



WebApollo-JBrowse for non-model genomes

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Amphimedon queenslandica coral reef sponge

nature

Vol 466 | 5 August 2010 | doi:10.1038/nature09201


ARTICLES 2010

The *Amphimedon queenslandica* genome and the evolution of animal complexity

Hologenome includes four bacterial symbiont genomes

One of the best characterized basal metazoan systems,
with > 1000 developmental and experimental gene
expression and gene regulation datasets:

- Bulk RNA-Seq from multiple developmental stages
- Single-embryo/larval RNA-Seq (CEL-Seq) – devt'l & expt'l
- Single-cell RNA-Seq (CEL-Seq, MARS-Seq) – adult & larval
- Dual RNA-Seq (holotranscriptome) – devt'l & expt'l
- ChIP-Seq – histone PTM & specific TFs, larval & adult
- ATAC-Seq – devt'l & expt'l
- Cut & run – devt'l



Origin and evolution of animals
Evolution of genome regulation
Animal-bacterial symbiosis

Acanthaster planci cf. *solaris* crown-of-thorns starfish

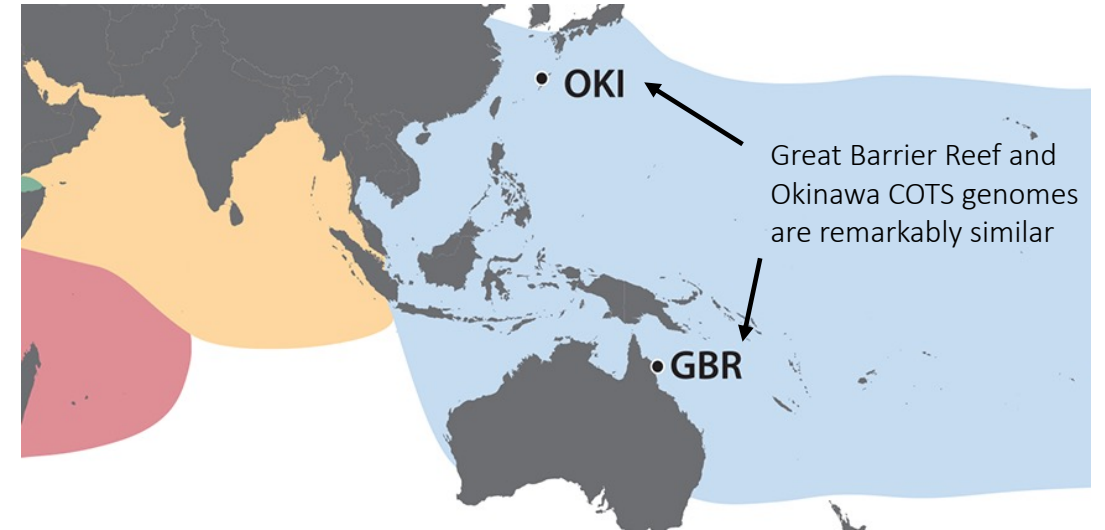
LETTER 2017

OPEN
doi:10.1038/nature22033

The crown-of-thorns starfish genome as a guide for biocontrol of this coral reef pest

Genomes, transcriptomes and exoproteomes from Great Barrier Reef and Okinawa individuals are providing insights into conspecific communication and biocontrol strategies

Animal communication in the ocean
Genome-guided biocontrol



160+ datasets:

