Mint poison frog 2015-00030, Necropsy performed 19 February 2018

===== NECROPSY REPORT =====

General
Date of death: 2018-02-19
Time of death: 0730
Carcass condition: Fresh
History: History: Adult mint poison dart frog found on exhibit thin and slightly weak on 2/8/2018. Aquarist brought the frog into back-up and a fecal showed a heavy load of mites (fruit fly cultures are likely infested with mites and need to be restarted). Frog is eating, but slower to eat, so aquarist is placing a large amount of fruit flies in the enclosure.

Observations: BAR, thin body condition (1.5/5). Moves appropriately, but occasionally is slightly weak. Eyes clear OU. Oral cavity normal. Good skin condition. Vent clear.

Treatments: Plan: Continue to house in back-up isolated with constant fruit fly supply to encourage eating. Continue PO feeding with critical care once daily (~0.05 mL: mix the critical care powder with frog-safe carbon filtered water to a consistency that can be sucked into a syringe). If frog shows any further sign of decline, we will likely start prophylactic antibiotics. Aquarist to restart fruit fly cultures due to mite infestation.

Necropsy
Examiner: Jane Kepler
Date of exam: 2018-02-19
Body condition: Emaciated
Score: 2.0
External exam: Frog was found in AM on water dish. Skin was slightly blueish, turning blue after placing in fridge. Stomach was round, but body condition had not changed very much in the past 10 days. Skin was still slightly discolored in places, but otherwise appeared normal.

Length: 3.5 cm
Internal exam: Stomach appeared very full with a few air pockets. Not much food was found in the small intestine. Gallbladder possibly enlarged.
Redear sunfish 2016-00506, Necropsy performed 22June2018

Found a redear sunfish (thought to have fallen over the spillway several weeks prior) on lower intake screen in a.m. and was euthanized with MS-222 - external exam (skin scrape/gill clip/fin clip) revealed nothing remarkable, left eye was ruptured and appeared deflated, internal exam showed a slightly pale liver and very small reproductive (female) anatomy

Alligator pipefish 2014-03702, Necropsy performed 1July2018

History: This pipefish was recently noted to be having difficulty with orientation and buoyancy, but reportedly continued to eat well. It was found deceased on 1July, before treatment could be initiated. Aquarists noted several white spots on the ventrum at the time of death. Opened body cavity and placed whole in formalin. This individual may be quite geriatric, and there is a history of mycobacteriosis in the system.
Plan: Submit for histopathology
Dusky salamander 2016-00158, Necropsy performed 3July2018

History: 23 June 2018 husbandry staff noticed animal was severely lethargic. Since that time, treatment has included daily amphibian ringer’s baths and enrofloxacin q 48 hr topically (0.01 mL of 2.27 mg/mL dilution). Staff reports that each day, animal seems to respond to ringer’s baths throughout the day by becoming more active, but seems lethargic again in the morning. Patient may be eating intermittently as worms have disappeared from enclosure some days. Back legs appear weak and not ambulatory. Patient has positive response to gentle needle touch to caudal portion of body. Coelomic trans-illumination unremarkable.
Observations: Found deceased in enclosure, reportedly seemed alive first thing this morning. Has developed some superficial skin ulcerations and swelling of the rear limbs and tail. Brief necropsy performed – large fat bodies/potentially ovaries in coelom. No other gross abnormalities noted.
Carcass placed in formalin for histopathology.

Green anole 2015-01670, Necropsy performed 6July2018

animal was found deceased in the morning. Necropsy was performed. There was a thick white substance near the throat internally. Possibly calcium powder the animal ate the day prior. The lower gi looked distended and fluid filled. There was a collection of sand in that area, possible impaction.
Carolina gopher frog 2018-00023-001, Necropsy performed 17July2018

History: Bilateral enlarged pale regions under mandible, aspirate at last visit was not diagnostic. Frog has been eating and is in quarantine in preparation for use as an ambassador animal.
Plan: Continue routine husbandry. A second animal with the same lesions was euthanized for a diagnostic necropsy/histopathology, which will inform any treatment options for this one.

History: Bilateral enlarged pale regions under mandible at commissures of mouth. This is the second animal to show these signs, developed when still a tadpole and have persisted through almost complete metamorphosis. Cytology of aspirate from the other affected animal was not diagnostic.
Procedures: As a precautionary screening for conditions that may pose a risk to the rest of the captive rearing and reintroduction program, this individual was sacrificed. Euthanized with an overdose of buffered MS-222.
External exam: No abnormalities noted aside from the pale yellow irregular subcutaneous deposits at both lateral commissures of the oral cavity. Froglet is almost completely metamorphosed from the tadpole stage, with 4 limbs normally developed, but still has a small tail remnant.
Internal exam: No gross abnormalities noted of coelomic organs
Whole carcass with coelomic cavity and one side of the mouth with deposits exposed submitted in formalin for histopathology.

Two other slightly abnormal metamorphs were isolated from the population slated for release. One individual had retained gill tissue and open opercula through the completion of metamorphosis – euthanized.
The second was an abnormal tadpole with a very distended coelom that has now completed metamorphosis and the distension has largely resolved – it appears slightly rotund, but not markedly abnormal. Will not be released due to the history, but if it thrives in human care (i.e. eating well), will be retained as an educational ambassador.
Atlantic spadefish 2002-00200, Necropsy performed 3August2018

Animal was seen swimming oddly previous day with darkened body color separated from the school.

Animal was observed this morning swimming in loops on its side. Aquarist removed the fish and it was euthanized in 100ppm MS-222. Necropsy was conducted. Liver was white and part of it floated. What appeared to be the gallbladder had solidified green material in it. The gi tract had a lot of fluid in it with green material (bile?). The stomach was empty. There was a large structure located between the swim bladder and the lower gi under the liver that had yellow thick substance in it. There are images from the substance under the microscope. Not sure if it was part of the gi or reproductive tract. The swimbladder lining was red and inflamed looking and separated from the outer lining. The spleen(?) had an outer mottled white layer on it but internally was red. The heart appeared normal. We were able to preserve samples of all the above mentioned organs plus the brain. There were eggs observed on the gills and one live worm seen on the gills.
Rosyside dace, QF3, freshwater fish, Necropsy performed 3August2018

**History:** A group of rosyside dace were collected in the wild 28June18. Since acquisition, mortalities have been routine. System has been treated with oxytetracycline 10ppm, and formalin 25 ppm prolonged immersion. Recent water quality results: Ammonia 0.08, Nitrites 0.01, nitrates are at 6.60ppm. This rosyside dace was seen spiraling in the tank. Fish was euthanized. Coelomic cavity opened and whole fish placed in formalin for submission to the NCSU-CVM histopathology lab.

**Assessment:** Early mortalities likely due to transport and acclimation stress. Unclear cause of continued mortalities

**Plan:** Submit to NCSU-CVM histopathology lab

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Tigertail seahorse 2018-00011, Necropsy performed 29August 2018

Animal found lying on bottom, gilling faster than normal. Sloughed areas of skin on tail. Gill clip appeared healthy, no parasites noted. Internal exam did not indicate presence of nodules. Body preserved in 10% formalin for histo analysis.
Corn snake 2005-00585, Necropsy performed 2September2018

History: Patient is being housed off site due to previously diagnosed Cryptosporidium with active shedding (diagnosed on qPCR and fecal evaluation). Treatment was provided with budesonide and paramomycin approximately 6 months ago. Patient tolerated treatment well, but has recently started having an increase in undigested feces (mouse fur present) and losing weight despite a ravenous appetite. Fecal evaluation was negative for Crypto on 27 Aug 18. Plan: Continue to monitor quality of life, consider repeat treatment course. Consider long-term housing option (adoption) as he cannot be returned to the collection. Ultimately, the disease free interval appears to be approximately 6 months following treatment, but the overall disease course, prognosis, and treatment requirements are unknown. Concerns were raised for once/if patient develops regurgitation, euthanasia should be strongly considered.

Snake was found dead on 1September2018.

Did a quick necropsy yesterday, and while there was definitely crypto in the stomach, it wasn't particularly thickened (the usual progression of worsening crypto infection), although there were a few white nodules. And the liver looked very atypical, so did a touch impression of that, and it was loaded with bacteria. My presumptive guess of the course of events at this point is that this was a slightly atypical case of the cryptosporidium compromising the GI wall enough to lead to bacterial entry into the bloodstream and sepsis being the actual cause of death. I don't know for SURE that GI was the entry point, but that and respiratory are the most likely candidates, and his lungs looked grossly normal.

Marbled salamander 2007-02214, Necropsy performed 22September 2018

Animal was found deceased during AM checks. Was placed in Necrop. fridge for necropsy that was performed in the afternoon. See attached photos. Animal did suffer from gastric eversion.
Eastern Slender Glass Lizard 2016-00293; Necropsy performed 26September 2018
History: Captive-born. Subcutaneous uric acid deposits diagnosed via FNA. Worsening lethargy and mobility in the past few weeks. Poor appetite.
Observations: 6 grams. BAR. Five round nodules along dorsum (0.1-0.3cm in diameter), larger than previously.
Assessment: Worsening dermal gout.
Procedures:
Euthanasia: Sedated with 1 mg ketamine and 5 mg ketamine IM. Moderate sedation produced within 5 minutes. 0.05mL Beuthasol (390 mg/mL pentobarbital) intracardiac.
Plan: Opened carcass along length of body cavity. No grossly obvious uric acid deposits within organs, or other abnormalities seen. Submit carcass for histopathology.

Sunfish Hybrid(Warmouth); 0.1 2007-04934, Necropsy performed 2October2018
History: Found laying on side and gilling heavily in bottom pool of Blackwater Swamp. Isolated and treated with ceftazidime 20 mg/kg IM for 1 dose. No improvement. Two other fish went over the waterfall—one is laying on its side as well, the other behaving normally. Additional fish could not be captured today.
Observations: Laying on side. Weak operculations.
Procedures:
Euthanasia: Immersion in MS-222 at 500mg/mL for 10 minutes, operculation ceased.
Necropsy: Tattered pectoral and tail fins. Enlarged, brown and yellow mottled ovaries. Scoliosis of midbody vertebral column. Pale left gill arch. Touch impressions of liver, kidney, and spleen were negative for acid-fast bacteria. Tissues collected in formalin.
Plan: Submit formalin-fixed tissues for histopathology.
Cope’s gray tree frog 2013-00713, Necropsy performed 7 October 2018

===== NECROPSY REPORT =====
General
Date of death: 10.06.2018
Time of death: sometime overnight of 10.05.2018 or morning of 10.06.2018
Carcass condition: Fresh
History: This animal was moved behind the scenes during hurricane Florence for extra protection. It was noted during the return and evaluation of all animals that this animal in particular had sustained 2 broken femurs and was having problems jumping and catching food. Vets were notified and animal was kept behind the scenes until vets could do a visual physical on 9.26.2018.
Treatments: Per vets requests, the animal was placed on a 0.02ml Ketoprofen and 0.01mL Calcium Gluconate to treat for 5 consecutive days to help with the pain and hopeful recovery and healing on the animal. The food was injected into a live cricket and fed to the frog PO.
Necropsy
Examiner: S. Murray
Date of exam: 10.07.2018
Body condition: Normal
Score: 3.0
External exam: Noticable broken femurs.
Internal exam: Normal. Stomach was full with a cricket still.
Comments/diagnosis: Animal is around 4 years old and the life span for this species is generally 5-9 years. Possible health decline due to age and being a captive animal. Sustaining the femur injuries during the hurricane caused major decline in the health of the animal. Treatment was tried, but the animal still expired while in treatment.
Red lionfish 2013-02174, Necropsy performed 16October2018

Fish was euthanized. Necropsy performed

History: Presented for negative buoyancy and anorexia two weeks ago. It has a history of an altercation with a lobster on exhibit in 4/2018 that resulted in extensive soft tissue injuries. A rescue medical protocol was put in place (dexamethasone and ceftazidime) but these injuries eventually healed without medical intervention. Diagnostics two weeks ago showed a small swim bladder on radiographs. It has been treated with ceftazidime 20mg/kg and ketoprofen 2 mg/kg IM q72h and been kept in back holding for close monitoring. In the past few days, it has been lying on its side and had an increased opercular rate. Animal care staff express concerns for its quality of life.

Observations: Dull. Lying in right lateral recumbency with rapid opercular rate.

Procedures:

Euthanasia: Placed in high-concentration MS-222 (500 mg/L) by animal care staff until cessation of operculum. Transported to necropsy.

Necropsy: BCS 1.5/5. Sunken coelom. Three erythematous ulcerations along ventral surface. No coelomic fluid. Dark green, fibrinous deposit (10x50x2mm) within ovary. Small, green to brown mottled liver. Empty intestinal tract. Markedly and diffusely thickened swim bladder containing red to brown mucus debris affixed to a 4mm diameter, black foci within the swim bladder wall and associated with a 3x3x12mm black fibrous structure. No other abnormalities.

Tissues collected: Heart, head kidney, stomach, intestines, right eye, skin, muscle, swim bladder (with black foci), fibrous item within swim bladder, mucoid swim bladder debris, ovary, fibrous ovary deposit, liver, brain.

Cytology of swim bladder revealed a diffuse basophilic background with no discernable cells; nondiagnostic.

Assessment: Morbidity suspect secondary to swim bladder puncture and secondary infection. Unknown if acute or chronic (suspect this fish was likely ‘vented’ upon collection multiple years ago).

Plan: Hold formalin fixed tissues. No tank health interventions indicated.
**Spotfin butterflyfish 2018-01441, Necropsy performed 30October2018**

History: Wild-caught locally several months ago, have been undergoing quarantine and are currently on chloroquine immersion treatment. A burrfish in the same population died following exhibiting neurologic signs and histopathology was consistent with viral encephalitis. The population has experienced sporadic mortalities, possibly related to water quality, but no other fish have shown notable neurologic signs until this butterflyfish was observed spinning in the water column on 23 October. It was sometimes able to swim normally and appeared to be eating, but neurologic signs persisted. Euthanized with an overdose of MS-222 on 30Oct.

