topology.hh.

```
{ return (m_num < 3) ? this + 1 : this - 3; }
```

Here is the caller graph for this function:



6.5.3.15 Edge* src::geometry::Edge::Rprev ( ) [inline]

Definition at line 293 of file Topology.hh.

```
{ return Sym()->Onext(); }
```

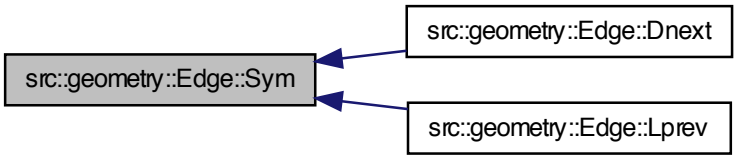
Here is the call graph for this function:

6.5.3.16 Edge* src::geometry::Edge::Sym ( ) [inline]

Definition at line 277 of file Topology.hh.

```
{ return (m_num < 2) ? this + 2 : this - 2; }
```

Here is the caller graph for this function:

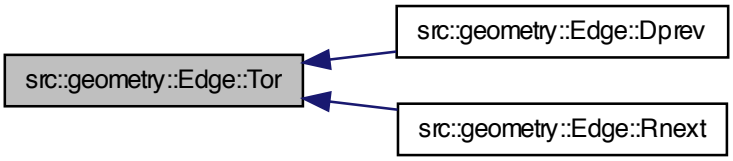


6.5.3.17 Edge* src::geometry::Edge::Tor ( ) [inline]

Definition at line 275 of file Topology.hh.

```
{ return (m_num > 0) ? this - 1 : this + 3; }
```

Here is the caller graph for this function:



6.5.3.18 VSite* src::geometry::Edge::VDest ( ) [inline]

Definition at line 301 of file Topology.hh.

```
{ return Sym()->VOrg(); }
```

6.5.3.19 void src::geometry::Edge::VDest_Set (VSite * *vs*) [inline]

Definition at line 312 of file Topology.hh.

```
{ Sym()->VOrg_Set(vs); }
```

6.5.3.20 VSite* src::geometry::Edge::VOrg ( ) [inline]

Definition at line 299 of file Topology.hh.

```
{ return (VSite*)m_data[1]; }
```

6.5.3.21 void src::geometry::Edge::VOrg_Set (VSite * *vs*) [inline]

Definition at line 311 of file Topology.hh.

```
{ m_data[1] = vs; }
```

6.5.4 Friends And Related Function Documentation

6.5.4.1 friend class QuadEdge [friend]

Definition at line 260 of file Topology.hh.

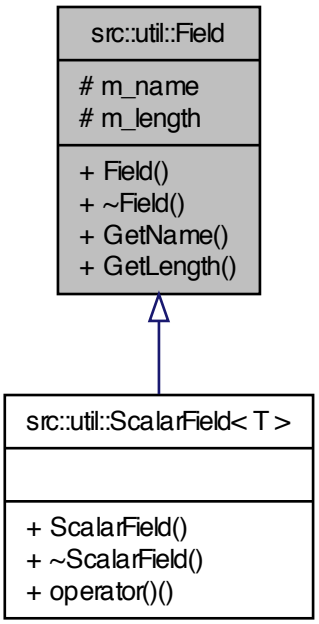
The documentation for this class was generated from the following file:

- src/geometry/Topology.hh

6.6 src::util::Field Class Reference

`#include <Field.hh>`

Inheritance diagram for src::util::Field:



Public Member Functions

- Field (string name, unsigned int length)
- virtual ~Field ()

- string GetName ()
- unsigned int GetLength ()

Protected Attributes

- string m_name
- unsigned int m_length

6.6.1 Detailed Description

Definition at line 53 of file Field.hh.

6.6.2 Constructor & Destructor Documentation

6.6.2.1 src::util::Field::Field (string *name,* unsigned int *length*)

6.6.2.2 virtual src::util::Field::~Field ( ) [virtual]

6.6.3 Member Function Documentation

6.6.3.1 unsigned int src::util::Field::GetLength ( )

6.6.3.2 string src::util::Field::GetName ( )

6.6.4 Member Data Documentation

6.6.4.1 unsigned int src::util::Field::m_length [protected]

Definition at line 64 of file Field.hh.

6.6.4.2 string src::util::Field::m_name [protected]

Definition at line 63 of file Field.hh.

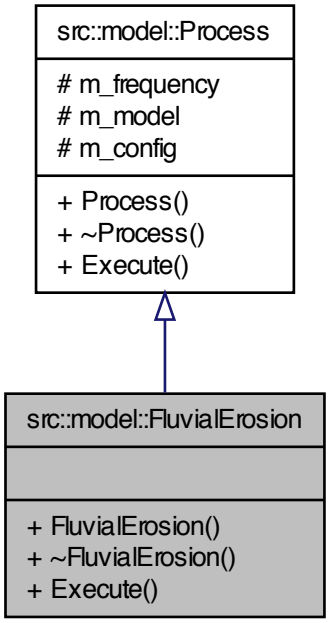
The documentation for this class was generated from the following file:

- src/util/Field.hh

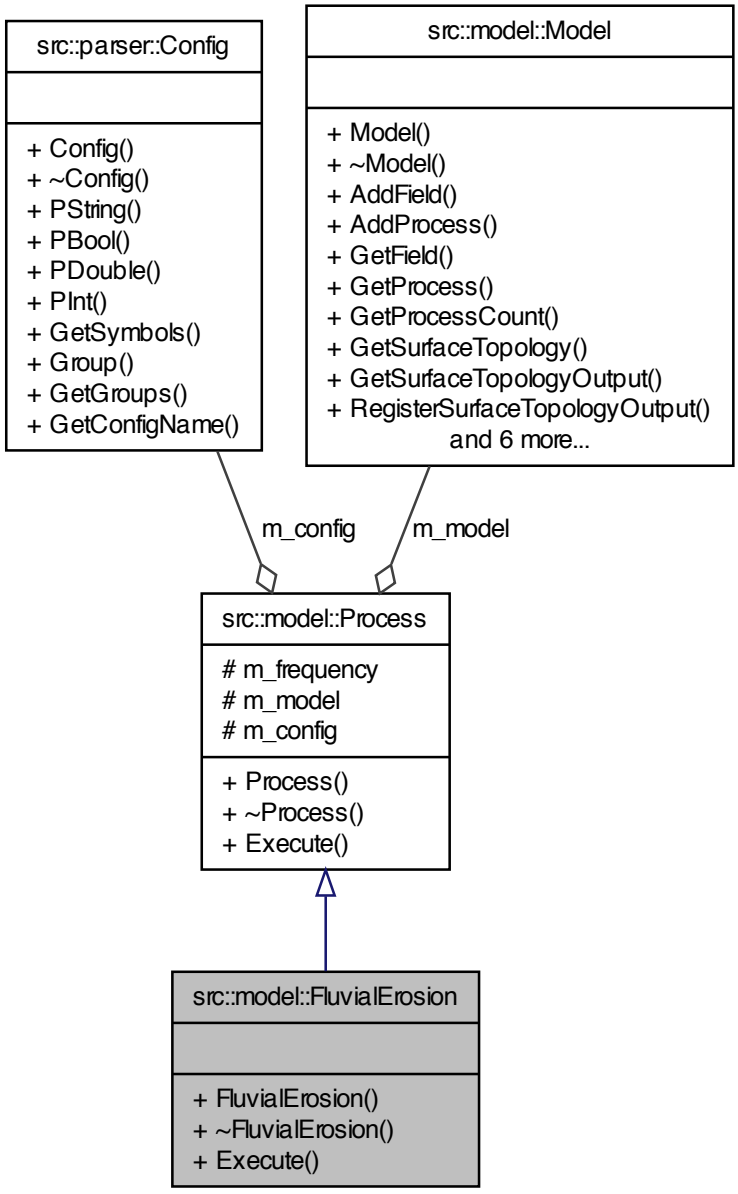
6.7 src::model::FluvialErosion Class Reference

```
#include <FluvialErosion.hh>
```

Inheritance diagram for src::model::FluvialErosion:



Collaboration diagram for src::model::FluvialErosion:



Public Member Functions

- FluvialErosion (const Model ∗m, Config ∗c)
- ∼FluvialErosion ()
- void Execute ()

6.7.1 Detailed Description

Definition at line 60 of file FluvialErosion.hh.

6.7.2 Constructor & Destructor Documentation

6.7.2.1 src::model::FluvialErosion::FluvialErosion (const Model ∗ *m,* Config ∗ *c*)

6.7.2.2 src::model::FluvialErosion::∼FluvialErosion ( )

6.7.3 Member Function Documentation

6.7.3.1 void src::model::FluvialErosion::Execute ( ) [virtual]

Implements src::model::Process.

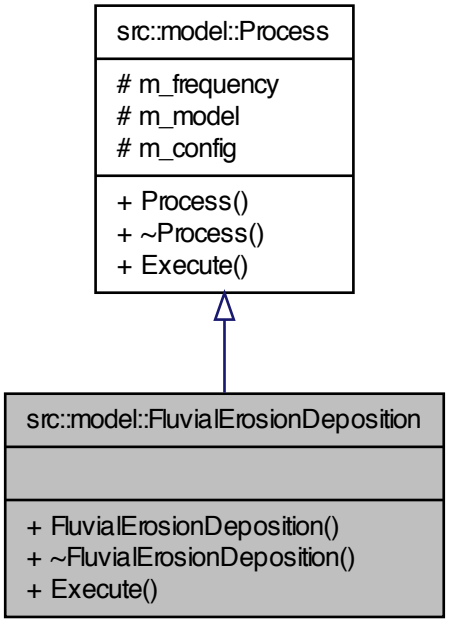
The documentation for this class was generated from the following file:

- src/model/FluvialErosion.hh

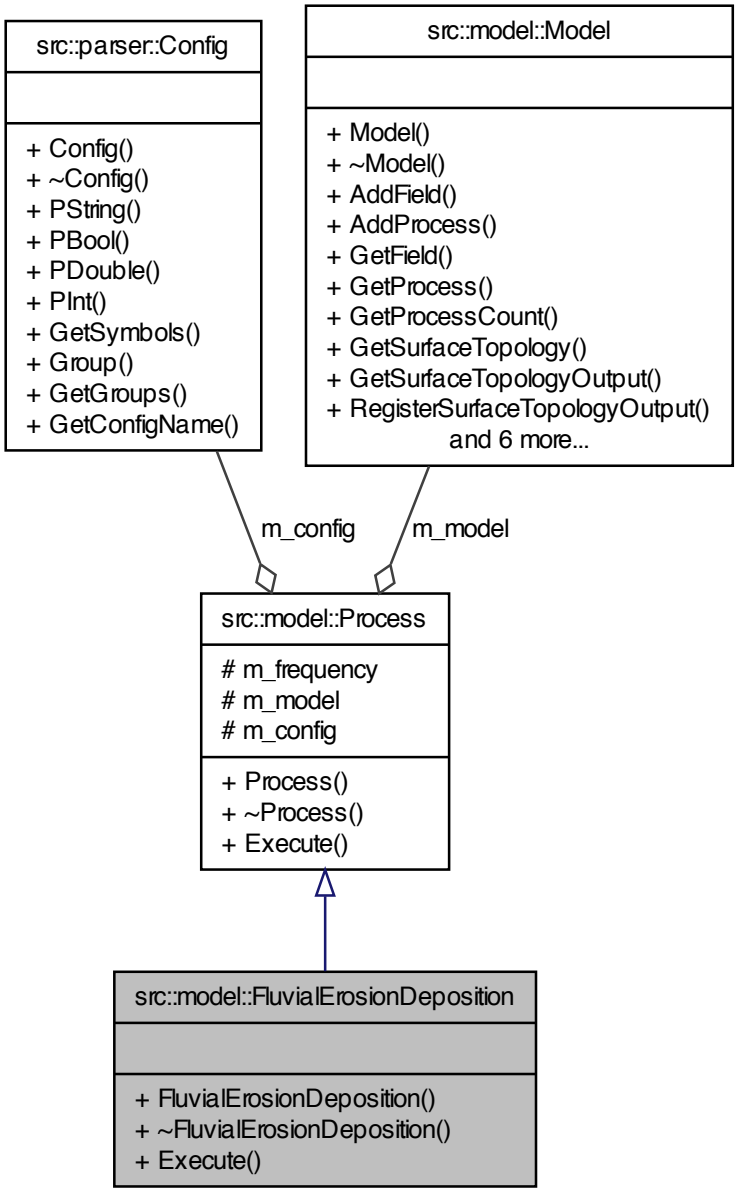
6.8 src::model::FluvialErosionDeposition Class Reference

```
#include <FluvialErosionDeposition.hh>
```

Inheritance diagram for src::model::FluvialErosionDeposition:



Collaboration diagram for src::model::FluvialErosionDeposition:



Public Member Functions

- FluvialErosionDeposition (const Model ∗m, Config ∗c)
- ∼FluvialErosionDeposition ()
- void Execute ()

6.8.1 Detailed Description

Definition at line 60 of file FluvialErosionDeposition.hh.

6.8.2 Constructor & Destructor Documentation

6.8.2.1 src::model::FluvialErosionDeposition::FluvialErosionDeposition (const Model ∗ *m,* Config ∗ *c*)

6.8.2.2 src::model::FluvialErosionDeposition::∼FluvialErosionDeposition ( )

6.8.3 Member Function Documentation

6.8.3.1 void src::model::FluvialErosionDeposition::Execute ( ) [virtual]

Implements src::model::Process.

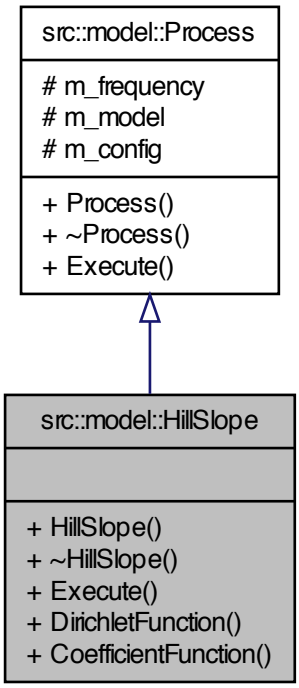
The documentation for this class was generated from the following file:

- src/model/FluvialErosionDeposition.hh

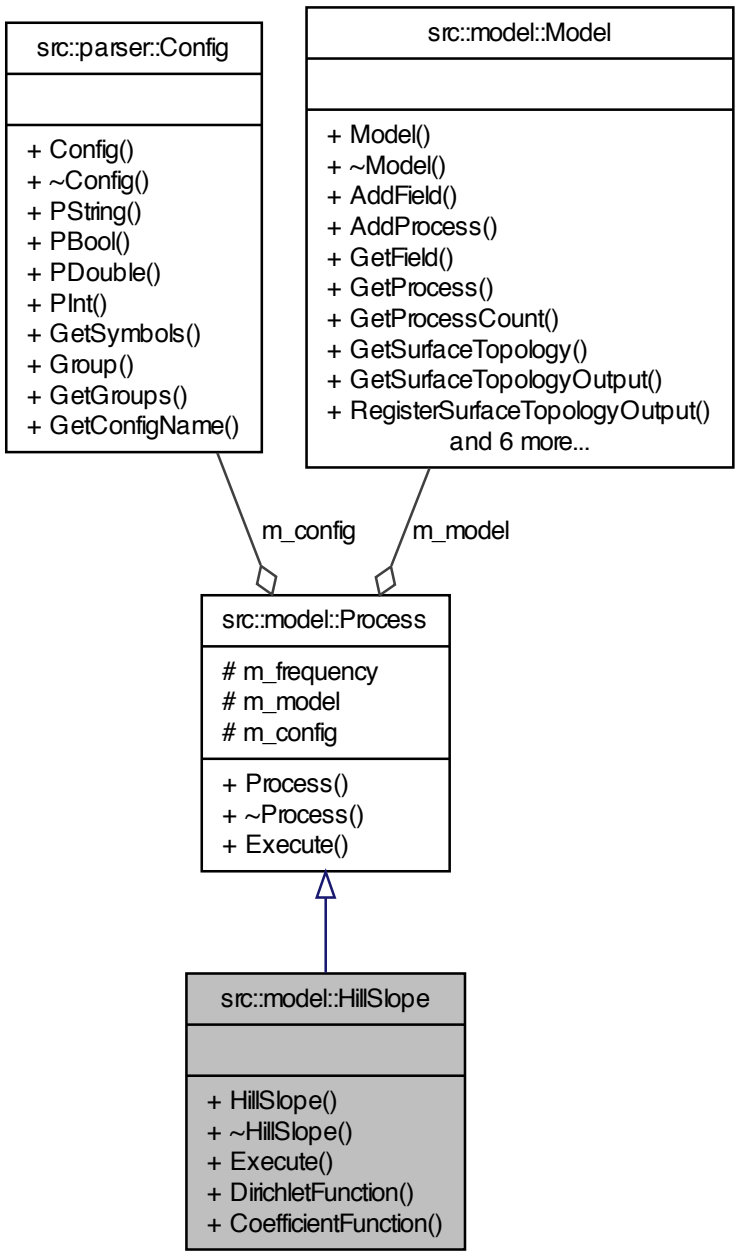
6.9 src::model::HillSlope Class Reference

```
#include <HillSlope.hh>
```

Inheritance diagram for src::model::HillSlope:



Collaboration diagram for src::model::HillSlope:



Public Member Functions

- HillSlope (const Model ∗m, Config ∗c)
- ∼HillSlope ()
- void Execute ()

Static Public Member Functions

- static float DirichletFunction (int idx)
- static float CoefficientFunction (int idx)

6.9.1 Detailed Description

Definition at line 62 of file HillSlope.hh.