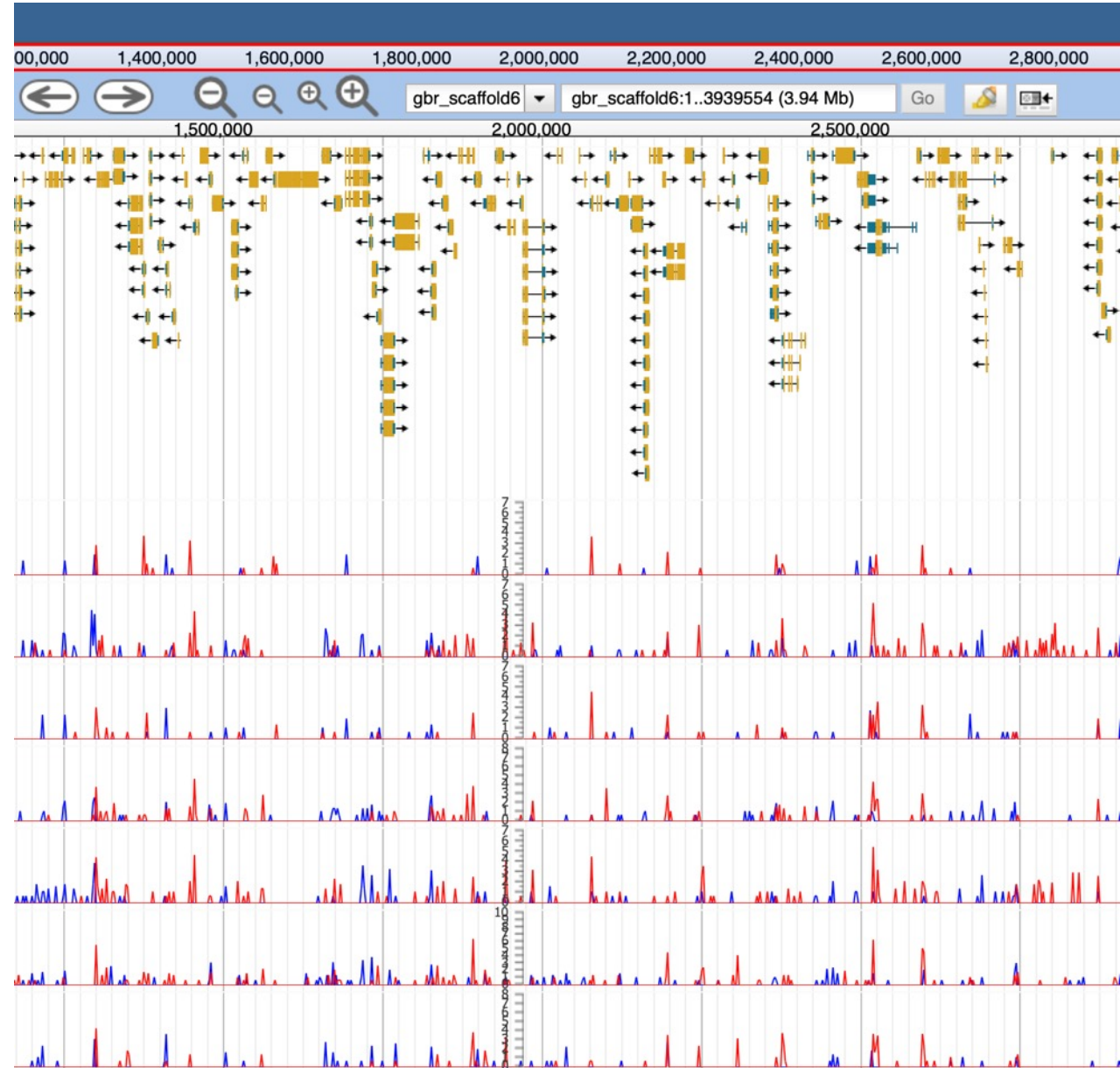
Bulk RNA-Seq – range of tissues

CEL-RNA-Seq – wild and captive tissues and cells

Acanthaster planci cf. *solaris*
crown-of-thorns starfish



A. planci cf. *solaris*
Apollo browser



Marine Genomics Lab Apollo browser

COTSV1.1 File View Help

0 500,000 1,000,000 1,500,000 2,000,000 2,500,000 3,000,000 3,500,000

gbr_scaffold6 gbr_scaffold6:1..3939554 (3.94 Mb) Go

Select tracks

Acanthaster planci (COTSV1.1)

- Amphimedon A. queenslandica (AQUV3.1)
- SYMBIONT1v2
- SYMBIONT2v2
- SYMBIONT3v2

Annotation Name ID All Types GO GP Prov

Reference Sequence All Users All Statuses

Rows 2 1-1 of 0

| Name | Seq | Type | Length | Updated |
|------------|-----|------|--------|---------|
| No results | | | | |

Select Tracks

My Tracks

Currently Active Recently Used

Category

- 1 (no data)
- 112 Captive
- 1 Reference Genome v1.0 EMV2
- 1 Reference Genome v1.1 PASA
- 1 Reference sequence
- 602 Wild
- 1 Wild_heatmap

Day

- 1 NA

File Format

- 1 gff3

Gender

- 1 NA

Individual

- 1 NA

Location

- 1 NA

Organism

- 1 Crown-of-thorns starfish

Sample

- 1 NA

Sample id

Back to browser Clear All Filters Contains text 1 matching track

| Name | Category | File Format | Organism | Sample | Tissue Type | Gender | Location | Day | Status | Individual | Sample id | Library Preparation |
|---------------|----------------------------|-------------|--------------------------|--------|-------------|--------|----------|-----|--------|------------|-----------|---------------------|
| cotsv1.1.PASA | Reference Genome v1.1 PASA | gff3 | Crown-of-thorns starfish | NA | NA | NA | NA | NA | NA | NA | NA | ... |

Acanthaster planci (COTSV1.1)