Update on histopathology: No viral inclusions or other suspicious findings on histopathology. Does not appear to be related to the condition affecting the burrfish.

The remaining butterflyfish can be placed onto exhibit with a mental and documented (RaptorMed) note of this history, so if any further individuals show clinical neurologic signs they can be investigated thoroughly.

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**Lined seahorse 2018-01439, Necropsy performed 1December 2018**

NOTES BY AQUARIST: Lesion observed on right side, possible Vibrio infection. Animal euthanized for necropsy. Necropsy showed no signs of myco. Preserved in formalin for histopathology. Submitted to NCSU-CVM
North Carolina Aquariums Medical Record

Eastern diamondback rattlesnake 2013-00783, necropsy performed 22 January 2019

===== NECROPSY REPORT =====
General
Date of death: 1.22.19
Time of death: found @ 11am
Carcass condition: Fair
History: previous cases of nematodes that were treated.

2.27.18 during the animals annual physical it was noted that there was a semi-firm mass in the caudal coelom cranial to the vent.
Treatments: Fenbenozle/Invermectin for nematode problems
Necropsy
Examiner: Stacey Murray, Jane Kepler, Julie Johnson, Ryan McAlarney
Date of exam: 1.22.19 @ 11am
Body condition: Normal
Score: 2.5
External exam: 2 small abrasions noted on the ventral side of the snakes body
Internal exam: fluid in the coelomic cavity (~25ml), dark red region above the cranial vent, ovaries pink/beige and motled, lower GI appeared to be hemmoraged & there was a small area where that tract seemed to be stuck to the sides/pinched
Comments/diagnosis: Animal was found deceased on the morning of 1.22.0219. Animal's body was upside down and submerged at the bottom of the pond in the exhibit. Last time the animal was seem alive was during the PM check on 1.21.2019 and was reported to be curled up on land in the middle of the exhibit.
Gopher frog 2016-00413; 0.1, Necropsy performed 24 January 2019

Update: Animal found deceased. Necropsy revealed traumatic penetrating laceration as well as prominent egg follicles. Based on the age of this individual and the available resources, we would expect the other gopher frogs to become reproductively active at approx. 2 years of age. Consideration should be made for providing adequate substrate and environment for egg deposition in the future.

Squirrel tree frog 2005-02258, Necropsy performed 30 January 2019

====== NECROPSY REPORT ======

General
Date of death: 1.30.2019
Time of death: sometime overnight
Carcass condition: Fresh
History: N/A
Treatments: No treatments were going on. Animal was pulled from exhibit for health concerns and monitored in the back.

Necropsy
Examiner: Stacey Murray
Date of exam: 1.30.2019
Body condition: Emaciated
Score: 2.0

External exam: color: greenish, dry skin, buldging eyes, skinny, clear oral cavity
Internal exam: liquid in coelmic cavity, empty stomach & intestinal tract, no abnormalities found
Comments/diagnosis: Animal was pulled of exhibit on 1.23.2019 for health concern. Was put in quarantine with heat made available to help with lethargic behavior (animal seemed slightly cold). Animal seemed to bounce back and was eating, jumping, & moving around, but its health seemed to rapidly decline again over 1.27-19-1.28.19. On morning of 1.29.19, the animal was again found upside down and was extremely lethargic and emaciated. Vets were here this day, so animal was looked at, and vets were going to work up a treatment plan. Animal was found dead on the morning of 1.30.2019. Animal has been at the facility since 2005, so old age is a possibility, but true cause of death is unknown at this time.
North Carolina Aquariums Medical Record

Tripletail 2009-00109, Necropsy performed 2 February 2019

Necropsy revealed nothing remarkable with the exception of noticeable amount of gas bubbles in the liver - anal/caudal/rear dorsal fin rays which were seen damaged earlier in the week had moderate amount of exposed fin rays but no evidence of further damage or infection - very little fat in abdominal cavity - small amount of substrate found in the stomach but did not appear to be related to cause of death.

Blue poison frog 2015-00893, Necropsy performed 9 Feb 2019

==== NECROPSY REPORT ====

General
Date of death: 2.8.2019
Time of death: found @ 11:15AM
Carcass condition: Fresh
History: This was an animal from the group in the dart frog exhibit that got pulled to undergo parasitic nematode treatment. Animal had just finished the second round of fenben treatment on 2.6.19 and had been behaving normally until it was found deceased.
Treatments: Fenbendazole
Necropsy
Examiner: Stacey Murray
Date of exam: 2.8.2019
Body condition: Robust
Score: 3.5
External exam: mouth was normal, animal was having some post-mortem skin sloughing, stomach region was enlarged and it was noted that the animals weight was +3g from the last weight of 3g 10 days prior.
Internal exam: No abnormalities noted, stomach was full of fruit flies, GI tract had no blockages, however, there was a good amount of liquid in the coleomic cavity that had a red tint to it, leaving thoughts of some sort of hemorrhaging occurring somewhere.
Comments/diagnosis: Animal was found deceased and upside down during AM checks on the morning of 2.8.2019, The animal had been going through a fenben treatment and was behaving normally up to their death.
Horseshoe crab 2016-00373, Necropsy performed 5March2019
History: Male horseshoe crab of unknown age currently under treatment for carapacial erosions, gill erosions, and dermal colonization with unknown sessile invertebrates. Gill lesions initially responded to iodine baths though did not resolve completely. Lesions then progressed despite treatment with ceftazidime IV.
Update: Appetite has been strong, but activity level is very low compared to conspecifics, and the animal has developed severe erosion of the book gill opercula. The left fifth limb has almost completely detached.
Observations: Low mobility in tank. Numerous pinpoint to 3 mm multifocal to coalescing partial-thickness to full-thickness carapacial erosions/ulcerations (tan-yellow tissue visible within the ulcerations) encompassing ~50% of the prosoma. Missing distal segments of the right first limb and left second limb. The left fifth limb has minimal muscle control; the exoskeleton is absent at the proximal segment and is replaced with exposed tan-irregular tissue. Affecting the 2nd through 6th book gill opercula are severe ulcerations and tissue loss. The defects are triangular (wide distally, narrow proximally on opercula) affecting 10-25% of the leaflet surface. The tissue at the margins of the defects appears light tan-brown, ulcerated, and thickened. The proximal arthrodial membranes of ventral body and ventral surface of several opercula are covered with grey-fuzzy material. Righting reflex is diminished compared to conspecifics.
Diagnostics:
1. Scrape of grey material: Numerous microscopic sessile invertebrates with a general conical-ovoid body shape and long ventral stalk. The distal aspect has a single conical protrusion surrounded by ~16 thin radiating arms. There appear to be multiple life stages including smaller round structures found around the larger sessile organisms. The round structures have a variable, symmetric internal structure. Mobility of the organisms is observed within the round structures.

Anesthesia, euthanasia:
1. Induced with 2-Phenoxyethanol at 8 mL/L in a 9-liter container. Light sedation achieved at 6 minutes, heavy sedation achieved by 30 minutes (lack of spontaneous movement, gentle probing did not induce ambulation, minor attempts to right when in dorsal recumbency, slight muscle tone with noxious stimuli, no cardiac contractions visible on ultrasound, GI motility present). At that time, it was noted that the 2-PE had settled at the bottom of the container. The 2-PE was circulated manually and within 10 minutes the animal was anesthetized. At 44 minutes, pentobarbital 1.5 mL (AQ bottle 2) was administered intracardiac resulting in immediate loss of muscle tone. No cardiac contractions or GI motility present on ultrasound. Carcass was left in the induction container for 1 hr prior to post mortem exam.

Assessment/Plan: Severe, progressive carapacial pitting, opercular erosion, colonization with sessile invertebrates, decreased activity level, progressive loss of limbs. Possible causes include bacterial, fungal, or parasitic disease, less likely nutrition or primary environmental cause. Based on the severity of clinical signs, the animal appears systemically affected. Due to concerns for poor quality of life, euthanasia was elected by veterinary and husbandry teams.
Necropsy:
Death to necropsy interval of 60 minutes. Carcass is in good post-mortem condition.
Ventral approach to dissection was utilized.

External findings:
The compound eyes are opaque bilaterally. Numerous pinpoint to 3 mm multifocal to coalescing partial-thickness to full-thickness carapacial erosions/ulcerations (tan-yellow tissue visible within the ulcerations) encompassing ~50% of the prosoma. Distal segments of the right first limb and left second limb are absent (amputation is at an arthrodial membrane). The exoskeleton is absent at the proximal segment of the left fifth limb and is replaced with exposed tan-irregular tissue. Affecting the 2nd through 6th book gill opercula are severe ulcerations and tissue loss. The defects are triangular (wide distally, narrow proximally on opercula) affecting 10-25% of the opercular surface, though most gill leaflets themselves appear grossly unaffected. The tissue at the margins of the defects appears light tan-brown, ulcerated, and thickened. The proximal arthrodial membranes of the ventral body and ventral surface of several opercula are covered with grey-fuzzy material.

Internal findings:
Moderate amount of food within the esophagus and stomach. The area of the pericardial sac contains pink-tan gelatinous tissue (presumed pentobarbital artifact). The following organs were identified and appeared unremarkable: mouth, GI tract, heart, limb muscle, hepatopancreas + gonad. Did not definitively identify neurologic structures or coxal glands.

Morphologic diagnoses:
Severe, chronic, diffuse, carapacial erosion and ulceration
Severe, chronic, opercular ulceration
Multiple limb amputations
Moderate epibiota colonization (unknown sessile invertebrate)
Diffuse ocular opacity, compound eyes

Tissues labelled and fixed in formalin (see photos below):
Abnormal gill and opercula - labelled “gill”
Unaffected gill and opercula - labelled “normal gill”
Mouth, esophagus, stomach, distal GI, heart - labelled with identification
Abnormal section of left 5th limb - “5th limb”
Hepatopancreas + gonad - labelled “fat?”

Not labelled in formalin:
Compound eyes and surrounding carapace collected individually
Several sections of abnormal gill and opercula
Normal leg.
Sections of prosomal carapace with pitting + underlying hepatopancreas + gonad.
The esophagus, stomach, distal GI tract, heart and associated vessels, limb muscles, and some components of the hepatopancreas and gonad were fixed as a single unit.
Yellow-banded poison dart frog 2015-00022, Necropsy performed on 11 March 2019

======== NECROPSY REPORT ======

General
Date of death: 3/11/2019
Time of death: 3:15pm
Carcass condition: Fresh
History: This animal was the smallest of the dart frogs. It had a recent history of flipping over and being unable to right itself, especially in the water dish. Day prior it had been found upside down under the paper towel.

History: The animals in this group have a long-term history of nematode infestation. All individuals in the population have been removed from exhibit and some fecals at the time were noted to have hematochezia with confirmatory diagnosis of nematodiasis on fecal exam. Treatment prescribed was fenbendazole (diluted to 10 mg/ml solution) 50 mg/kg PO every 7 days for 3 doses. Fecal analysis on 9 Feb did not identify nematodes. Update: Recent fecal exam on 2 Mar identified a single un-larvated nematode egg. Caretaker continues to report blood in fecals.

Observations: All frogs appear bright and alert and are in good body condition. Multiple fecals on paper towel substrate have a slight orange-rust coloration. No evidence of melena or frank blood.

Historically the Yellow Banded frogs developed splayed legs.

Treatments: Treatment prescribed was fenbendazole (diluted to 10 mg/ml solution) 50 mg/kg PO every 7 days for 3 doses. Treatment started Jan 30 and ended Feb 13, 2019. Caretakers have been cleaning the enclosure daily during the weekdays.

Necropsy
Examiner: JK
Date of exam: 3/11/2019
Body condition: Normal
Score: 3.5
External exam: Length: 3.3 cm
Animal appears normal, slightly robust. Skin color is normal, slight discoloration on dorsal end. Mouth agape, with tongue protruding. Eyes have white rims on undersides. Underside of body appears normal.

Internal exam: Initial internal exam appears normal. No hemmoraging or pooled blood found. Lungs appear filled with water. Stomach and intestine filled with flies and digested material (red spot on photo is eye of a fly). Healthy fat deposits. Instestine has digested fly material throughout.
Abnormalities: Gallbladder appears enlarged and yellow. Liver possibly enlarged?
Comments/diagnosis: Animal was eating and appeared healthy. No internal hemorrhaging apparent. Gallbladder was slightly enlarged and yellow. Frog had a history of being unable to right itself in a few instances (dating back to 2017). This behavior was exacerbated by being in quarantine. Nemotode history could have diminished its ability to right itself as well, resulting in drowning.
Corn snake 2005-00584, Necropsy performed 13March2019

History: Long-term resident used for educational programming. Annual wellness exam. Appetite and demeanor are good. History of being mildly over-conditioned. No current concerns reported.


Weight: 1.0 kg

Proc:
Ventral coccygeal venipuncture
PCV: 26%
TS: 6.4 g/dL

Update: This snake was found dead on 13 Mar 2019. Necropsy performed, and samples collected in formalin by caretakers. The following abnormalities were found: < 1cm white nodule on the liver and several white pinpoint nodules along the outside of the GI tract. There seemed to be a couple of red hemorrhage spots in the fat tissue (like it is encapsulated by the fat).

Assessment: Apparently healthy on physical exam, unknown cause of death. Low-normal PCV.

Plan: Submit tissue samples for histopathology.