6.9.2 Constructor & Destructor Documentation

6.9.2.1 src::model::HillSlope::HillSlope (const Model ∗ *m*, Config ∗ *c*)

6.9.2.2 src::model::HillSlope::∼HillSlope ( )

6.9.3 Member Function Documentation

6.9.3.1 static float src::model::HillSlope::CoefficientFunction (int *idx*) [static]

6.9.3.2 static float src::model::HillSlope::DirichletFunction (int *idx*) [static]

6.9.3.3 void src::model::HillSlope::Execute ( ) [virtual]

Implements src::model::Process.

The documentation for this class was generated from the following file:

- src/model/HillSlope.hh

6.10 src::mesh::KdItem Class Reference

`#include <KdItem.hh>`

Public Member Functions

- KdItem ()
- void Print ()
- ∼KdItem ()

Public Attributes

- double m_coord [2]
- int m_id

Friends

- class KdTree

6.10.1 Detailed Description

Definition at line 52 of file KdItem.hh.

6.10.2 Constructor & Destructor Documentation

6.10.2.1 src::mesh::KdItem::KdItem ( )

6.10.2.2 src::mesh::KdItem::~KdItem ( )

6.10.3 Member Function Documentation

6.10.3.1 void src::mesh::KdItem::Print ( )

6.10.4 Friends And Related Function Documentation

6.10.4.1 friend class KdTree [friend]

Definition at line 55 of file KdItem.hh.

6.10.5 Member Data Documentation

6.10.5.1 double src::mesh::KdItem::m_coord[2]

Definition at line 61 of file KdItem.hh.

6.10.5.2 int src::mesh::KdItem::m_id

Definition at line 62 of file KdItem.hh.

The documentation for this class was generated from the following file:

- src/mesh/KdItem.hh

6.11 src::mesh::KdNode Class Reference

`#include <KdNode.hh>`

Classes

- struct **KdItemSort**

Public Member Functions

- KdNode (KdTree ∗tree)
- KdNode (KdNode ∗node)
- void Add (KdItem ∗m)
- void Split (KdItem ∗m)
- void Expand (double ∗newCoord)
- void Print ()
- void DeleteHelper ()
- bool Intersects (double ∗up0, double ∗low0, double ∗up1, double ∗low1)
- void Range (double ∗upper, double ∗lower, vector< KdItem ∗ > ∗result)
- bool Contains (double ∗upper, double ∗lower, double ∗pnt)
- ∼KdNode ()

6.11.1 Detailed Description

Definition at line 56 of file KdNode.hh.

6.11.2 Constructor & Destructor Documentation

6.11.2.1 src::mesh::KdNode::KdNode (KdTree ∗ *tree*)

6.11.2.2 src::mesh::KdNode::KdNode (KdNode ∗ *node*)

6.11.2.3 src::mesh::KdNode::∼KdNode ( )

6.11.3 Member Function Documentation

6.11.3.1 void src::mesh::KdNode::Add (KdItem ∗ *m*)

6.11.3.2 bool src::mesh::KdNode::Contains (double ∗ *upper,* double ∗ *lower,* double ∗ *pnt*)

6.11.3.3 void src::mesh::KdNode::DeleteHelper ( )

6.11.3.4 void src::mesh::KdNode::Expand (double ∗ *newCoord*)

6.11.3.5 bool src::mesh::KdNode::Intersects (double * *up0*, double * *low0*, double * *up1*, double * *low1*)

6.11.3.6 void src::mesh::KdNode::Print ( )

6.11.3.7 void src::mesh::KdNode::Range (double * *upper*, double * *lower*, vector< KdItem * > * *result*)

6.11.3.8 void src::mesh::KdNode::Split (KdItem * *m*)

The documentation for this class was generated from the following file:

- src/mesh/KdNode.hh

6.12 src::mesh::KdTree Class Reference

`#include <KdTree.hh>`

Public Member Functions

- KdTree (int maxElems)
- void Add (float *c, int id)
- void Print ()
- void DeleteAll ()
- int Size ()
- void QueryBallPoint (float *pos, float r, vector< float > *distance, vector< int > *id)
- ~KdTree ()

Friends

- class src::mesh::KdNode

6.12.1 Detailed Description

Definition at line 56 of file KdTree.hh.

6.12.2 Constructor & Destructor Documentation

6.12.2.1 src::mesh::KdTree::KdTree (int *maxElems*)

6.12.2.2 src::mesh::KdTree::~KdTree ( )

6.12.3 Member Function Documentation

6.12.3.1 void src::mesh::KdTree::Add (float * c, int id)

6.12.3.2 void src::mesh::KdTree::DeleteAll ( )

6.12.3.3 void src::mesh::KdTree::Print ( )

6.12.3.4 void src::mesh::KdTree::QueryBallPoint (float * pos, float r, vector< float > * distance, vector< int > * id)

6.12.3.5 int src::mesh::KdTree::Size ( )

6.12.4 Friends And Related Function Documentation

6.12.4.1 friend class src::mesh::KdNode [friend]

Definition at line 60 of file KdTree.hh.

The documentation for this class was generated from the following file:

- src/mesh/KdTree.hh

6.13 src::mem::MemoryPool Class Reference

`#include <MemoryPool.hh>`

Public Types

- enum MemoryPoolMode_t { Fixed, Dynamic }
- typedef enum src::mem::MemoryPool::MemoryPoolMode_t MemoryPoolMode

Public Member Functions

- MemoryPool (int elemSize, int numElemsPerChunk, MemoryPoolMode m=-Dynamic)
- unsigned long GetNumFree ()
- void * GetDataPointer ()
- ~MemoryPool ()
- void * NewObject ()
- int DeleteObject (void *object)

6.13.1 Detailed Description

Definition at line 75 of file MemoryPool.hh.

6.13.2 Member Typedef Documentation

6.13.2.1 typedef enum src::mem::MemoryPool::MemoryPoolMode_t src::mem::MemoryPool::MemoryPoolMode

6.13.3 Member Enumeration Documentation

6.13.3.1 enum src::mem::MemoryPool::MemoryPoolMode_t

Enumerator:

Fixed

Dynamic

Definition at line 78 of file MemoryPool.hh.

```
{
    Fixed,
    Dynamic
}MemoryPoolMode;
```

6.13.4 Constructor & Destructor Documentation

6.13.4.1 src::mem::MemoryPool::MemoryPool (int *elemSize,* int *numElemsPerChunk,* MemoryPoolMode *m* = Dynamic) [inline]

Definition at line 91 of file MemoryPool.hh.

```
{
    int i = 0;

    assert( numElemsPerChunk > 0 );
    assert( elemSize > 0 );

    numElementsPerChunk = numElemsPerChunk;

    numChunks = 0;
    elementSize = elemSize;
    mode = m;

    if(mode == Dynamic)
    {
        if( numElementsPerChunk > TWO_EXP16 )
        {
            numElementsPerChunk = TWO_EXP16;
        }
    }

    maxChunkEntries = CHUNK_ARRAY_DELTA;
    chunkToUse = INVALID;

    chunks = ( Chunk* )NULL;
    chunks = ( Chunk* )malloc( sizeof( Chunk ) * maxChunkEntries );
    memset( chunks, 0, sizeof( Chunk )*maxChunkEntries );
```

```
        for( i=0; i<maxChunkEntries; i++ )
        {
            chunks[i].chunkId = INVALID;
            chunks[i].numFree = INVALID;
        }

        assert( chunks != NULL );
    }
```

6.13.4.2 src::mem::MemoryPool::~MemoryPool ( ) [inline]

Definition at line 179 of file MemoryPool.hh.

```
    {
        int i = 0;

        for( i=0; i<maxChunkEntries; i++ )
        {
            if( chunks[i].numFree != INVALID )
            {
                free( chunks[i].memory );
                free( chunks[i].freeList );
            }
        }

        free( chunks );
    }
```

6.13.5 Member Function Documentation

6.13.5.1 int src::mem::MemoryPool::DeleteObject (void * *object*) [inline]

Definition at line 260 of file MemoryPool.hh.

```
    {
        if( object != NULL )
        {
            int                 i           = 0;
            int                 valid       = 0;
            int                 chunkIdx    = 0;

            for( i=0; i<maxChunkEntries; i++ )
            {

                if( chunks[i].memory != NULL &&
                    (( char* )object >= chunks[i].memory ) &&
                    (( char* )object < ( chunks[i].memory+( numElementsPerChunk
      *elementSize ) ) ) )
                {
                    valid = 1;
                    chunkIdx = i;
                    break;
                }
            }
```

```
            if( valid )
            {
                memset( object, 0, elementSize );
                chunks[chunkIdx].freeList[chunks[chunkIdx].numFree++] = ( char*
    )object;

                Shrink();

                return 1;
            }
            else
            {
                return 0;
            }
        }
        else
        {
            return 0;
        }
    }
```

6.13.5.2 void* src::mem::MemoryPool::GetDataPointer ( ) [inline]

Definition at line 161 of file MemoryPool.hh.

```
    {
        if(mode==Fixed)
        {
            if(chunks[0].numFree != INVALID)
                return chunks[0].memory;
        }

        return NULL;
    }
```

6.13.5.3 unsigned long src::mem::MemoryPool::GetNumFree ( ) [inline]

Definition at line 135 of file MemoryPool.hh.

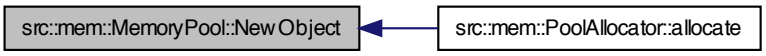
```
    {
        unsigned long numFree = 0;

        if(mode == Fixed)
        {
            int i = 0;
            for( i=0; i<maxChunkEntries; i++ )
            {
                if( chunks[i].numFree != INVALID )
                {
                    numFree += chunks[i].numFree;
                }
            }
        }

        return numFree;
    }
```

6.13.5.4 void* src::mem::MemoryPool::NewObject ( ) [inline]

Definition at line 202 of file MemoryPool.hh.

```
    {
        int             index       = 0;
        Chunk           *chunk      = NULL;

        if( chunkToUse == INVALID )
        {
            chunkToUse = CreateChunk( 0 );
        }

        chunk = &( chunks[chunkToUse] );

        assert( chunk != NULL );

        /*
       ------------------------------------------------------------------------
         * Abort if this is a fixed-pool and all slots have been allotted
         *
       ------------------------------------------------------------------------*/
        if(mode==Fixed)
        {
            if(chunk->numFree <= 0) return NULL;
        }
label:
        index = chunk->numFree - 1;
        if( index < 0 )
        {

            chunkToUse = GetChunkWithFreeSlots();

            if( chunkToUse == INVALID )
            {
                int chunkSlot = GetFreeChunkSlot();

                if( chunkSlot==INVALID )
                {
                    chunkToUse = CreateChunk( maxChunkEntries );
                    assert( chunkToUse != INVALID );
                }
                else
                {
                    chunkToUse = CreateChunk( chunkSlot );
                    assert( chunkToUse != INVALID );
                }
            }

            chunk = &( chunks[chunkToUse] );
            goto label;
        }

        return ( void* )( chunk->freeList[--chunk->numFree] );
    }
```

Here is the caller graph for this function:



The documentation for this class was generated from the following file:

- src/mem/MemoryPool.hh

6.14 src::model::Model Class Reference

`#include <Model.hh>`

Public Member Functions

- Model (const SurfaceTopology *st, Config *c)
- ~Model ()
- void AddField (Field *f) const
- void AddProcess (Process *p) const
- Field * GetField (string name) const
- Process * GetProcess (int index) const
- int GetProcessCount () const
- const SurfaceTopology * GetSurfaceTopology () const
- SurfaceTopologyOutput * GetSurfaceTopologyOutput () const
- void RegisterSurfaceTopologyOutput (SurfaceTopologyOutput *sfo)
- float GetDt () const
- float GetTime () const
- int GetTimeStep () const
- int GetNumTimeSteps (float t) const
- int GetNumTimeSteps () const
- bool NextTimeStep ()
- int GetNParallelCores () const

6.14.1 Detailed Description

Definition at line 77 of file Model.hh.

6.14.2 Constructor & Destructor Documentation

6.14.2.1 src::model::Model::Model (const SurfaceTopology * *st*, Config * *c*)

6.14.2.2 src::model::Model::~Model ( )

6.14.3 Member Function Documentation

6.14.3.1 void src::model::Model::AddField (Field * *f*) const

6.14.3.2 void src::model::Model::AddProcess (Process * *p*) const

6.14.3.3 float src::model::Model::GetDt ( ) const

6.14.3.4 Field* src::model::Model::GetField (string *name*) const

6.14.3.5 int src::model::Model::GetNParallelCores ( ) const

6.14.3.6 int src::model::Model::GetNumTimeSteps (float *t*) const

6.14.3.7 int src::model::Model::GetNumTimeSteps ( ) const

6.14.3.8 Process* src::model::Model::GetProcess (int *index*) const

6.14.3.9 int src::model::Model::GetProcessCount ( ) const

6.14.3.10 const SurfaceTopology* src::model::Model::GetSurfaceTopology ( ) const

6.14.3.11 SurfaceTopologyOutput* src::model::Model::GetSurfaceTopology-Output ( ) const

6.14.3.12 float src::model::Model::GetTime ( ) const

6.14.3.13 int src::model::Model::GetTimeStep ( ) const

6.14.3.14 bool src::model::Model::NextTimeStep ( )

6.14.3.15 void src::model::Model::RegisterSurfaceTopologyOutput (SurfaceTopologyOutput * *sfo*)

The documentation for this class was generated from the following file:

- src/model/Model.hh

6.15 src::model::ModelBuilder Class Reference

`#include <ModelBuilder.hh>`

Public Member Functions

- ModelBuilder (Config ∗c)
- ∼ModelBuilder ()
- Model ∗ GetModel ()
- SurfaceTopology ∗ GetSurfaceTopology ()
- SurfaceTopologyOutput ∗ GetSurfaceTopologyOutput ()

6.15.1 Detailed Description

Definition at line 65 of file ModelBuilder.hh.