Annotations Tracks Ref Sequence Search Organism Users Groups Admin

Show All Show Visible Only

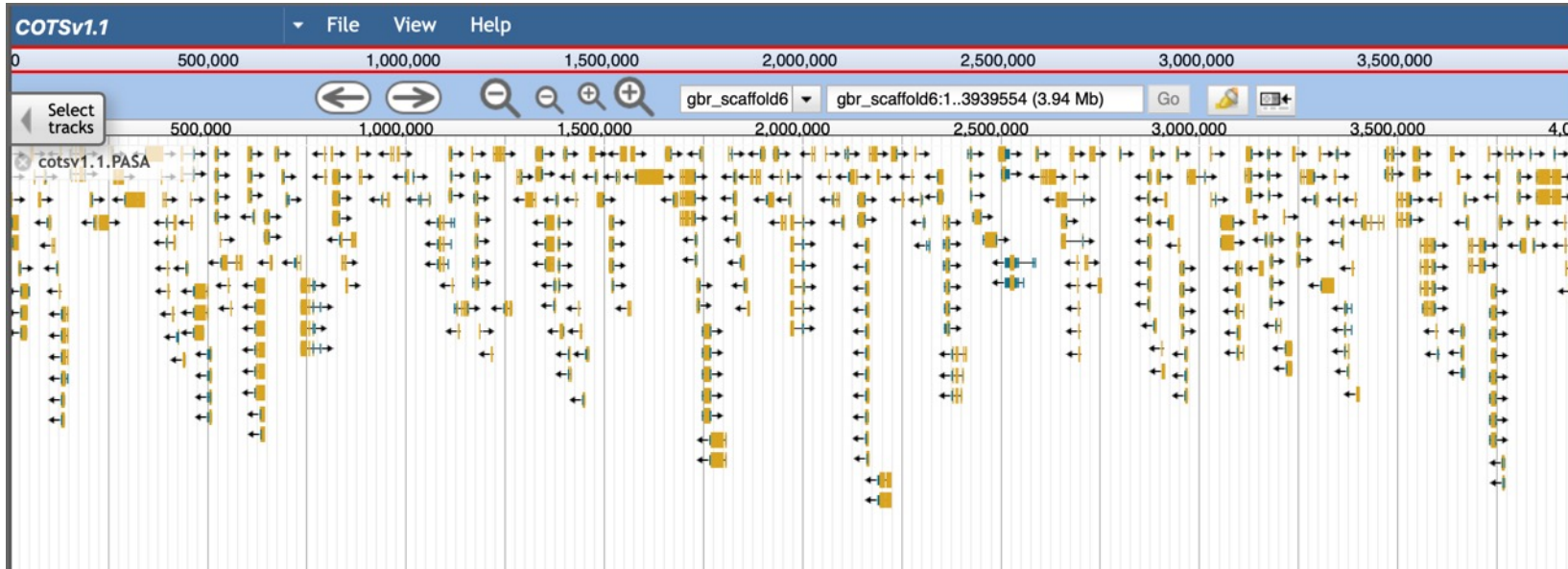
Annotation Name ID All Types GO GP Prov

Reference Sequence All Users All Statuses

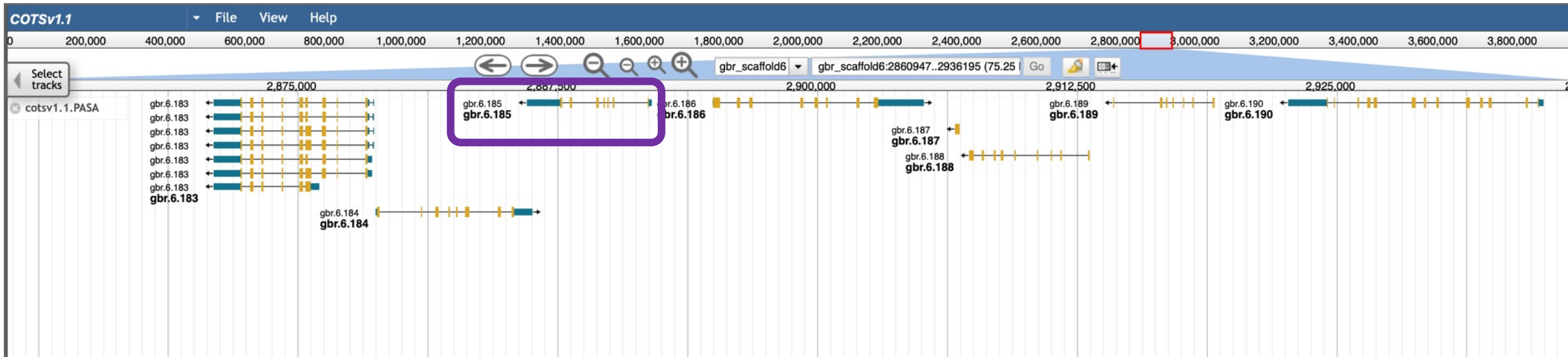
Rows 2 1-1 of 0

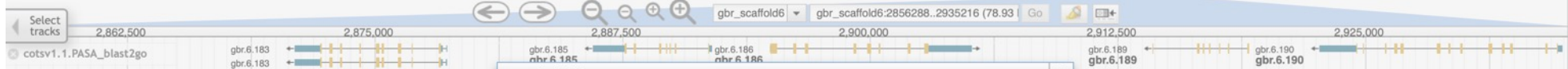
| Name | Seq | Type | Length | Updated |
|------------|-----|------|--------|---------|
| No results | | | | |

A. planci cf. solaris browser



Acanthaster planci (COTsv1.1) b.degnan@uq.ed...
Annotations Tracks Ref Sequence Search Organism Users Groups Admin
Show All Show Visible Only
Annotation Name ID All Types GO GP Prov
Reference Sequence All Users All Statuses
Rows 2 1-1 of 0
Name Seq Type Length Updated
No results





gene gbr.6.185

Primary Data

| | |
|----------|---|
| Name | gbr.6.185 |
| Type | gene |
| Position | gbr_scaffold6:2886035..2892044 (- strand) |
| Length | 6,010 bp |

Attributes

| | |
|--------|---------------|
| Id | gbr.6.185 |
| Seq_id | gbr_scaffold6 |

Region sequence

```

>gbr_scaffold6 gbr_scaffold6:2886035..2892044 (- strand)
class=gene length=6010
GTTGGACATTCGCACTCGCGCTCGCAGGTTGTGTACAGTTTCCACTAGTTACTATCAACT
GAGTGGCAAAATGAGAACCAATAATTCTTCATTTTCAGGTTAACTTCTCAGCTTAAGAAG
CAGTTTTGGTTGCGTGATCTTCAAGATGCCTGCCCGCATGCCGGTGGTTTTGCGAGCCA
AATGCGTGGTTGTAGGTACGTATTTATACCAGTGGGTAGTGTATTTTCCATGGTGTTA
CTACTATACTAGGCCTAGGGCCTACTCGGAGTAGGCAATATTTTTAGCCTAGGCCCC