Yellow perch 2006-04820, Necropsy performed 16March2019

found a dead perch on lower screen in a.m. - necropsy showed nothing externally and internally found a very high amount of fat (~2/3 of coelomic cavity was fat masses)
Yellow perch 2014-00342-002 Necropsy performed 9 January 18

==== NECROPSY REPORT =====

General
Date of death: 1/09/18
Time of death:
Carcass Condition: Fair

History: Pulled from Falls Lake Reservoir for vet check to determine whether treatment for nematodes.

Treatments:
Necropsy
Examiner:
Date of exam:
Body condition: Normal

External exam: Skin scrape and gill clip, nothing found.

Internal exam:
Comments/Diagnosis: Skin scrape and gill clip, nothing found.
North Carolina Aquariums Medical Record

Rock bass 2014-00221-006, MBH2, Necropsy performed 6February18

History: Adult rock bass that was frequently observed to lay on its side in holding and on exhibit. Aquarists noted a lesion on the left body wall that appeared fungal-like and moved the fish to backup (MBH2) for veterinary assessment. Fish is anorexic.

Observations: QAR on bottom of tank, slight curvature of spine to the right. Large (3X2.5 cm) superficial ulceration of the left body wall with areas of erythema and white proliferative material that resembles water mold. Eyes clear OU, appropriate gilling rate, otherwise good skin and scale condition, adequate body condition, vent clear.

Procedures:

1. Weight: 132 grams
2. Skin scrape: chromatophores, green/rainbow fungal hyphae in chains, red blood cells
3. Medications:
   - Ceftazidime 20 mg/kg (3 mg, 0.03 mL of 100 mg/mL ceftazidime) IM
   - Ketoprofen 2 mg/kg (0.3 mg, 0.03 mL of diluted 10 mg/mL ketoprofen) IM
   - Topical betadine then SSD to body wall lesion
4. Found dead morning 7 Feb 2016: necropsy
   - External exam: the left body wall ulceration appears improved after topical treatment, skin scrape revealed mild amount of saprophytic-water mold-like fungal elements. Acid fast negative. No other abnormalities.
   - Internal exam: the skin lesion on the body wall did not extend past the dermis. Organs are moderately autolyzed with no obvious abnormalities grossly. Tissues disposed without histopathology due to autolysis.

Assessment: This fish had a large but superficial ulcer on the left side of the body wall (unknown etiology) that had some fungal growth that did not extend past the dermis. Fish was moderately autolyzed so tissues were not submitted for histopathology.

Plan: Aquarists to alert veterinary staff if any other fish on exhibit show similar lesions.
Lined Seahorse 2017-00006, Necropsy performed 16March18: Moderate autolysis due to delay between euthanasia and necropsy. Subcutaneous bubbles along tail, slightly thin. No abnormalities or granulomas seen in organs or coelomic cavity.

Cytology of tail in area of bubbles and kidney (acid-fast stain): some evidence of mixed bacteria in tail (possibly post-mortem colonization), but no clearly identifiable acid-fast positive organisms consistent with Mycobacteriae.
Corn snake 2017-00028. Necropsy performed 30March18

History: Adult male corn snake found acutely dead on exhibit this morning. Transferred to CMAST for necropsy. Records indicate weight loss over time (555 g in April 2017, 432 g in Feb 2018 at recent annual exam). Body condition during the annual exam was deemed healthy (3/5). Aquarist notes this snake regurgitated a meal recently. A group fecal in Feb 2018 showed nematodes, and snakes were treated with a course of PO fenbendazole.

Weight: 362 g
Necropsy:

External exam: Body condition 2.5/5 with slightly prominent spine and mild epaxial muscle wasting. Good scale condition and color. Oral cavity clear, nares clear bilaterally. Vent clear. No other abnormalities noted on external exam

Internal exam: (very little intracoelomic fat)
Liver: red-brown, sharp margins, homogenous, no abnormalities noted
Gall bladder: full and appears normal
Splenopancreas: appears normal and homogenous
Lungs: Trachea appears clear, lung tissue is pink, fluffy, and grossly normal

Reproductive: Testes appear tan, homogenous, no abnormalities noted

GI: Small amount of mucus in the stomach, no lesions noted. Normal appearing digesta present throughout intestines.
Cytology: Stomach wall AF negative (routine check for cryptosporidium)
Kidney: bilaterally similar in size, brown, homogenous, no abnormalities noted
Heart: appears normal
Brain: no abnormalities noted
Spine: appears normal grossly

Assessment: No abnormalities on gross necropsy except mild loss of body condition that is consistent with the slowly decreasing body weight over time. Snake was too autolyzed for histopathology.
Muskellunge, 2017-00127-007. Necropsy performed 23April18

===== NECROPSY REPORT =====

General
  Date of death: 04-23-2018
  Time of death: 1100
  Carcass Condition: Fresh, Poor/decomposed

History: Exhibit muskellunge - this individual has always been outcompeted, easily spooked, and harassed by tankmates. Found against skimmer this morning (4/23/18) very weak, beat up, with damaged eye, but still alive.

Treatments: N/A

Euthanasia performed with 200 ppm MS-222, with equal part buffer

Necropsy
  Examiner: almcclanahan
  Date of exam: 4-23-2018
  Body condition: Emaciated
  External exam: Damaged left eye
  Abrasions and inflammation along entire body and present in pectoral and caudal fin(s)
  Anorexic
  Marginally smaller than same-age conspecifics present in habitat
  Internal exam: N/A

Much smaller than same-age conspecifics in habitat

Comments/Diagnosis: This individual had a negative history throughout its life in exhibit; conspecifics were first to outcompete and harass this individual; congeners present in habitat also outcompeted. [This individual] spooked easily and had a habit of beating itself up against sharp insert. After over half a year, decision was made to euthanize - no holding/recovery space; previous attempts on this species to rehabilitate were unsuccessful.
Bluestriped grunt #1 and #2; Necropsy performed 21 May 2018

**History:** Captive reared from eggs collected in February 2017. Aquarist observed fish spiraling on exhibit and swimming tail down. The fish were easily caught and removed from exhibit. There has been a historical issue with other bluestriped grunts reared from the same batch of eggs that have no swim bladder. Curator sent an image and one of the two grunts had a lesion on the right lateral side. Decision was to euthanize the fish due to poor prognosis. Fish were euthanized with 500 ppm MS222 by aquarist staff. Fish were taken to CMAST for radiographs and necropsy.

**Bluestriped grunt #1**

**External exam:** Abnormal shape of head noted, fish in fair body condition.
Skin scrape and gill biopsy: negative for ectoparasites

**Internal exam:** Adequate fat deposits, empty GI tract. Liver was friable, small and pale pink, gallbladder distended with green bile. Swim bladder intact. Kidneys reddish brown. Heart appeared normal. Brain mushy.

**Plan:** Full suite of tissues minus the brain were submitted in formalin for histopathology.

**Bluestriped grunt #2**

**External exam:** Fish in good body condition. Lesion on right lateral side through muscle.
Skin scrape and gill biopsy: negative for ectoparasites

**Internal exam:** Gills frayed. Adequate fat deposits, empty GI tract. Liver was friable, small and pale pink, gallbladder distended with green bile. Swim bladder intact. Kidneys reddish brown. Heart appeared normal.

**Plan:** Whole carcass opened and submitted in formalin for histopathology.
Creek chub 2009-00066-001, Necropsy performed 7June2018

===== NECROPSY REPORT =====
General
Date of death: 2018-06-07
Time of death: AM
Carcass Condition: Fresh
History: No previous history
Treatments: No previous treatments
Necropsy
Examiner: almcclanahan
Date of exam: 2018-06-07
Body condition: Normal
External exam: Body condition appeared normal, no anorexia or external lesions or edema or physical deformation.
Skin/slime coat scrape well-executed with no abnormalities. Gill clipping showed some deterioration of the lamellae and lack of blood present - however, no abnormalities.
Internal exam: N/A
Comments/Diagnosis: Unknown cause of death - a wild caught animal already at adulthood and had been in aquaria since 2009. Potentially old age.
Corn snake 2009-00108; amelanistic, Necropsy performed 27 July 2018

History: This snake is a long-term exhibit animal. Was apparently healthy through annual exam in April 2018, but has rapidly lost weight since then. Exhibit/group has a history of nematode infestation that is treated periodically with fenbendazole. Found dead in the enclosure the morning of 26 July 2018.

Gross necropsy:
External exam: Emaciated body condition, no SQ fat deposits. Several small, firm nodules associated with ribs along the dorsal spine. Skin in good condition, no other external abnormalities seen.
Weight: 216 g (267 g in June 2018)
Length: 116 cm
Internal exam: No coelomic fat deposits present.
Heart: unremarkable
Lung: Completely infiltrated/effaced with pinpoint tan nodules throughout the surface and parenchyma
Trachea: unremarkable
Liver: Dark red, firm, no nodules or other gross abnormalities. Gall bladder distended with dark green bile
Splenopancreas: unremarkable
GI tract: Stomach contains only a small amount of tan mucoid digesta, mucosa appears normal, wall not overtly thickened. Intestines empty, small amount of fecal material present in colon.
Kidneys: unremarkable
Gonad: testes, small and inactive
Cytology:
Lung touch impression: peripheral blood contamination with inflammatory cells (macrophages, heterophils) and numerous bacteria, including filamentous. Few clumps of cells that may have a monomorphic population.
Stomach touch impression (acid-fast): no acid-fast organisms consistent with Cryptosporidiosis
Preserved in 10% NBF:
Lung + trachea + heart
Liver
Stomach
Splenopancreas + gallbladder + intestine
Kidney + gonad + colon
Segment of spine and ribs with nodule
Brain
Assessment: R/O primary respiratory disease (infectious vs neoplasia) vs secondary metastasis of neoplasia in lungs. No obvious primary tumor identified grossly. Cytology does not completely rule out neoplasia, but infectious disease seems more likely.
Plan: Submit preserved tissues for histopathology.
Lined Seahorse 2016-01662-003, Necropsy performed 20November18

History: Removed from exhibit on 31 October due to development of a wound on the caudal ‘neck’ area. Seahorse was reportedly still eating well and behaving normally on exhibit. Treatment was initiated with ceftazidime at 20 mg/kg IM q72h (0.04 ml of 10 mg/ml dilution). Acid-fast staining of swab from lesion showed a large number of acid-fast positive bacteria in chains, not the typical appearance of Mycobacterium sp, and may represent a different acid-fast positive bacteria. Treatment with ceftazidime has been completed, and wound is stable to improved, but seahorse has subsequently become increasingly lethargic and anorectic. She has shown no interest in even live food for several days. The decision was made to humanely euthanize.

Procedures: Euthanized with an overdose of buffered MS-222 (500 mg/L), and necropsy was performed on site.

Necropsy

External exam: Adequate body condition verging on thin. The wound is unchanged in size, white, not apparently any deeper than previously, but also not appreciably contracting in from the edges. No other visible external abnormalities.

Internal exam: No free coelomic fluid.


Kidneys are partially effaced by soft white nodules containing thick purulent fluid, extending throughout much of the retroperitoneal space, and likely extending cranially towards the external wound. Presumed abscess formation secondary to the penetrating ulcer.

Cytology of purulent material: myriad acid-fast positive bacilli consistent with Mycobacterium sp.

Culture of fluid collected and stored in refrigerator at CMAST.
Marbled salamander 2018-00733, Necropsy performed 11 December 2018

====== NECROPSY REPORT ======

General
Date of death: 2018-12-10
Time of death: AM
Carcass Condition: Fair
History: Obtained from Underground Reptiles on 11/30/18. Early fecal found strange worms, look like flukes. This individual was observed to be lethargic on Sunday, 12/9. Found dead in AM on 12/10 (a little smelly)
Treatments: N/A

Necropsy
Examiner: almcclanahan
Date of exam: 12/10/18
Body condition: Normal
External exam: Small red, inflamed area on toe of left back limb.
Fine otherwise.
Internal exam: No food items in stomach/GI tract. Retrieved fluid from intestines.
Comments/Diagnosis: Fluid from intestine revealed a lot of fluke-looking parasites. Will need to start Prazi treatment on others in group.
Rough green snake 2017-00039, Necropsy performed 14 January 2019

History: Keeper arrived in the morning and found this animal deceased. Keeper reports that the animal was not looking well last week. In response the animal was soaked and weighed. Recently the animal seemed to be losing weight and losing color, looking more blue than green. Last exam was for annual in March 2018 and the animal appeared normal at that time.

External Findings: Animal presents in fair post mortem condition. Moderate autolysis has occurred. Estimate 5-10% dehydrated and in fair body condition. No external wounds or abnormalities are present. There is a mid-body dark staining on the ventrum, corresponding to the location of the gall bladder.

Internal Findings: Reduced to absent coelomic fat stores. Principal finding is that at the caudal portion of the lung, there are multifocal tan raised nodules, approximately 1 mm diameter visible on the parenchymal surface. These nodules continue deeper into the parenchyma on cut surface. There is a small amount of tan fluid exuding from the pulmonary parenchyma when cut. The remainder of the internal organs appear unremarkable accounting for autolytic change. Normal female gonads are identified.

Cytology: A touch impression of the pulmonary lesion was collected and stained with diff quick. The slide is predominated by large mononuclear cells, many of them macrophages along with many degenerate heterophils. In the background there is abundant bacteria, two populations of coci and rod bacteria.

Summary: Based on gross necropsy findings and cytology, suspect animal had pneumonia characterized by septic suppurative pyogranulomatous inflammation.