6.15.2 Constructor & Destructor Documentation

6.15.2.1 src::model::ModelBuilder::ModelBuilder (Config ∗ *c*)

6.15.2.2 src::model::ModelBuilder::∼ModelBuilder ( )

6.15.3 Member Function Documentation

6.15.3.1 Model∗ src::model::ModelBuilder::GetModel ( ) [inline]

Definition at line 71 of file ModelBuilder.hh.

```
{ return m_model; }
```

6.15.3.2 SurfaceTopology∗ src::model::ModelBuilder::GetSurfaceTopology ( ) [inline]

Definition at line 72 of file ModelBuilder.hh.

```
{ return m_surfaceTopology; }
```

6.15.3.3 SurfaceTopologyOutput∗ src::model::ModelBuilder::GetSurfaceTopologyOutput ( ) [inline]

Definition at line 73 of file ModelBuilder.hh.

```
{ return m_surfaceTopologyOutput; }
```

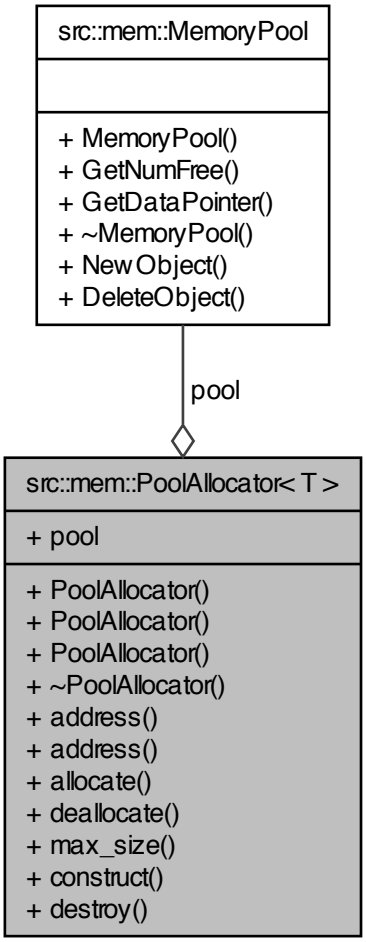
The documentation for this class was generated from the following file:

- src/model/ModelBuilder.hh

6.16 src::mem::PoolAllocator< T > Class Template Reference

`#include <Allocator.hh>`

Collaboration diagram for src::mem::PoolAllocator< T >:



Classes

- struct rebind

Public Types

- typedef T value_type
- typedef value_type * pointer
- typedef const value_type * const_pointer
- typedef value_type & reference
- typedef const value_type & const_reference
- typedef std::size_t size_type
- typedef std::ptrdiff_t difference_type

Public Member Functions

- PoolAllocator ()
- PoolAllocator (const PoolAllocator &)
- template<class U >
  PoolAllocator (const PoolAllocator< U > &)
- ~PoolAllocator ()
- pointer address (reference x) const
- const_pointer address (const_reference x) const
- pointer allocate (size_type n, const_pointer=0)
- void deallocate (pointer p, size_type)
- size_type max_size () const
- void construct (pointer p, const value_type &x)
- void destroy (pointer p)

Static Public Attributes

- static MemoryPool * pool = NULL

6.16.1 Detailed Description

template<class T>class src::mem::PoolAllocator< T >

Definition at line 57 of file Allocator.hh.

6.16.2 Member Typedef Documentation

6.16.2.1 template<class T > typedef const value_type* src::mem::PoolAllocator< T >::const_pointer

Definition at line 62 of file Allocator.hh.

6.16.2.2 template<class T > typedef const value_type& src::mem::PoolAllocator< T >::const_reference

Definition at line 64 of file Allocator.hh.

6.16.2.3 template<class T > typedef std::ptrdiff_t src::mem::PoolAllocator< T >::difference_type

Definition at line 66 of file Allocator.hh.

6.16.2.4 template<class T > typedef value_type* src::mem::PoolAllocator< T >::pointer

Definition at line 61 of file Allocator.hh.

6.16.2.5 template<class T > typedef value_type& src::mem::PoolAllocator< T >::reference

Definition at line 63 of file Allocator.hh.

6.16.2.6 template<class T > typedef std::size_t src::mem::PoolAllocator< T >::size_type

Definition at line 65 of file Allocator.hh.

6.16.2.7 template<class T > typedef T src::mem::PoolAllocator< T >::value_type

Definition at line 60 of file Allocator.hh.

6.16.3 Constructor & Destructor Documentation

6.16.3.1 template<class T > src::mem::PoolAllocator< T >::PoolAllocator ( ) [inline]

Definition at line 76 of file Allocator.hh.

```
{
}
```

6.16.3.2 template<class T > src::mem::PoolAllocator< T >::PoolAllocator (const PoolAllocator< T > &) [inline]

Definition at line 80 of file Allocator.hh.

```
{
}
```

6.16.3.3 template<class T > template<class U > src::mem::PoolAllocator< T >::PoolAllocator (const PoolAllocator< U > &) [inline]

Definition at line 85 of file Allocator.hh.

```
{
}
```

6.16.3.4 template<class T > src::mem::PoolAllocator< T >::~PoolAllocator ( ) [inline]

Definition at line 89 of file Allocator.hh.

```
{
}
```

6.16.4 Member Function Documentation

6.16.4.1 template<class T > pointer src::mem::PoolAllocator< T >::address (reference *x*) const [inline]

Definition at line 93 of file Allocator.hh.

```
{
    return &x;
}
```

6.16.4.2 template<class T > const_pointer src::mem::PoolAllocator< T >::address (const_reference *x*) const [inline]

Definition at line 97 of file Allocator.hh.

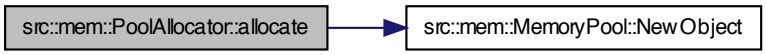
```
{
    return x;
}
```

6.16.4.3 template<class T > pointer src::mem::PoolAllocator< T >::allocate (size_type *n*, const_pointer = 0) [inline]

Definition at line 102 of file Allocator.hh.

```
{
    pthread_mutex_lock( &mutex );

    if( !PoolAllocator::pool )
    {
        PoolAllocator::pool = new MemoryPool( sizeof( T ), TWO_EXP16 );

        pools.push_back( PoolAllocator::pool );
    }

    void* p = pool->NewObject();
    if( !p )
        throw std::bad_alloc();

    pthread_mutex_unlock( &mutex );

    return static_cast<pointer>( p );
}
```

Here is the call graph for this function:



6.16.4.4 template<class T > void src::mem::PoolAllocator< T >::construct (pointer *p*, const value_type & *x*) [inline]

Definition at line 131 of file Allocator.hh.

```
{
    new( p ) value_type( x );
}
```

6.16.4.5 template<class T > void src::mem::PoolAllocator< T >::deallocate (pointer *p*, size_type) [inline]

Definition at line 122 of file Allocator.hh.

```
{
}
```

6.16.4.6 template<class T > void src::mem::PoolAllocator< T >::destroy (pointer *p*) [inline]

Definition at line 136 of file Allocator.hh.

```
{
    //p->~value_type();
}
```

6.16.4.7 template<class T > size_type src::mem::PoolAllocator< T >::max_size ( ) const [inline]

Definition at line 126 of file Allocator.hh.

```
{
    return static_cast<size_type>( -1 ) / sizeof( T );
}
```

6.16.5 Member Data Documentation

6.16.5.1 template<class T > MemoryPool * src::mem::PoolAllocator< T >::pool = NULL [static]

Definition at line 74 of file Allocator.hh.

The documentation for this class was generated from the following file:

- src/mem/Allocator.hh

6.17 src::mem::PoolAllocator< void > Class Template Reference

`#include <Allocator.hh>`

Classes

- struct **rebind**

6.17.1 Detailed Description

template<>class src::mem::PoolAllocator< void >

Definition at line 145 of file Allocator.hh.

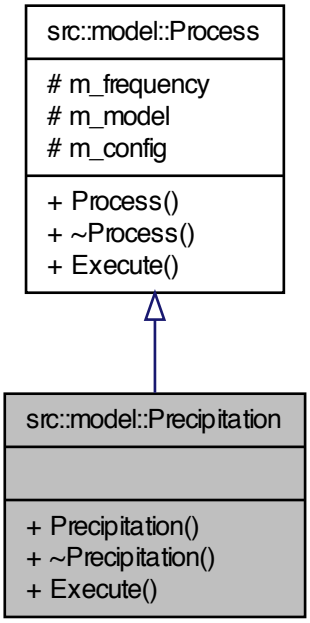
The documentation for this class was generated from the following file:

- src/mem/Allocator.hh

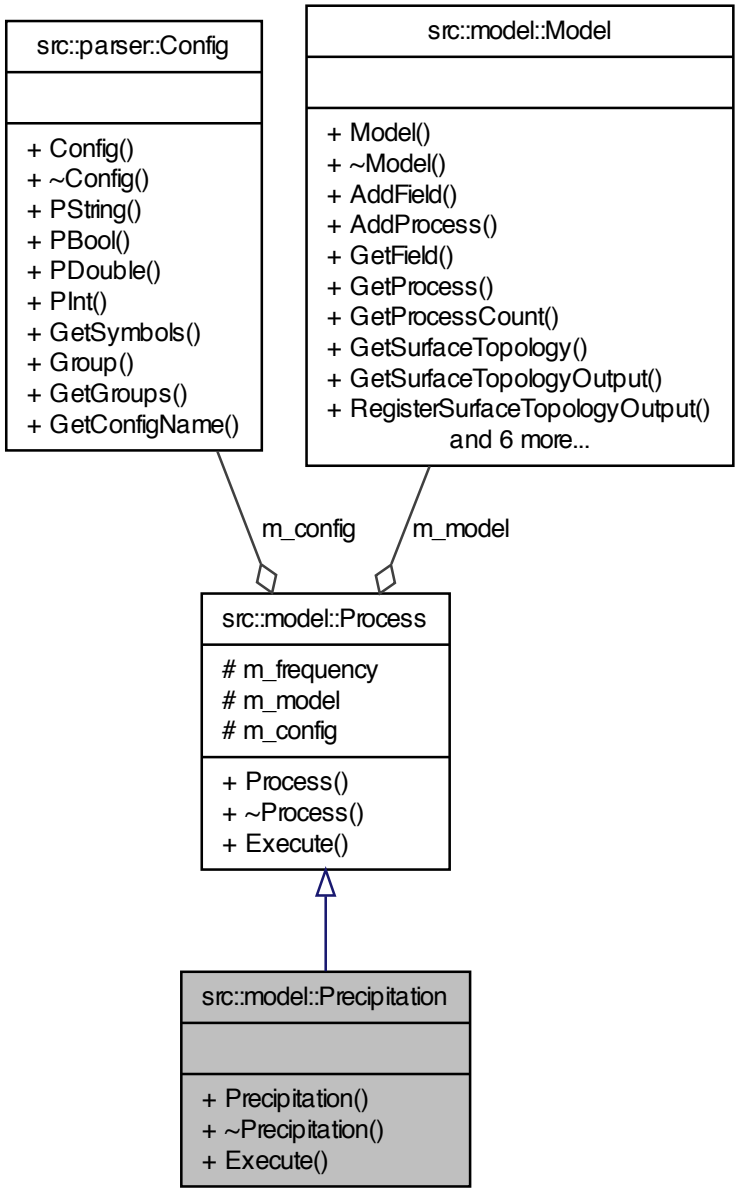
6.18 src::model::Precipitation Class Reference

`#include <Precipitation.hh>`

Inheritance diagram for src::model::Precipitation:



Collaboration diagram for src::model::Precipitation:



Public Member Functions

- Precipitation (const Model ∗m, Config ∗c)
- ∼Precipitation ()
- void Execute ()

6.18.1 Detailed Description

Definition at line 57 of file Precipitation.hh.

6.18.2 Constructor & Destructor Documentation

6.18.2.1 src::model::Precipitation::Precipitation (const Model ∗ *m,* Config ∗ *c*)

6.18.2.2 src::model::Precipitation::∼Precipitation ( )

6.18.3 Member Function Documentation

6.18.3.1 void src::model::Precipitation::Execute ( ) [virtual]

Implements src::model::Process.

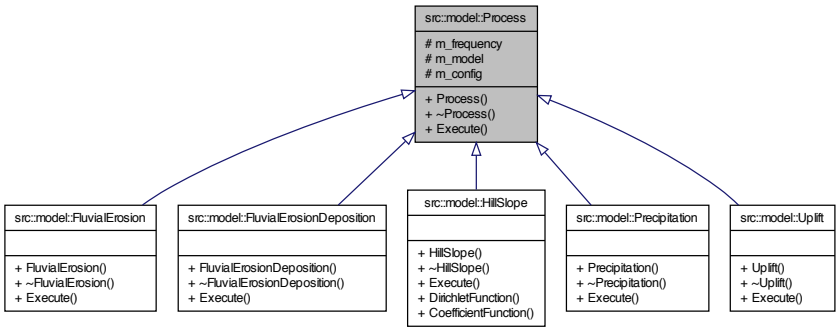
The documentation for this class was generated from the following file:

- src/model/Precipitation.hh

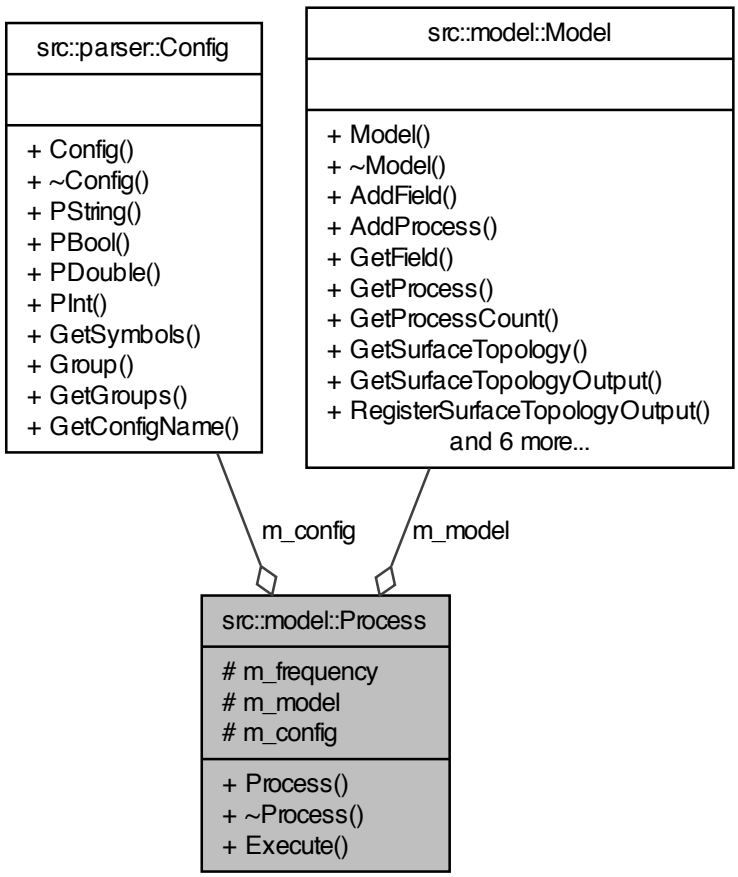
6.19 src::model::Process Class Reference

`#include <Process.hh>`

Inheritance diagram for src::model::Process:



Collaboration diagram for src::model::Process:



Public Member Functions

- Process (const Model ∗m, Config ∗c)
- virtual ∼Process ()
- virtual void Execute ()=0

Protected Attributes

- int m_frequency
- const Model ∗ m_model

- Config * m_config

6.19.1 Detailed Description

Definition at line 55 of file Process.hh.

6.19.2 Constructor & Destructor Documentation

6.19.2.1 src::model::Process::Process (const Model * *m*, Config * *c*)

6.19.2.2 virtual src::model::Process::~Process ( ) [virtual]

6.19.3 Member Function Documentation

6.19.3.1 virtual void src::model::Process::Execute ( ) [pure virtual]

Implemented in src::model::HillSlope, src::model::FluvialErosion, src::model::FluvialErosionDeposition, src::model::Precipitation, and src::model::Uplift.

6.19.4 Member Data Documentation

6.19.4.1 Config* src::model::Process::m_config [protected]

Definition at line 65 of file Process.hh.

6.19.4.2 int src::model::Process::m_frequency [protected]

Definition at line 63 of file Process.hh.

6.19.4.3 const Model* src::model::Process::m_model [protected]

Definition at line 64 of file Process.hh.

The documentation for this class was generated from the following file:

- src/model/Process.hh

6.20 src::geometry::QuadEdge Class Reference

```
#include <Topology.hh>
```

Public Member Functions

- QuadEdge ()
- int Visited ()
- void ResetVisited ()
- void IncrementVisited ()
- void DecrementVisited ()
- bool IsFree ()
- void SetFree ()
- void SetInUse ()

Friends

- class Triangulator

6.20.1 Detailed Description

Definition at line 325 of file Topology.hh.

