Practitioner Workshop

20 – 22 March 2017

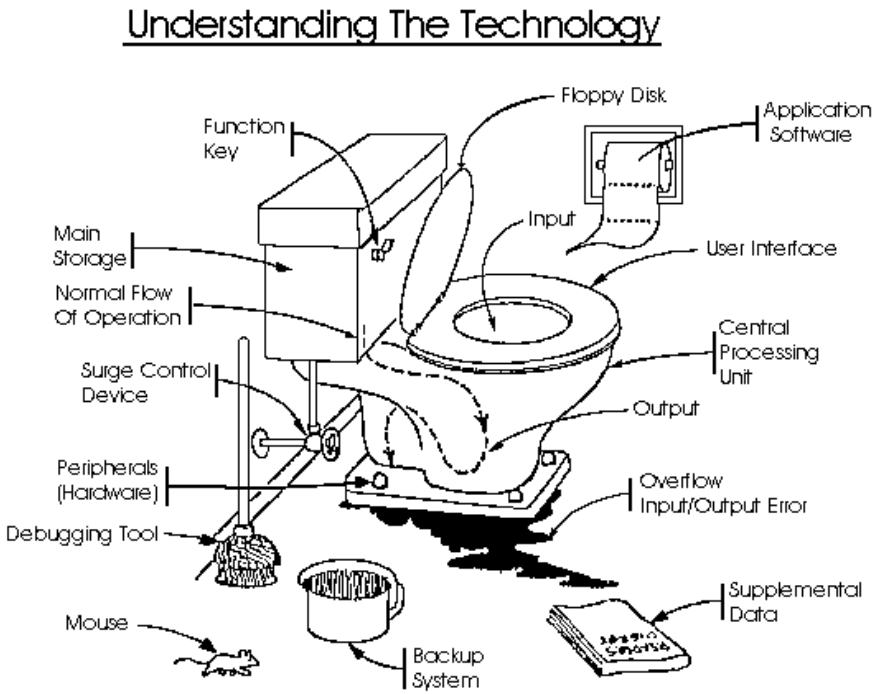
Brisbane, Queensland

NATIONAL REPORT CARD NETWORK

G’day

By the way, where are the loos?

NATIONAL REPORT CARD NETWORK



Who are we?

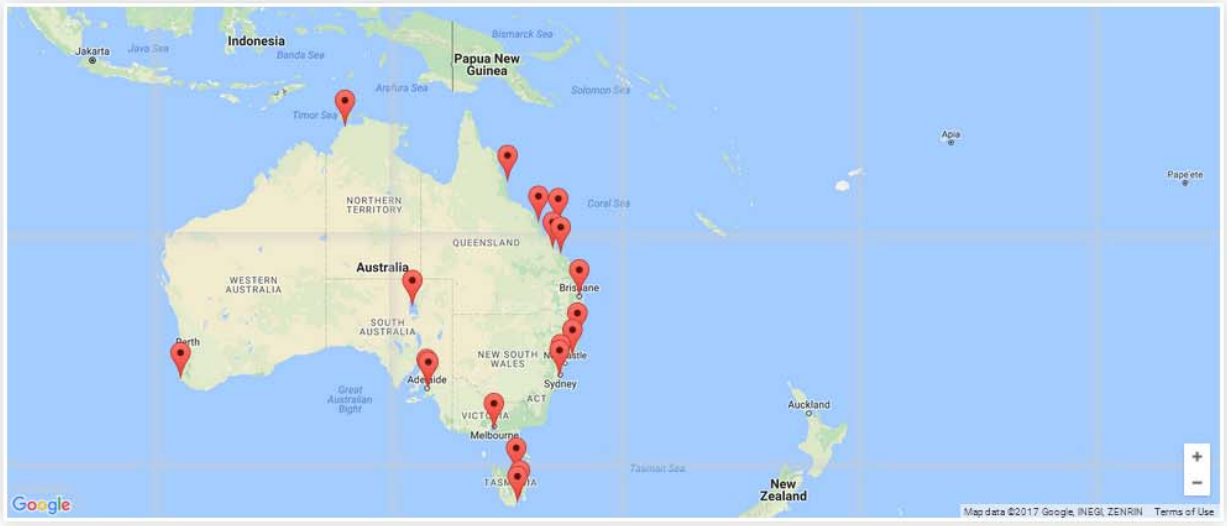
*The **National Report Card Network** is an informal forum where representatives from waterway report card initiatives meet to:*

- *Raise awareness of the various initiatives*
- *Exchange knowledge and ideas*
- *Learn from each other*
- *Explore opportunities for collaboration to deliver organisational goals and operational efficiencies*

Welcome

Welcome to the home page of the National Waterway Report Card Network (referred to as the 'Network'). The Network is an informal group of waterway health practioners and specialists involved in producing report cards on waterway, estuary, harbour, reef and marine health across Australia.

The interactive map below displays the numerous organisations around Australia who develop and produce report cards on the health of waterways in their region. Explore the map by zooming in and clicking on the red pins to display details of each organisation, their report card and website link.



About the network

Currently the Fitzroy Partnership for River Health (FPRH) in Central Queensland is hosting the Network website. If you would like to add your organisation to this map, and/or would like to join the Network, please click here to contact us.

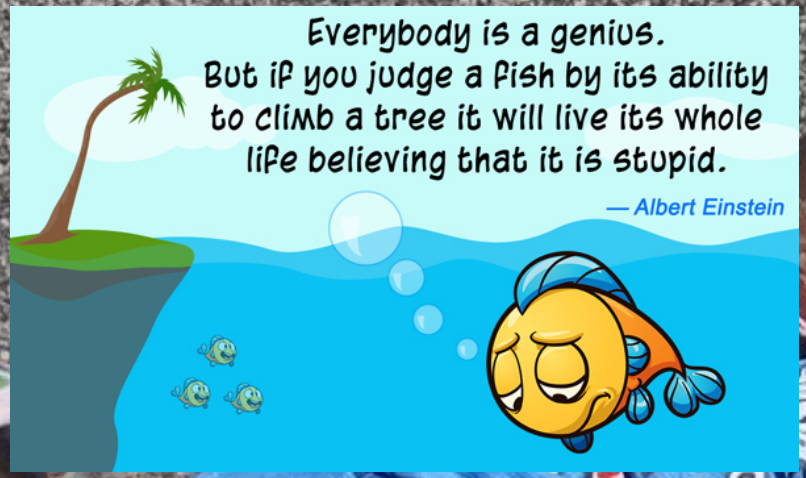
For more information about the Network, please visit the About page.

Create new Report Card

ID	Name	About	Web Address	Position	Actions
		The Partnership is a collective of government, agriculture, resources, industry, research and community interests across the Fitzroy Basin in central Queensland.			
3	Fitzroy Partnership for River Health	Partners have a common goal of providing a more complete picture on river health and support this goal by providing funding, resources and contributing water quality and ecosystem health monitoring data through data-sharing arrangements.	http://www.riverhealth.org.au	-23.38170208 150.5172666	Edit Delete
	Healthy	Healthy Waterways is an independent, not-for-profit organisation that works with our		27.46796423	Edit

Workshop Principals

NATIONAL REPORT CARD NETWORK



fitzroy partnership for river health

Queensland Government
Department of Environment and Heritage Protection

Gladstone Healthy Harbour Partnership

Tuesday 21st March 2017

Time	Item	How it will work	Facilitator
08:00	**Welcome**	We say G'day and let you know where the loo's can be found	Nathan Johnston
08:30	**Report Cards – what are they good for?**	Before we delve into the bowels of report card minutia, let's spend some time exploring why we do what we do. This session will reflect on the potential value and influence of environmental report cards. The presenter will draw upon success and learnings of established report cards as well other materials such as the recent Wentworth group report on water accounts.	Di Tarte & Charlie Morgan
09:00	**It's the principal of the matter**	This session is devoted to brushing up on the principals to consider and apply when initiating reporting programs and designing waterway report cards The presenter will reflect upon their knowledge and experience as well as resources like Integrating and Applying Science: A handbook for effective coastal ecosystem assessment and the Aquatic Ecosystems Toolkit	Heath Kelsey & Bill Dennison (Video) Mike Ronan, and Glen Scholz
09:30	**Speed reporting**	Every report card initiative represented at the workshop gets up to 5 minutes and up to 3 slides to introduce their awesome work. Yep, it's a tough gig but that's all we have time for! Be warned that the facilitator will have a bell If several people are attending from your initiative, please negotiate who will deliver the presentation	A nominee from each reporting initiative represented at the workshop will be invited to present. You – or your colleague!
10:30	**Morning Tea**		
		• Fitzroy Partnership – Nathan Johnston • Darwin Harbour – Simon Townsend • SEQ Healthy Waterways – Paul Maxwell • Gladstone Healthy Harbours – Mark Schulz	

11:00	**Speed reporting – continued**	• WA Estuary Report Card – Catherine Thomson • Northern NSW – Sara Mika • Great Barrier Reef – Greg Greene • Lake Eyre Basin – Glen Scholz • Wet Tropics – Suzanne Jenkins • Mackay HRRP – Charlie Morgan • NSW Estuary Health Reporting – Peter Scanes • Victoria–Regan East & others • Wallis, Myall & Karuah Mid Coast NSW – Prue Tucker • Nigel Willoughby – SA NRM Report Cards • Murray Darling Basin – Justine Smith • SA surface water status reports – Dan Penny • SA Aquatic Ecosystem Condition Reports – Clive Jenkins • Others	
13:00	**Lunch**		
14:00	**Cultural reporting and engagement**	How does one go about measuring and reporting the #People#Waterways#Happiness Nexus? Two case studies (Lake Eyre Basin and Gladstone) will be presented to get you thinking about what might work in your neck of the woods.	Glen Scholz & Uthpala Pinto
15:00	**Steering the 'stewardship' – what is best practice in assessment and reporting on management effectiveness**	The recently prepared Network document that covers stewardship approaches will be used as a reference as we explore how each initiative tackles stewardship reporting and what is considered to be the elements of a best practice approach. We will also take a look at some international best practice approaches and applications outside the environmental reporting perspective	Greg Greene
16:00	**Afternoon Tea**		
16:30	**Merry little stroll**	We will to the bus terminal!	
17:00	**RiverCrawl Local Report Card case study, tour, dinner.**	We will be learning about the health of Brisbane River and initiatives being delivered by Healthy Land and Water. Dinner at The Charming Squire Dinner proudly supplied by workshop sponsor Gladstone Healthy Harbour Partnership	Paul Maxwell
20:00	**Close**		

Wednesday 22nd March 2017

Time	Item	How it will work	Facilitator
6:00	**Riverside walk/run**	Optional social event catering for all ability levels. Meet at designated hotel Lobby (Ibis Brisbane).	For those who were sensible at dinner the night before. Nathan Johnston
8:00	**Welcome**	Review and introduce day ahead	Lyndal Hansen
8:30	**Report card onions Can we deliver tiered report cards without too many tears?**	Case studies followed by facilitated discussion. Explore the potential for nesting report cards with emphasis on the mix of initiatives represented in the room as the case in point	Murray Darling Justine SmithGreat Barrier Reef Carl MitchellFacilitator: Kirstin Kenyon
9:30	**Report card BMI Report card thresholds, weightings and normalisation criteria**	A show and tell session. Break into small groups and discuss a.) Formulas & mathematics b.) Human process for selection (rationale) Report back to wider group, with a view to consolidating findings after the workshop and using this as the basis for development of a compendium of existing approaches	Introductory Presentation Nicole Flint Attendees will be encouraged to bring along threshold, weighting and normalisation criteria relevant to their initiative where this applies. Please start to think about your materials relevant to this session Facilitators: Nathan Johnston & Nicole Flint
10:30	**Morning Tea**		
11:00	**Report cards beyond the abacus**	Exploring how technology can help improve quality and efficiency of report card development Break into small groups and discuss what might work in your particular situation.	Machine Learning, Artificial Intelligence, Big Data and what it might mean to the future of report carding Luke UkkolaAutomated waterway health assessment and reporting Nathan JohnstonSmall group session Attendees should start to think about their particular initiative and where technology may support efficiency of reporting or other activity Facilitator Luke Ukkola
12:00	**Partnering and collaboration Why can't everyone just think like me?**	Role play with 'thinking hats' and sector hats. Time for personal reflection and observation on what this might mean for your particular initiative and mix of investor, partner or sponsor arrangements	Facilitator: Tanya James, Collaboration for Impact Associate
13:00	**Lunch**		