CAGGCTTTCTAGGCCTTGCTTTGGTCATTTACTACTACTAGGCTAAGTTTCATGTTGG
TCATGTTGGTTGGTGCATGATGTAGGGAGGAAACCGGGTTTCTCCATGACCATGGTCAGA
TTATTATGGAGGAAGGAGACTGTCATCTTCTTCCCTAGTACTGAAACAACCTCCACGGCAC
TAGCACTACAGGACTAGTATGATTTGCAGGGCAGGTGCCAGCTGACTCTAATCTAATA
  
```

Subfeatures

Primary Data

| | |
|-------------|---|
| Name | gbr.6.185 |
| Type | mRNA |
| Description | intraflagellar transport protein 27 homolog |
| Position | gbr_scaffold6:2886035..2892044 (- strand) |
| Length | 6,010 bp |

Attributes

| | |
|--------|---------------|
| Id | gbr.6.185.t1 |
| Seq_id | gbr_scaffold6 |

Region sequence

```

>gbr_scaffold6 gbr_scaffold6:2886035..2892044 (- strand)
class=mRNA length=6010
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GAGTGGCAAAATGAGAACCAATAATTCTTCATTTTCAGGTTAACTTCTCAGCTTAAGAAG
CAGTTTTGGTTGCGTGATCTTCAAGATGCCTGCCCGCATGCCGGTGGTTTTGCGAGCCA
AATGCGTGGTTGTAGGTACGTATTTATACCAGTGGGTAGTGTATTTTCCATGGTGTTA
CTACTATACTAGGCCTAGGGCCTACTCGGAGTAGGCAATATTTTTAGCCTAGGCCCC
CAGGCTTTCTAGGCCTTGCTTTGGTCATTTACTACTACTAGGCTAAGTTTCATGTTGG
TCATGTTGGTTGGTGCATGATGTAGGGAGGAAACCGGGTTTCTCCATGACCATGGTCAGA
TTATTATGGAGGAAGGAGACTGTCATCTTCTTCCCTAGTACTGAAACAACCTCCACGGCAC
TAGCACTACAGGACTAGTATGATTTGCAGGGCAGGTGCCAGCTGACTCTAATCTAATA
  
```


Select Tracks

Help

Category ✖

- 1 (no data)
- 112 Captive
- 1 Reference Genome v1.0 EMV2
- 1 Reference Genome v1.1 PASA
- 602 Wild**