6.20.2 Constructor & Destructor Documentation

6.20.2.1 src::geometry::QuadEdge::QuadEdge ( ) [inline]

Definition at line 340 of file Topology.hh.

```
{
    m_e[0].m_num = 0, m_e[1].m_num = 1, m_e[2].m_num = 2, m_e[3].m_num = 3;
    m_e[0].m_next = &(m_e[0]); m_e[1].m_next = &(m_e[3]);
    m_e[2].m_next = &(m_e[2]); m_e[3].m_next = &(m_e[1]);

    m_attributes = 0;
}
```

6.20.3 Member Function Documentation

6.20.3.1 void src::geometry::QuadEdge::DecrementVisited ( ) [inline]

Definition at line 404 of file Topology.hh.

```
{
    int val = (m_attributes & 0xffff0000) >> 16;
    m_attributes &= ~0xffff0000;
    val--;
    m_attributes |= (val<<16);
}
```

6.20.3.2 void src::geometry::QuadEdge::IncrementVisited ( ) [inline]

Definition at line 390 of file Topology.hh.

```
{
    int val = (m_attributes & 0xffff0000) >> 16;
    m_attributes &= ~0xffff0000;
    val++;
    m_attributes |= (val<<16);
}
```

6.20.3.3 bool src::geometry::QuadEdge::IsFree ( ) [inline]

Definition at line 418 of file Topology.hh.

```
{
    return (m_attributes & 0x0000ffff)==0;
}
```

6.20.3.4 void src::geometry::QuadEdge::ResetVisited ( ) [inline]

Definition at line 378 of file Topology.hh.

```
{
    m_attributes &= ~0xffff0000;
}
```

6.20.3.5 void src::geometry::QuadEdge::SetFree ( ) [inline]

Definition at line 429 of file Topology.hh.

```
{
    m_attributes &= ~0x0000ffff;
}
```

6.20.3.6 void src::geometry::QuadEdge::SetInUse ( ) [inline]

Definition at line 440 of file Topology.hh.

```
{
    m_attributes |= 1;
}
```

6.20.3.7 int src::geometry::QuadEdge::Visited ( ) [inline]

Definition at line 367 of file Topology.hh.

```
{
    return (m_attributes & 0xffff0000) >> 16;
}
```

6.20.4 Friends And Related Function Documentation

6.20.4.1 friend class Triangulator [friend]

Definition at line 327 of file Topology.hh.

The documentation for this class was generated from the following file:

- src/geometry/Topology.hh

6.21 src::mem::PoolAllocator< T >::rebind< U > Struct - Template Reference

`#include <Allocator.hh>`

Public Types

- typedef PoolAllocator< U > other

6.21.1 Detailed Description

template<class T>template<class U>struct src::mem::PoolAllocator< T >::rebind< U >

Definition at line 69 of file Allocator.hh.

6.21.2 Member Typedef Documentation

6.21.2.1 template<class T > template<class U > typedef PoolAllocator<U> src::mem::PoolAllocator< T >::rebind< U >::other

Definition at line 71 of file Allocator.hh.

The documentation for this struct was generated from the following file:

- src/mem/Allocator.hh

6.22 src::mesh::RegularMesh Class Reference

`#include <RegularMesh.hh>`

Public Types

- typedef Matrix< double, Dynamic, Dynamic, RowMajor > MatrixRM

Public Member Functions

- RegularMesh (int nx, int ny, const float *upper, const float *lower)
- ~RegularMesh ()
- double X (int i, int j)
- double Y (int i, int j)
- double & V (int i, int j)
- void UpdateInterpolator ()
- void GetFunctionValuesAt (int nCoor, float **coor, vector< float > *result)
- void Print ()

Friends

- class SurfaceTopology

6.22.1 Detailed Description

Definition at line 56 of file RegularMesh.hh.

6.22.2 Member Typedef Documentation

6.22.2.1 typedef Matrix<double, Dynamic, Dynamic, RowMajor> src::mesh::RegularMesh::MatrixRM

Definition at line 60 of file RegularMesh.hh.

6.22.3 Constructor & Destructor Documentation

6.22.3.1 src::mesh::RegularMesh::RegularMesh (int *nx*, int *ny*, const float * *upper*, const float * *lower*)

6.22.3.2 src::mesh::RegularMesh::~RegularMesh ( )

6.22.4 Member Function Documentation

6.22.4.1 void src::mesh::RegularMesh::GetFunctionValuesAt (int *nCoor,* float ** *coor,* vector< float > * *result*)

6.22.4.2 void src::mesh::RegularMesh::Print ( )

6.22.4.3 void src::mesh::RegularMesh::UpdateInterpolator ( )

6.22.4.4 double& src::mesh::RegularMesh::V (int *i,* int *j*) [inline]

Definition at line 69 of file RegularMesh.hh.

```
{ return m_values(i,j); }
```

6.22.4.5 double src::mesh::RegularMesh::X (int *i,* int *j*) [inline]

Definition at line 67 of file RegularMesh.hh.

```
{ return m_coords[i*m_nx + j][0]; }
```

6.22.4.6 double src::mesh::RegularMesh::Y (int *i,* int *j*) [inline]

Definition at line 68 of file RegularMesh.hh.

```
{ return m_coords[i*m_nx + j][1]; }
```

6.22.5 Friends And Related Function Documentation

6.22.5.1 friend class SurfaceTopology [friend]

Definition at line 62 of file RegularMesh.hh.

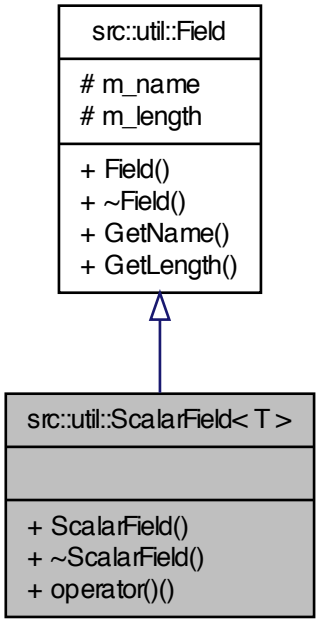
The documentation for this class was generated from the following file:

- src/mesh/RegularMesh.hh

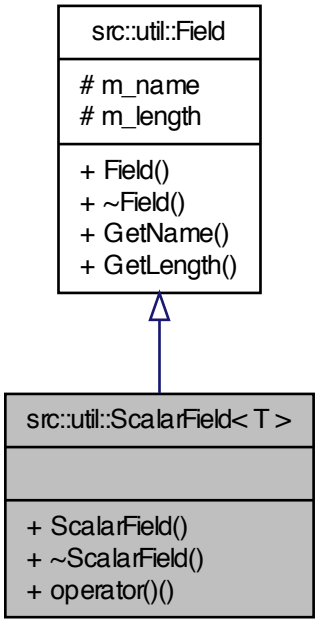
6.23 src::util::ScalarField< T > Class Template Reference

```
#include <ScalarField.hh>
```

Inheritance diagram for src::util::ScalarField< T >:



Collaboration diagram for src::util::ScalarField< T >:



Public Member Functions

- ScalarField (string name, unsigned int length)
- ~ScalarField ()
- T & operator() (unsigned int index)

6.23.1 Detailed Description

template<class T>class src::util::ScalarField< T >

Definition at line 54 of file ScalarField.hh.

6.23.2 Constructor & Destructor Documentation

6.23.2.1 template<class T> src::util::ScalarField< T >::ScalarField (string *name*, unsigned int *length*)

6.23.2.2 template<class T> src::util::ScalarField< T >::~ScalarField ( )

6.23.3 Member Function Documentation

6.23.3.1 template<class T> T& src::util::ScalarField< T >::operator() (unsigned int *index*) [inline]

Definition at line 60 of file ScalarField.hh.

```
{
    return m_data[index];
}
```

The documentation for this class was generated from the following file:

- src/util/ScalarField.hh

6.24 src::geometry::Site Class Reference

`#include <Topology.hh>`

Static Public Member Functions

- static int InCircle (Site *_a, Site *_b, Site *_c, Site *_d)
- static void CCW (Site *_a, Site *_b, Site *_c, double *result)
- static void CCW (Site *_a, VSite *_b, VSite *_c, double *result)
- static bool Circumcenter (const Site *s1, const Site *s2, const Site *s3, VSite *vs)

Public Attributes

- float ** m_coord
- unsigned int m_id

Friends

- std::ostream & operator<< (std::ostream &os, const Site &mp)

6.24.1 Detailed Description

Definition at line 91 of file Topology.hh.

6.24.2 Member Function Documentation

6.24.2.1 static void src::geometry::Site::CCW (Site * _a, Site * _b, Site * _c, double * result) [inline, static]

Definition at line 128 of file Topology.hh.

```
{
    float *a = *(_a->m_coord);
    float *b = *(_b->m_coord);
    float *c = *(_c->m_coord);

    double ax = a[0];  double ay = a[1];
           double  bx = b[0]; double by = b[1];
           double  cx = c[0]; double cy = c[1];
           *(result) = ((bx*cy-by*cx) - (ax*cy-ay*cx) + (ax*by-ay*bx));
}
```

6.24.2.2 static void src::geometry::Site::CCW (Site * _a, VSite * _b, VSite * _c, double * result) [inline, static]

Definition at line 147 of file Topology.hh.

```
{
    float *a = *(_a->m_coord);
    float *b = _b->m_coord;
    float *c = _c->m_coord;

    double ax = a[0];  double ay = a[1];
           double  bx = b[0]; double by = b[1];
           double  cx = c[0]; double cy = c[1];
           *(result) = ((bx*cy-by*cx) - (ax*cy-ay*cx) + (ax*by-ay*bx));
}
```

6.24.2.3 static bool src::geometry::Site::Circumcenter (const Site * s1, const Site * s2, const Site * s3, VSite * vs) [inline, static]

Definition at line 166 of file Topology.hh.

```
{
    float *n1 = *(s1->m_coord);
    float *n2 = *(s2->m_coord);
    float *n3 = *(s3->m_coord);

    double x1 = n1[0];
    double y1 = n1[1];

    double x2 = n2[0];
    double y2 = n2[1];

    double x3 = n3[0];
    double y3 = n3[1];
```

```
    // Distances relative to point n1 of the triangle
    double x21 = x2 - x1;
    double y21 = y2 - y1;
    double x31 = x3 - x1;
    double y31 = y3 - y1;

    double denominator = 0.5 / (x21 * y31 - y21 * x31);

    if (denominator == 0)
    {
        // Degenerate triangle
        cerr << "Error: Degenerate triangle encountered.." << endl;
        return false;
    }

    // Squares of the lengths of the edges incident to n1
    double length21 = x21 * x21 + y21 * y21;
    double length31 = x31 * x31 + y31 * y31;

    // Calculate offset from n1 of circumcenter
    double x = (y31 * length21 - y21 * length31) * denominator;
    double y = (x21 * length31 - x31 * length21) * denominator;

    // Create a node at the circumcenter
    vs->m_coord[0] = x + x1;
    vs->m_coord[1] = y + y1;

    // Circumcenter calculated
    return true;
}
```

6.24.2.4 static int src::geometry::Site::InCircle (Site * _a, Site * _b, Site * _c, Site * _d) [inline, static]

Definition at line 104 of file Topology.hh.

```
{
    float *a = *(_a->m_coord);
    float *b = *(_b->m_coord);
    float *c = *(_c->m_coord);
    float *d = *(_d->m_coord);

    double x1 = a[0], y1 = a[1];
    double x2 = b[0], y2 = b[1];
    double x3 = c[0], y3 = c[1];
    double x4 = d[0], y4 = d[1];

    return ((y4-y1)*(x2-x3)+(x4-x1)*(y2-y3))*((x4-x3)*(x2-x1)-(y4-y3)*(y2-
  y1)) >
                ((y4-y3)*(x2-x1)+(x4-x3)*(y2-y1))*((x4-x1)*(x2-x3)-(y4-y1)*(
  y2-y3));
}
```

6.24.3 Friends And Related Function Documentation

6.24.3.1 std::ostream& operator<< (std::ostream & *os,* const Site & *mp*) [friend]

Definition at line 218 of file Topology.hh.

```
{
    os << "Site: id(" << mp.m_id << "): " << "(" <<
          (*mp.m_coord)[0] << ", " << (*mp.m_coord)[1] << ")" << endl;
    return os;
}
```

6.24.4 Member Data Documentation

6.24.4.1 float** src::geometry::Site::m_coord

Definition at line 94 of file Topology.hh.

6.24.4.2 unsigned int src::geometry::Site::m_id

Definition at line 95 of file Topology.hh.

The documentation for this class was generated from the following file:

- src/geometry/Topology.hh

6.25 src::geometry::SiteComparator Class Reference

`#include <Topology.hh>`

Public Member Functions

- bool operator() (const Site &a, const Site &b)

6.25.1 Detailed Description

Definition at line 233 of file Topology.hh.

6.25.2 Member Function Documentation

6.25.2.1 bool src::geometry::SiteComparator::operator() (const Site & *a,* const Site & *b*) [inline]

Definition at line 236 of file Topology.hh.

```
{
    float *coordA = (*(a.m_coord));
    float *coordB = (*(b.m_coord));

    if(coordA[0] != coordB[0])
        return coordA[0] < coordB[0];
    else
        return coordA[1] < coordB[1];
}
```

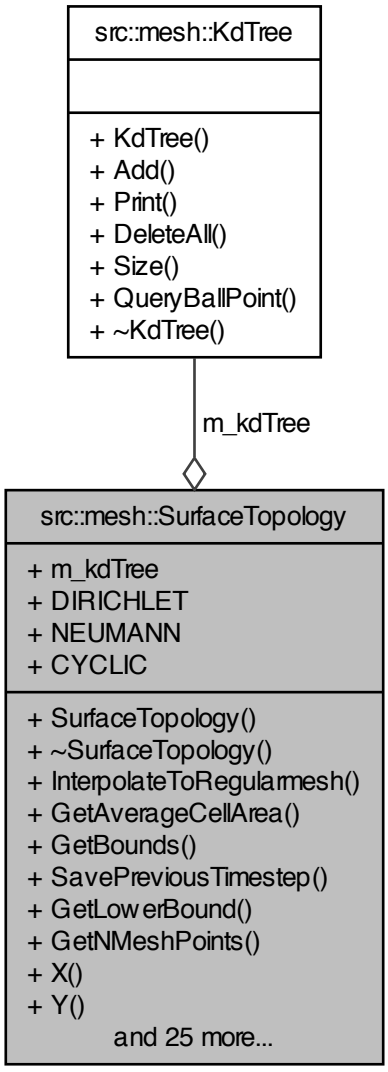
The documentation for this class was generated from the following file:

- src/geometry/Topology.hh

6.26 src::mesh::SurfaceTopology Class Reference

```
#include <SurfaceTopology.hh>
```

Collaboration diagram for src::mesh::SurfaceTopology:



Public Types

- typedef set< int >::const_iterator CatchmentIterator

Public Member Functions

- SurfaceTopology (Config *c)
- ~SurfaceTopology ()
- void InterpolateToRegularmesh (RegularMesh *rm, vector< float > &field) const
- float GetAverageCellArea () const
- void GetBounds (vector< float > &upper, vector< float > &lower) const
- void SavePreviousTimestep () const
- const float * GetLowerBound ()
- unsigned int GetNMeshPoints () const
- float X (int index) const
- float Y (int index) const
- float Z (int index) const
- float Z0 (int index) const
- float Zp (int index) const
- float B (int index) const
- int R (int index) const
- int Dn (int index) const
- const int * D (int index) const
- int C (int index) const
- int S (int index) const
- int O (int index) const
- int SR (int index) const
- const unsigned int ** GetTriangleIndices () const
- const float ** GetVoronoiSides () const
- const float * GetVoronoiCellAreas () const
- const unsigned int * GetNumNeighbours () const
- const unsigned int ** GetNeighbours () const
- const int * GetHull () const
- long int GetNumTriangles () const
- long int GetNumFaces () const
- long int GetNumVoronoiVertices () const
- const VSite * GetVoronoiVertices () const
- void UpdateZ (ScalarField< float > *z) const
- void UpdateNetwork ()
- void PrintNode (int index) const
- CatchmentIterator CatchmentsBegin () const
- CatchmentIterator CatchmentsEnd () const

Public Attributes

- KdTree * m_kdTree

Static Public Attributes

- static const int DIRICHLET
- static const int NEUMANN
- static const int CYCLIC

Friends

- class Triangulator
- class SurfaceTopologyOutput

6.26.1 Detailed Description

Definition at line 76 of file SurfaceTopology.hh.