13:00	**Lunch**		
14:00	**Get my message?**	A session to get you thinking about your report card from a marketing and promotion perspective. You will then use this as inspiration to have a crack at designing a revised or new product for your initiative	Interactive session and practical exercise exploring marketing, human behaviour and graphic design elements of report cards Including application of the learnings to a live item. Please start to think about the item you will work on for the session Facilitator: Lyndal Hansen
16:00	**Beyond the workshop and beyond report cards…**	Reflection of the workshop. Introduction for the major topic of discussion for the next Network teleconference. This topic is how report cards can be used for: a) decision making and guiding on ground action b) community engagement outcomes	Reflection & Beyond reporting discussion starter Prue Tucker
16:30	**Close**	People travel home. Informal dinner at Julius Pizzeria or similar arranged on the day for those overnighting in Brisbane	

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NATIONAL REPORT CARD NETWORK

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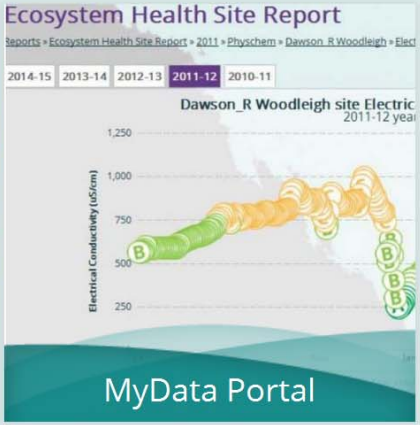
River Health Report data in detail

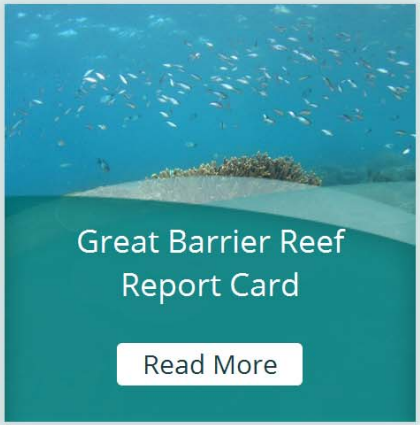
Agricultural Use Report data in detail

Drinking Water Report data in detail

MyWater Community Portal - get involved!



MyData Portal



Great Barrier Reef Report Card

Read More

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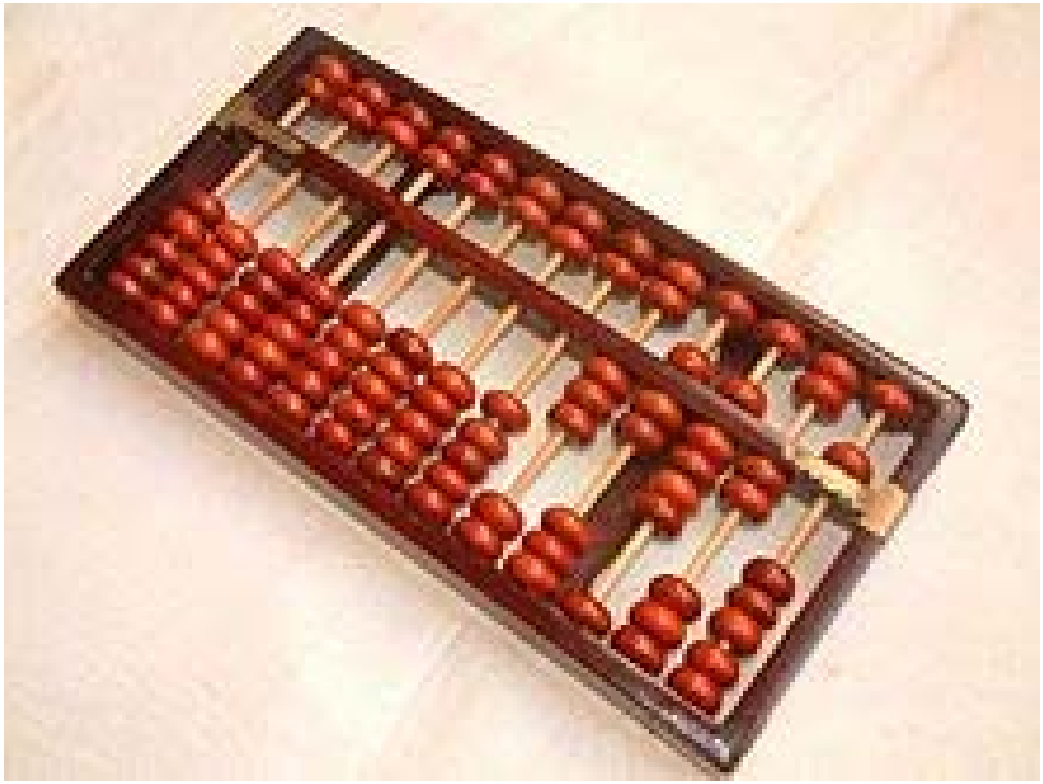
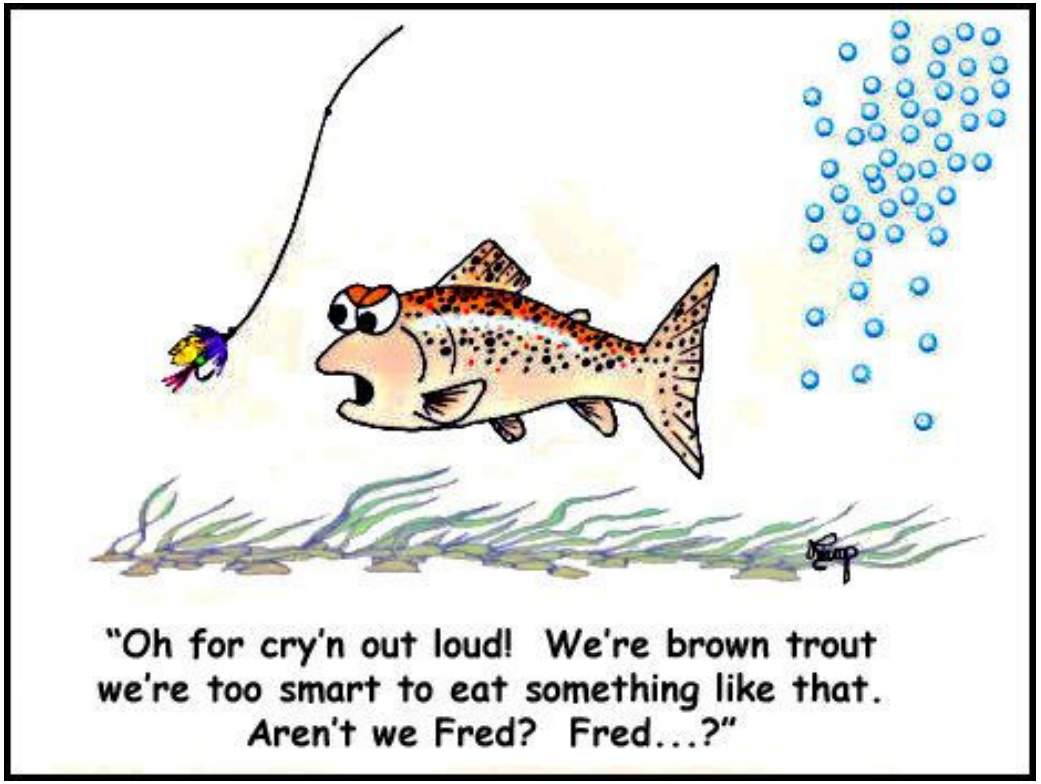
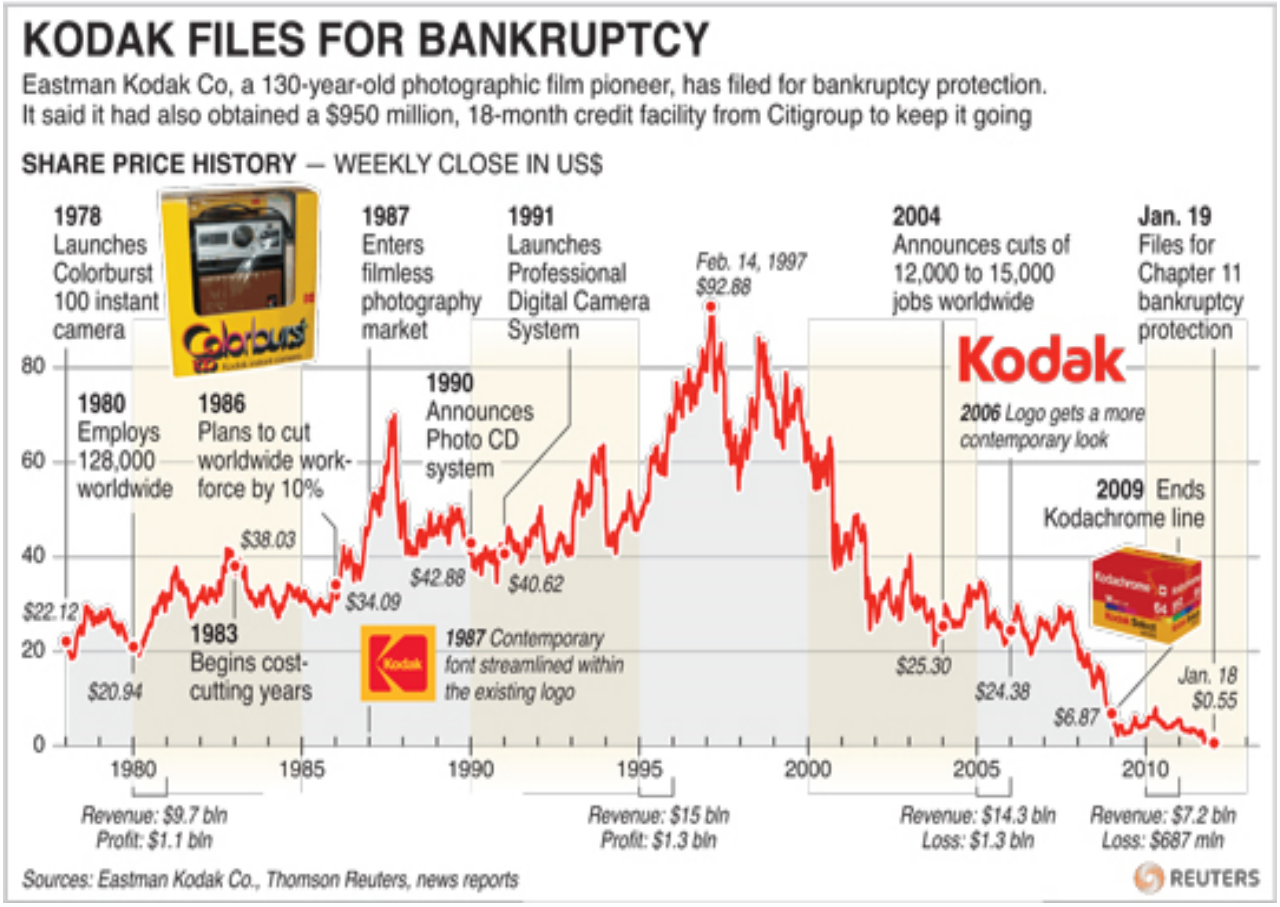
Report Cards
beyond the abacus

NATIONAL REPORT CARD NETWORK





Kodak Example



- Ran a loss 7 of 8 years: 2004-12
- Did not move into digital world well or fast enough
- Were people who saw it coming
  - buried in the organization
  - did not act early enough
- New technology:
  - fierce competitors
  - low margins
  - Eats into margin of core business.
- Kodak did not take decisive action to combat the inevitable challenges.

Kodak Example

- After being innovation leaders, Kodak moved to one overflowing with complacency.
- In the late 1980s. Kodak was failing to keep up even before the digital revolution when Fuji started doing a better job with the old technology, the roll-film business.
- With complacency rock-solid and no one at the top devoting priorities toward turning the problem into a huge urgency with opportunity, they went nowhere.
- We now see this playing out again with camera companies and smartphones

So how is the relevant to us and what can we learn from Kodak's failure?

Why is this important to your report card initiative?