Day

- 1 NA
- 414 summer
- 188 winter

File Format

- 151 bam
- 151 bigwig
- 150 bigwig fwd
- 150 bigwig rvs
- 1 gff3

Gender

- 1 NA
- 223 female
- 191 male
- 188 unknown

Individual

- 603 NA

Location

- 442 Davies Reef
- 160 Lynch Reef
- 1 NA

Organism

- 603 Crown-of-thorns starfish

Sample

- 72 Coelomic Fluid
- 56 Gonads
- 1 NA
- 80 Papula
- 79 Radial Nerve Cord
- 80 Sensory Tentacles
- 80 Skin
- 76 Spines
- 79 Tube Feet

Sample id

- 31 1
- 32 10
- 32 11
- 31 12
- 32 13
- 32 14
- 28 15
- 28 16
- 28 17
- 28 18
- 24 19
- 32 2
- 20 20
- 32 3
- 32 4
- 32 5

Back to browser ✖ Clear All Filters 603 matching tracks

| <input type="checkbox"/> | Name | Category | File Format | Organism | Sample | Tissue Type | Gender | Location | Day | Status | Individual | Sample id | Library Preparation |
|--------------------------|-----------------------------|----------|-------------|--------------------------|----------------|-------------|--------|-------------|--------|-------------|------------|-----------|---------------------|
| <input type="checkbox"/> | Co_S_F_A_D_SU1_0002_fwd | Wild | bigwig fwd | Crown-of-thorns starfish | Coelomic Fluid | Co | female | Davies Reef | summer | Aggregation | NA | 2 | ... |
| <input type="checkbox"/> | Co_S_F_A_D_SU1_0002_fwd_rvs | Wild | bigwig | Crown-of-thorns starfish | Coelomic Fluid | Co | female | Davies Reef | summer | Aggregation | NA | 2 | ... |
| <input type="checkbox"/> | Co_S_F_A_D_SU1_0002_rvs | Wild | bigwig rvs | Crown-of-thorns starfish | Coelomic Fluid | Co | female | Davies Reef | summer | Aggregation | NA | 2 | ... |
| <input type="checkbox"/> | Co_S_F_A_D_SU1_0003_fwd | Wild | bigwig fwd | Crown-of-thorns starfish | Coelomic Fluid | Co | female | Davies Reef | summer | Aggregation | NA | 3 | ... |
| <input type="checkbox"/> | Co_S_F_A_D_SU1_0003_fwd_rvs | Wild | bigwig | Crown-of-thorns starfish | Coelomic Fluid | Co | female | Davies Reef | summer | Aggregation | NA | 3 | ... |
| <input type="checkbox"/> | Co_S_F_A_D_SU1_0003_rvs | Wild | bigwig rvs | Crown-of-thorns starfish | Coelomic Fluid | Co | female | Davies Reef | summer | Aggregation | NA | 3 | ... |
| <input type="checkbox"/> | Co_S_F_A_D_SU1_sample_0002 | Wild | bam | Crown-of-thorns starfish | Coelomic Fluid | Co | female | Davies Reef | summer | Aggregation | NA | 2 | ... |
| <input type="checkbox"/> | Co_S_F_A_D_SU1_sample_0003 | Wild | bam | Crown-of-thorns starfish | Coelomic Fluid | Co | female | Davies Reef | summer | Aggregation | NA | 3 | ... |
| <input type="checkbox"/> | Co_S_F_A_L_SU1_0010_fwd | Wild | bigwig fwd | Crown-of-thorns starfish | Coelomic Fluid | Co | female | Lynch Reef | summer | Aggregation | NA | 10 | ... |
| <input type="checkbox"/> | Co_S_F_A_L_SU1_0010_fwd_rvs | Wild | bigwig | Crown-of-thorns starfish | Coelomic Fluid | Co | female | Lynch Reef | summer | Aggregation | NA | 10 | ... |
| <input type="checkbox"/> | Co_S_F_A_L_SU1_0010_rvs | Wild | bigwig rvs | Crown-of-thorns starfish | Coelomic Fluid | Co | female | Lynch Reef | summer | Aggregation | NA | 10 | ... |
| <input type="checkbox"/> | Co_S_F_A_L_SU1_sample_0010 | Wild | bam | Crown-of-thorns starfish | Coelomic Fluid | Co | female | Lynch Reef | summer | Aggregation | NA | 10 | ... |
| <input type="checkbox"/> | Co_S_F_S_D_SU1_0005_fwd | Wild | bigwig fwd | Crown-of-thorns starfish | Coelomic Fluid | Co | female | Davies Reef | summer | Solitary | NA | 5 | ... |
| <input type="checkbox"/> | Co_S_F_S_D_SU1_0005_fwd_rvs | Wild | bigwig | Crown-of-thorns starfish | Coelomic Fluid | Co | female | Davies Reef | summer | Solitary | NA | 5 | ... |
| <input type="checkbox"/> | Co_S_F_S_D_SU1_0005_rvs | Wild | bigwig rvs | Crown-of-thorns starfish | Coelomic Fluid | Co | female | Davies Reef | summer | Solitary | NA | 5 | ... |
| <input type="checkbox"/> | Co_S_F_S_D_SU1_0006_fwd | Wild | bigwig fwd | Crown-of-thorns starfish | Coelomic Fluid | Co | female | Davies Reef | summer | Solitary | NA | 6 | ... |
| <input type="checkbox"/> | Co_S_F_S_D_SU1_0006_fwd_rvs | Wild | bigwig | Crown-of-thorns starfish | Coelomic Fluid | Co | female | Davies Reef | summer | Solitary | NA | 6 | ... |
| <input type="checkbox"/> | Co_S_F_S_D_SU1_0006_rvs | Wild | bigwig rvs | Crown-of-thorns starfish | Coelomic Fluid | Co | female | Davies Reef | summer | Solitary | NA | 6 | ... |
| <input type="checkbox"/> | Co_S_F_S_D_SU1_0012_fwd | Wild | bigwig fwd | Crown-of-thorns starfish | Coelomic Fluid | Co | female | Davies Reef | summer | Solitary | NA | 12 | ... |
| <input type="checkbox"/> | Co_S_F_S_D_SU1_0012_fwd_rvs | Wild | bigwig | Crown-of-thorns starfish | Coelomic Fluid | Co | female | Davies Reef | summer | Solitary | NA | 12 | ... |
| <input type="checkbox"/> | Co_S_F_S_D_SU1_0012_rvs | Wild | bigwig rvs | Crown-of-thorns starfish | Coelomic Fluid | Co | female | Davies Reef | summer | Solitary | NA | 12 | ... |
| <input type="checkbox"/> | Co_S_F_S_D_SU1_0013_fwd | Wild | bigwig fwd | Crown-of-thorns starfish | Coelomic Fluid | Co | female | Davies Reef | summer | Solitary | NA | 13 | ... |
| <input type="checkbox"/> | Co_S_F_S_D_SU1_0013_fwd_rvs | Wild | bigwig | Crown-of-thorns starfish | Coelomic Fluid | Co | female | Davies Reef | summer | Solitary | NA | 13 | ... |