Saved in formalin:
Lung, heart and surrounding muscle, vertebrae, ribs, and skin

Plan: With snake pneumonia, we potentially look for a predisposing cause such as another infection like a virus or a husbandry mishap, which can often be bad news in the winter. Recommend a check of the other snake and a visit to the reptile room to assess for any other potential issues.
Red Lionfish, 2009-00020, Necropsy performed 23 January 19

Red lionfish 2009-00020

History: Several lionfish from exhibit were noted to be resting on the bottom respiring heavily, with some degradation of the skin along the fin rays, in November 2018. Two of the larger/older fish seem to be the most severely affected, with one slightly smaller fish less so, and at least 2 other lionfish from the same exhibit have died in recent months. On initial evaluation in November, a heavy mucus layer was noted on the gills of the affected fish, and biopsies of the fins showed a non-specific inflammatory response. No significant abnormalities were noted on CBC, chemistry panels. These two fish were treated with a course of empirical ceftazidime at 20 mg/kg (40 mg; 0.4 ml of 100 mg/ml) IM q 72h x 5 doses, with no apparent effect. They have not eaten since being placed in holding, and respiration remains unchanged (labored). Subsequent biopsies showed nonspecific gill injury that is severe enough to suspect regeneration of these injuries is unlikely.

See biopsy cases AP18-03731 (gills) and AP18-03099 (skin).

Gill biopsies from two additional fish from the same exhibit (a less-severely affected lionfish, and a clinically unaffected catfish) have been submitted to pathology on 24 Jan 2019.

Euthanasia: 23 January 2019 both fish were euthanized due to poor prognosis and declining quality of life. Euthanasia by immersion in 500 ppm of MS-222. A secondary method of euthanasia was not warranted. Fish were placed in a refrigerator overnight and a full necropsy of one individual (2009-00020) was performed 23 January 2019. The other carcass was frozen for a future teaching exercise.

External findings: Presented in fresh condition. Weight 1.25 kg. Ideal body condition. Few healed abrasions were noted on lateral aspect of body wall. Gills appear diffusely pale bilaterally with frayed and irregular margins.

Internal Findings:
There is adequate coelomic fat reserves and animal is adequately muscled. There is a moderate amount of brown clear free coelomic fluid in the caudal coelom.

Cardiovascular: Heart appears diffusely pale on epicardial surface.
Hepatic: Liver appears pale, tan, and is friable. It floats when placed in formalin. Pale liver/heart
Swim bladder: Air sac appears smooth and normal.
Gastrointestinal: No lesions appreciated. The stomach is empty. Intestine, pyloric ceca, and colon contain a small amount of light green fluid with a small amount of white urate present at the vent.
Spleen is identified and appears unremarkable.
Gall bladder is distended with bile.

Urogenital: One gonad is identified. The head kidney is friable. 2 hard round stones are noted within the urinary bladder.
Green tree frog 2016-01000, Necropsy performed 16February2019

===== NECROPSY REPORT =====

General
Date of death: 2019-02-16
Time of death: 9 AM
Carcass condition: Fresh
History: Notice slight skin discoloration (dorsum) last week - did not see any other clinical signs of illness. Yesterday, 2/15/19, noticed worsening skin discoloration in patches and lethargy. Removed animal from exhibit enclosure at 5 PM on 2/15 and set up new enclosure to stay isolated overnight.
Checked on individual this AM at 8 AM and was sitting on substrate (unusual for GTF) but alert and alive. Returned to the area around 10:30 and found DOB with extreme edema and black patches (where discolored patches were).
Necropsy performed at 11:15 AM, 2/16/19
Treatments: N/A

Isolation
Necropsy
Examiner: almcclanahan
Date of exam: 2/16/19

Body condition: Robust
External exam: Patches (not true lesions) of discolored skin on dorsum. Turned black after death, including right tympanum completely black. Ventrum normal colored with exception of slight redness and vascularization on hind limbs (femur and "drink patch"). Looked obese/bloated prior to death, but truly swelled up large, edema forming postmortem.
Internal exam: Opened internal cavity and a red, clear fluid surrounded the coelom. Stomach and intestine empty (passed undigested crickets [2] prior to death - overnight). Internal organs look inflamed (in my opinion) and highly vascularized. Many photos will be attached to this entry.
Comments/diagnosis: I would like to preliminarily diagnose this as a "Red-leg" case (bacterial septicemia) with actual death caused by systemic infection (renal/kidney failure?) based on external ventral redness on hindlimbs and pelvic girdle with subsequent fluid retention/edema. I have no explanation for postmortem black coloration (especially on the right tympanum) whether it be natural or bacterial.
No exhibit-mates are showing signs of illness.
Lined seahorse 2017-00038-006, Necropsy performed 18February2019
Veterinary Team: Michelle Whitehead, DVM
Lined Seahorse (Hippocampus erectus) 0.1 (RAPTORMED ID: ____)
History: Animal has had difficulty eating and in thin body condition since 23 December 2018 and has been intermittently off exhibit. Last week, the exhibit was being renovated, so all the animals were in holding. The animal was found deceased this morning (18 Feb 2019). According to keeper staff, all of the other seahorses in the exhibit appear well. This exhibit has had a history of mycobacteriosis.

Gross:
EXTERNAL: Submitted to necropsy is an adult female lined seahorse measuring 13 cm crown to tail, and post-mortem condition reveals mild to moderate autolysis. Integument intact, although dull coloring, and skin scrape wet mount did not reveal any parasitic organisms.

MUSCLE/FAT: Adipose stores (visceral and subcutaneous) and muscling are both markedly atrophied with overall emaciated body condition score (BCS 1/5).

HEART/GILLS: The heart is dark purple. Gills are grey with slight autolysis present. Gill biopsy and wet mount showed diffuse mucus but did not reveal any parasites nor granulomas.

LIVER: The liver is diffusely tan, and soft with no focal lesions.

SWIM BLADDER: shiny silver-white, appropriate size and location.

GI TRACT: The gastrointestinal tract is pale yellow to white, with a small amount of mucus within, but otherwise is empty.

UROGENITAL: Ovaries are smoothly marginated peach 1cm in length. The kidneys are brown to red with diffuse multifocal pinpoint tan to brown foci (creating a miliary pattern).

Acid fast cytology (coelomic and GI impression smears): no acid fast bacteria observed.

Gross Diagnosis:
1. Marked, diffuse, miliary granulomatous nephritis – primary differential Mycobacteria spp. despite acid fast negative
2. Emaciation, secondary
NOTE: Entire animal saved in situ, in 10% neutral buffered formalin

Page 14 of 31
North Carolina Aquariums Medical Record

Rock bass 2014-00221-008 Necropsy performed 4March 2019

History: Long-term exhibit animal discovered behaving abnormally on exhibit this morning, seemingly ‘neurologic’. Lying ventral side up on the bottom and twitching with rapid respiration. No previous signs noted, and all other fish in exhibit are behaving normally. Skin scrape and gill biopsy reportedly unremarkable. Fish euthanized with an overdose of MS-222.

External exam: Fish is in excellent body condition. Right cornea is diffusely cloudy, possibly perimortem abrasion. There is a <1cm diameter skin ulceration ventrally between pelvic fins. Skin is otherwise in good condition. Gill margins are slightly tattered. Wet mount of biopsy unremarkable, no parasites seen.
Weight: 275 g

Internal exam: Ample fat deposits.
Heart unremarkable, still beating with stimulation.
Female with active ovaries, but not ‘eggbound’.
Liver is slightly mottled pale pink to yellowish but smooth, gallbladder distended with green bile.
Stomach and GI tract largely empty, small amount of digesta in lower intestine, mucosa appears normal.
Swim bladder intact.
Kidneys deep red, small but likely normal species variation, no granulomas noted.
Spleen dark red and smooth, small amount of capsular adipose.
Brain and spinal cord grossly unremarkable.

Cytology (Diff-Quik stain):
Liver – peripheral blood contamination only
Spleen – unremarkable
Kidney – unremarkable
Acid-fast stains performed on touch impression of all above organs, no acid-fast positive organisms seen.

Tissues preserved for histopathology (in 10% NBF):
Heart, gill, skin/muscle including ulcerated area, ovary, liver, kidney (separate head section and tail section), spleen, liver, stomach, pyloric ceca, intestine, brain, right eye
Lined Seahorse (Hippocampus erectus) 0.1 (2016-01662-009), necropsy performed 7March2019

History: found dead this morning. Another female from this exhibit was found dead over the weekend 2March19. Both were in good body condition. A third female that died on 18 Feb was thin. The seahorses in this tank appear to be doing well, with good appetites, and body condition. The exhibit has a history of mycobacteriosis.

Gross:

EXTERNAL: adult female, 10.0 cm TL, 13.4 g, adequate body condition. There is epithelial and body wall loss at the vent but the coelomic cavity is not penetrated. There is intermandibular epithelial loss.

Gill biopsy wet mount – moderate autolysis, no motile organisms observed, no indication of fungal or oomycete hyphae.

INTERNAL:

There is moderate autolysis, and a small amount of clear coelomic fluid (about 0.05 ml). Adipose tissue is adequate. The heart is pale. Liver is pale (lipid stores). Ovaries are enlarged and orange-tinged. Swim bladder NSF. Kidneys are red with abundant white granulomas of varied sizes up to about 2 mm diameter visible on surface and cut surface.

Dif-Quick and acid fast cytology (renal granuloma smears): macrophages containing ghost bacteria are observed on Dif-Quick cytology, and abundant acid fast bacteria are observed on acid fast stain.

Gross Diagnosis:

Marked, multifocal granulomatous nephritis – presumptive diagnosis Mycobacterium sp. Possible anemia (pale heart) secondary to decreased renal erythropoiesis.

Entire animal saved in 10% neutral buffered formalin for option of histopathology.
Blue striped grunt, 2016-01024-002, Soundside holding. Necropsy performed 15March19

History: Two individuals in a group of captive-raised grunts presented for diffuse swelling and elevation of scales. Aquarist noticed that two fish appeared to have patchy discoloration two day ago, and this was initially attributed to stress from conspecific trauma. However, today these fish appeared swollen and are gulping air at the surface. This group of grunts have been in their current system for ~2 months and water quality is overall unremarkable. Salinity currently at 28 ppt, there was a mild increase in ammonia noted this week (0.29), though this may represent a spurious result as values were 0.01 last week. The remaining fish appear asymptomatic. Aquarist performed skin scrapes on the affected fish and did not observe abnormalities or parasites.

Observations: Affected fish separated in bucket. Both appear to have moderate coelomic swelling and diffuse elevation of scales (pinecone appearance). Gilling rate is increased, and fish are frequently gulping air at the surface.

Anesthesia/euthanasia: 2016-01024-002
Induced with MS-222 at 500 ppm. Resulting in respiratory arrest. Five minutes later the spinal cord was transected and brain was pithed. See necropsy findings below.

Assessment: Acute onset coelomic swelling, scale elevation - both findings represent potential fluid imbalance - r/o primary gill, renal, dermal disease (infectious vs. non-infectious).

Plan: More severely affected individual (002) euthanized for diagnostic necropsy and histopathology. 001 treated empirically with ceftazidime. If clinical signs are improved in 3 days, repeat ceftazidime (1 mg IM, 0.01 mL of 100 mg/mL). If clinical signs are not improved, plan to euthanize.

Necropsy findings and sample collection: 2016-01024-002
Weight 40.1 g
External findings: Diffuse scale elevation. Moderate coelomic swelling.
Internal findings: Coelom is distended with ~2 mL of pink-translucent fluid. Caudal kidney appears diffusely dark brown, surrounding coelomic membranes are heavily pigmented black-grey. Cranial kidney is diffusely pale. No gross abnormalities of GI tract and liver.

Samples placed in 10% formalin: Right eye, gill arch, scaled dermis + underlying muscle, liver + GI tract (en bloc), cross section of spine at the level of the cranial kidney, caudal kidney.

Diagnostics:
2. Renal culture (coelom opened with sterile instruments, swab applied to caudal kidney) - pending.
3. Renal touch impressions: Diff quick: Various stages of hematopoietic cells, background contains numerous melanin granules. There are several long tubular clumps of uniform cells (presumed renal parenchyma). No evidence of inflammation. No etiologic agents identified. Acid fast negative.
Lined seahorse, 2018-00450. Necropsy performed 22March19

History: This male seahorse was removed from exhibit on 20March due to abnormal positive buoyancy. Attempts have been made to ‘burp’ air from the pouch, but were not successful in normalizing buoyancy.

Observations: Animal is BAR, in good body condition, but struggling at surface. It is not immediately clear where the gas accumulation is causing positive buoyancy. Pouch is empty. Skin is intact and in good condition. On closer examination and ultrasound scanning, several small subcutaneous bubbles are noted on the flanks, and diffuse air within the coelom is suspected. Two small bubbles and the coelom were aspirated in separate procedures. Mostly air with a very small amount of pink fluid was removed. This resulted in improved buoyancy, and the seahorse was returned to holding until cytology could be examined.

Aspirate cytology:
Diff-quik: some inflammatory cells on a low-cellularity light pink background
Acid-fast: rare scattered acid-fast positive bacteria seen. Not in high numbers, but this is not surprising given the low quality of the aspirate obtained.

Assessment: Abnormal gas accumulation, presumptive mycobacteriosis.

Plan: Recommend humane euthanasia (overdose MS-222) due to poor prognosis and to reduce risk of additional shedding to the remainder of the population.
Blue striped grunts, 2016-01024, 003-005, Soundside holding. Necropsies performed 2April19

History: Two individuals in a group of captive-raised grunts presented for diffuse swelling and elevation of scales in mid-March. Aquarist noticed that two fish appeared to have patchy discoloration around 13 March, and this was initially attributed to stress from conspecific trauma. On 15 March, these fish appeared swollen and are gulping air at the surface. This group of grunts have been in their current system for ~2 months and water quality is overall unremarkable. One fish (-002) was euthanized for diagnostic necropsy and bacterial culture grew Staphylococcus epidermidis and Staphylococcus warneri. This animal was started on treatment with ceftazidime but was euthanized due to lack of response. Today, multiple fish appear abnormal.