- Perhaps you have an established report card process that works with what seems to be a reliable revenue stream. Everything is going ok just how it is. But what if you loose a major funding provider or government priorities change? Can you weather the storm?
- Perhaps funding was good in the first few years, but interest and funding is waning
- Perhaps you have a growing list of priorities and additional information to report about but the bucket of funds isn't getting any bigger.
- Our failure puts more than profits at risk. It is the sustainable management and care of our waterways that is on the line - so we must thrive.

Leveraging from IT advancements is an item everyone must consider

Case Study:

Fitzroy Partnership Report Card Journey

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2008
Floods. Water released from mine sites contributes to short term issues such as drinking water taste

2008
Community concerned but no independent body reporting on waterway health

2009
Queensland Premier commissioned reports that identified need for integrated monitoring partnership

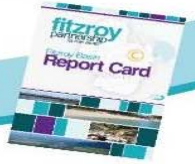
2010
Fitzroy Partnership establishes independent Science Panel

2011
First GBR Report Card released providing information on health of marine zone

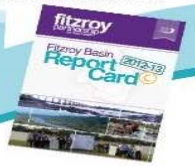
2012
Fitzroy Partnership formally established

fitzroy partnership for river health

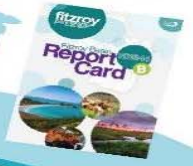
2013
First Ecosystem Health Report Card released



2014
First Drinking Water Reports for Member Councils released



2015
First Agricultural water Use Report released



2016
Release of 14-15 Report Card with 5 year trends available

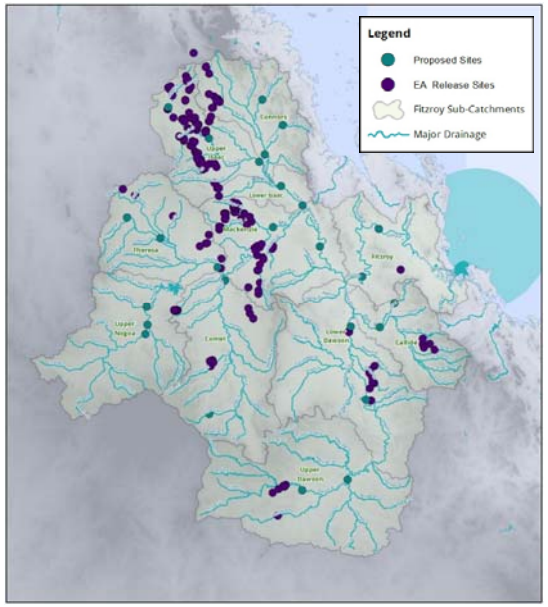
FUTURE

Strategic Plan 2016-2021

- ☑ Trusted source of information
- ☑ Inform policy and planning decisions
- ☑ Build technical assessment capacity
- ☑ Provide value for all sectors
- ☑ Maintain a robust business model

Maintaining a robust business model

Third Party co-investment



Negotiating Integrated Fitzroy REMP

Collaboration

Gladstone Healthy Harbour Partnership

partnership for river health

fba
FITZROY BASIN ASSOCIATION

NATIONAL REPORT CARD NETWORK

FPRH & GHHP

FPRH & FBA (Host)

National RC Network

Attract & Retain Members

Gladstone Area Water Board

Jellinbah Resources

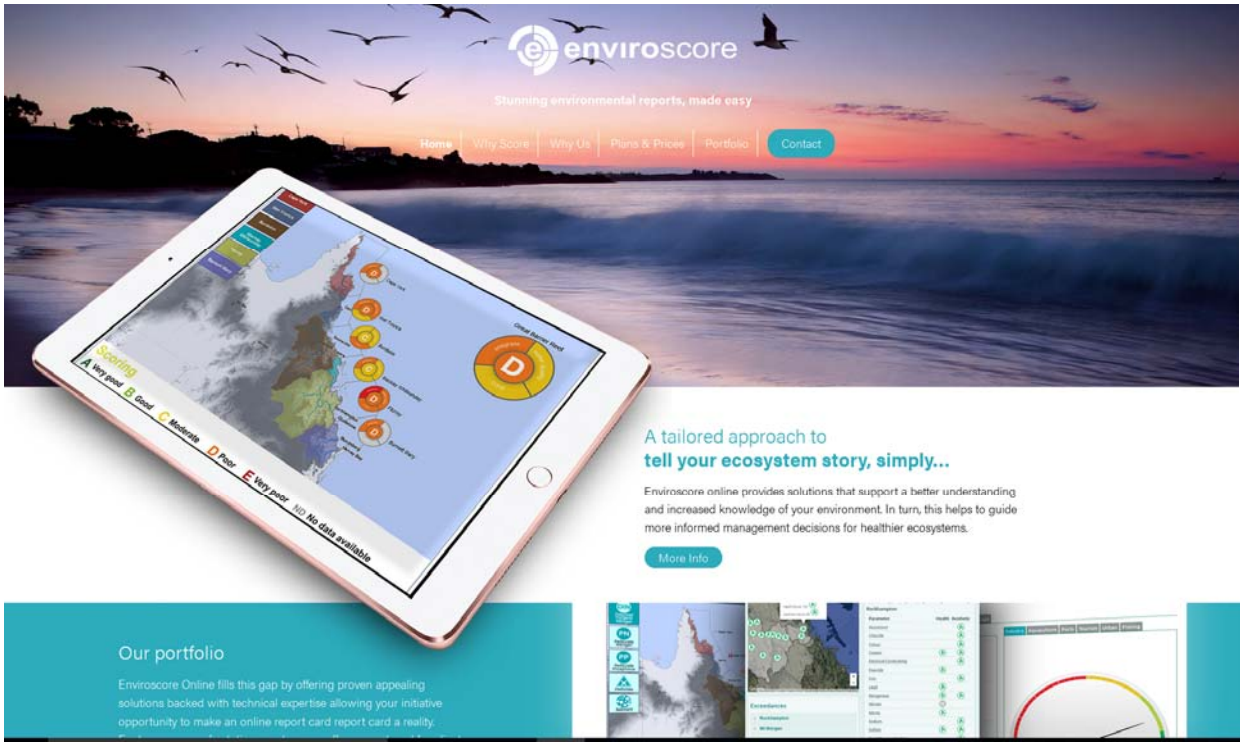
stanmore IP Coal

Stanmore joined last week

GAWB last year

Jellinbah back on-board

Maintaining a robust business model



Social Enterprise Offering

www.enviroscore.org

> *"Our altruistic end goal is to offer a free lite version to help resource poor communities around the world tell a better story about the health of their local environment.*

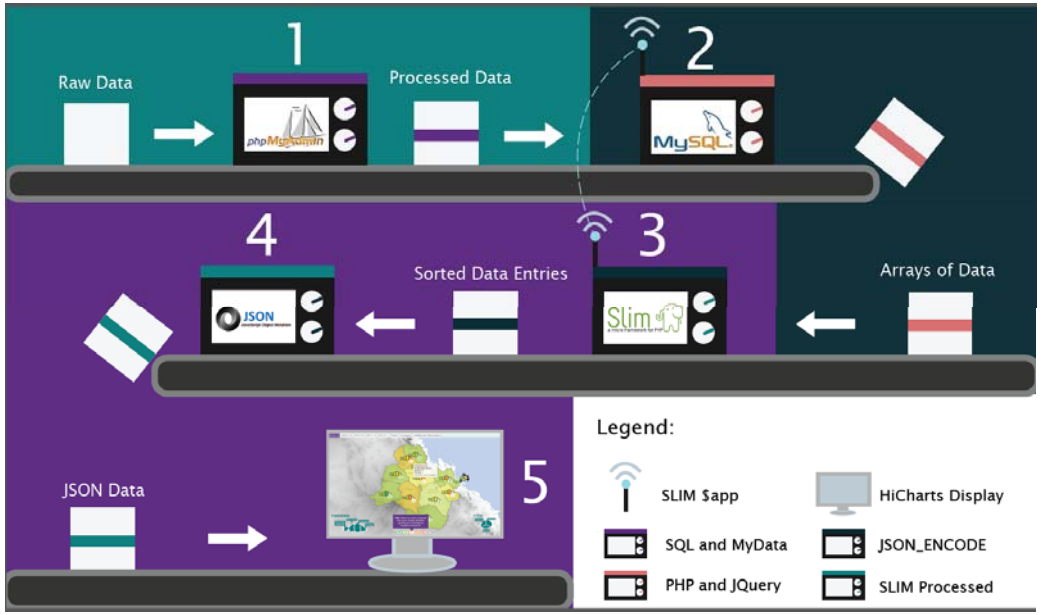
Technology & Efficiency

Report Card Production Process

Report Card Development Process

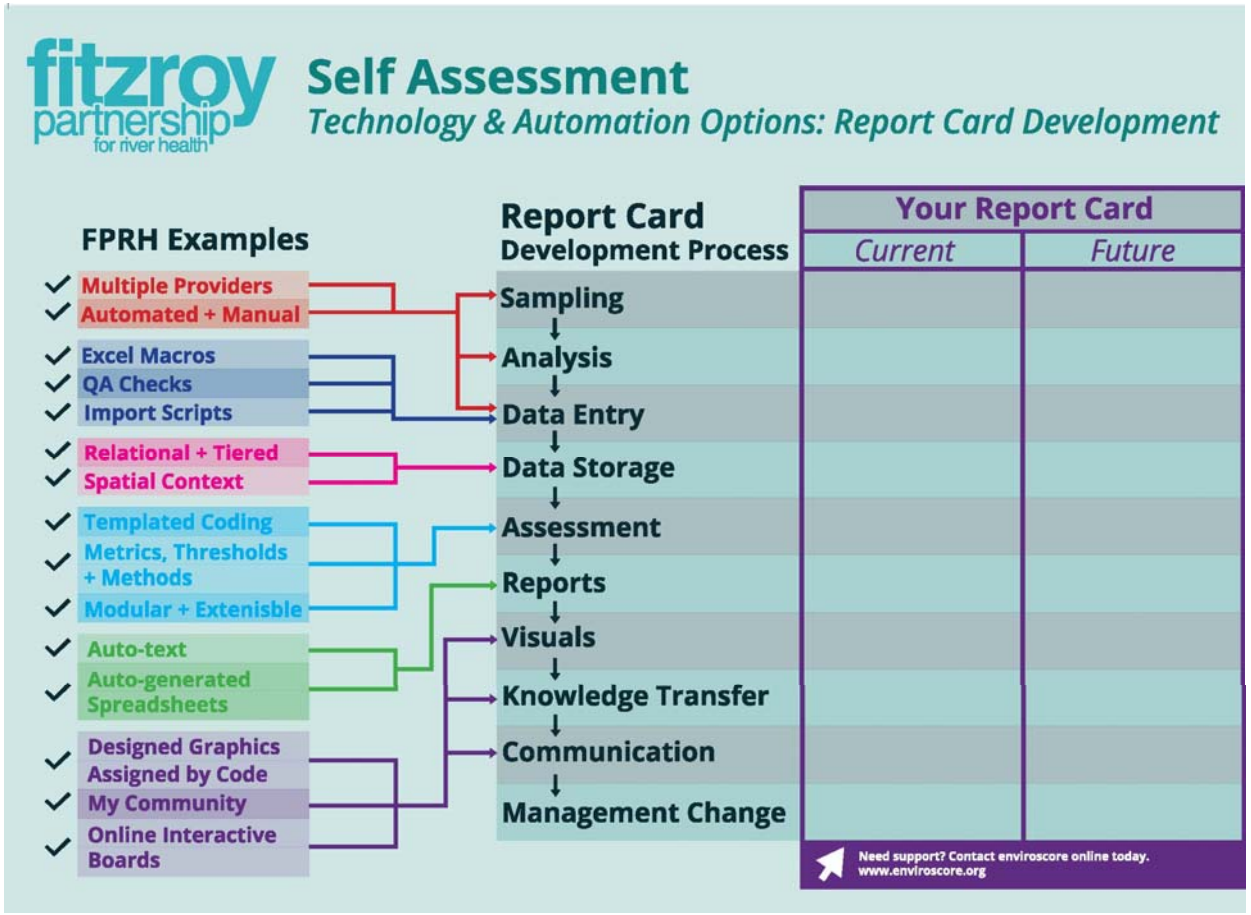
**Throughout the development process templates are used wherever possible to improve efficiency and encourage future-proof development strategies.*