6.26.2 Member Typedef Documentation

6.26.2.1 typedef set<int>::const_iterator src::mesh::SurfaceTopology::Catchment-Iterator

Definition at line 145 of file SurfaceTopology.hh.

6.26.3 Constructor & Destructor Documentation

6.26.3.1 src::mesh::SurfaceTopology::SurfaceTopology (Config * *c*)

6.26.3.2 src::mesh::SurfaceTopology::~SurfaceTopology ( )

6.26.4 Member Function Documentation

6.26.4.1 float src::mesh::SurfaceTopology::B (int *index*) const [inline]

Definition at line 157 of file SurfaceTopology.hh.

```
{return m_rawGeometry[index][3];}   /* BC */
```

6.26.4.2 int src::mesh::SurfaceTopology::C (int *index*) const [inline]

Definition at line 162 of file SurfaceTopology.hh.

```
{return m_catchmentIds[index];}       /* Catchment-Id */
```

6.26.4.3 CatchmentIterator src::mesh::SurfaceTopology::CatchmentsBegin ( ) const [inline]

Definition at line 189 of file SurfaceTopology.hh.

```
{ return m_catchments.begin(); };
```

6.26.4.4 CatchmentIterator src::mesh::SurfaceTopology::CatchmentsEnd ( ) const [inline]

Definition at line 190 of file SurfaceTopology.hh.

```
{ return m_catchments.end(); };
```

6.26.4.5 const int* src::mesh::SurfaceTopology::D (int *index*) const [inline]

Definition at line 161 of file SurfaceTopology.hh.

```
{return m_donors[index];}      /* Donors-list */
```

6.26.4.6 int src::mesh::SurfaceTopology::Dn (int *index*) const [inline]

Definition at line 160 of file SurfaceTopology.hh.

```
{return m_donorCounts[index];}       /* Donors-count */
```

6.26.4.7 float src::mesh::SurfaceTopology::GetAverageCellArea ( ) const [inline]

Definition at line 147 of file SurfaceTopology.hh.

```
{return m_averageCellArea;}
```

6.26.4.8 void src::mesh::SurfaceTopology::GetBounds (vector< float > & *upper*, vector< float > & *lower*) const

6.26.4.9 const int* src::mesh::SurfaceTopology::GetHull ( ) const [inline]

Definition at line 174 of file SurfaceTopology.hh.

```
{return (const int*) m_triangulator->GetHull();}
```

6.26.4.10 const float* src::mesh::SurfaceTopology::GetLowerBound ( ) [inline]

Definition at line 150 of file SurfaceTopology.hh.

```
{ return m_lower; }
```

6.26.4.11 const unsigned int** src::mesh::SurfaceTopology::GetNeighbours ( ) const [inline]

Definition at line 173 of file SurfaceTopology.hh.

```
{return (const unsigned int**) m_triangulator->GetNeighbours();}
```

6.26.4.12 unsigned int src::mesh::SurfaceTopology::GetNMeshPoints ( ) const [inline]

Definition at line 151 of file SurfaceTopology.hh.

```
{return m_nMeshPoints;}
```

6.26.4.13 long int src::mesh::SurfaceTopology::GetNumFaces ( ) const [inline]

Definition at line 176 of file SurfaceTopology.hh.

```
{return m_triangulator->GetNumFaces();}
```

6.26.4.14 const unsigned int* src::mesh::SurfaceTopology::GetNumNeighbours ( ) const [inline]

Definition at line 172 of file SurfaceTopology.hh.

```
{return (const unsigned int*) m_triangulator->GetNumNeighbours();}
```

6.26.4.15 long int src::mesh::SurfaceTopology::GetNumTriangles ( ) const [inline]

Definition at line 175 of file SurfaceTopology.hh.

```
{return m_triangulator->GetNumTriangles();}
```

6.26.4.16 long int src::mesh::SurfaceTopology::GetNumVoronoiVertices ( ) const [inline]

Definition at line 177 of file SurfaceTopology.hh.

```
{return m_triangulator->GetNumVoronoiVertices();}
```

6.26.4.17 const unsigned int** src::mesh::SurfaceTopology::GetTriangleIndices ( ) const [inline]

Definition at line 169 of file SurfaceTopology.hh.

```
{return (const unsigned int **)m_triangulator->GetTriangleIndices();}
```

6.26.4.18 const float* src::mesh::SurfaceTopology::GetVoronoiCellAreas ( ) const [inline]

Definition at line 171 of file SurfaceTopology.hh.

```
{return (const float*) m_triangulator->GetVoronoiCellAreas();}
```

6.26.4.19 const float** src::mesh::SurfaceTopology::GetVoronoiSides ( ) const [inline]

Definition at line 170 of file SurfaceTopology.hh.

```
{return (const float **) m_triangulator->GetVoronoiSides();}
```

6.26.4.20 const VSite* src::mesh::SurfaceTopology::GetVoronoiVertices ( ) const [inline]

Definition at line 178 of file SurfaceTopology.hh.

```
{return (const VSite*) m_triangulator->GetVoronoiVertices();}
```

6.26.4.21 void src::mesh::SurfaceTopology::InterpolateToRegularmesh (RegularMesh * *rm*, vector< float > & *field*) const

6.26.4.22 int src::mesh::SurfaceTopology::O (int *index*) const [inline]

Definition at line 164 of file SurfaceTopology.hh.

```
{return m_originalOrder[index];}      /* original-order */
```

6.26.4.23 void src::mesh::SurfaceTopology::PrintNode (int *index*) const

6.26.4.24 int src::mesh::SurfaceTopology::R (int *index*) const [inline]

Definition at line 159 of file SurfaceTopology.hh.

```
{return m_receivers[index];}          /* Receiver-id */
```

6.26.4.25 int src::mesh::SurfaceTopology::S (int *index*) const [inline]

Definition at line 163 of file SurfaceTopology.hh.

```
{return m_stack[index];}              /* Stack-order */
```

6.26.4.26 void src::mesh::SurfaceTopology::SavePreviousTimestep ( ) const

6.26.4.27 int src::mesh::SurfaceTopology::SR (int *index*) const [inline]

Definition at line 166 of file SurfaceTopology.hh.

```
{return m_receiversSillCorrected[index];}
```

6.26.4.28 void src::mesh::SurfaceTopology::UpdateNetwork ( )

6.26.4.29 void src::mesh::SurfaceTopology::UpdateZ (ScalarField< float > * *z*) const

6.26.4.30 float src::mesh::SurfaceTopology::X (int *index*) const [inline]

Definition at line 152 of file SurfaceTopology.hh.

```
{return m_rawGeometry[index][0];}   /* x-coordinate */
```

6.26.4.31 float src::mesh::SurfaceTopology::Y (int *index*) const [inline]

Definition at line 153 of file SurfaceTopology.hh.

```
{return m_rawGeometry[index][1];}   /* y-coordinate */
```

6.26.4.32 float src::mesh::SurfaceTopology::Z (int *index*) const [inline]

Definition at line 154 of file SurfaceTopology.hh.

```
{return m_rawGeometry[index][2];}   /* z-coordinate */
```

6.26.4.33 float src::mesh::SurfaceTopology::Z0 (int *index*) const [inline]

Definition at line 155 of file SurfaceTopology.hh.

```
{return m_z0[index];}              /* z at time-step 0 */
```

6.26.4.34 float src::mesh::SurfaceTopology::Zp (int *index*) const [inline]

Definition at line 156 of file SurfaceTopology.hh.

```
{return m_zp[index];}              /* z at previous time-step */
```

6.26.5 Friends And Related Function Documentation

6.26.5.1 friend class SurfaceTopologyOutput [friend]

Definition at line 80 of file SurfaceTopology.hh.

6.26.5.2 friend class Triangulator [friend]

Definition at line 79 of file SurfaceTopology.hh.

6.26.6 Member Data Documentation

6.26.6.1 const int src::mesh::SurfaceTopology::CYCLIC [static]

Definition at line 84 of file SurfaceTopology.hh.

6.26.6.2 const int src::mesh::SurfaceTopology::DIRICHLET [static]

Definition at line 82 of file SurfaceTopology.hh.

6.26.6.3 KdTree* src::mesh::SurfaceTopology::m_kdTree

Definition at line 186 of file SurfaceTopology.hh.

6.26.6.4 const int src::mesh::SurfaceTopology::NEUMANN [static]

Definition at line 83 of file SurfaceTopology.hh.

The documentation for this class was generated from the following file:

- src/mesh/SurfaceTopology.hh

6.27 src::mesh::SurfaceTopologyOutput Class Reference

`#include <SurfaceTopologyOutput.hh>`

Public Types

- enum Attributes_t { SurfaceTopologyOutput_WriteMesh = (1<<0), SurfaceTopologyOutput_WriteNetwork = (1<<1) }
- typedef enum src::mesh::SurfaceTopologyOutput::Attributes_t Attributes

Public Member Functions

- SurfaceTopologyOutput (const Model *m, Config *c)
- ~SurfaceTopologyOutput ()
- void RegisterScalarField (ScalarField< float > *sf)
- void Write ()

Friends

- class SurfaceTopology

6.27.1 Detailed Description

Definition at line 59 of file SurfaceTopologyOutput.hh.

6.27.2 Member Typedef Documentation

6.27.2.1 typedef enum src::mesh::SurfaceTopologyOutput::Attributes_t src::mesh::SurfaceTopologyOutput::Attributes

6.27.3 Member Enumeration Documentation

6.27.3.1 enum src::mesh::SurfaceTopologyOutput::Attributes_t

Enumerator:

SurfaceTopologyOutput_WriteMesh

SurfaceTopologyOutput_WriteNetwork

Definition at line 67 of file SurfaceTopologyOutput.hh.

```
                        {
    SurfaceTopologyOutput_WriteMesh      = (1<<0),
    SurfaceTopologyOutput_WriteNetwork   = (1<<1),
}Attributes;
```

6.27.4 Constructor & Destructor Documentation

6.27.4.1 src::mesh::SurfaceTopologyOutput::SurfaceTopologyOutput (const Model * *m*, Config * *c*)

6.27.4.2 src::mesh::SurfaceTopologyOutput::~SurfaceTopologyOutput ( )

6.27.5 Member Function Documentation

6.27.5.1 void src::mesh::SurfaceTopologyOutput::RegisterScalarField (ScalarField< float > * *sf*)

6.27.5.2 void src::mesh::SurfaceTopologyOutput::Write ( )

6.27.6 Friends And Related Function Documentation

6.27.6.1 friend class SurfaceTopology [friend]

Definition at line 65 of file SurfaceTopologyOutput.hh.

The documentation for this class was generated from the following file:

- src/mesh/SurfaceTopologyOutput.hh

6.28 src::util::Timer Class Reference

`#include <Timer.hh>`

Public Member Functions

- Timer ()
- ~Timer ()

Static Public Member Functions

- static double Elapsed (const Timer &begin, const Timer &end)

6.28.1 Detailed Description

Definition at line 53 of file Timer.hh.

6.28.2 Constructor & Destructor Documentation

6.28.2.1 src::util::Timer::Timer ( )

6.28.2.2 src::util::Timer::~Timer ( )

6.28.3 Member Function Documentation

6.28.3.1 static double src::util::Timer::Elapsed (const Timer & *begin*, const Timer & *end*) [static]

The documentation for this class was generated from the following file:

- src/util/Timer.hh

6.29 src::util::TimeSeries Class Reference

`#include <TimeSeries.hh>`

Public Member Functions

- TimeSeries (const Model *m, Config *c, string paramName)
- ~TimeSeries ()
- void GetCurrentFieldValue (vector< double > *result)

6.29.1 Detailed Description

Definition at line 66 of file TimeSeries.hh.

6.29.2 Constructor & Destructor Documentation

6.29.2.1 src::util::TimeSeries::TimeSeries (const Model * *m*, Config * *c*, string *paramName*)

6.29.2.2 src::util::TimeSeries::~TimeSeries ( )

6.29.3 Member Function Documentation

6.29.3.1 void src::util::TimeSeries::GetCurrentFieldValue (vector< double > * *result*)

The documentation for this class was generated from the following file:

- src/util/TimeSeries.hh

6.30 src::geometry::Triangulator Class Reference

`#include <Triangulator.hh>`

Public Types

- enum Attributes_t { Triangulator_SuperTriangle = (1<<0), Triangulator_TriangleIndices = (1<<1), Triangulator_TriangleNeighbours = (1<<2), Triangulator_VoronoiVertices = (1<<3), Triangulator_VoronoiSides = (1<<4), Triangulator_VoronoiCellAreas = (1<<5), Triangulator_NodeNeighbours = (1<<6) }
- typedef enum src::geometry::Triangulator::Attributes_t Attributes

Public Member Functions

- Triangulator (int ns, float **s, unsigned int attr)
- ~Triangulator ()
- unsigned int ** GetTriangleIndices ()
- float ** GetVoronoiSides ()
- float * GetVoronoiCellAreas ()
- unsigned int * GetNumNeighbours ()
- unsigned int ** GetNeighbours ()
- int * GetHull ()
- long int GetNumTriangles ()
- long int GetNumFaces ()
- long int GetNumVoronoiVertices ()
- VSite * GetVoronoiVertices ()
- void ComputeBound (float *minx, float *miny, float *maxx, float *maxy)

Friends

- std::ostream & operator<< (std::ostream &os, const Triangulator &t)

6.30.1 Detailed Description

Definition at line 56 of file Triangulator.hh.

6.30.2 Member Typedef Documentation

6.30.2.1 typedef enum src::geometry::Triangulator::Attributes_t src::geometry::Triangulator::Attributes

6.30.3 Member Enumeration Documentation

6.30.3.1 enum src::geometry::Triangulator::Attributes_t

Enumerator:

Triangulator_SuperTriangle

Triangulator_TriangleIndices

Triangulator_TriangleNeighbours

Triangulator_VoronoiVertices

Triangulator_VoronoiSides

Triangulator_VoronoiCellAreas

Triangulator_NodeNeighbours

Definition at line 98 of file Triangulator.hh.

```
{
    Triangulator_SuperTriangle          = (1<<0),
    Triangulator_TriangleIndices        = (1<<1),
    Triangulator_TriangleNeighbours     = (1<<2),
    Triangulator_VoronoiVertices        = (1<<3),
    Triangulator_VoronoiSides           = (1<<4),
    Triangulator_VoronoiCellAreas        = (1<<5),
    Triangulator_NodeNeighbours         = (1<<6)
}Attributes;
```

6.30.4 Constructor & Destructor Documentation

6.30.4.1 src::geometry::Triangulator::Triangulator (int *ns,* float ** *s,* unsigned int *attr*)

6.30.4.2 src::geometry::Triangulator::~Triangulator ( )

6.30.5 Member Function Documentation

6.30.5.1 void src::geometry::Triangulator::ComputeBound (float * *minx,* float * *miny,* float * *maxx,* float * *maxy*)

6.30.5.2 int* src::geometry::Triangulator::GetHull ( )

6.30.5.3 unsigned int** src::geometry::Triangulator::GetNeighbours ( )

6.30.5.4 long int src::geometry::Triangulator::GetNumFaces ( )

6.30.5.5 unsigned int* src::geometry::Triangulator::GetNumNeighbours ( )

6.30.5.6 long int src::geometry::Triangulator::GetNumTriangles ( )

6.30.5.7 long int src::geometry::Triangulator::GetNumVoronoiVertices ( )

6.30.5.8 unsigned int** src::geometry::Triangulator::GetTriangleIndices ( )

6.30.5.9 float* src::geometry::Triangulator::GetVoronoiCellAreas ( )

6.30.5.10 float** src::geometry::Triangulator::GetVoronoiSides ( )

6.30.5.11 VSite* src::geometry::Triangulator::GetVoronoiVertices ( )

6.30.6 Friends And Related Function Documentation

6.30.6.1 std::ostream& operator<< (std::ostream & *os*, const Triangulator & *t*) [friend]

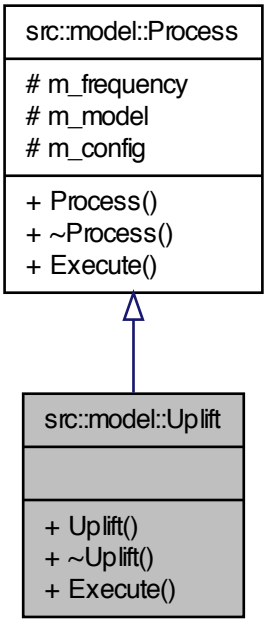
The documentation for this class was generated from the following file:

- src/geometry/Triangulator.hh

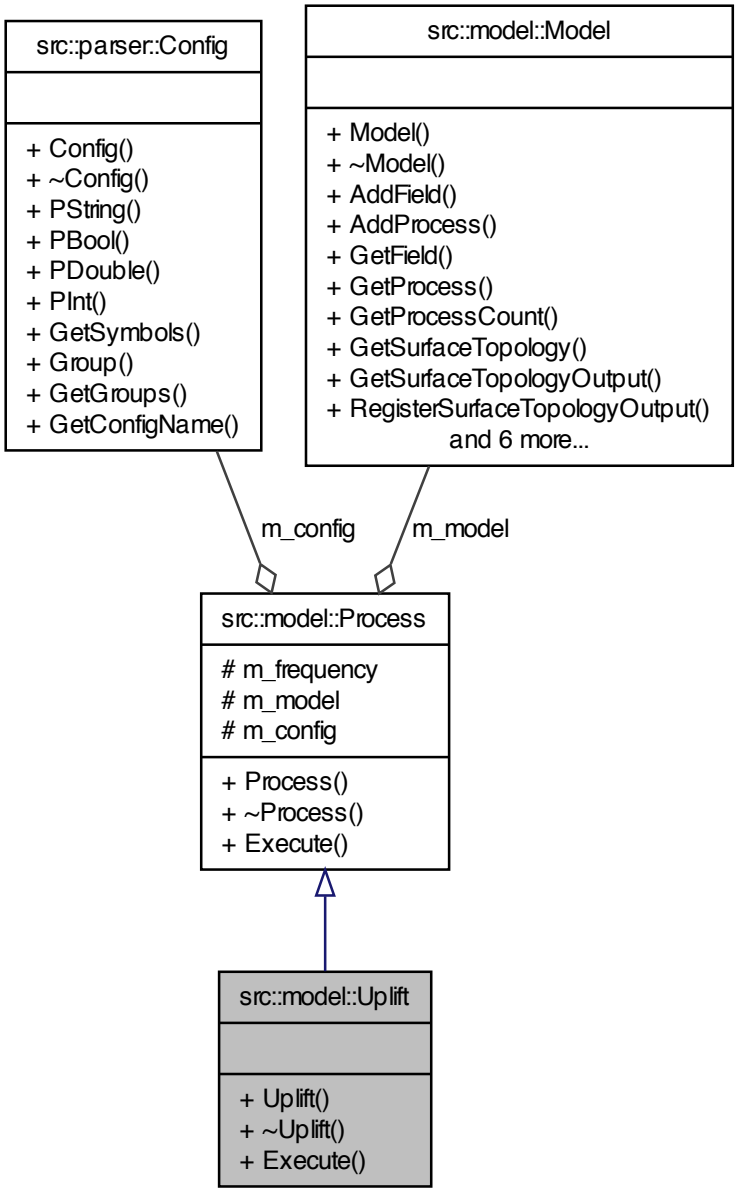
6.31 src::model::Uplift Class Reference

```
#include <Uplift.hh>
```

Inheritance diagram for src::model::Uplift:



Collaboration diagram for src::model::Uplift:



Public Member Functions

- Uplift (const Model *m, Config *c)
- ~Uplift ()
- void Execute ()

6.31.1 Detailed Description

Definition at line 57 of file Uplift.hh.

6.31.2 Constructor & Destructor Documentation

6.31.2.1 src::model::Uplift::Uplift (const Model * *m*, Config * *c*)

6.31.2.2 src::model::Uplift::~Uplift ( )

6.31.3 Member Function Documentation

6.31.3.1 void src::model::Uplift::Execute ( ) [virtual]

Implements src::model::Process.

The documentation for this class was generated from the following file:

- src/model/Uplift.hh

6.32 src::geometry::VSite Class Reference

`#include <Topology.hh>`

Public Attributes

- float m_coord [2]

Friends

- std::ostream & operator<< (std::ostream &os, const VSite &mp)

6.32.1 Detailed Description

Definition at line 65 of file Topology.hh.

6.32.2 Friends And Related Function Documentation

6.32.2.1 std::ostream& operator<< (std::ostream & *os*, const VSite & *mp*) [friend]

Definition at line 75 of file Topology.hh.

```
{
    os << "VSite: (" << (mp.m_coord)[0] <<
          ", " << (mp.m_coord)[1] << ")" << endl;
    return os;
}
```

6.32.3 Member Data Documentation

6.32.3.1 float src::geometry::VSite::m_coord[2]

Definition at line 68 of file Topology.hh.

The documentation for this class was generated from the following file:

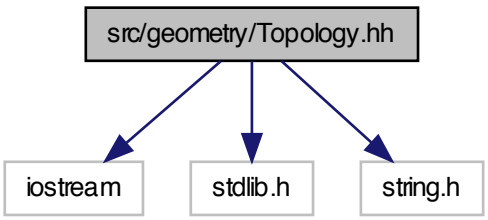
- src/geometry/Topology.hh

Chapter 7

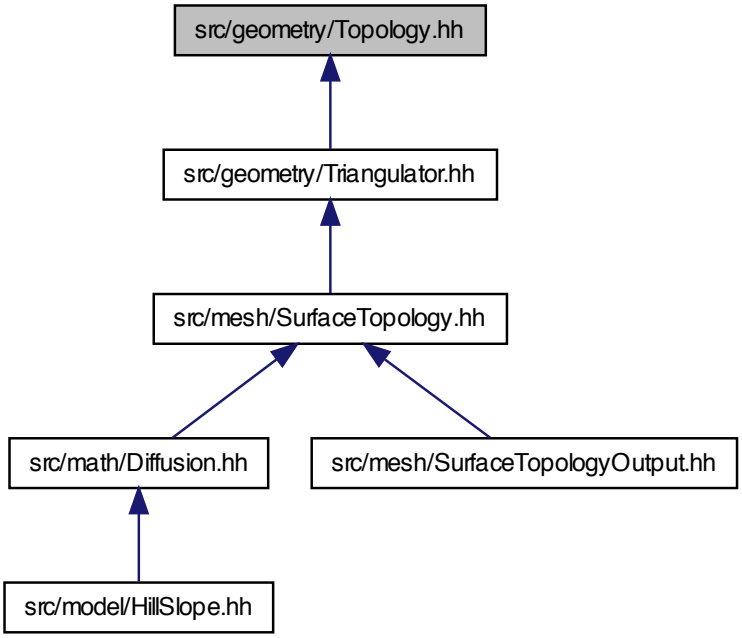
File Documentation

7.1 src/geometry/Topology.hh File Reference

`#include <iostream>` `#include <stdlib.h>` `#include <string.-h>` Include dependency graph for Topology.hh:



This graph shows which files directly or indirectly include this file:



Classes

- class src::geometry::VSite
- class src::geometry::Site
- class src::geometry::SiteComparator
- class src::geometry::Edge
- class src::geometry::QuadEdge

Namespaces

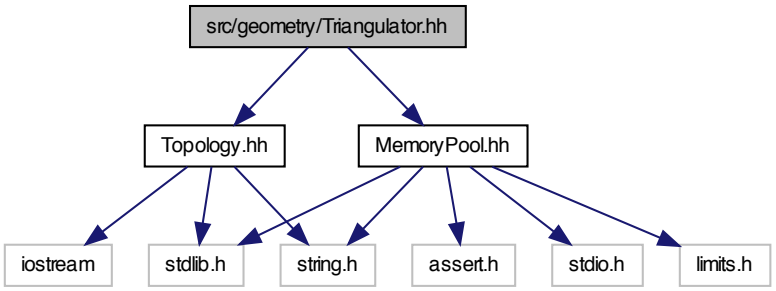
- namespace src
- namespace src::geometry

Functions

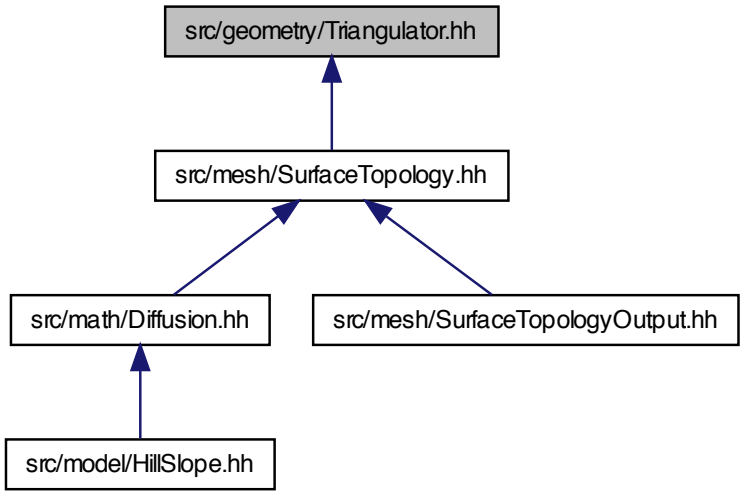
- float src::geometry::FABS (float a)

7.2 src/geometry/Triangulator.hh File Reference

`#include <Topology.hh>` `#include <MemoryPool.hh>` Include dependency graph for Triangulator.hh:



This graph shows which files directly or indirectly include this file:



Classes

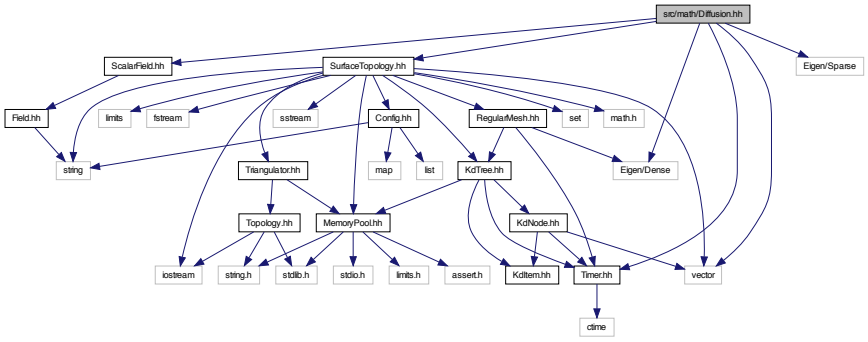
- class src::geometry::Triangulator

Namespaces

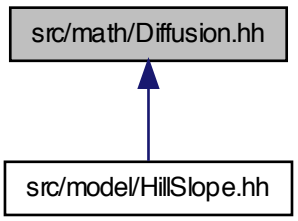
- namespace src
- namespace src::geometry

7.3 src/math/Diffusion.hh File Reference

`#include <vector> #include <SurfaceTopology.hh> #include <ScalarField.hh> #include <Timer.hh> #include <Eigen/Dense> #include <Eigen/Sparse>` Include dependency graph for Diffusion.hh:



This graph shows which files directly or indirectly include this file:



Classes

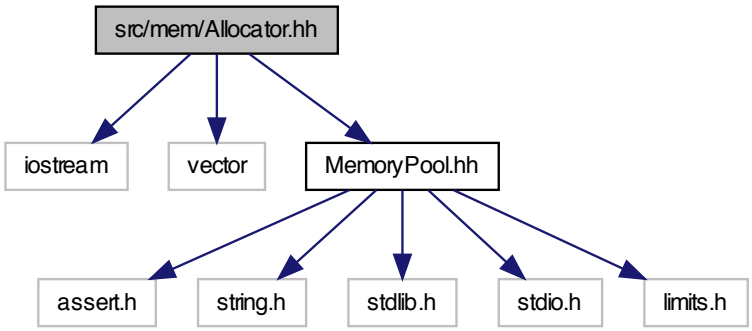
- class src::math::Diffusion
- struct src::math::Diffusion::Coord_t

Namespaces

- namespace src
- namespace src::math

7.4 src/mem/Allocator.hh File Reference

`#include <iostream> #include <vector> #include <MemoryPool.hh>` Include dependency graph for Allocator.hh:



Classes

- class src::mem::PoolAllocator< T >
- struct src::mem::PoolAllocator< T >::rebind< U >
- class src::mem::PoolAllocator< void >
- struct **src::mem::PoolAllocator**< **void** >**::rebind**< **U** >

Namespaces

- namespace src
- namespace src::mem

Functions

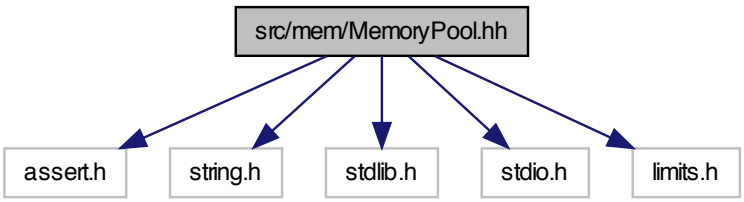
- template<class T >
  bool src::mem::operator== (const PoolAllocator< T > &, const PoolAllocator< T > &)
- template<class T >
  bool src::mem::operator!= (const PoolAllocator< T > &, const PoolAllocator< T > &)
- void src::mem::InitPool ()
- void src::mem::FinalisePool ()

Variables

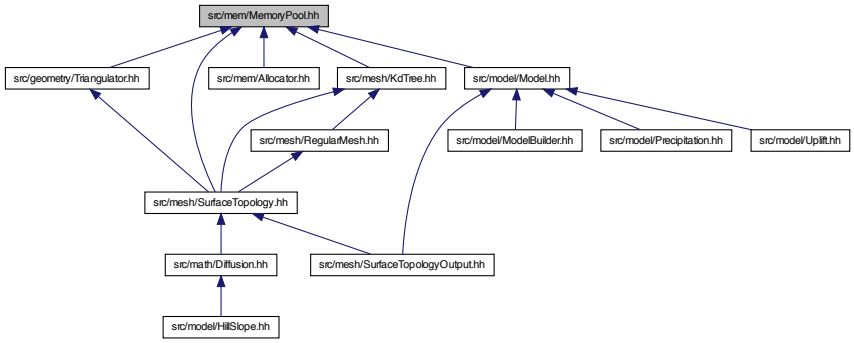
- pthread_mutex_t src::mem::mutex
- static std::vector< MemoryPool * > src::mem::pools

7.5 src/mem/MemoryPool.hh File Reference

`#include <assert.h>` `#include <string.h>` `#include <stdlib.h>` `#include <stdio.h>` `#include <limits.h>` Include dependency graph for MemoryPool.hh:



This graph shows which files directly or indirectly include this file:



Classes

- struct src::mem::Chunk
- class src::mem::MemoryPool

Namespaces

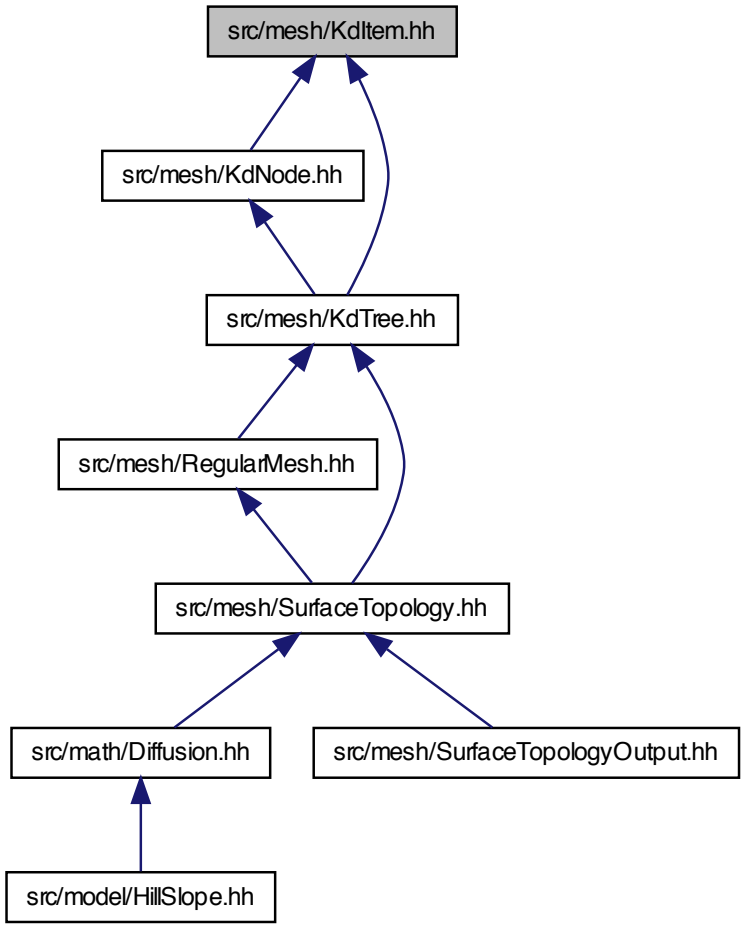
- namespace src
- namespace src::mem

Variables

- const int src::mem::CHUNK_ARRAY_DELTA = 10
- const int src::mem::INVALID = -1
- const int src::mem::SUCCESS = 1
- const int src::mem::FAILURE = 0
- const int src::mem::TWO_EXP16 = 65535