800,000

Select tracks

Select Tracks

Help

My Tracks
Currently Active
Recently Used

Back to browser

Clear All Filters

Contains text

8 matching tracks

800,000

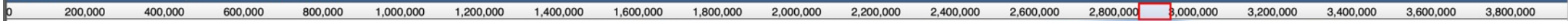
| <input checked="" type="checkbox"/> | Name | Category | File Format | Organism | Sample | Tissue Type | Gender | Location | Day | Status | Individual | Sample id | Library Preparation |
|-------------------------------------|-----------------------------|----------|-------------|--------------------------|-------------------|-------------|--------|-------------|--------|----------|------------|-----------|---------------------|
| <input checked="" type="checkbox"/> | Co_S_F_S_D_SU1_0012_fwd_rvs | Wild | bigwig | Crown-of-thorns starfish | Coelomic Fluid | Co | female | Davies Reef | summer | Solitary | NA | 12 | ... |
| <input checked="" type="checkbox"/> | Go_S_F_S_D_SU1_0012_fwd_rvs | Wild | bigwig | Crown-of-thorns starfish | Gonads | Go | female | Davies Reef | summer | Solitary | NA | 12 | ... |
| <input checked="" type="checkbox"/> | Pa_S_F_S_D_SU1_0012_fwd_rvs | Wild | bigwig | Crown-of-thorns starfish | Papula | Pa | female | Davies Reef | summer | Solitary | NA | 12 | ... |
| <input checked="" type="checkbox"/> | RN_S_F_S_D_SU1_0012_fwd_rvs | Wild | bigwig | Crown-of-thorns starfish | Radial Nerve Cord | Rn | female | Davies Reef | summer | Solitary | NA | 12 | ... |
| <input checked="" type="checkbox"/> | ST_S_F_S_D_SU1_0012_fwd_rvs | Wild | bigwig | Crown-of-thorns starfish | Sensory Tentacles | ST | female | Davies Reef | summer | Solitary | NA | 12 | ... |
| <input checked="" type="checkbox"/> | SK_S_F_S_D_SU1_0012_fwd_rvs | Wild | bigwig | Crown-of-thorns starfish | Skin | Sk | female | Davies Reef | summer | Solitary | NA | 12 | ... |
| <input checked="" type="checkbox"/> | Sp_S_F_S_D_SU1_0012_fwd_rvs | Wild | bigwig | Crown-of-thorns starfish | Spines | Sp | female | Davies Reef | summer | Solitary | NA | 12 | ... |
| <input checked="" type="checkbox"/> | TF_S_F_S_D_SU1_0012_fwd_rvs | Wild | bigwig | Crown-of-thorns starfish | Tube Feet | TF | female | Davies Reef | summer | Solitary | NA | 12 | ... |