Observations: One fish is moribund isolated in a floating basket and at least 3 others were seen swimming abnormally in repetitive circles. The moribund fish and two other more severely affected fish were separated for euthanasia (003, 004, and 005). In the isolation bucket, one fish was seen alternating between swimming in repetitive circles then stopping and displaying a horizontal nystagmus.

Anesthesia/euthanasia:
Induced with MS-222 at 500 ppm, resulting in unconsciousness and respiratory arrest. The spine of each fish was severed just caudal to the skull and necropsied, including removing the heart as quickly as possible.
Skin scrape, Gill clip: Performed on two fish prior to gross necropsy. No remarkable findings.

Necropsy:
-003: This fish appeared in good body condition. The kidneys were approach dorsally using aseptic technique and a culture swab was collect for aerobic bacterial culture (submitted to MSU-DCPAH). The coelomic cavity appeared unremarkable. No distinctive gross lesions were identified on the coelomic organs. Brain appeared grossly unremarkable. Saved in formalin: gills, entire coelomic visceral mass en bloc. Separated individually in cassettes: heart, kidney, and brain.

-004: This fish appeared in good body condition. The coelomic cavity appeared unremarkable. No distinctive gross lesions were identified on the coelomic organs. Brain appeared grossly unremarkable. Saved in formalin: gills, skin, muscled, and entire coelomic visceral mass en bloc. Separated individually in cassettes: heart, kidney, and brain.

-005 (moribund pre mortem): This fish appeared in thin body condition. The coelomic cavity appeared unremarkable. No distinctive gross lesions were identified on the coelomic organs. Brain appeared grossly unremarkable. Organs were not preserved in formalin for this individual.
Impression smears: Diff quick stains of kidney impressions have a heavily hemodiluted background with a population of cells that are faintly stained and therefore difficult to identify. Also scattered among the background are numerous cocci bacteria. There are occasional multinucleated cells with heavy clusters of cocci aggregates near or within these cells. Acid fast stains of kidney, liver, and brain impressions fail to reveal any acid fast etiologic agents.

Assessment: Severe morbidity affecting multiple fish in the group. Clinical signs and gross necropsy of initial mortalities was most consistent with septicemia. Clinical signs of today’s mortalities were
neurologic/vestibular. Additionally, appearance of kidney impressions today suggests bacterial nephritis or septicemia. In multiple fish, suspect bacterial, viral, or toxic etiology.

Plan: Sensitivity profile from previous mortality is pending. Await results and selective appropriate antibiotic for gel food for remaining fish. Review toxic etiologies resulting in neurologic clinical signs to expand differential list. If additional mortalities occur, continue to perform necropsies as available and perform gram stains on visceral impressions in addition to other stains.
Ratsnake 2013-00436, Necropsy performed 4April2019

History: About 1 week ago, keeper noticed a coelomic mass effect in the cranial third of the body. Fine needle aspirate of the mass was consistent with necrotic tissue. Surgical biopsy was performed. During that procedure, major hepatic blood vessel was compromised and the patient had uncontrolled intraoperative hemorrhage. The hemorrhage was eventually controlled by ligating the vessel, but not before an estimated 20+ mL blood was lost. The mass was confirmed to arise from the cranial liver and was removed via a partial hepatectomy. Other smaller masses were identified, but not removed. Impression cytology of the mass revealed sheets of epithelial cells. Anisokaryosis and anisocytosis are observed throughout the slide with occasional cells containing multiple nuclei and/or nucleoli. The patient recovered from anesthesia and was hospitalized overnight. The next morning the snake was quiet and responsive, but lacked muscle tone in the caudal half of its body. Ketoprofen and subcutaneous LRS fluids were administered. PCV was 6%, total solids were 6.9 mg/dL. The snake was extremely pale. While administering iron dextran, the snake appeared to go agonal and lost its righting reflex. Pulse could not be detected with ultrasonic doppler.

Necropsy was performed approximately 5 hours after death.

External Findings:
Weight 1.35 kg, total length 70.5 cm
The snake presents in fresh post mortem condition, no significant autolysis is appreciated. Estimate 5-10% dehydrated. Mucus membranes and subcutaneous tissue are markedly tacky. Patient is in ideal to slightly over conditioned body condition. Externally, there is a 9 cm longitudinal incision on the right ventrolateral aspect of the body approximately one quarter body length from the rostrum that is well apposed with horizontal mattress sutures. On the left side of the body there are multiple soft expansions of the subcutaneous space, consistent with subcutaneous fluid administration. Oral mucus membranes are extremely pale, nearly white.

Internal Findings:
Abundant coelomic fat stores are present. There is an estimated 5 mL of red tinged hemorrhagic fluid in the cranial coelomic cavity.

Liver: At the cranial aspect of the liver, there is a 4 cm space between the cranial and caudal portions of the liver representing the mass and surrounding tissue region removed by the partial hepatectomy. On the surface of the liver, there is a 1.5 cm diameter raised lobulated tan mass that rises 1 cm above the liver surface and extends an additional 1 cm deep into the parenchyma on cut surface. There are 5-6 additional multifocal raised tan masses ranging from 2-5 mm diameter visible on the liver surface. The gall bladder is distended with normal appearing bile. Ligatures placed on hepatic vessels and encircling hepatic ligatures are still in place.
Respiratory: There are two ligatures present in the caudal air sac that represent the small tears that occurred during the surgical procedure. The caudal aspect of the lung has a small amount of frothy fluid, while the cranial portion of the lung appears unremarkable. The trachea and glottis appear normal.

Normal tissues: gastrointestinal tract, kidneys, testes, hemipenes, adrenal glands, splenopancreas

Summary: Based on gross necropsy findings and cytology from the surgical procedure this animal had an invasive hepatic neoplasia. Rule outs include biliary carcinoma, hepatocellular carcinoma, or other. Death likely occurred due to complications of acute blood loss intraoperatively. It does not appear that uncontrolled hemorrhage occurred post operatively.

Tissues saved in formalin:
Multiple sections of the liver, splenopancreas, caudal pole of the right kidney with vas deferens and ureter attached, caudal and cranial pole of the left kidney, both testes with adrenal glands attached in the mesentery, caudal esophagus to cardiac stomach transition, pylorus to duodenum transition, small intestine with gall bladder, colon, cloaca, thyroid with tracheal and esophagus attached, heart, lung, hemipene, ribs with intercostal muscles, and skin
Goldfish, 2006-00019. Necropsy performed 11April19

History: Long-term exhibit animal, part of the collection initial ‘rescued’ from a local pond in 2006, already adult size. This fish has been in holding with a chronic spinal deformity (kyphotic), and when retrieving the other koi, was noted to be very thin with tattered and degraded fins, with difficulty swimming and maintaining normal buoyancy. Euthanasia was elected due to poor quality of life.

Observations:
Fish was placed in an overdose of MS-222 (500 ppm) for approximately 15 minutes past cessation of gilling, and the cervical spinal cord was severed immediately prior to necropsy.
Necropsy:
A quick necropsy was performed with no preservation of tissues.
Coelomic cavity diffusely pigmented throughout body wall and organs
No gross abnormalities were noted on any coelomic organs, a small amount of digesta present in GI tract.
Eastern diamondback rattlesnake, 2014-00077, ‘Grace’, Necropsy performed 14April2019

Veterinary team: Gregory Scott, MA, DVM

History: This snake was found dead today unexpectedly. This snake had been eating and behaving normally up until death. According to the keeper she did begin to appear larger than normal in the caudal half of the body prior to death. This is a female who has never been intentionally bred but was housed with a male snake for a couple days during the hurricane last fall. This snake has no significant medical history. The keeper suspects she was dead less than 24 hours prior to discovery and presentation for necropsy.

External Findings:

Weight 5.3 kg, total length 181.5 cm, snout to vent length 162.5 cm

The snake presents in autolyzed post mortem condition. Estimate 5-10% dehydrated, subcutaneous tissue is markedly tacky. Patient is in ideal body condition. Externally, no significant lesions or abnormalities are appreciated. Palpation of the caudal third of the body cranial to the vent is consistent with marked coelomic effusion. The oral cavity is taped closed and the head was covered with a plastic syringe casing. These structures were not examined.

Internal Findings:

Abundant coelomic fat stores are present. Caudal to the air sac, there is marked hemorrhagic coelomic effusion. Estimate 200-300 mL fluid that appears to be frank blood. There are large blood clots within the coelomic cavity as well.

Reproductive: There are multiple large ovarian follicles present. These follicles appear to be at various stages of necrosis, although necrosis may be difficult to distinguish from the marked autolysis also occurring with these tissues. The left and right ovaries are difficult to distinguish.

Marked autolysis affects the liver, splenopancreas, lung, gastrointestinal tract, and kidneys. There is a mass of unremarkable fecal material within the distal colon. No gross abnormalities are appreciated in any other organs. Tissues were not preserved in formalin.

Summary: Based on gross necropsy findings it appears this snake died from complications of severe hemorrhage into the coelomic cavity. This snake was also undergoing robust folliculogenesis and it appears there may have been possible ovulatory stasis and/or secondary coelomitis. Ovarian activity would increase blood flow to the reproductive organs. Rupture of a prominent ovarian vessel, facilitated by complications of coelomitis, could cause the clinical signs and post mortem findings, although the exact source of coelomic hemorrhage was not identified in this case. The carcass and skin are saved for NCAPKS staff.
Koi, 2016-01003, Necropsy performed 22April2019
History: Long-term exhibit animal, found on bottom of exhibit gilling heavily this morning. Was moved into holding and appeared deceased at vet staff arrival. Fish may be quite geriatric, but specific history is unclear.

Observations: No respirations observed on arrival, gills very pale, no other external abnormalities.
Skin scrape, gill biopsy: negative for external parasites.
Fish was placed in an overdose of MS-222 (500 ppm) for approximately 15 minutes to ensure euthanasia, and the cervical spinal cord was severed prior to necropsy.

Necropsy:
Coelomic cavity diffusely edematous within and around coelomic organs. Pericardial sac filled with atypical quantity of clear fluid.
Heart flaccid and friable.
Liver small with some tissue appearing entwined with GI tract (normal for species?). Gallbladder distended with dark green bile.
Gonad thin and edematous, inactive.
Spleen dark red and unremarkable
Swim bladder unremarkable
Stomach and intestines empty, mucosa appears normal.
Tissues preserved in 10% NBF if needed for future submission (not planned unless other mortalities seen): heart, spleen, brain, swim bladder, caudal kidney, gonad/intestines/stomach/liver en bloc, liver/muscle, gills
Fantail darter 2019-00075-003. Necropsy performed 7May19

History: A couple weeks ago these fish were collected from a free ranging population. Species in this system include tessellated and fantail darters, 43 total fish were collected. These fish were treated with oxytetracyline 10 ppm as part the quarantine treatment protocol. Salt was not used in these fish due to species sensitivity. On 26 April there were 12 mortalities in this system. 27 April the system was dosed with praziquantel at 2ppm. On 29 April there were 5 mortalities. From 1-4 May there was 1 mortality daily. There were no mortalities 4-6 May. However today there is one fish who appears severely debilitated (2019-00075-003). The aquarist suspects that most of the mortalities have been females who may have been gravid at the time, however no necropsies have been performed on any deceased fish thus far.

Observations: Majority of fish in the system observed swimming well and displaying normal behavior. One fish is severely debilitated, sitting on the tank bottom and not swimming.

Euthanasia and Necropsy: The debilitated animal was euthanized with 500 ppm MS-222. Externally the fish has bilateral erythemic ulcerations on the lateral and ventral surfaces. There is excessive mucus on the skin surface. The animal is confirmed female with large gravid ovaries. There remainder of the coelomic structures appear unremarkable. The gills appear unremarkable grossly. Skin scape wet mount did not reveal any remarkable findings. Diff quick cytology of the skin scrape revealed numerous macrophages and degenerative heterophils. There are two abundant populations of bacteria, rods and cocci, with some bacteria appearing intracellular within macrophages. The carcass was saved in formalin.

Assessment: Severe bacterial skin infection, with possible septicemia. Overall the mortalities in this system have decreased after higher numbers at the start of quarantine. Suspect that the stress of acquisition and transport left more susceptible individuals to develop debilitating infections, but with the recent low mortality numbers, it appears the remaining fish have survived the initial episode and appear healthy.

Plan: Continue routine quarantine and continue to monitor these fish. Report ongoing mortalities to the veterinary staff. Opportunistically perform gross necropsies and skin scrapes on any freshly dead animals if they are noticed.
Fantail darter 2019-00075-005, Necropsy performed 14May2019

===== NECROPSY REPORT =====

General
Date of death: 2019-05-14
Time of death: AM
Carcass condition: Fair
History: Mass mortalities for this species since acquisition. Possibly adverse reaction to initial Oxytetracycline treatment.
Treatments: Prazi dosed on 4/27 and 5/11: 1.2 g for 160 USG system.

Necropsy
Examiner: almcclanahan
Date of exam: 2019-05-14
Body condition: Thin
External exam: Patchy discoloration (lack of coloration in spots); some open-looking wounds (unknown what would cause this).
Scrapes on the most recent two mortalities showed one single moving Uronema and a couple of (I think) dead Gyrodactylids.
Internal exam: I think both were gravid females
Red ear sunfish, 2016-00698-002. Necropsy performed 15May19

History: Earlier this month, aquarist noticed one fish (2016-00698-002) had abnormal masses on the skin, and these fish were removed from exhibit to holding. 23 April this fish was sedated for biopsies and results are consistent with granulomatous dermatitis. Acid fact bacteria were observed on a special stain, that most likely represent *Mycobacterium* spp. The fish has normal activity and is eating well according to the aquarists.

Observations: Visual exam was performed through the viewing window. The fish is bright and alert. There are multiple raised masses bilaterally similar to those that were biopsied.