7.6 src/mesh/KdItem.hh File Reference

This graph shows which files directly or indirectly include this file:



Classes

- class src::mesh::KdItem

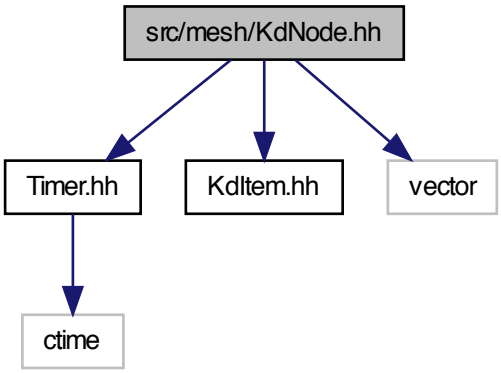
Namespaces

- namespace src

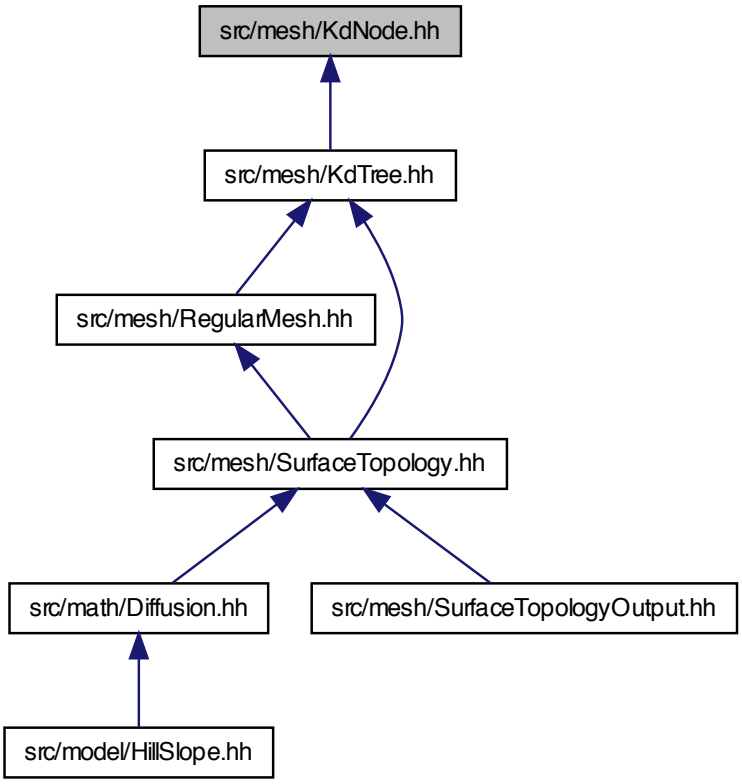
- namespace src::mesh

7.7 src/mesh/KdNode.hh File Reference

`#include <Timer.hh>` `#include <KdItem.hh>` `#include <vector>` ×
Include dependency graph for KdNode.hh:



This graph shows which files directly or indirectly include this file:



Classes

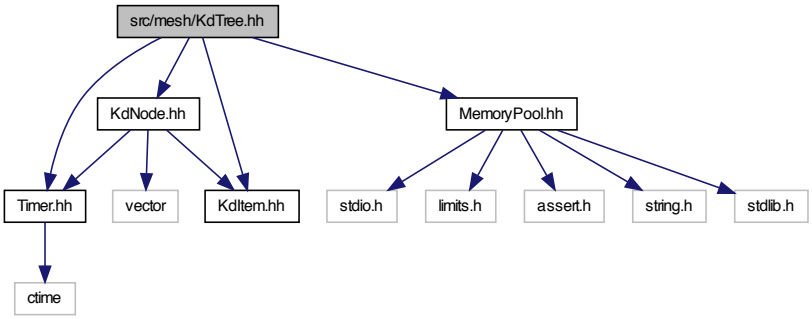
- class src::mesh::KdNode
- struct **src::mesh::KdNode::KdItemSort**

Namespaces

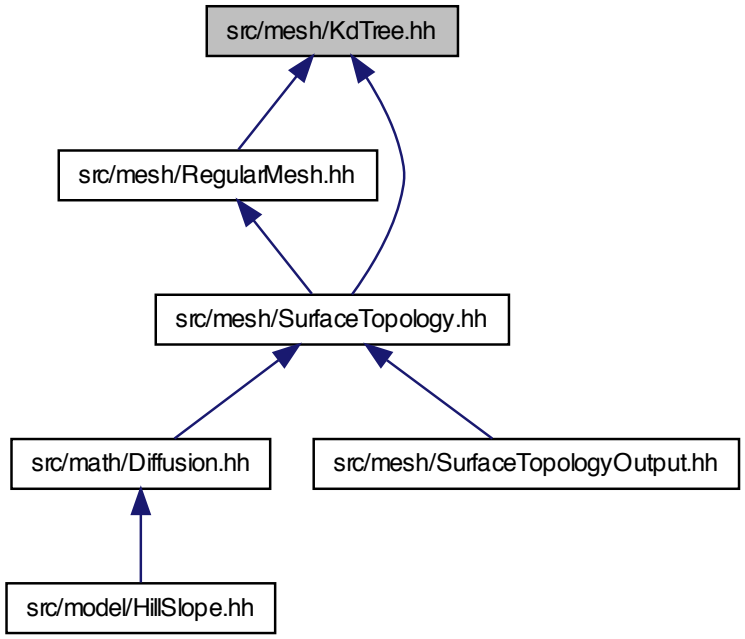
- namespace src
- namespace src::mesh

7.8 src/mesh/KdTree.hh File Reference

`#include <Timer.hh>  #include <KdItem.hh>  #include <KdNode.hh> #include <MemoryPool.hh>` Include dependency graph for KdTree.hh:



This graph shows which files directly or indirectly include this file:



Classes

- class src::mesh::KdTree

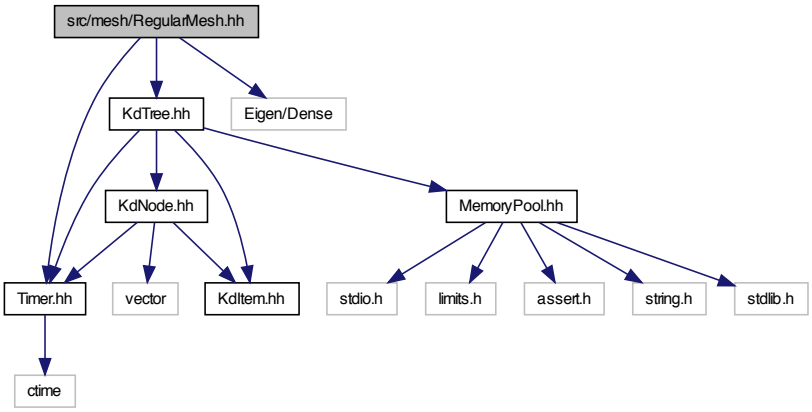
Namespaces

- namespace src
- namespace src::mesh

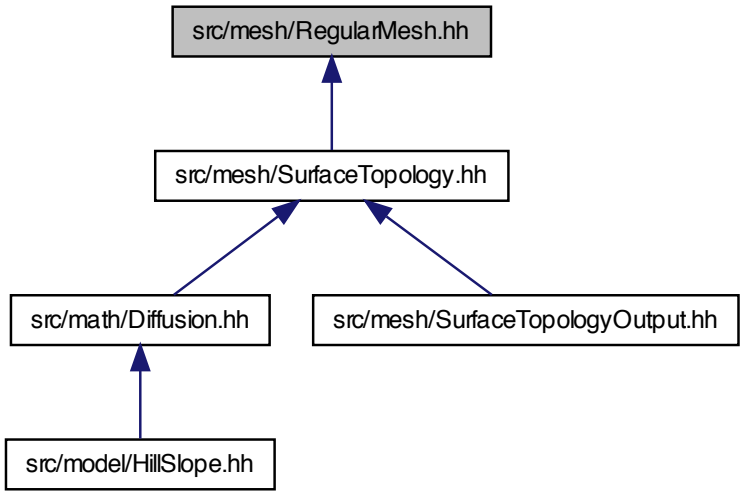
7.9 src/mesh/RegularMesh.hh File Reference

```
#include <KdTree.hh>   #include <Timer.hh>   #include <-
```

Eigen/Dense> Include dependency graph for RegularMesh.hh:



This graph shows which files directly or indirectly include this file:



Classes

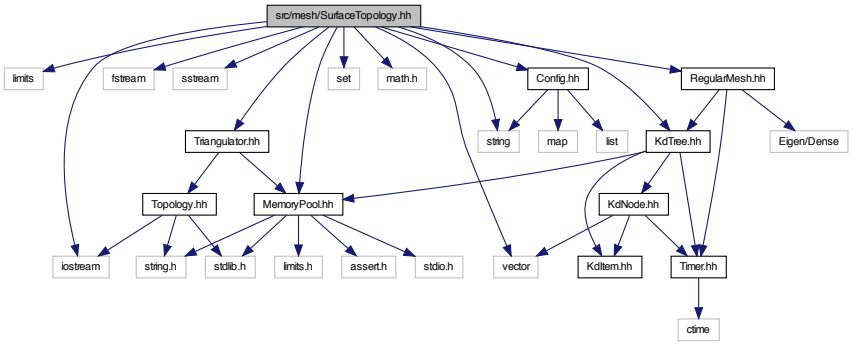
- class src::mesh::RegularMesh

Namespaces

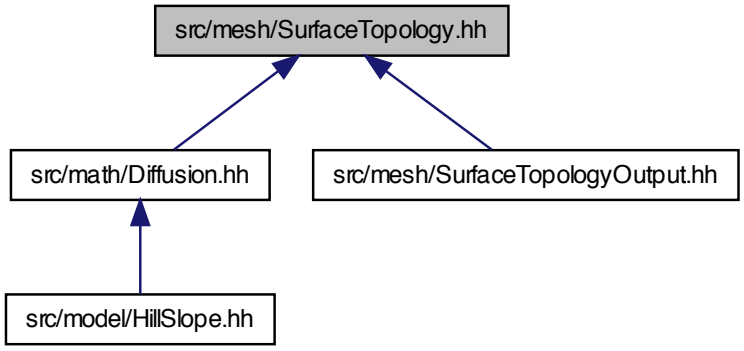
- namespace src
- namespace src::mesh

7.10 src/mesh/SurfaceTopology.hh File Reference

`#include <limits> #include <iostream> #include <fstream> #include <sstream> #include <string> #include <vector> #include <set> #include <math.h> #include <MemoryPool.hh> #include <Triangulator.hh> #include <Config.hh> #include <KdTree.hh> #include <RegularMesh.hh>` Include dependency graph for SurfaceTopology.hh:



This graph shows which files directly or indirectly include this file:



Classes

- class src::mesh::SurfaceTopology

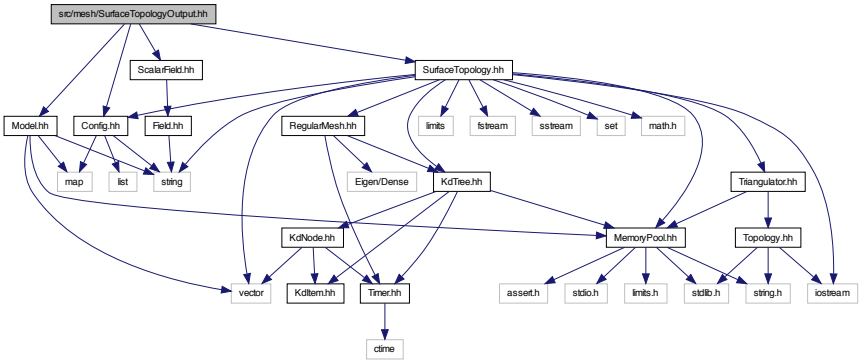
Namespaces

- namespace src
- namespace src::util
- namespace src::mesh

7.11 src/mesh/SurfaceTopologyOutput.hh File Reference

`#include <Model.hh>` `#include <SurfaceTopology.hh>` `#include <ScalarField.hh>` `#include <Config.hh>` Include dependency graph for

SurfaceTopologyOutput.hh:



Classes

- class src::mesh::SurfaceTopologyOutput

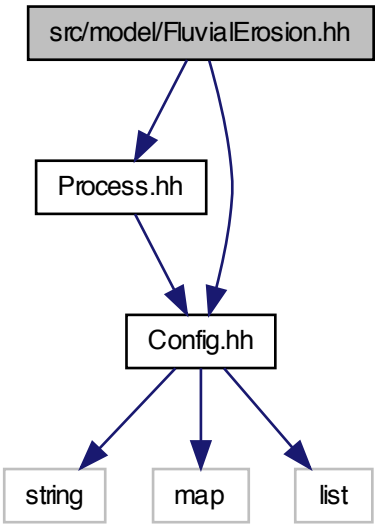
Namespaces

- namespace src
- namespace src::mesh

7.12 src/model/FluvialErosion.hh File Reference

`#include <Process.hh>` `#include <Config.hh>` Include dependency

graph for FluvialErosion.hh:



Classes

- class src::model::FluvialErosion

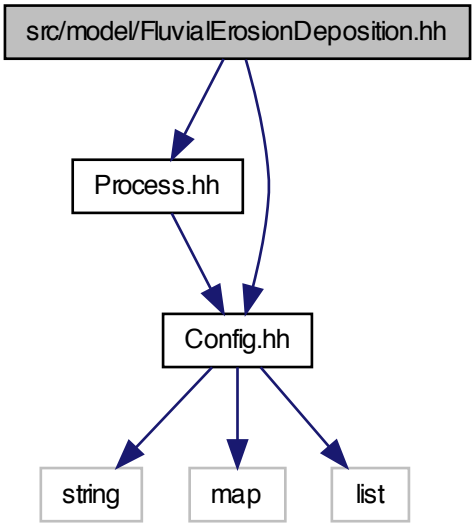
Namespaces

- namespace src
- namespace src::model

7.13 src/model/FluvialErosionDeposition.hh File Reference

`#include <Process.hh>` `#include <Config.hh>` Include dependency

graph for FluvialErosionDeposition.hh:



Classes

- class src::model::FluvialErosionDeposition

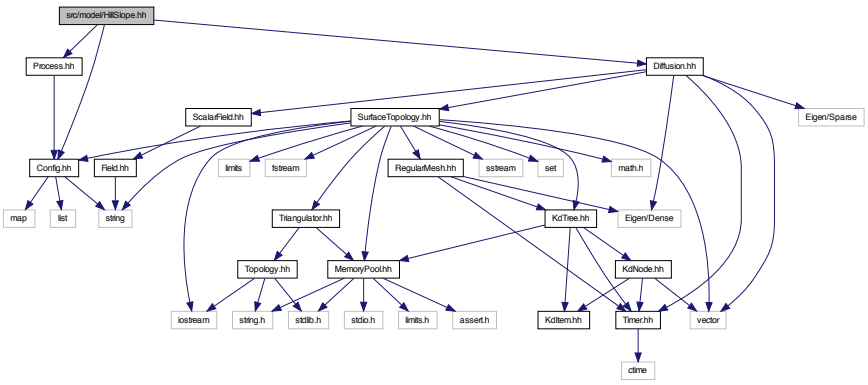
Namespaces

- namespace src
- namespace src::model

7.14 src/model/HillSlope.hh File Reference

```
#include <Process.hh>  #include <Config.hh>  #include <-
```