1. *Raw data is received from various providers. Data is then sorted and uploaded using MyData (PHP driven) into SQL databases.*
2. *PHP is used to run JQuery and access data from SQL databases. This data is then stored into arrays under relevant variables. Grading is calculated based on array values.*
3. *Slim app is a toolkit used as a framework for MyData. It enables acquisition of specific datasets from SQL databases.*
4. *Arrays of data are converted to JavaScript data entries using JSON_ENCODE. Data at this stage is ready to be displayed using HiCharts and can utilise GeoJSON.*
5. *Requested datasets are displayed in various forms and compiled*

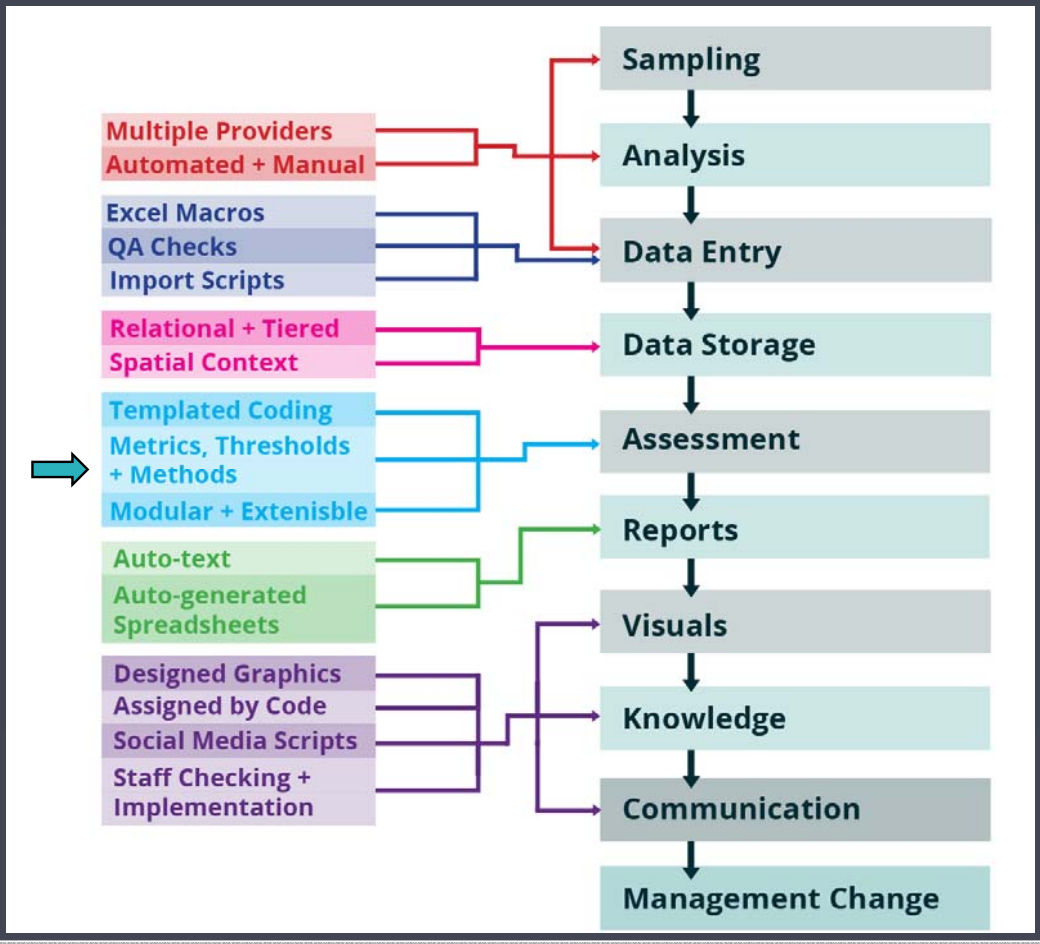


Technology & Efficiency

Report Card Production Process



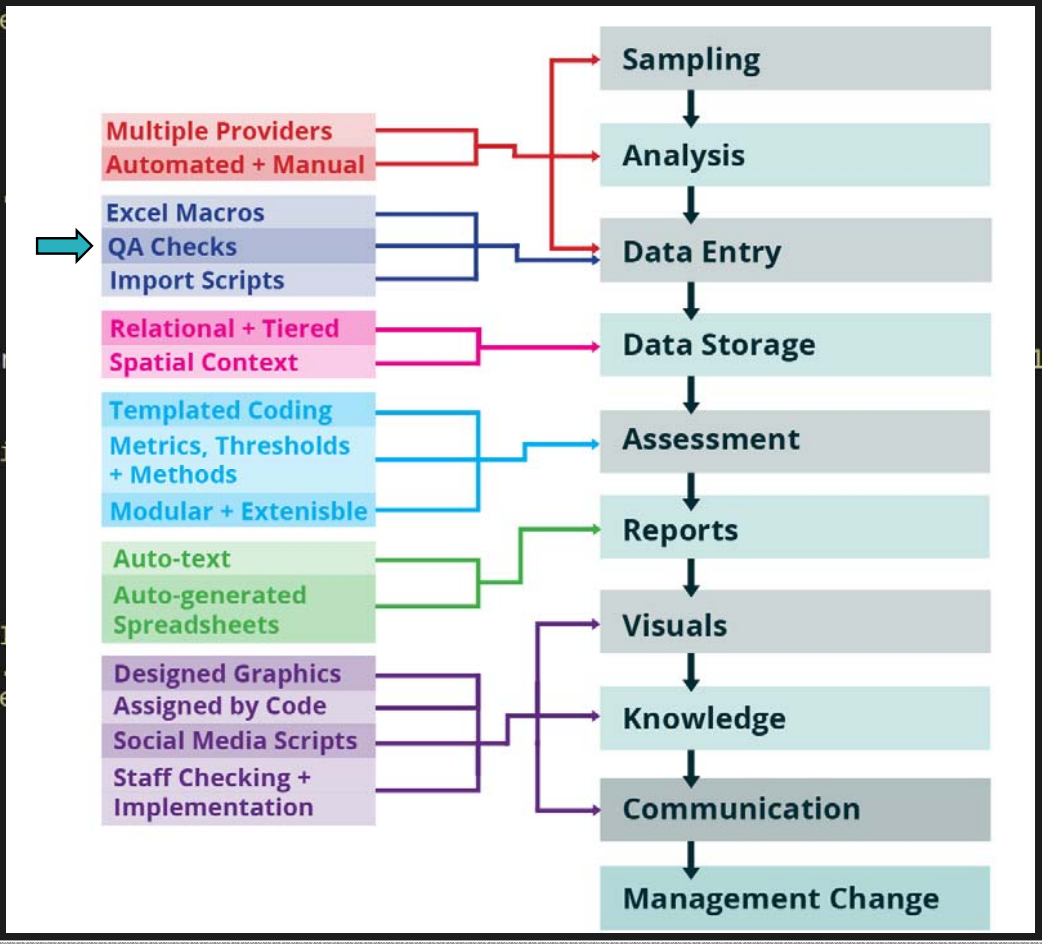
```
91.4897 ] -----[Site Parameter Summary]------
91.4897 ] Site ID = 1581
91.4897 ] Grade = A
91.4897 ] Average Site Score = 100
91.4898 ] Average Concentration = 0.028(mg/L)
91.4898 ] Total Scores = 1
91.4898 ] Data Representativeness = Poor
91.4898 ] Standard Deviation = 0
91.4898 ] Total over Wost Case Scenario = 0
91.4898 ] Max Score = 100
91.4898 ] Min Score = 100
91.4898 ] -------------------------
91.5671 ] -----[Site Parameter Summary]------
91.5672 ] Site ID = 1698
91.5672 ] Grade = B
91.5672 ] Average Site Score = 96
91.5672 ] Average Concentration = 0.066(mg/L)
91.5672 ] Total Scores = 1
91.5672 ] Data Representativeness = Poor
91.5672 ] Standard Deviation = 0
91.5672 ] Total over Wost Case Scenario = 0
91.5672 ] Max Score = 96
91.5672 ] Min Score = 96
91.5672 ] -------------------------
91.6368 ] -----[Catchment Parameter Summary]------
91.6369 ] Catchment: Callide
91.6369 ] Catchment ID: 1
91.6369 ] Flow: low
91.6369 ] Parameter: Total Phosphorus
91.6369 ] Function used:EHMP_formula
91.6369 ] Average: 68
91.6369 ] Grade: B
91.6369 ] Total Scores: 3
91.6369 ] ----------------------------
91.6370 ] Working With Flow Type: high
91.6373 ] ERROR! Year 2015 for 1 has no high flow data!
91.6373 ] Can not query database with invalid flow limit!
91.6374 ] Writing High and Low Flow data File 'output/2017_01_18-17_13_06/data/ehi/csv_overview/2015 - Callide - Total Phosphor
91.6375 ] Data File Saved
91.6375 ] Working With Parameter: Filterable Reactive Phosphorus
91.6375 ] Working With Flow Type: low
91.6400 ]      [Site Parameter Summary]
91.6401 ] Site ID = 1569
91.6401 ] Grade = C
91.6401 ] Average Site Score = 53
91.6401 ] Average Concentration = 0.091(mg/L)
91.6401 ] Total Scores = 1
```



What's Going on here?

- EHI Grading Script running in command line view
- Separating data into high/low flow conditions and applying relevant WQOs and WCS thresholds
- Assessing raw data and preparing it to be written to the results table in MySQL

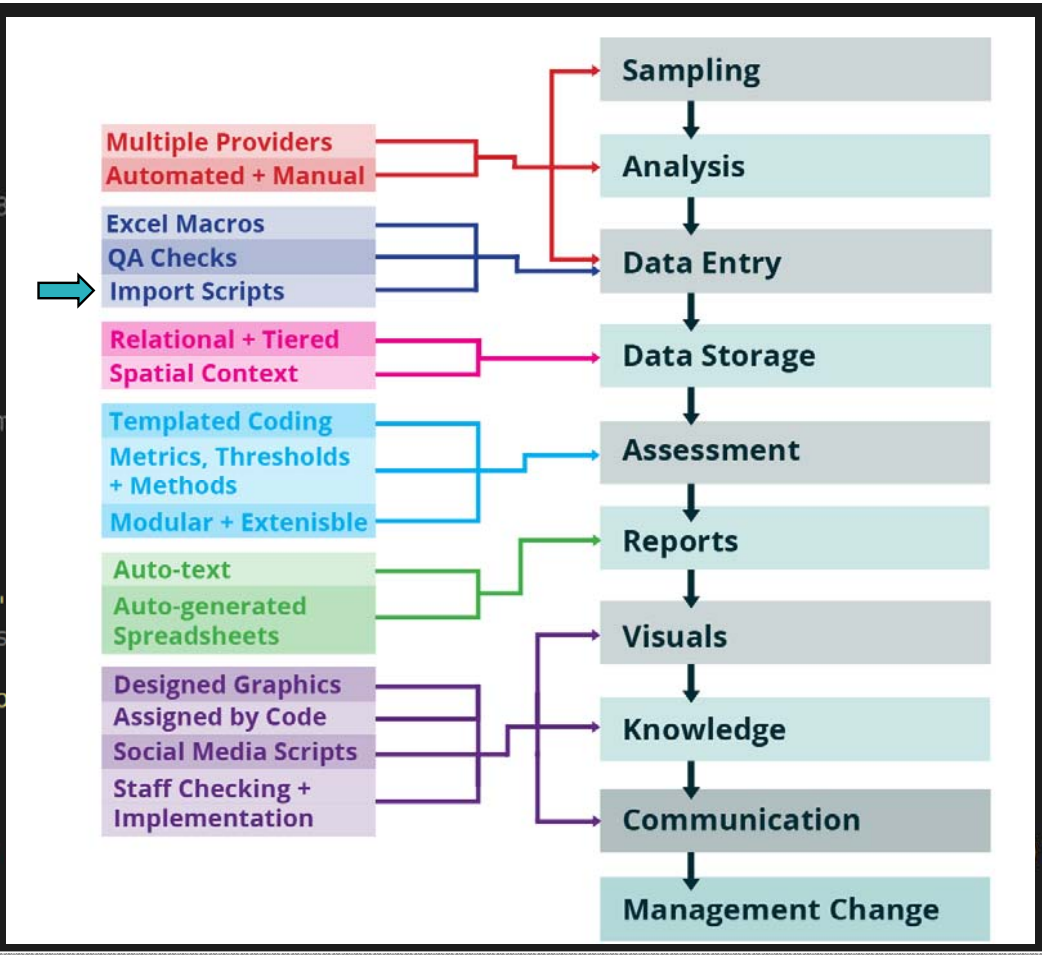
```
$badFormatRows = array_map(array($this, 'malformedWhereFie

$badFormatRows = implode("\r\n OR ", $badFormatRows);
//$badFormatRows = 1;
$recorderLimit = '';
if (count($this->recorderLimit) > 0) {
    $recorderLimit = " AND `recorder ID` IN (" . implode(
}

$yearLimit = '';
if ($this->yearLimit != false) {
    $yearLimit = " AND `datetime` BETWEEN '" . $this->yea
}

$sql = "SELECT ri.*, r.`recorder name`, s.`project`, s.`si
        FROM (
            SELECT *
            FROM `raw_indicators` WHERE
            ($badFormatRows) $recorderLimit $yearLimit
            ) as ri
        LEFT JOIN `sites` as s on s.`site ID` = ri.`site I
        LEFT JOIN `recorder` as r on r.`recorder ID` = ri.
        ORDER BY s.`catchment ID`+0, s.`Site ID`, ri.`date
        ";

$this->log('Executing Bad Data row query...');

$bad_format_rows = mysql_query($sql);
if (!$bad_format_rows) {

    throw new exception('SQL Exception: ' .
        mysql_error());
}
$bad_format_rows_count = mysql_num_rows($bad_format_rows);
$this->log('Found ' . $bad_format_rows_count . ' bad formatted rows');

$bad_formatted_fields = array();
$whitespace_rows      = array();
```



What's Going on here?