8 bigwig

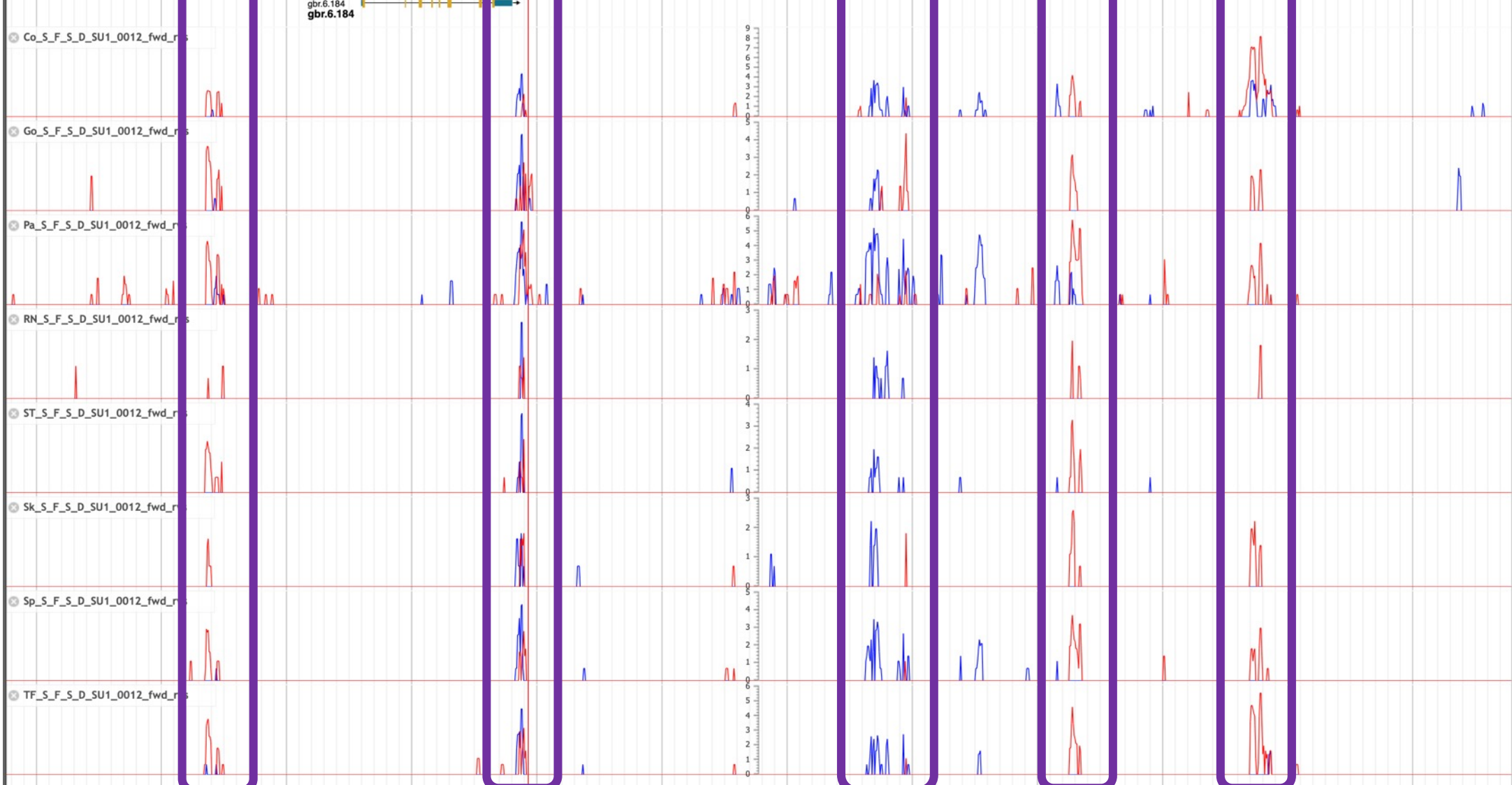
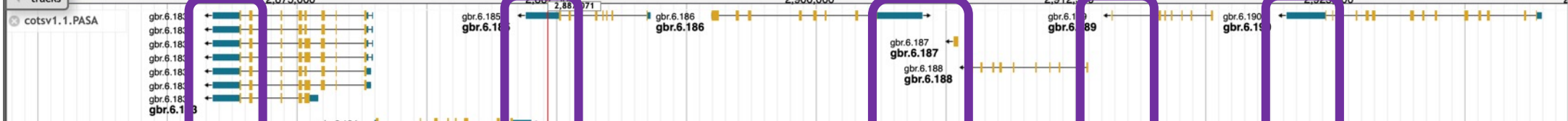
8 12