Diffusion.hh> Include dependency graph for HillSlope.hh:



Classes

- class src::model::HillSlope

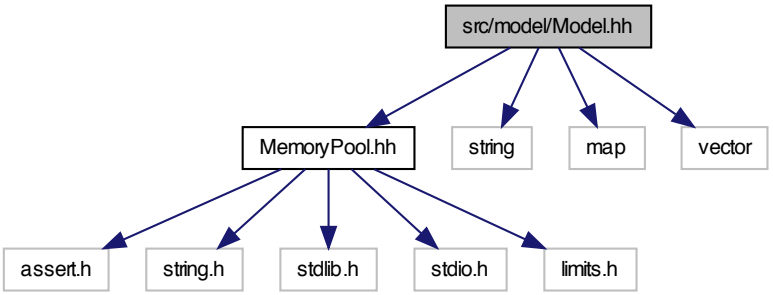
Namespaces

- namespace src
- namespace src::model

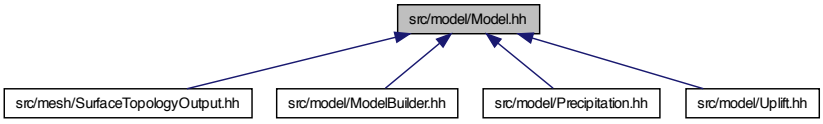
7.15 src/model/Model.hh File Reference

#include <MemoryPool.hh> #include <string> #include <map> ×

#include <vector> Include dependency graph for Model.hh:



This graph shows which files directly or indirectly include this file:



Classes

- class src::model::Model

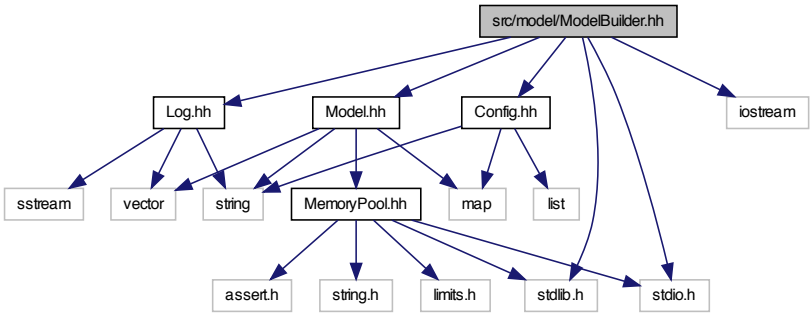
Namespaces

- namespace src
- namespace src::util
- namespace src::mesh
- namespace src::parser
- namespace src::model

7.16 src/model/ModelBuilder.hh File Reference

#include <Config.hh> #include <Log.hh> #include <Model.-
hh> #include <iostream> #include <stdio.h> #include <stdlib.-

h> Include dependency graph for ModelBuilder.hh:



Classes

- class src::model::ModelBuilder

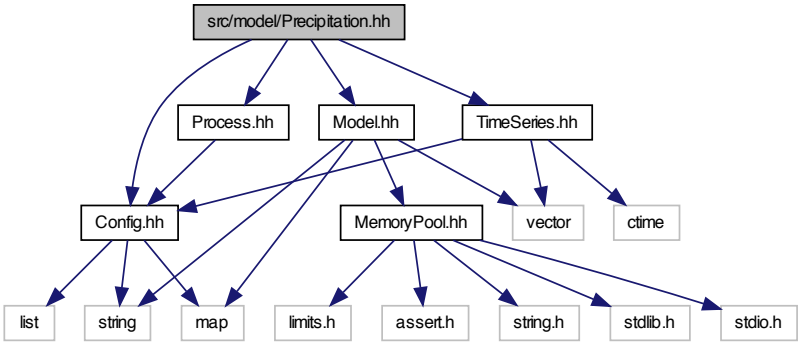
Namespaces

- namespace src
- namespace src::mesh
- namespace src::model

7.17 src/model/Precipitation.hh File Reference

#include <Process.hh> #include <Model.hh> #include <-Config.hh> #include <TimeSeries.hh> Include dependency graph for

Precipitation.hh:



Classes

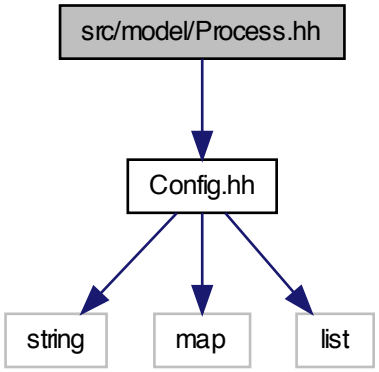
- class src::model::Precipitation

Namespaces

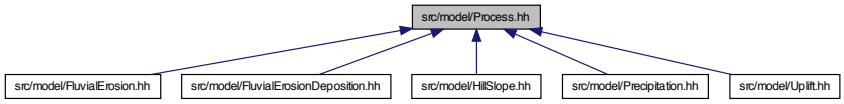
- namespace src
- namespace src::model

7.18 src/model/Process.hh File Reference

`#include <Config.hh>` Include dependency graph for Process.hh:



This graph shows which files directly or indirectly include this file:



Classes

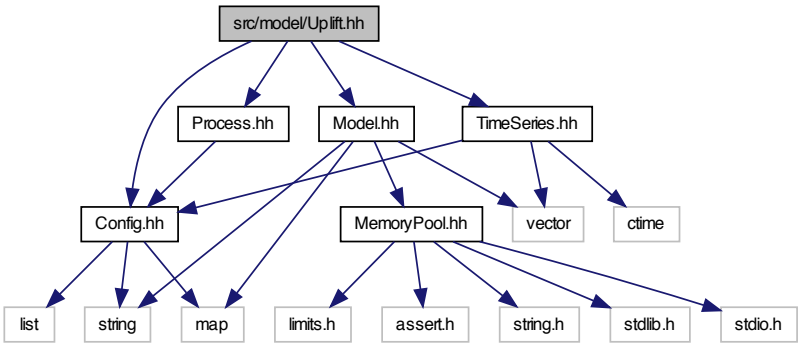
- class src::model::Process

Namespaces

- namespace src
- namespace src::model

7.19 src/model/Uplift.hh File Reference

`#include <Process.hh>  #include <Model.hh>  #include <-Config.hh> #include <TimeSeries.hh>` Include dependency graph for Uplift.hh:



Classes

- class src::model::Uplift

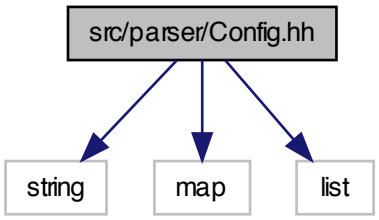
Namespaces

- namespace src
- namespace src::model

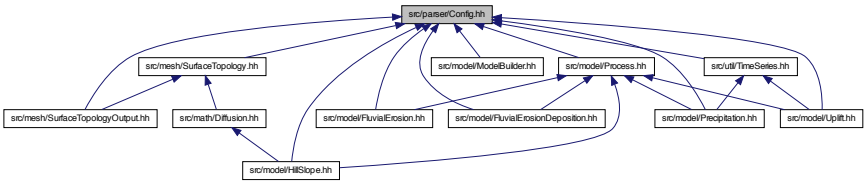
7.20 src/parser/Config.hh File Reference

`#include <string> #include <map> #include <list>` Include de-

pendency graph for Config.hh:



This graph shows which files directly or indirectly include this file:



Classes

- class src::parser::Config

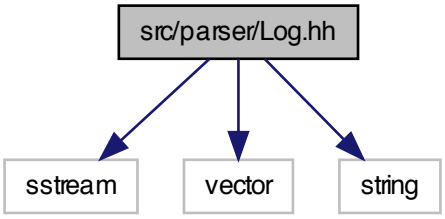
Namespaces

- namespace src
- namespace src::parser

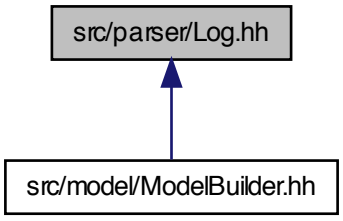
7.21 src/parser/Log.hh File Reference

```
#include <sstream> #include <vector> #include <string> x
```

Include dependency graph for Log.hh:



This graph shows which files directly or indirectly include this file:



Namespaces

- namespace src
- namespace src::parser

Defines

- #define LogError(A) ((logLevel >= LOG_ERROR)?((A),0):(0))
- #define LogInfo(A) ((logLevel >= LOG_INFO)?((A),0):(0))
- #define LogDebug(A) ((logLevel >= LOG_DEBUG)?((A),0):(0))

Enumerations

- enum src::parser::LogLevel { src::parser::LOG_QUIET, src::parser::LOG_ERROR, src::parser::LOG_INFO, src::parser::LOG_DEBUG }

Functions

- void src::parser::debugBreak ()
- vector< string > src::parser::split (const string &s, char delim)

Variables

- LogLevel src::parser::logLevel

7.21.1 Define Documentation

7.21.1.1 #define LogDebug(A) ((logLevel >= LOG_DEBUG)?((A),0):(0))

Definition at line 54 of file Log.hh.

7.21.1.2 #define LogError(A) ((logLevel >= LOG_ERROR)?((A),0):(0))

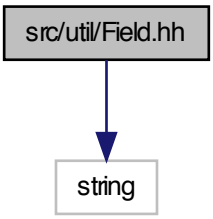
Definition at line 52 of file Log.hh.

7.21.1.3 #define LogInfo(A) ((logLevel >= LOG_INFO)?((A),0):(0))

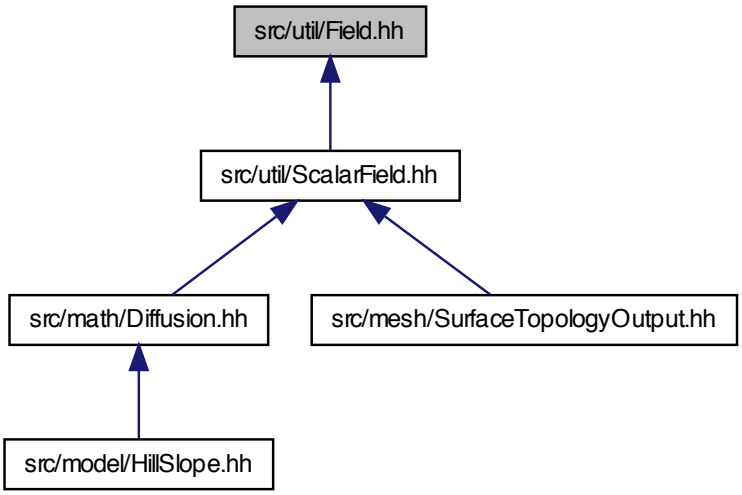
Definition at line 53 of file Log.hh.

7.22 src/util/Field.hh File Reference

`#include <string>` Include dependency graph for Field.hh:



This graph shows which files directly or indirectly include this file:



Classes

- class src::util::Field

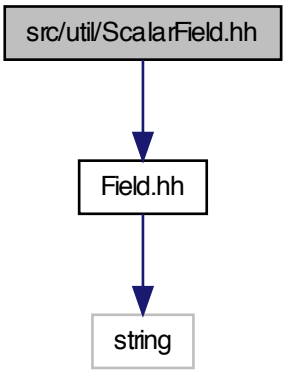
Namespaces

- namespace src

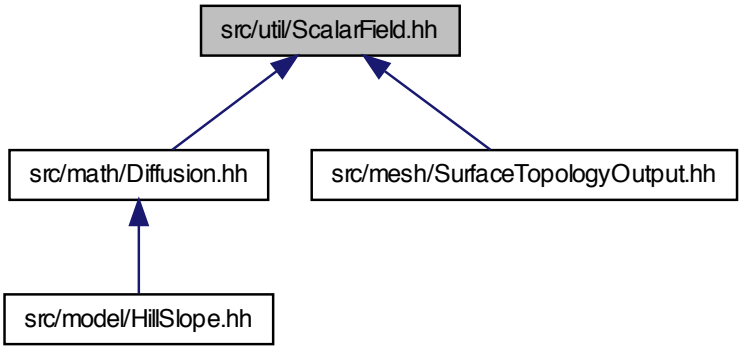
- namespace src::util

7.23 src/util/ScalarField.hh File Reference

`#include <Field.hh>` Include dependency graph for ScalarField.hh:



This graph shows which files directly or indirectly include this file:



Classes

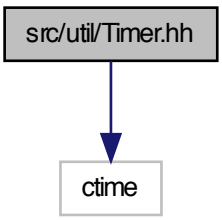
- class src::util::ScalarField< T >

Namespaces

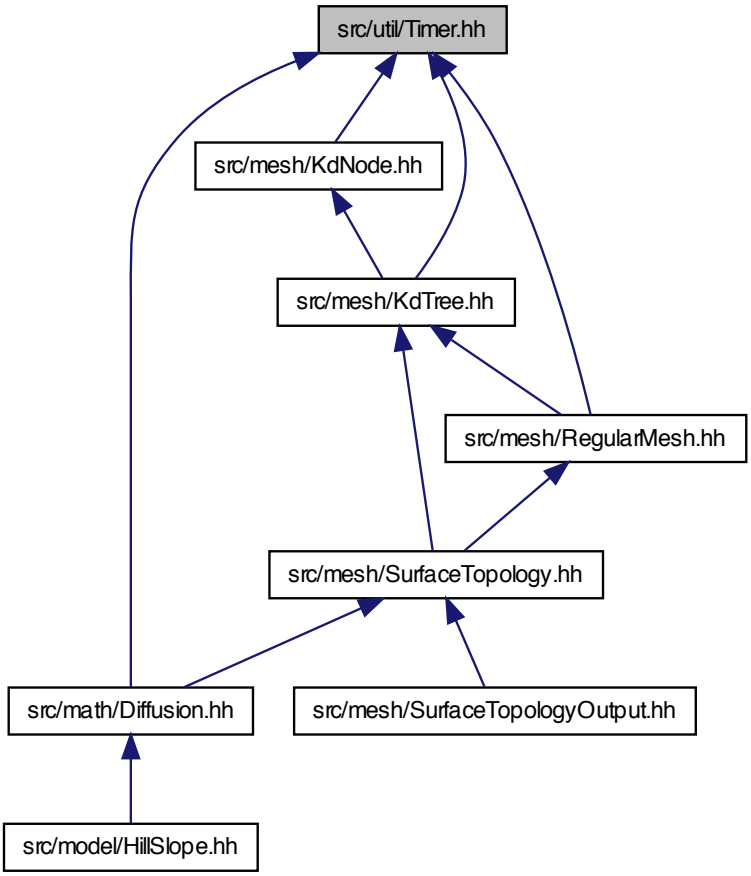
- namespace src
- namespace src::util

7.24 src/util/Timer.hh File Reference

`#include <ctime>` Include dependency graph for Timer.hh:



This graph shows which files directly or indirectly include this file:



Classes

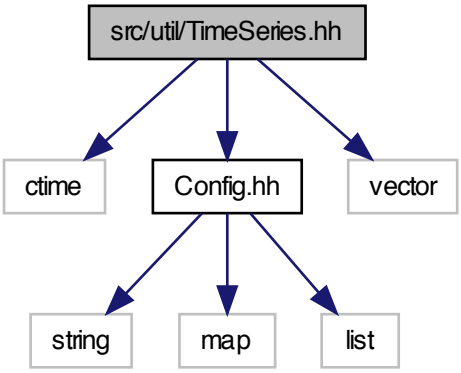
- class src::util::Timer

Namespaces

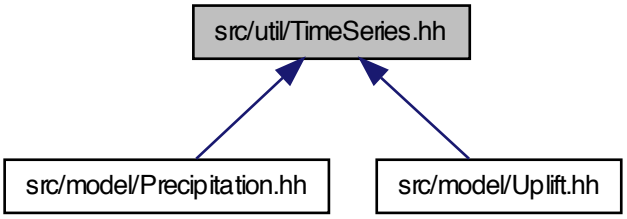
- namespace src
- namespace src::util

7.25 src/util/TimeSeries.hh File Reference

`#include <ctime> #include <Config.hh> #include <vector>` ×
Include dependency graph for TimeSeries.hh:



This graph shows which files directly or indirectly include this file:



Classes

- class src::util::TimeSeries

Namespaces

- namespace src
- namespace src::model
- namespace src::util