- Checking data being imported for QA issues - currently malformed data (one of many)
- Outputting issues as an array (string of text and numbers) ready for visualisation
- Visualisation served to QA table that can be reviewed. Access via MyData admin platform

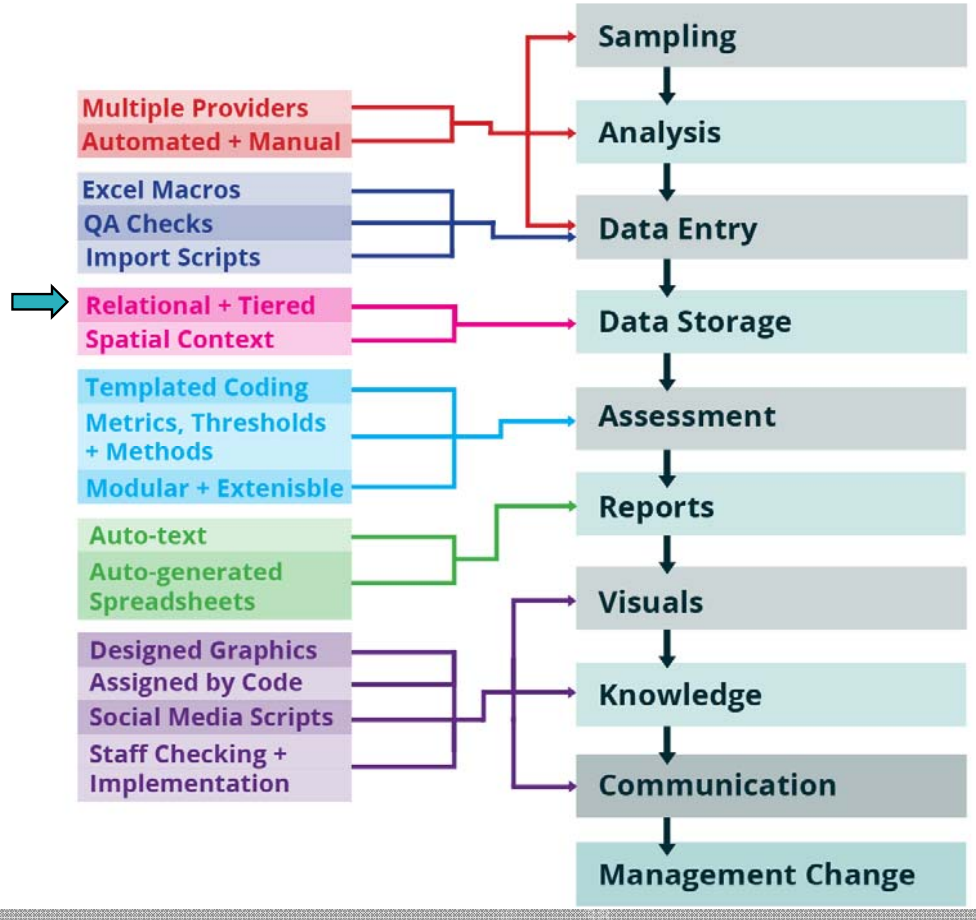
```php
$this->db->query("START TRANSACTION");

$transactionOk = true;

foreach ($processedData['data'] as $line => $row) {

    //$row['siteUrlID'] = substr(md5(microtime()), 0,8

    $fields = array_keys($row);
    $fields = array_map(function ($item) {
        return '`' . $item . '`';
    }, $fields);

    $values = ($row); //retain keys, we might use them
    $db = $this->db;
    $values = array_map(function ($item) use ($db) {
        return '"' . $db->real_escape_string($item) .
    }, $values);

    if (in_array($line, $processedData['collisions']['
        //data is already in the database and is the s
        continue;
    } elseif (in_array($line, $processedData['collisio
        continue;
        //no need to replace overrides either.
    }

    $sql = "INSERT INTO `" . $this->dataTable . "` ("

    $this->db->query($sql);

    if ($this->db->error) {
        $transactionOk = false;
        $this->errors[] = $this->db->error;
        break;
    }
}

if ($transactionOk) {
```



What's Going on here?

- Import Script
- Getting data ready to write to MySQL
- Checking the data hasn't already been loaded before

```
    ),
    'region' => array(
        'table' => 'regions',
        'id' => 'region ID',
        'parent_id' => 'area I
        'data_table_id' => 're
        'name' => 'region name
        'geo_field' => 'coord'
        'extent_field' => 'ext
        'meta_fields' => array
            'region ID',
            'region name',
            'region type',
        ),
        'parent'=>'area'
    ),
    'basin' => array(
        'table' => 'basins',
        'id' => 'basin ID',
        'parent_id' => 'region
        'data_table_id' => 'ba
        'name' => 'basin name'
        'geo_field' => 'coords
        'extent_field' => 'ext
        'meta_fields' => array
            'basin ID',
            'basin name',
        ),
        'parent'=>'region'
    ),
    'catchment' => array(
        'table' => 'catchments
```

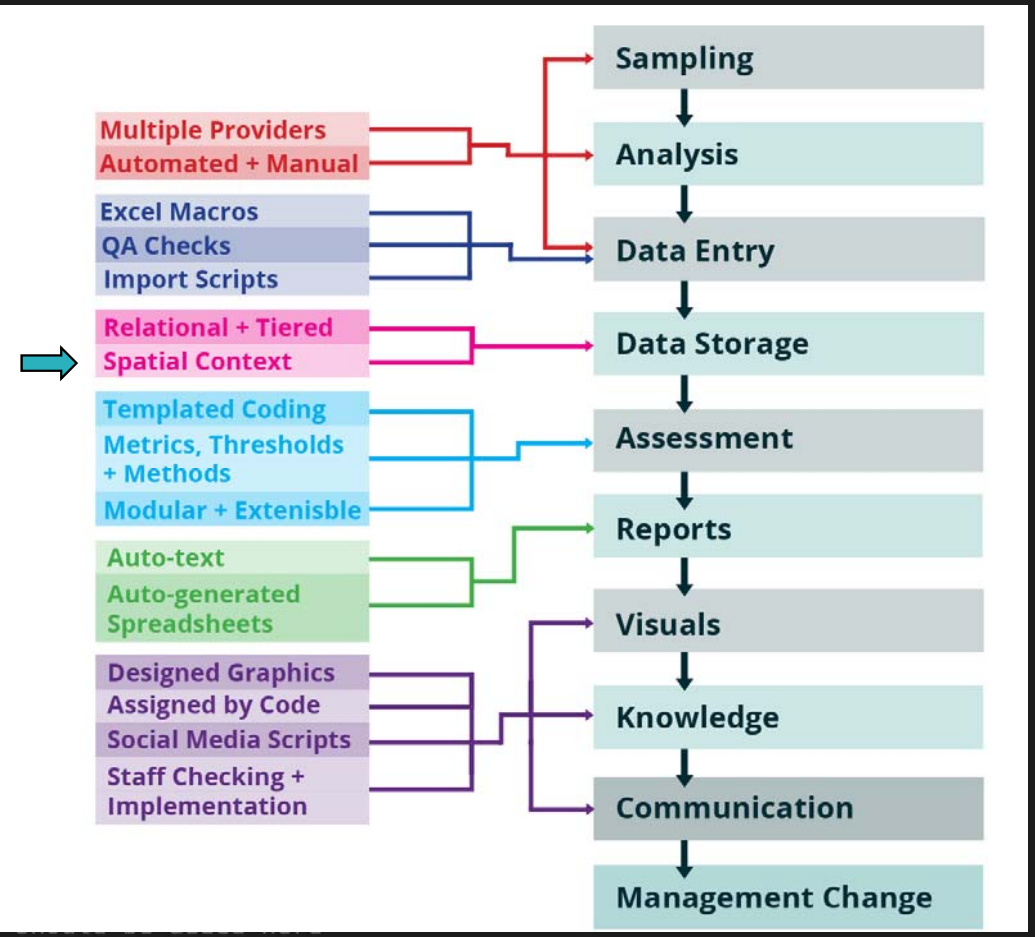



```
l',
y(
 array(
 'Physical & Chemical',
 => array(
rical Conductivity' => array(
tandardized' => true,

 array(
tandardized' => true,

te' => array(
tandardized' => true,

dity' => array(
tandardized' => true,


 array(
 'Nutrient',
 => array(
 Nitrogen" => array(
tandardized' => true,

sed Nitrogen" => array(
tandardized' => true,

 Phosphorus" => array(
tandardized' => true,

rable Reactive Phosphorus" => array(
```

What's Going on here?

- Setting up results so they are geospatially aware and tiered (in this case region, basin, catchment)
- Preparing the results (arrays) relevant to these special context
- Preparing results (arrays) relevant to the geometries (eg. Physical & Chemical) and Indicator (Conductivity)