Euthanasia and necropsy: Fish was immersed in 500 ppm MS-222. After opercular movement ceased, the spinal cord was severed, followed by pithing. The fish was in good body condition with adequate celomic fat stores. There are 2-3 raised ~0.5 cm diameter mottled lesions on each lateral flank. Internally, no gross lesions were noted on the viscera. Grossly the gonads appeared consistent with testes. The stomach contained normal ingesta. Spleen, liver, kidney, stomach, intestine, heart, gills, and lateral body wall lesions were preserved in formalin.

Cytology: Impression smears were made from the cut surface of liver, spleen, kidney and one of the lateral body masses. Acid fast stained slides of the kidney revealed occasional rod bacteria that stained a dull red.

Assessment: Clinical presentation, histopathology of lesions, and acid fast cytology of the kidney are consistent with mycobacterial infection.

Plan: Closely monitor additional fish from this system for signs of Mycobacterial disease. Isolate and examine any fish suspected to be infected promptly.
Red ear sunfish, 2018-00277-006. Necropsy performed 15May19

History: This fish has a chronic kyphotic curvature of its vertebrae and has been in back holding since it is unable to be on exhibit. Body condition is poor, and fish is reported to not feed well.

Update: Husbandry and veterinary staff agreed to euthanize this fish due to poor quality of life and poor display quality.

Euthanasia and necropsy: Fish was immersed in 500 ppm MS-222. After opercular movement ceased, the spinal cord was severed, followed by pithing. The fish was in good body condition with adequate celomic fat stores. No lesions were appreciated internally. Grossly the gonads appeared consistent with ovaries. Tissue were not preserved in formalin.
Walleye 2016-00713-014. Necropsy performed 15May19

History: This fish has chronic weight loss and emaciation of unknown etiology. Body condition 1/9.

Update: Husbandry and veterinary staff agreed to euthanize this fish due to poor quality of life and lack of feeding response.

Euthanasia and necropsy: Fish was immersed in 500 ppm MS-222. After opercular movement ceased, the spinal cord was severed, followed by pithing. The fish was in poor body condition with no coelomic fat stores and a very small liver. No lesions were appreciated internally. Grossly the gonads appeared consistent with ovaries. Tissues were not preserved in formalin.
Barking tree frog 2019-00082-001, necropsy performed 19May2019

History: On 30April, 4 barking tree frogs were acquired from a breeder. Within a couple days, two of the frogs died. The keeper reported that prior to death the two animals appeared bloat ed. They were soaked in amphibian ringer’s solution but were found dead the next day. The ventral surfaces of the belly and legs of those two animals appeared abnormally red, and infectious cause was suspected. The two remaining animals have been doing well and are reportedly eating (not seen, but crickets disappear). However, both frogs had erythema and edema of the distal right front limbs. These two frogs were prescribed enrofloxacin two weeks ago, but thus far have not received any treatment. At least one fecal sample has been collected which did not show any parasites. Chytrid and ranavirus tests were negative. There has been no notable change in redness of the front limbs, or overall appearance of the frogs.

19May: Found lying on paper towels on bottom of enclosure.
Treatments: Per Ara’s instructions, put into a container with Ringer's solution, but was not moving much.
Comments/diagnosis: Checked again, died. Dr. Christiansen was in the building and took the frog to CMAST for necropsy.

Necropsy:
External exam: Adequate body condition, slightly thin. In rigor mortis at time of exam. The first digit on the right front limb is fully ulcerated down to bone, with surrounding swelling and erythema. Eyes clear, skin otherwise unremarkable. Oral cavity clear.

Internal exam:
Small amount of clear coelomic fluid. One large nematode ~4cm long found free in coelom, unclear from where it originated.
Liver: small and dark red, suspect decreased lipid stores. Gallbladder distended with bile. GI tract: fully distended with fluid, minimal ingesta, small amount of gelatinous goo in stomach. A second large nematode is coiled in a thin pouch of tissue that may be stretched distal esophagus, but is not clearly connected with either GI tract or respiratory system.
Lungs collapsed: wet mount prep unremarkable with no visible lungworms
Heart: unremarkable
Spleen: unremarkable
Gonads: ovaries, minimally active
Kidneys: unremarkable

Fecal (direct): moderate load of ova consistent with Strongyloides-type nematodes
Cytology of RFF (Diff-quik): myriad mixed bacterial population with some inflammatory cells

Full opened carcass preserved in 10% NBF for histopathology. Will be submitted to NCSU-CVM for histopath analysis.
2018 & 2019 NECROPSY REPORTS

 ===== NECROPSY REPORT =====
Species: Atlantic stingray
Enclosure: Turtle 02
ID #: 2017-00221

General
  Date of death: 09Jan2018
  Time of death: morning
  Carcass post-mortem condition: fresh

History: This juvenile, female stingray was transferred from NCAPKS after being collected locally from a pound net. She is housed with another young male Atlantic stingray. She had reportedly been doing well and feeding normally until a few days ago. Primary caretaker was off for the weekend and upon return noted that her body condition was visibly poor, and she was not interested in feeding. On 8Jan, there was some redness around the rostrum and ventrum, possibly a result of aggression from the other animal, and body condition is very thin. Treatment was initiated with ceftazidime at 20 mg/kg IM. Animal appeared to be actively feeding off the bottom.

Morphometrics:
  Weight: 123 g (192 g on 15Dec2017)
  Disc width: 16 cm

Necropsy
  Examiner: EFC, HJB
  Date of exam: 10Jan2018
  Body condition: poor, very thin
  External exam: Superficial hyperemia of rostrum and around edges of ventrum. Some bile staining of ventrum over the gallbladder.

  Wounds / Injuries: redness around rostrum and ventrum

Internal Exam: Liver is pale and fatty, but smaller than typical, and with scalloped margins. Kidneys appear subjectively enlarged. GI tract empty. No other abnormalities seen.
Tissues saved in 10% NBF for histopathology: Liver, GI tract, spleen en bloc, Kidney, Heart, Left eye, Rostral skin, cartilale in area of redness.
North Carolina Aquariums Medical Record

===== NECROPSY REPORT =====
Species: Green Anole
Enclosure: FG-6H
ID #: 2012-00066
General
  Date of death: 27Jan2018
  Time of death: Animal was ok in morning, aquarist found dead in afternoon.
  Carcass post-mortem condition: ~1 day old
History: This anole is on exhibit with several other of the same species. She has a history of absent digits on the left rear foot but appears to get around well and no other health problems have been noted. Recently, aquarist was doing a routine check and noted that the RF limb appears to be missing. Believed to have shed in the recent past. Anole is in good body condition. Historical rear foot amputation is unchanged. The right front limb appears mostly missing. Suspect there was an abnormality to the shedding process that resulted in partial amputation of the limb and entrapment of the upper limb bones. SSD ointment was being applied to wound.
Morphometrics:  Body Mass = 3.654g
Necropsy
  Examiner: TV
  Date of exam: 28Jan2018
  Body condition: poor
  External exam: Sex =  F , Age =  unknown
    Skin: lesions/redness; Eyes, nostrils, cloaca: clear
Internal Exam:
Musculoskeletal: muscle atrophy- None
Fat:  soft
Body cavity:  no fluid;
Liver: smooth, firm, homogenous/ brown
Heart: smooth , firm, homogenous/ red
Lungs: smooth, friable, homogenous; pink
Kidney: smooth, firm, homogenous / black/ brown
Stomach:  smooth, homogenous; tan/ red  Contents: Full of food items, Parasites: No
Small intestines:  smooth, homogenous; tan
Bladder:  smooth, homogenous tan/ red; Contents: urates present
Samples Collected: lungs, stomach, small intestine
North Carolina Aquariums Medical Record

====== NECROPSY REPORT ======

Species: Green Moray Eel
Enclosure: G3
ID #: 2016-00057

General

Date of death: 1-29-18 Found dead 7am in the morning floating head up
Carcass post-mortem condition: Moderate decomposition based on pink gills and unknown time of death overnight

History: This eel has a long-term history of diffuse dermatitis and had a somewhat elevated WBC count at annual exam in February. It had been eating regularly until this summer and may not have eaten anything since the end of June. Eel was moved from the pier to G03 and started on ceftazidime on 2 November. On 5 November, the aquarist reported that eel had deteriorated and was laying upside down and gilling even harder than usual for an extended period – treated with dexamethasone SP. Five dose course of ceftazidime was completed and the eel’s condition stabilized. Animal ate a mackerel on 17 November but regurgitated it later that evening. It continues to respire more heavily than normal, blood culture was positive for a bacteria sensitive to ceftazidime, and cardiac ultrasound appeared suggestive of some form of dilated heart disease (distended lumen with thin walls, poor contractility). Eel reportedly seems more lethargic than it has been.

Treatments / Medications: presently on ceftaz for suspect cardiac disease

Morphometrics:

- Body Mass = 10.6kg (23Jan2018)
- Standard Length (cm) = 129.5

Necropsy

Examiner: LJ, KD, JF, TV, SJ

Date of exam: 1-29-18 @9am

Body condition: was poor. Animal was being force fed.

External exam: Sex = Male, Age = adult

SKIN: mottled. Skin had redness on the anterior dorsal area. Dark skin observed posterior dorsal and ventral Backend of tail appeared to be necrotic. Dark in color and scraps observed on tip of tail. Sample taken of normal and abnormal skin.

EYES: cloudy (sample taken)

NOSTRILLS: Clear

CLOACA: Distended

Internal Exam:

GILLS: Sample taken. Gills looked pink and normal.

MUSCULOSKELETAL: No muscle atrophy

FAT: Soft texture. Fat was observed all around the organs and throughout the body.

BODY CAVITY: Lots of clear fluid came out of the body cavity

LIVER: Photo and Sample taken. Granular and friable. Liver was mottled tan/white and had fat nodules throughout.

HEART: Entire heart was put in formalin. Firm, mottled red in color. Had clear fluid around it. There was a lining around fluid that was white firm and think but pliable.

SWIM BLADDER: Thick firm walls and white in color.

GONADS: Testes?

SPLEEN: granular, soft, homogenous brown/tan/white color. Encased in fat and had fat within.
North Carolina Aquariums Medical Record

KIDNEY: Rough, friable, fell apart when touched. Homogenous black in color. Black charcoal looking material. Appeared to have a blood clot or growth anterior to kidney entrance.

ORAL: Smooth mucosa, mottled and pink. Had pieces of digested food in mouth.

ESOPHAGUS: smooth, mottled greenish color. No contents

STOMACH: Rough mucosa, mottled red to white in color. Contained digesta (herring) Photo and sample taken. Fatty. Red areas that appear to be ulcer or hemorrhage in lining.

SMALL INTESTINES: smooth, homogenous yellow in color, contained digesta (herring)

LARGE INTESTINES: Photo and sample taken. Smooth mucosa, homogenous yellow color. Blood clot or growth observed in tissue.

GALL BLADDER: pale yellow and full of fluid. The organ was encased in fatty tissue.

BRAIN: White in color. Appeared uniform and normal.

Samples Collected: heart whole, skin, eyes, liver, stomach and large intestine
North Carolina Aquariums Medical Record

====== NECROPSY REPORT ======
Species: Corn Snake
ID: 2005-00082
General
   Date of death: 2018-01-29
   Carcass condition: Fresh
History: Adult, male. Surgery was performed on 4 August to remove two coelomic masses. The cranial mass was not attached to any organs with very little blood supply. Biopsy of this mass was consistent with a spindle cell sarcoma. The caudal intramural GI cystic mass was removed via resection and anastomosis and was identified as an intestinal adenocarcinoma. Post-surgery, he was treated with cyclophosphamide and piroxicam in a food item twice a week. In November, his appetite and fecal production began to decrease, and coelomic swelling cranial to the R&A site was noted. CBC and chemistry revealed decreased PCV, low normal WBC count, elevated globulins, and hypercalcemia. On 22 Dec 2017 a second surgery was performed to explore the previous surgical site for recurrence of neoplasia. The GI tract was thickened, but patent, consistent with a stricture at the R&A site. Biopsy results confirmed fibroplasia with some populations of atypical cells (could not be confirmed as neoplasia). Zeus was stable after surgery, but appetite and body condition remained poor. Recently he has not passed fecal material, and a new large firm mass is palpated mid-coelom. Due to continued decline and poor prognosis, euthanasia was elected.
Treatments: Observations: Weight: 800 g (stable)
Necropsy
   Examiner: LW; EFC; HB
   Date of exam: 2018-01-29
   Body condition: Thin
   Score: 2.0
   Internal exam: Trachea/lung: no abnormalities observed. Heart: Evidence of heart stick from euthanasia with hemorrhage, no abnormalities noted on cut section. Esophagus: no abnormalities noted. Stomach: no digesta, no abnormalities noted. Liver: homogenous, sharp margins. Spleonpancreas: appears normal grossly. Kidneys: some adhesions from kidney to GI tract at the previous R&A surgical site, homogenious. Testes: difficult to visualize due to surgical site adhesions, small parts visualized appear normal grossly. Intestines: Distal GI tract at previous R&A surgical site is thickened, but the lumen is patent. Large amount of fecal material located just cranial to stricture with distended intestinal walls. Cloaca: contained some dry urate material. Mid-coelom mass: 7X3X2 cm, firm, tan and red on cut section, does not appear associated with any organs. Mass distal of stomach in coelom: 2X1X0.5 cm firm and tan – unknown if this is associated with the GI tract, placed in cassette.
   Tissues saved in formalin: brain in situ, trachea, lung, esophagus, stomach, intestines (normal and abnormal), cloaca, heart, liver, gallbladder, spleonpancreas, kidney, testes, mid-coelomic masses (smaller one in cassette, larger mass has sections free in formalin), rib, skin, muscle.
Cytology of mid-coelomic mass: pink proteinaceous background, red blood cells, degenerate nuclei and cytoplasmic material, no obvious neoplastic cells observed

Comments/diagnosis: Assessment: Suspect this snake was not able to pass fecal material due to the thickened distal GI tract, though it was patent with a small lumen. A large firm red and white/tan mass was found mid-coelom not directly associated with any organ – suspect neoplasia recurrence.