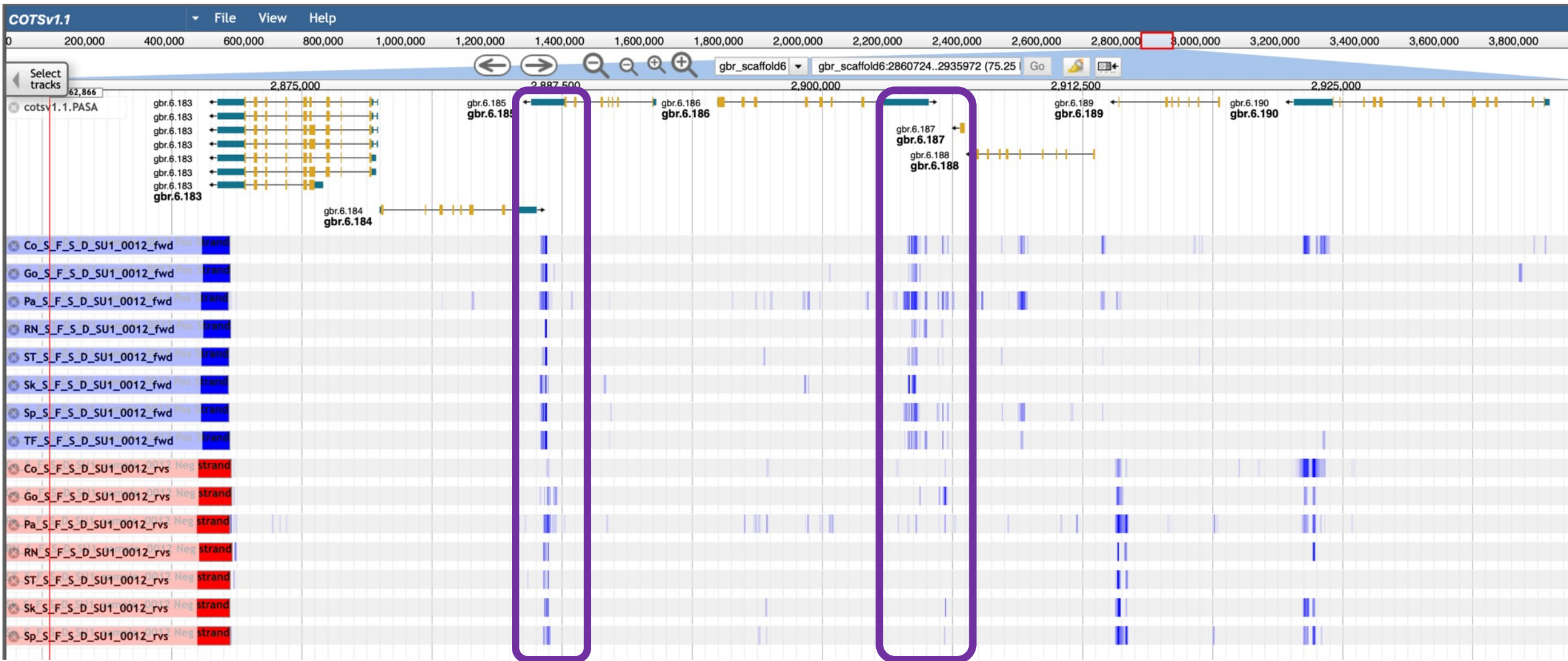
Select tracks





Select tracks
gbr_scaffold6 gbr_scaffold6:2860947..2936195 (75.25) Go





To come:

1. Additional developmental and experimental *A. planci* cf. *solaris*
2. *Amphimedon queenslandica* hologenome, including host + symbiont gene expression, host chromatin state and *cis/trans* interactions
3. Other sponge and marine invertebrate genomes

The team making it happen

QUEENSLAND CYBER INFRASTRUCTURE FOUNDATION LTD

Dr Dominique Gorse

Nick Rhodes

Michael Thang

Dr Gareth Price



AUSTRALIAN BIOCOMMONS

Dr Jeff Christiansen

Dr Tiffanie Nelson



Australian
BioCommons



GENOME INNOVATION HUB

Dr Brooke Purdue

DEGNAN MARINE GENOMICS LAB

Many talented lab members, with special thanks to: Ms Marie Morin

Dr Sheen Wong



Australian Government
Australian Research Council