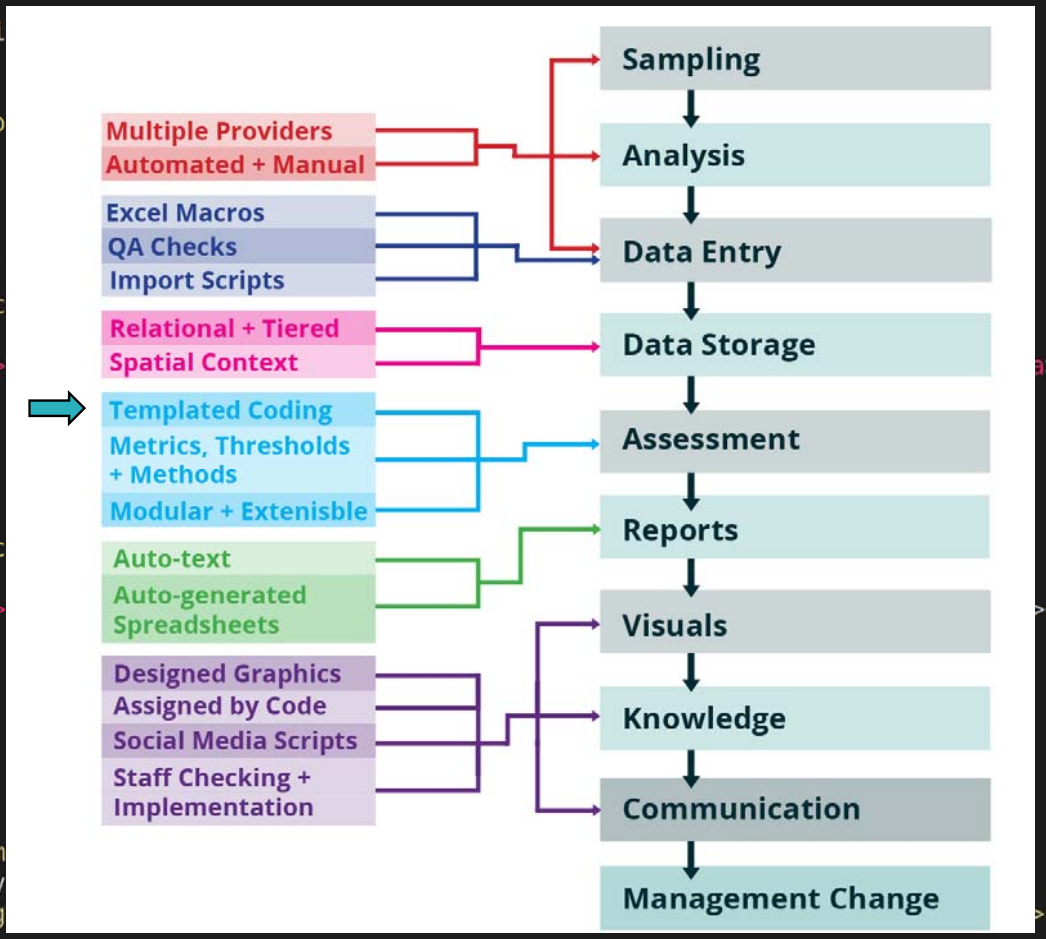
```php
public function arrayToFeatureCollection($results, $GeoColumn, $out = 'json')
{
    $possible_outputs = array('json', 'array');
    if (!in_array($out, $possible_outputs)) {
        throw new exception('Outknown output method: ' . $out);
    }

    //add all the results to a feature collection
    $feature_collection = array(
        "type"     => "FeatureCollection",
        "features" => array(), // <=this is where our features will go.
    );

    foreach ($results as $result) {

        //For each catchment we want to define it as a "feature", an ele
        //A feature is an object with geometry and properties.
        //geometry comes straight from the database as GeoJSON
        //properties are any fields we want associated with the geometry

        //define a new "feature"
        $new_feature = array(
            //type is Feature
            'type'       => 'Feature',
            //Geometry is our geoJSON data from the database
            //Im decoding the JSON here because it is being constructed
            //It will be converted jack to proper json in the object whe
            'geometry'   => json_decode($result[$GeoColumn]),
            //a unique ID
            //'id'         => $row['catchment ID'],
            //an array of properies from the database, Extra column info
            'properties' => array(
            ),
        );
        foreach ($result as $key => $value) {
            if ($key != $GeoColumn) {
                $new_feature['properties'][$key] = $value;
            }
        }
        //push that to our set of features
```



What's Going on here?

- Providing spatial context to the site/area about to be served up to the webpage so they line up correctly on a map
- Assigning the results to this spatial feature so it can be served up to highcharts as a pretty map

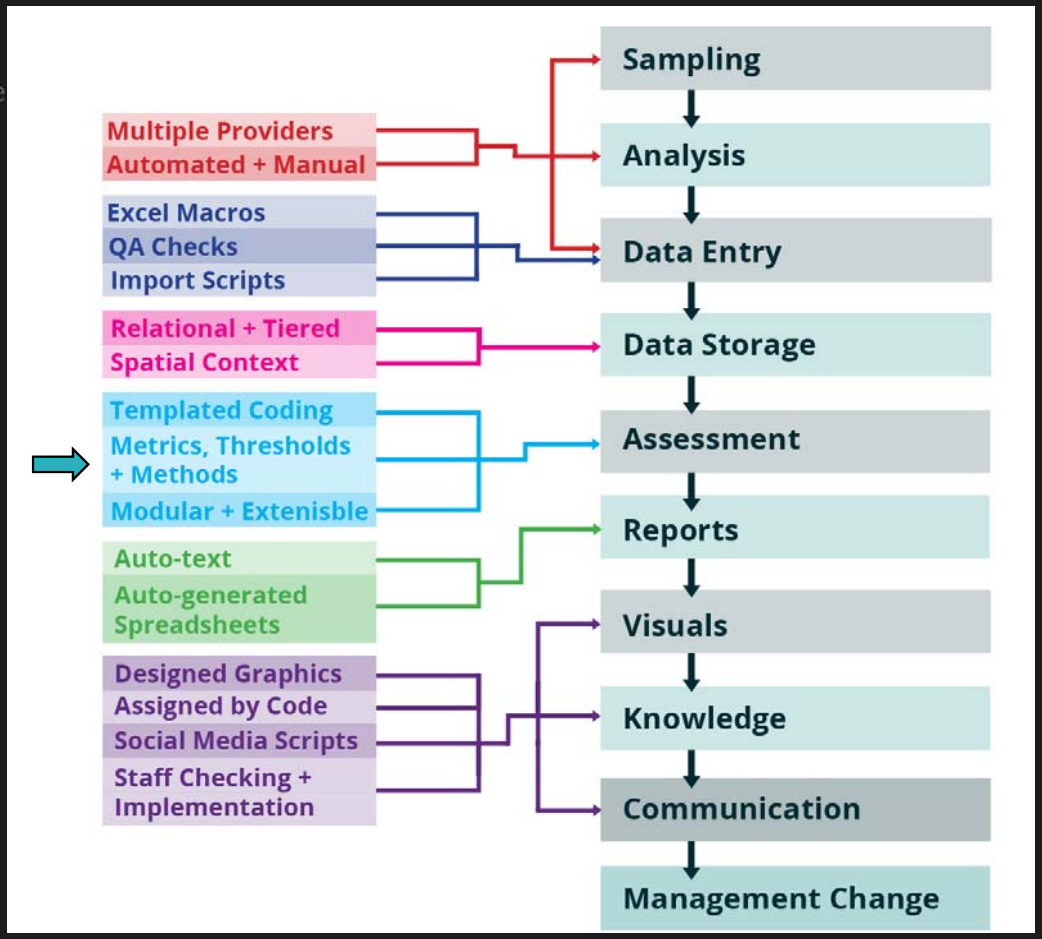
```
    <ul class="tabnav">
        <?php foreach ($this->data['versions'] as $version => $ti
            <?php $class = $this->data['version'] == $version  ?
            <li class="<?php echo $class; ?>">
            <a href="<?php echo $this->data['reportRoot'].$versio
            </li>
        <?php endforeach; ?>
    </ul>
    <ul class="tabnav">
        <?php foreach ($this->data['views'] as $view => $title):
            <?php $class = $this->data['view'] == $view  ? 'selec
            <li class="<?php echo $class; ?>">
            <a href="<?php echo $this->data['reportRoot'].$this->
            </li>
        <?php endforeach; ?>
    </ul>
    <ul class="tabnav">
        <?php foreach ($this->data['times'] as $time): ?>
            <?php $class = $this->data['time'] == $time  ? 'selec
            <li class="<?php echo $class; ?>">
            <a href="<?php echo $this->data['reportRoot'].$this->
                echo $time; ?></a>
            </li>
        <?php endforeach; ?>
    </ul>
    <div class="tabnav tabnav_small_block">
    <?php if ($this->data['categories']) : ?>
    <span class="pretty-select">
        <select class="chart-parameter" name="category" id="param
            <?php foreach ($this->data['categories'] as $category
                <option <?php if ($category == $this->data['categ
                    echo $category; ?></option>
            <?php endforeach; ?>
        </select>
    </span>
    <?php endif; ?>
    <?php if ($this->data['parameters']) : ?>
    <span class="pretty-select">
        <?php
        $bare-param
        foreach ($this->data['parameters'] as $parameter) {
```



What's Going on here?

- Code is written so that it can be used across multiple web development applications.
- Templated coding is a core philosophy and is employed wherever possible to facilitate extensibility
- Templated coding allows the creation of new reporting products for Fitzroy and external clients cheaper

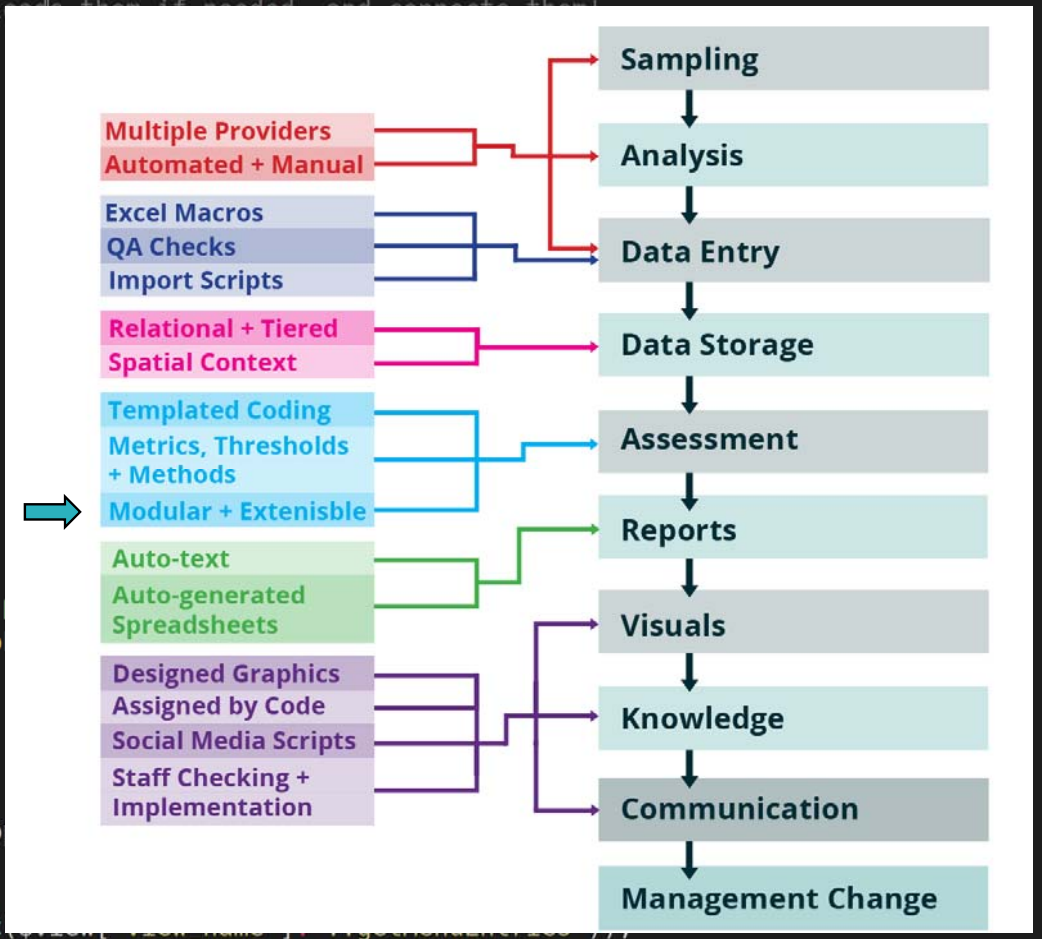
```php
function EHMP_formula($value, $parameters)
{

    // maths for assessment (EHMP Method). Assumes anything better than the
    // worse than WCS scores zero, in between gets formulised in the else
    $wqo = $parameters['wqo'];
    $wcs = $parameters['wcs'];
    if ($value <= $wqo) {
        $score = 1;
    } elseif ($value >= $wcs) {
        $score = 0;
    } else {
        $score = 1 - abs(($value - $wqo) / ($wcs - $wqo)); //EHMP formula
    }
    $score = abs($score); //convert negative scores
    return $score * 100;
}

function EHMP_PH_formula($value, $parameters)
{

    $wqo = $parameters['wqo'];
    $wcs = $parameters['wcs'];

    if ($value >= 6.5 && $value <= 8.5) {
        $score = 1;
    } elseif ($value > 4.5 && $value < 6.5) {
        $score = (exp($value) * exp($value)) / (exp(6.5) * exp(6.5));
    } elseif ($value > 8.5 && $value <= 11) {
        $score = exp(15 - $value) / exp(6.5);
    } elseif ($value <= 4.5) {
        $score = 0;
    } elseif ($value > 11) {
        $score = 0;
    }

    return $score * 100;
}

function EHMP_DO_formula($value, $parameters)
{
```



What's Going on here?