Plan: Submit tissues in formalin for histopathology.
2013-00051 Desert Horned lizard
Enclosure: RA12
History: Animal was unresponsive when Aquarist gave fluids this morning. Animal was full of fluid and had died overnight sometime. Female, 5 years old.
Treatments: On fluids.
Date of death: 2/1/2018
Date Necropsied: 2/1/2018
Examiner: JDF
Body Condition: Fair; photos taken
Post-mortem Condition: ~1 day old
External Exam: no injuries. Skin uniform and normal. Eyes, nostrils, cloaca: clear discharge from nose.
Musculoskeletal: no muscle atrophy
Fat: jelly-like
Body Cavity: lots of clear fluid.
Liver: Photo Y. Smooth, firm, homogenous, black
Heart: Photo Y Sample Y. Smooth, firm, homogenous, red
Lungs: Photo Y Sample Y Squash prep Y. Granular, spongy, mottled; pink/ red
Trachea: Smooth, homogenous white. Appeared normal with no contents
Kidney: Photo Y. Smooth firm homogenous black. Kidneys were firm to the touch.
Oral: smooth homogenous pale, no contents.
Esophagus: smooth homogenous white with no contents
Stomach: Photo Y Sample Y Squash prep Y. smooth homogenous with large cricket and ants for contents. No parasites were observed under the microscope.
Small Intestines: Photo Y Sample Y. smooth homogenous tan with no contents nor parasites.
Large Intestines: Photo Y Sample Y. smooth homogenous tan with no parasites. Contained ants.
Bladder: smooth homogenous tan.
North Carolina Aquariums Medical Record

===== NECROPSY REPORT =====
Species: Green Treefrog
Enclosure: FG6-H
ID #: 2016-00823
General
  Date of death: 11Feb2018
  Time of death: 10am
  Carcass post-mortem condition: fresh dead
History: Animal showed signs of having a seizure while clean the exhibit glass. It jumped and its legs went stiff straight then limp. Aquarist removed from exhibit and put it in amphibian ringers solution. Animal appeared to be recovering as it was showing signs of regaining limb control. 1 hour later animal had died.
Necropsy
  Examiner: JDF
  Date of exam: 11Feb2018 at 2pm
  Body condition: Normal
  External exam: Female. No injuries. Animal appeared to be having a seizure while aquarist was cleaning the window. The animal was immediately put in amphibian ringers solution. Animal appeared to regaining control of limbs and died soon after.
  Skin: uniform. Eyes, nostrils, cloaca: clear
  Internal Exam:
    MUSCULOSKELETAL: muscle atrophy- None, animal did die with legs straight out however when retrieved from solution the limbs were movable.
    FAT: soft
    BODY CAVITY: Photo, small amounts of fluid of bloody
    LIVER: Sample Y Surface: smooth Consistency: firm Color: homogenous-black
    GALL BLADDER Full? Yes. Fluid color: pale almost clear
    LUNGS: Photo Y Sample Y Squash prep Y Microscope photo camera not working however got a rough photo from phone. Surface: granular. Consistency: spongy. Color: mottled; pink/ tan streaks of black. Any parasites observed Y observed several lungworms in various stages
    TRACHEA: Photo N Sample: Y. Surface: smooth Color: homogenous clear
    SPLEEN: appeared enlarged. Surface: smooth Consistency: firm Color: mottled red and black
    KIDNEY: Photo Y. Rough Consistency: firm Color: mottled; brown with white spots
    ORAL: Mucosa: smooth Color: homogenous-pale
    ESOPHAGUS: Mucosa: smooth Color: homogenous-pale Contents? none
    SMALL INTESTINES: Sample Y Squash prep Y smooth, homogenous- tan. No contents. Parasites:Y
    LARGE INTESTINES: Photo Y Sample Y Smooth thickened, homogenous-tan some bloody reddish material
  Comments: Positive for stongyloides parasites on necropsy.
North Carolina Aquariums Medical Record

====== NECROPSY REPORT ======
Species: Yellow Stingray
ID#: 2017-00081

General
Date of death: 2-18-18
Time of death: Overnight
Carcass condition: Fresh

History: Adult female. Animal removed from exhibit at the end of day yesterday due to some superficial bite wounds along back of animal. Ate 1 pc of shrimp with .01mL of 100mg/mL Ketoprofen after being placed in Q3 tank in Quarantine. Animal BAR at time of departure from workday.
Treatments: .01mL of 100mg/mL Ketoprofen PO 1X/day q24hrs for 3 days.

Necropsy
Examiner: LMJ
Date of exam: 2-18-18
Body condition: Normal, Score: 4.0

External exam: Weight = 482.4g. Length = 32 cm. Girth = 16 cm. Body in full rigor, so really freshly dead. Body condition looks excellent except for superficial wounds on back that were present yesterday. Eyes clear. Skin clear.

Internal exam: Organs are all intact and appear healthy. Food present in digestive tract. Samples taken: Liver, Gall bladder, Spleen, Reproductive organs, Brain, Heart, Stomach, Large intestine, Small intestine, Kidney.
Comments/diagnosis: All organs were normal coloration and firm, except for the brain. Samples taken were just pieces due to brain being "mushy". Unknown illness. Apparently healthy stingray.
North Carolina Aquariums Medical Record

====== NECROPSY REPORT ======
Species: Spotted Scorpionfish
Enclosure: D01
ID #: 2015-00459
General
  Date of death: 08March2018
  Time of death: found dead this morning
  Carcass post-mortem condition: fresh
History: Recently removed from exhibit due to decreased appetite and lethargy. Some haziness to the R eye and slightly swollen was noted during the move, but no other physical abnormalities.
Tx: Keto and ceftaz treatment for inappetence and lethargy.
Necropsy
  Examiner: KD
  Date of exam: 8March2018
  Body condition: thin
  Exam:
  Right eye bloody and cloudy. Body cavity full of yellow-tinged fluid. Gall bladder was large and red fluid filled. Liver pale and fatty. Hemorrhage located near the vent. Stomach empty, intestines had food in it. Possible clusters of eggs.
North Carolina Aquariums Medical Record

====== NECROPSY REPORT ======
Species: Gray Treefrog
Enclosure: FG-6I
ID #: 2016-00696
General
  Date of death: 13 March 2018
  Carcass post-mortem condition: fresh dead
History: Geriatric female with history of bilateral keratitis/lipid keratopathy. Caretaker reports slow, progressive hyporexia, muscle and weight loss and associated decreased mobility. “Head bobbing” behavior noticed earlier this month and is suspected to be attributed to poor vision or development of neurologic disease. Corneal scarring OD, anterior chamber appears opaque, wispy corneal opacities OS. Does not appear to be visual OU. Severely decreased muscle mass, most notable in pelvic limbs. Mentation is dull, intermittently exhibits bilateral wide head excursions. Euthanized.
Necropsy
  Examiner: EFC, HB
  Date of exam: 13 March 2018
  Body condition: emaciated
Brief postmortem exam reveals mild ovarian follicular development. No gross abnormalities of lungs, heart, liver, GI tract or kidneys.
  Comments / Diagnosis: Geriatric female with progressively decreased mobility, vision loss, and severe muscle wasting. Humane euthanasia was elected.
  Samples Collected: Submit for histopathology.
North Carolina Aquariums Medical Record

==== NECROPSY REPORT ====
Species:  Yellow Perch
ID#: 2005-00153-001

General
Date of death: 18 March 2018
Carcass condition: Fair

Necropsy
Examiner: TV
Date of exam: 18 March 2018
Body condition: Robust
External exam: No obvious wounds or signs of injury.
Internal exam: Lots of fat on inside, organs appear normal.
Comments/diagnosis: Did both a gill clip and skin scrape. Exhibit has been confirmed Myco, but no obvious signs on scrape or clip. No obvious signs of cause of death.
North Carolina Aquariums Medical Record

======== NECROPSY REPORT ======
Species: Eastern Spadefoot Toad
ID: 2017-00140

General
  Date of death: 3/26/2018
  Time of death: between 1:30 PM on 3/25/18 and 10:00 am on 3/26/2018
  Carcass condition: Fair

Necropsy
  Examiner: TV
  Date of exam: 3/26/2018
  Body condition: Thin, Weight = 4.6g
  External exam: Toad was semi dry when found, no visible injuries or marks to note on external exam.
  Internal exam: Organs all appeared normal. A large amount of eggs was found. There were cricket parts in the stomach. No obvious lesions to note.
==== NECROPSY REPORT ====
Species: Atlantic Stingray
Enclosure: TT01
ID #: 2016-00062

General
Date of death: 05April2018
Time of death: found in morning
Carcass post-mortem condition: fresh dead

History: Atlantic stingray was found deceased on floor outside of exhibit in AM. Animal is still soft, but skin is mostly dry to the touch. Likely that the animal jumped out in the early morning hours (maybe 3-5am??). Will save animal for vets to perform necropsy today. Skin scrape yielded no significant findings. Blood pooling to edges of body, but otherwise appears "healthy" with no significant wounds or markings. Apparently healthy male that jumped from exhibit overnight last night and was discovered mildly desiccated on arrival in the morning. There is no indication of any changes that might have caused him to jump.

Necropsy
Examiner: SDJ, EFC, HB
Date of exam: 05April2018
Body condition: normal

External exam – Perimeter of pectoral fins bright red and dried. Postmortem condition appears fresh. Adult male. No obvious injuries.
Internal exam – No significant lesions seen. Liver is large and yellowish-tan, consistent with good feeding and health. Reproductively active male with ample sperm present in gonads and claspers. Tissues were not preserved due to known cause of death.
2016-00800-001 Bluehead Chub

===== NECROPSY REPORT =====

General
Date of death: 4-8-2018
Time of death: 12:00pm
Carcass condition: Fresh

History: The fish had no history to report. It was eating well and healthy.

Necropsy
Examiner: TV
Date of exam: 4-8-2018
Body condition: Normal

External exam: External exam showed no visible signs of injury. Fish was found dead and had to be taken away from Crayfish, so there were a few red marks where the Crayfish had a hold of it. Other than that, it appeared normal. Skin scrape and gill clip showed no parasites.

Internal exam: Organs appeared normal. There was food in stomach. Swim bladder was intact.

Comments/diagnosis: No obvious signs for why fish died.
====== NECROPSY REPORT ======
Species: Skillet fish
Enclosure: SG01A
ID #: 2016-00782
General
  Date of death: 4/12/2018
Necropsy
  Examiner: EL
  Date of exam: 4/13/2018
External exam: Adult female, found to be filled with eggs. No injuries noted.
North Carolina Aquariums Medical Record

====== NECROPSY REPORT ======
Species: Summer Flounder
ID#: 2011-00128
General
  Date of death: 4/17/2018
  Time of death: 9 am
  Carcass condition: Fresh
History: animal was observed refusing food the previous day. Two divers dove the exhibit. Found flounder dead on bottom during dive. Color was still normal, and no injuries were observed. Divers removed and necropsy was performed after dive.
Treatments: Believe this was the animal removed due to tank aggression a while back. It was treated for injuries and recovered nicely.
Necropsy
  Examiner: JDF
  Date of exam: 4/17/2018
  Body condition: Normal
  External exam: small tear near vent although this animal was difficult to removed and aquarist believes it was from the removal process. 45 cm L X 21 cm H
  Internal exam: Skin uniform and dark in color. Lateral line normal, eyes clear, mouth had blood in it and came out of mouth when removed from tank. Fins slightly frayed but ok. muscles looked good and no atrophy. Fat firm and normal. Gills were pale with some hemorrhage. Gill clip did not show any parasites or abnormalities. body cavity had no fluid present. Liver was large, granular surface appearance, firm and mottled with lighter spots and a few black spots present. Heart was smooth, firm, red and had a white growth just above the heart near the gills. spleen was large, smooth and black in color. kidneys were black, smooth, firm. stomach was empty except some sand and thick walled, light in color. Intestines were thick walled, tank and smooth. Gallbladder was large with light yellow fluid. Gonads present with dark walled, tank and smooth. Gallbladder was large with light yellow fluid. Gonads present with dark yellow firm substance extracted from them.
==== NECROPSY REPORT ==== 
Species: Blue-spotted Sunfish 
ID#: 2016-00046-002 

--- General ---
Date of death: 2018-04-26
Carcass condition: Fresh

History: Acquired 20April16, underwent routine quarantine prior to placement on exhibit. No problems have been reported until today, when the fish was observed lying on its side. Still moderately responsive to touch, but unable to fully right itself even with stimulation. Euthanized for diagnostic necropsy to identify any potential risks to the remainder of the population.

--- Necropsy ---
Examiner: EFC
Date of exam: 2018-04-26
Body condition: Normal
Score: 3.0

External exam: No abnormalities noted, fish in good body condition.
Skin scrape and gill biopsy: negative for ectoparasites

Internal exam: Adequate fat deposits, empty GI tract. Liver slightly small and dark pink, gallbladder distended with green bile. Swim bladder wall appears thickened and irregular, don’t believe this is normal for the species. Otherwise unremarkable

North Carolina Aquariums Medical Record

===== NECROPSY REPORT =====
Species: Golden Shiner
ID#: 20015-00453-001

General
  Date of death: 2018-05-01
  Carcass condition: Fresh
History: Acquired in 2015, underwent routine quarantine prior to placement on exhibit. No problems have been reported until today, when the fish was observed swimming on its side. Still moderately responsive to touch, but unable to fully right itself even with stimulation. Euthanized for diagnostic necropsy to identify any potential risks to the remainder of the population. This exhibit has a history of periodic mycobacteriosis outbreaks that frequently manifest with neurologic signs.