- Selecting the method to be applied to data (in this case a modified version of EHMP from SEQ)
- Setting thresholds – in this case WQOs and WCs normalised
- Setting pH WQOs, noting that this is a logarithmic scale and has both upper and lower WCS & WQOs

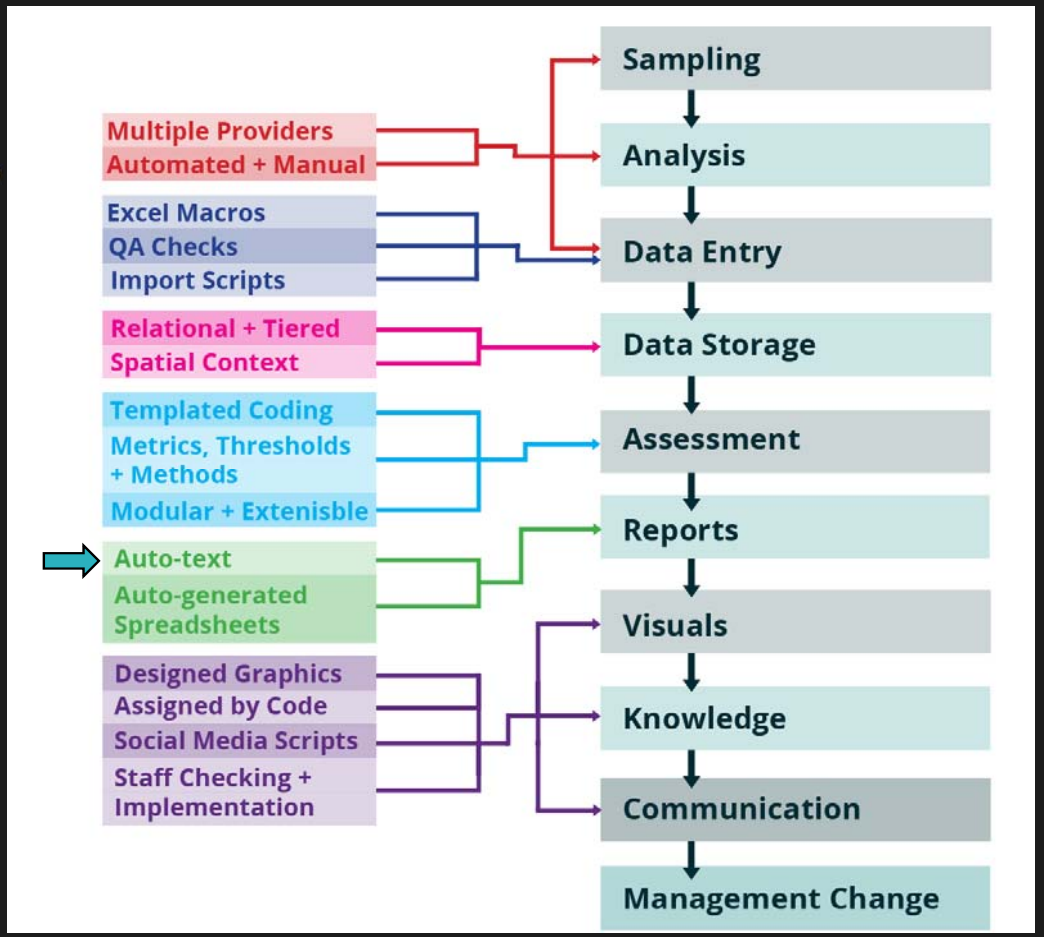
```php
/*
* This method looks through what Auth has said they have permission to, l
* to the $app we have set up for MyData.
**/

if (Auth::loggedIn()) {

    $reports = Auth::get('reports');

    require_once (LIB_DIR . 'RiverHealth/SiteManager.php');
    SiteManager::connectToApp($app);

    $connectedViews = array();
    $menuEntries = array();

    foreach ($reports as $report) {
        foreach ($report['views'] as $view) {
            if (in_array($view['view_name'], $connectedViews)) {
                continue;
            }
            if (!class_exists($view['view_name']) && file_exists(LIB_DIR.'
                require_once(LIB_DIR.'RiverHealth/'.$view['view_name'].'.p
            }
            if (!class_exists($view['view_name'])) {
                continue;
            } else {
                if (is_callable($view['view_name'].'::connectToApp')) {
                    call_user_func($view['view_name'].'::connectToApp',$ap
                }
                if (is_callable($view['view_name'].'::getMenuEntries')) {
                    $menuEntries = array_merge($menuEntries,call_user_func
                }
            }
            $connectedViews[] = $view['view_name'];
        }
    }
    $app->view()->appendData(array('menuEntries' => $menuEntries));
}
```



What's Going on here?

- Code that authorises access to the different report and data management solutions.
- Allows code template libraries to be used and applied to meet the needs of a particular report product or end user
- Approach means that only requiring specific modifications are required and not the need to rewrite from scratch.

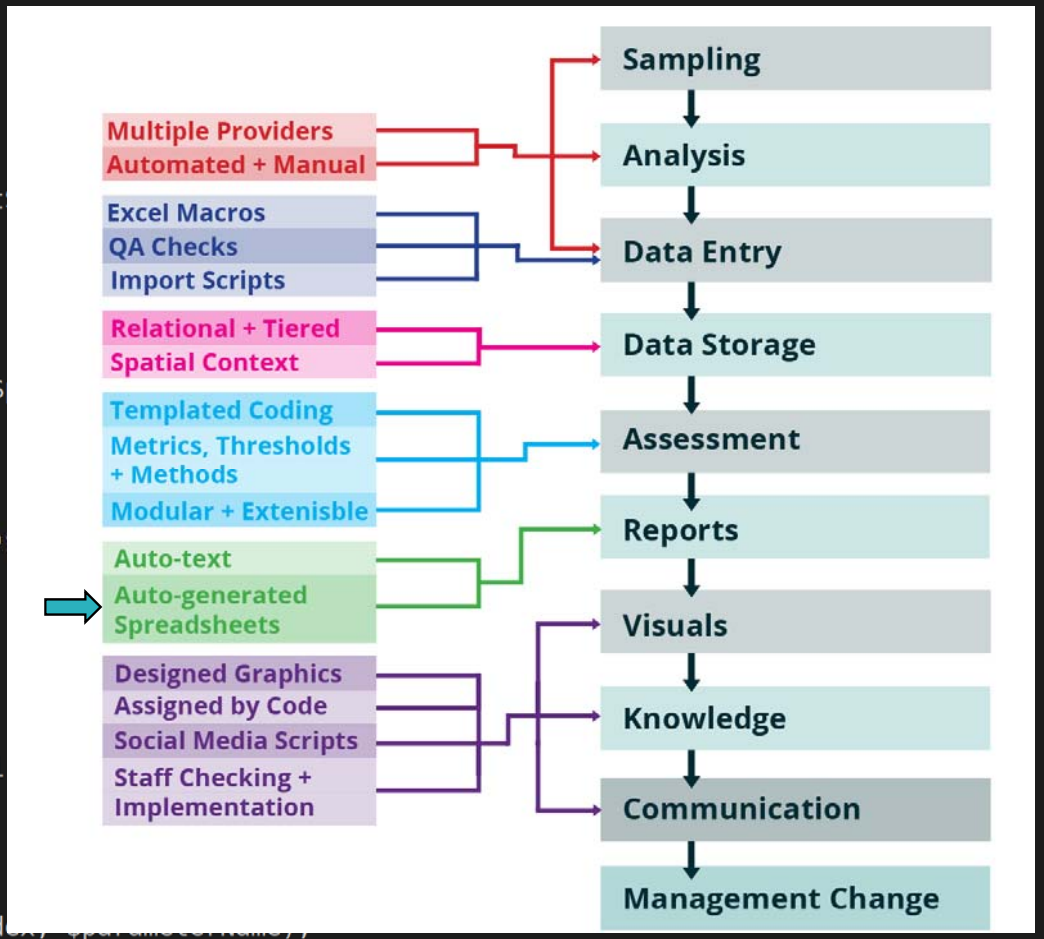
```
            $trends[$area][$trend][] = $field['name'];

        }
    }
    $text = '<p>';
    $text .= sprintf('In %s the overall condition of %s %s compared to %s.
        (max($years)) . '-' . (max($years)-1999),
        $catchment,
        strtolower($overall_trend['last_year']),
        (max($years)-1) . '-' . ((max($years)-1)-1999)
    );

    //only look at all years if there are more than 2 years
    if (count($years) > 2) {
        switch ($overall_trend['all_years']) {
            case 'increased':
                $overall_trend['all_years'] = 'been steadily improving';
            break;
            case 'decreased':
                $overall_trend['all_years'] = 'seen a steady decline';
            break;
            case 'Remained Stable':
                $overall_long_term = 'remained stable';
            break;
        }

        $text .= sprintf('The long term condition of %s has %s. ',
            $catchment,
            strtolower($overall_trend['all_years'])
        );
    }
    $text .= '</p>';
    $text .= sprintf('Trend for indicators in the %s in %s compared to %s:',
        $catchment,
        (max($years)) . '-' . (max($years)-1999),
        (max($years)-1) . '-' . ((max($years)-1)-1999)
    );
```



What's Going on here?

- Autotext logic for trend visualisation that assesses the results and prepares text displayed underneath trend graphs

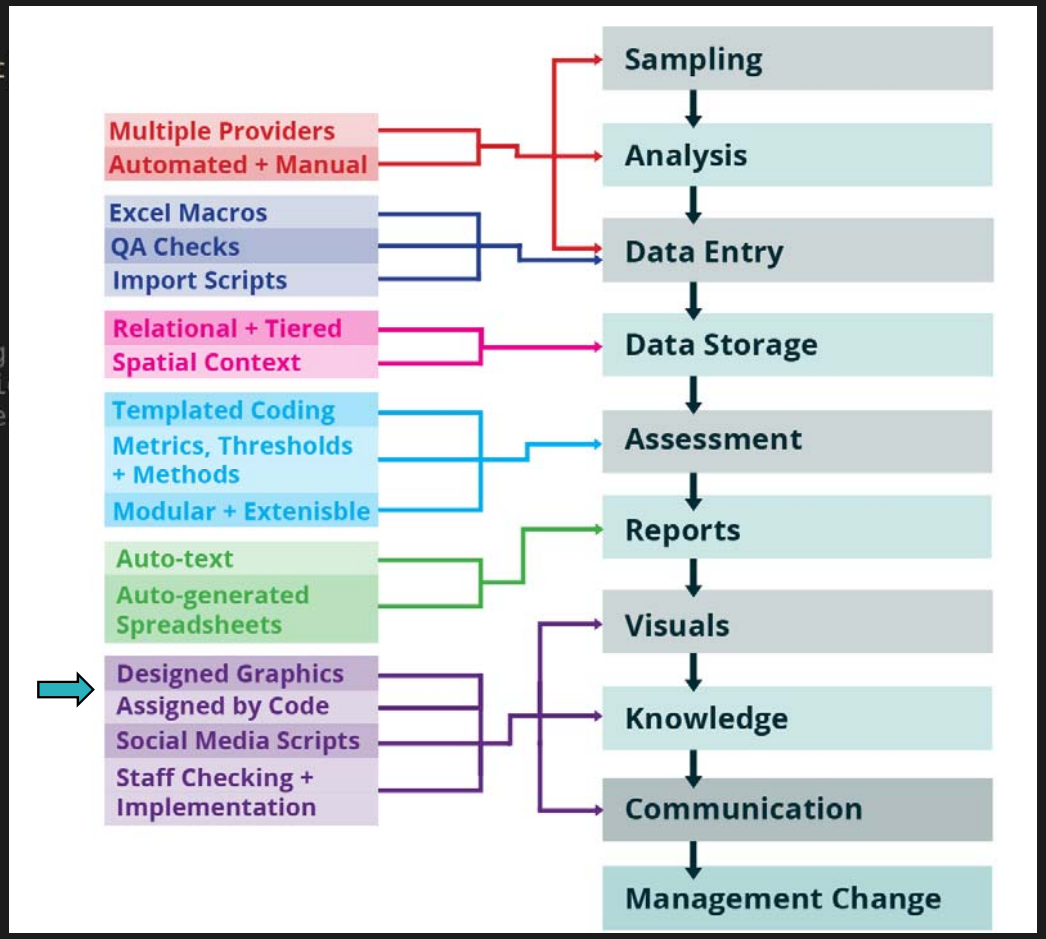
```
foreach ($categories as $categoryTitle => $data) {

    echo 'Category: ' . $categoryTitle . "\r\n";

    $row_index = 0;

    $objPHPExcel->createSheet();
    $out_sheet = $objPHPExcel->getSheet( $objPHPExcel->get
    $out_sheet->setTitle($categoryTitle);

    foreach ($data["parameters"] as $parameterName) {


        $file = $year . ' - ' . $catchmentName . ' - ' . $

        if (!file_exists($this->csvDir.'/'.$file)) {
            echo 'Skipping  ' . $file . ' - not found' . "
            continue;
        } else {
            echo 'Reading File ' . $file . "\r\n";
        }

        $objReader = new PHPExcel_Reader_CSV();
        $objPHPExcelReader = $objReader->load($this->csvDi

        $in_sheet = $objPHPExcelReader->getActiveSheet();

        $row_index++;
        $out_sheet->setCellValueByColumnAndRow(0, $row_ind
        foreach ($in_sheet->getRowIterator() as $row) {
            $row_index++;
            $cellIterator = $row->getCellIterator();
            $cellIterator->setIterateOnlyExistingCells(false);
            $column_index = -1;
            foreach ($cellIterator as $cell) {
```



What's Going on here?

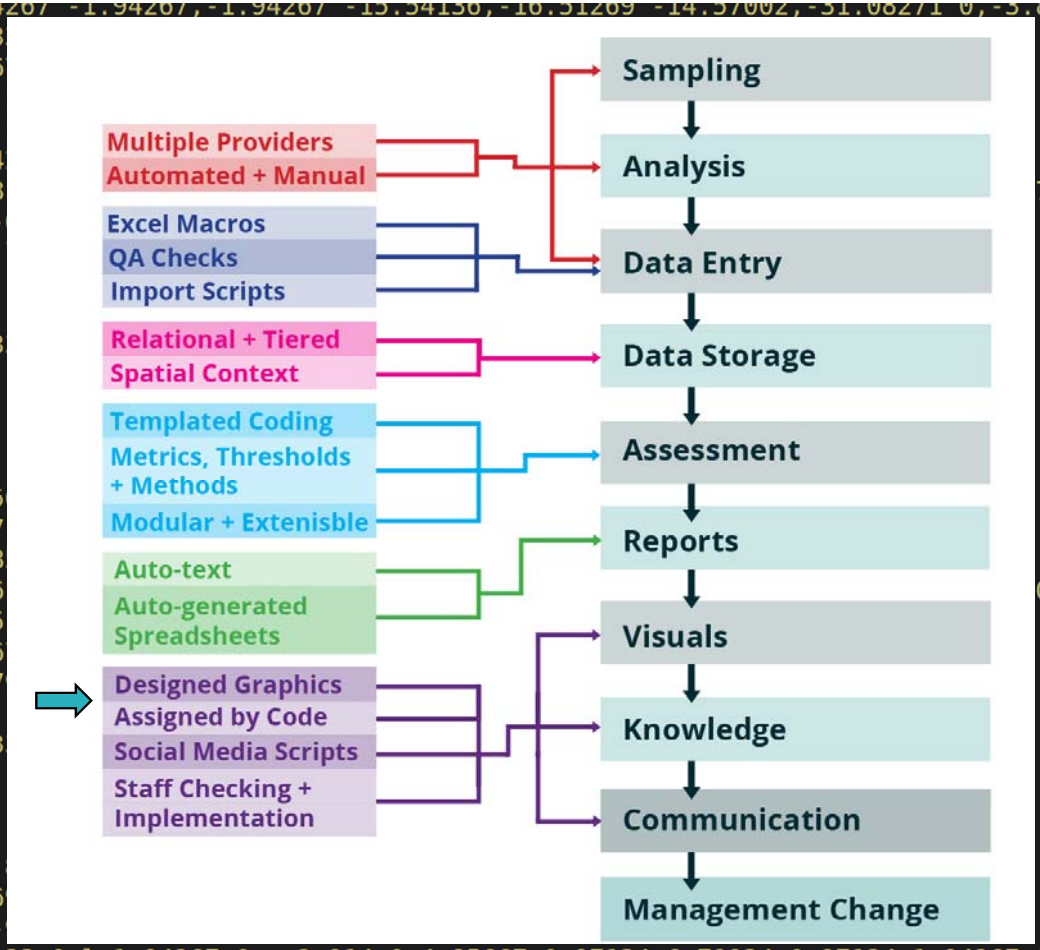
- Preparing job of creating an excel spreadsheet
- Confirming the data requirements relevant to the spreadsheet (year, catchment
- Compiling results & writing to a spreadsheet located via a specific url, linking this to the correct section of the report

```php
$xdoc = new DomDocument;
$xdoc->Load(LIB_DIR.'../img/ehi/Section Icon-'.$catchment
$tags = $xdoc->getElementsByTagName('path');
for ($tag = 0; $tag < $tags->length; $tag++) {
    $item = $tags->item($tag);
    $attr = $item->getAttributeNode('id');
    if (!$attr) continue;
    $id = $attr->value;

    //rewritten to use styles.
    //because it looks like SVG editors use the style tag
    //that the SVG spec says, ive reworked this to overri
    //to do that we must break down what styles are there

    $styleAttr = $item->getAttributeNode('style');
    if (!$styleAttr) {
        $currentStyles = array();
    } else {
        $vals = $styleAttr->value;
        $currentStyles = array();
        $vals = explode(';',$vals);
        foreach ($vals as $stylestr) {
            list($key,$value) = explode(':',$stylestr);
            $currentStyles[$key] = $value;
        }
    }

    if (array_key_exists($id, $fillColours)) {
        $currentStyles['fill'] = $fillColours[$id];
        $styles = '';
        foreach($currentStyles as $k => $v) {
            $styles.=$k.':'.$v.';';
        }
        $item->setAttributeNode(new DOMAttr('class', ''));
        $item->setAttributeNode(new DOMAttr('style', $styles));
    }
}
header("Content-Type: image/svg+xml");
echo $xdoc->saveXML();
```



What's Going on here?

- Calling up images (svgs) from a particular image library
- Defining the relevant attributes (fill colours, transparency, border colour) to apply given a particular result
- Serving the images and attribute properties up to the relevant section of the report to be displayed



What's Going on here?

- This is what an image looks like in code
- Art in numbers!

IT improvents for FPRH

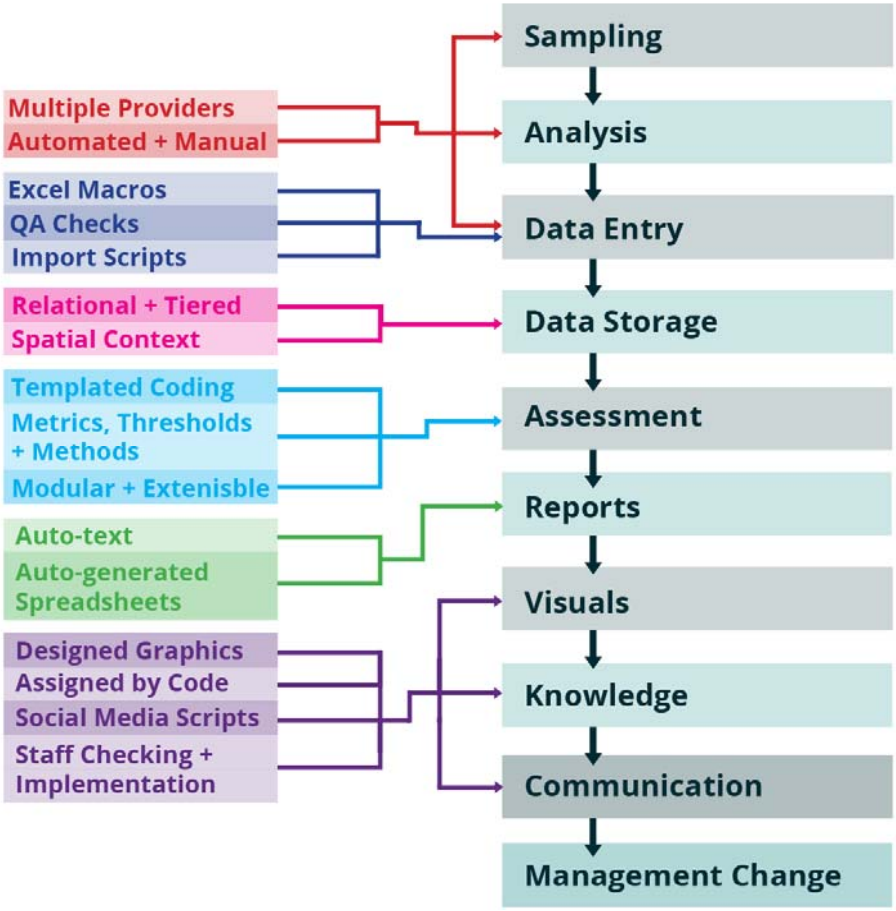
- Automated indicator and metrics dashboard
- Automate raw biota calculations (Macros and Fish)
- More detailed statistical analysis of results
- More additional information to support the main report card
- Automate content preparation and link to social media feed
- Work toward ‘lite’ version of Enviroscore Online product for small report card groups
- Incorporate more EV reports (primary + secondary recreation)
- Incorporate social, cultural and stewardship elements
- Visualising catchment modelling scenarios
- Plus more!

But this just made my job redundant!

We still need you!

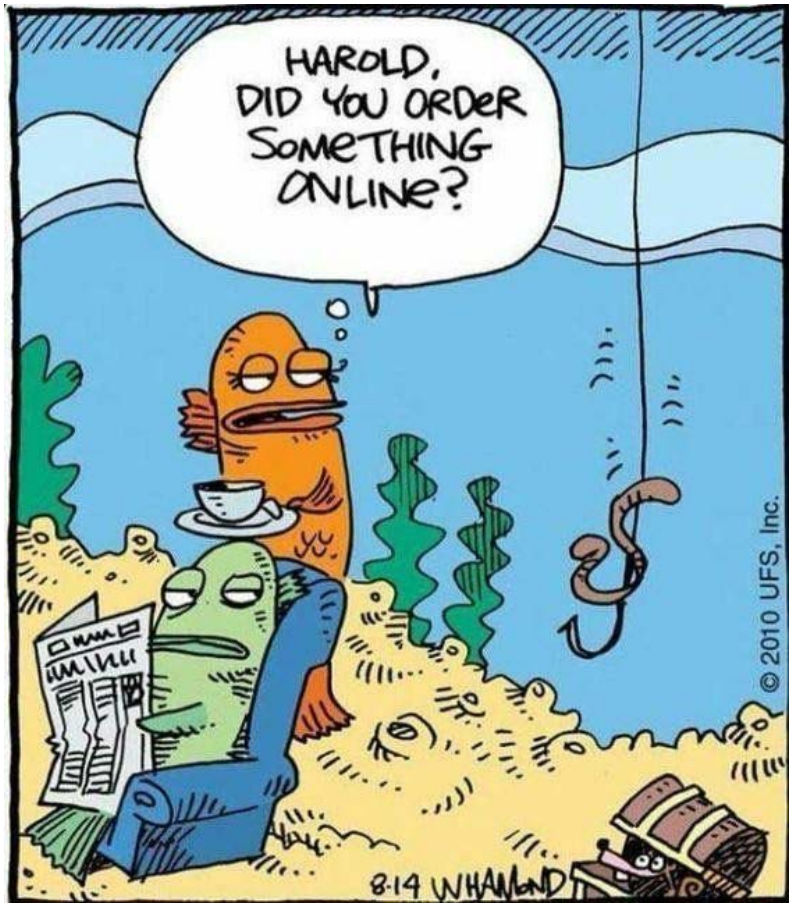
- Graphic designer input (establishment, rebranding and larger product range)
- Continuous improvement to Science Knowledge, followed by updates
- Manual technical input – there will always be exceptions!
- Have more time to focus on human interaction and knowledge transfer
- Reach out beyond your report card – other areas other environmental assets
- Dedicate more time for in depth analysis
- Prepare one off bespoke communications products (children's books)
- Learn how to code and add web developer to your portfolio

Activity: Reflection



- What elements of your report card process require the most manual handling currently?
- How could you use technology to reduce this effort?
  - Web development dependant
  - Efficiency not requiring web development
  - Short term
  - Long term
- What elements are common? Collaborate to reduce up-front cost?

Over to Luke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