Necropsy
  Examiner: ECF
  Date of exam: 2018-05-01
  Body condition: Normal
  Score: 3.0
  External exam: No abnormalities noted, fish in good body condition.
  Skin scrape and gill biopsy: negative for ectoparasites
  Internal exam: Adequate fat deposits, empty GI tract. Liver slightly small and dark pink, gallbladder distended with green bile. No granulomas or gross abnormalities seen. Female.
North Carolina Aquariums Medical Record

==== NECROPSY REPORT =====
Species: Green Treefrog
ID#: 2016-00825
General
  Date of death: 05/16/18
  Time of death: AM
  Carcass condition: Fair
History: animal was treated with fenbendazole 10 days ago
Necropsy
  Examiner: JDF
  Date of exam: 5/16/18
  Body condition: Normal
  External exam: external exam did not find any issues
  Internal exam: Liver was mottled with brown and red. Firm to touch
Heart: normal looking and red
Mouth: normal
Clear fluid in body cavity
Lungs: were cloudy in color, lung worms and eggs observed under microscope. 6 adults and 2 eggs observed.
Stomach: Did not observe any parasites under microscope. Stomach was empty but food remnants found in intestines. Gall bladder was small and almost empty.
Kidneys were red in color and firm
Spleen was white and firm.
North Carolina Aquariums Medical Record

====== NECROPSY REPORT ======
Species: Foureye Butterfly Fish
Enclosure: AC01
ID #: 2017-00145-001

General
Date of death: 16May2018
History: In March 2018 these fish completed a 30 day observational quarantine without any obvious health concerns, but a butterflyfish within this group was found to have multiple monogene parasites consistent with Microcotyle sp. on the gills. The system underwent treatment with praziquantel at 2 ppm for 2 doses 14 days apart. The fish were recently cleared and moved onto exhibit. Fish appear BAR. The butterflyfish appear stressed with dark bands in their coloration but are reportedly eating. Aquarist has recently started increased vitamin supplementation and feeding of seaweed to improve nutrition. The butterflyfish may benefit from being moved out of the environment. We suspect that the system itself may contain/leach some abnormalities affecting the fish.

Necropsy
Examiner: ERW
Date of exam: 16May2018
External exam: Animals show large lesions on sides that have resulted in a hole through the one fish. Unsure of when symptoms started for these animals.
North Carolina Aquariums Medical Record

====== NECROPSY REPORT ======
Species: Striped Blenny
Enclosure: TT04
ID #: 2018-00073

General
Date of death: 01June2018
Time of death: found dead in morning checks

History: This fish presents for progressive coelomic distension and a dermal lesion on its right side.

Observations: The coelom is markedly distended, but the fish behaves normally despite the increased body habitus. There is a focal raised pale area on the dorsal right body wall. Weight = 27.9g.

Ultrasound: coelom contains 2-3 large cystic pockets of fluid. Assisted by transillumination, approximately 6.5 mL of a cloudy yellow fluid was aspirated from the coelom. Coelomic distension is caused by multiple pockets of accumulated fluid in the coelom. Palliative coelomocytes were performed to help reduce pressure in the coelomic cavity and potential discomfort and swimming difficulty.

Treatments / Medications: Rx: Enrofloxacin 15 mg/kg IC into a fluid pocket.

Necropsy
Examiner: ERW
Date of exam: 01June2018

Internal Exam: A large mass was identified in the coelom and removed. The mass was approximately the size of a penny. The mass and organs were preserved in formalin. Tissues collected for histopathology.
----- NECROPSY REPORT -----
Species: Atlantic Spadefish
Enclosure: SG03
ID #: 2007-00003-001
General
  Date of death: 12June2018
  Carcass post-mortem condition: fresh dead, euthanized
History: No issues. Apparently healthy fish.
Necropsy
  Examiner: SDJ
  Date of exam: 12June2018
  Body condition: normal
  External exam: Skin: uniform, Eyes/nostrils/cloaca: clear. Weight 490g.
  Internal Exam: Musculoskeletal: normal, Fat: firm, No Fluid in body cavity, Strange intestinal connections, Liver: smooth surface, firm consistency, homogenous tan; Could not locate gall bladder
North Carolina Aquariums Medical Record

===== NECROPSY REPORT =====
Species: Dusky Pipefish
Enclosure: SG01B
ID #: 2016-00694-004
General
  Date of death: 14June2018
  Carcass post-mortem condition: heavily scavenged by hermit crab
History: Had seemed a little lethargic the last couple days but was still eating.
Necropsy
  Examiner: EL
  Date of exam: 14June2018
External exam: Most of the body had been consumed by a hermit crab.
===== NECROPSY REPORT =====
Species: Naked Goby
Enclosure: SG01A
ID #: 2017-00024-002
General
  Date of death: 23June2018
  Carcass post-mortem condition: fresh
History: Suspect geriatric. Animal was found deceased on the bottom of the exhibit during PM checks.
Necropsy
  Examiner: ERW
  Date of exam: 23June2018
  Exam: Skin scrape was done and lots of ciliates were found. Video/Pictures taken.
Samples Collected: Animal was preserved in formalin.
North Carolina Aquariums Medical Record

===== NECROPSY REPORT =====
Species: Blacknose Dace
ID#: 2016-00810-001
General
   Date of death: 2018-06-24
   Time of death: morning
   Carcass condition: Fair
History: Animal has had no historical issues. The right side operculum was missing presumable from crayfish
Necropsy
   Examiner: JDF
   Date of exam: 2018-06-24
   Body condition: Normal
   External exam: Skin sloughing a little. Right side of operculum and pectoral fin were missing
   Internal exam: Organs were friable to the touch. Stomach had food inside. Heart, stomach, intestines, swim bladder all looked normal. Gills were very dark in color. Liver was pale tan and friable. Kidneys were almost black. Not able to distinguish spleen.
   Comments/diagnosis: No parasites observed on gill clip or skin scrape. Animal was autolyzed and organs were falling apart. Carcass was discarded due to condition of organs.
==== NECROPSY REPORT =====
Species: Dusky Pipefish
Enclosure: SG01B
ID #: 2016-00694-005

General
  Date of death: 24June2018
  Time of death: found dead on morning rounds
  Carcass post-mortem condition: fresh

History: It had been eating during every feed and there was no observed change in behavior or physical appearance prior to its death.

Necropsy
  Examiner: EL
  Date of exam: 24June2018
  Exam: Skin scrape revealed the presence of nothing besides a couple Uronema.
North Carolina Aquariums Medical Record

===== NECROPSY REPORT =====
Species: Naked Goby
Enclosure: SG01A
ID #: 2017-00024

General
- Date of death: 23June2018
History: This fish presented 4May18 after it was observed it had a distended coelom. On exam, its coelom was moderately distended, but its behavior and mentation were normal. Ultrasound and radiographic examination were not diagnostically meaningful. Diagnosis was apparent (visual) coelomic distension due to muscle atrophy, but no obvious coelomic pathology.

Necropsy
- Examiner: ERW
- Date of exam: 23June2018
- Exam: Performed a skin scrape and found several ciliate like animals on the scrape and took pictures of them for later identification
North Carolina Aquariums Medical Record

===== NECROPSY REPORT =====
Species: Sharpnose Puffer
ID#: 2015-00273
General
  Date of death: 07/03/2018
  Time of death: 5 pm
  Carcass condition: Fair
History: No history other than slightly distended stomach. Still ate well and never showed signs of lethargy.
Necropsy
  Examiner: MV
  Date of exam: 07/04/2018
  Body condition: Robust, Score: 4.0
  External exam: Weight = 25.8 grams, Length = 9 cm
Post-mortem condition = ~1 day old
Parasites-Negative; Skin – uniform; Lateral line – Normal; Eyes – Clear; Mouth – Clear; Body Condition – Normal; Injuries - None
  Internal exam: Musculoskeletal- Atrophy = none; Fat = firm; Gills - Parasites = none, hemorrhage = none, color = red; Body Cavity = no fluid; Liver - Surface = smooth, consistency = firm, color = homogenous brown; Heart - Surface = smooth, consistency = firm, color = red; Spleen - Surface = smooth, consistency = firm, color = red; Stomach - Surface = smooth, color - homogenous pink, contents = none, parasites = none; Intestines - Mucosa = smooth, color = tan, contents = empty, parasites = none; Swim bladder - Mucosa = smooth, color = homogenous pink, Full of air at time of necropsy
Reproductive organs = none found
====== NECROPSY REPORT ======

Species: Red Lionfish
ID#: 2015-00375

General
Date of death: 07-05-2018
Time of death: unknown, found in morning
Carcass condition: Poor/decomposed

Necropsy
Examiner: JDF
Date of exam: 7-5-2018
Body condition: Normal

External exam: Body was floating behind the insert and full of gas. Fins were ragged. Mouth white and tongue swollen, eyes cloudy. No parasites found on gill clip or skin scrape.


Comments/diagnosis: Other fish were stressed. The nitrates were high at 12.6. Water change done on tank and fish started to look much better.
North Carolina Aquariums Medical Record

===== NECROPSY REPORT =====
Species: Red lionfish
ID#: 2016-00244-002

General
  Date of death: 7.7.2018
  Time of death: Sometime between 5pm 7.6.18 and 7am on 7.7.18
  Carcass condition: Fresh
History: Poor water quality the past week. Animal was having trouble swimming in SG8 this past week. It was taken off exhibit and put into W5 in quarantine on 7.6.18.

Necropsy
  Examiner: MV
  Date of exam: 7.7.18
  Body condition: Normal, Score: 4.0
  External exam: Normal
Samples Collected: Liver, Gonads, Spleen, Gallbladder, Heart, Gills, Kidney
North Carolina Aquariums Medical Record

====== NECROPSY REPORT =====
Species: Silver Perch
ID#: 2014-00139-004

General
Date of death: 2018-07-30
Carcass condition: Previously frozen
History: This fish presented with a several day to week history of worsening abnormal swimming behavior on 26July. Exam revealed no obvious abnormalities on bloodwork or physical exam, but lateral radiograph showed an obvious defect of the spinal column near the level of the vent, presumed traumatic. Unable to determine if chronic or acute but suspect this may be related to the current signs (either spinal trauma alone, or concurrent head trauma).
Update: The fish’s behavior continued to deteriorate over the next several days until it was spending nearly all of the time inverted on the bottom. Secondary skin and ocular lesions were developing, and the decision was made to humanely euthanize on 30July. Silver perch is still not eating when offered food and doesn't even show interest. Animal is now almost constantly on its back and seems to be arching its body to the left when attempting to swim. The left eye seems to be very irritated and scratched, possibly from rubbing against items while trying to navigate. After contacting the vets, it has been decided that the best plan of action for this animal is now euthanasia. Gill clipping was performed, yielding no abnormal or significant findings. Fish was frozen and subsequently thawed for necropsy.

Necropsy
Examiner: EFC, HJB
Date of exam: 2018-08-02
External exam: no abnormalities seen
Internal exam: still slightly frozen, but no gross abnormalities of coelomic organs. The affected area of spine was dissected down to bone, and no apparent hemorrhage or instability is present – there is some palpable thickening of the spine suggestive of a more chronic than acute injury.
North Carolina Aquariums Medical Record

===== NECROPSY REPORT =====
Species: Yellow belly Slider
ID#: 2012-00115
General
  Date of death: 2018-08-05
  Time of death: 12:00
  Carcass condition: Fair
History: Animal cleared her annual exam a few days earlier. Was found dead floating upside down and unresponsive. No response to pinching or eye. Doppler indicated no heartbeat. Aquarist Reported there were bubbles coming from the mouth and there was mucous material in mouth. Removed and found to be barely breathing with some bubbles from nares. Staff unable to detect heartbeat via Doppler. Administered atropine at 0.02 mg/kg (0.1 ml IM) and assisted ventilation with a red rubber catheter, with no response seen. Turtle presumed dead and maintained at room temperature for several hours prior to chilling for later necropsy.
Necropsy
  Examiner: JF
  Date of exam: 2018-08-06
  Body condition: Robust
  Score: 2.5
  External exam: No injuries observed on the exterior of body. No discharge in mouth, nose or eyes.
  Internal exam: Muscle: There was some large dark brown hard material around the muscles on the back legs. Does not appear to be part of reproductive tract. Fat deposits were observed all over cavity of body and adhered to some organs, like liver. Body cavity did have a moderate about of bloody fluid. Liver was brown, friable and granular in appearance and had fat deposits as well as some solid black spots. Heart was smooth, red with darker red nodules above the heart, firm. Trachea was clear although there was noticeable black pigmentation near left lung. Spleen: was large, smooth firm and homogenous red. Kidneys were friable, and dark brown to black in color. Oral exam showed some mucous material and irritation when pulled from tank. During necropsy, there was not any noticeable spots. Esophagus was smooth, reddish pink and no noticeable abnormalities. Stomach was full of omnivore gel food, smooth and homogenous pink. Small intestines had mucous material in it that was thick in consistency and whitish color. Food particles were present. Large intestines were dark red and had a rough appearance with thick walls. There were lots of follicles present during necropsy.
  Samples Collected: Esophagus, stomach, intestines (large/small), eggs, trachea, lungs (both) liver, spleen.
====== NECROPSY REPORT ======
Species: Blackbanded Sunfish
ID#: 2015-00490-001
General
  Date of death: 08-09-2018
  Carcass condition: Fresh
History: Animal had been pulled off exhibit after noticing hazy/inflamed eyes. Animal also had a frayed right pectoral fin.
Animal was found stuck to the inflow of the filter.
Treatments: Eyes were treated with flurb for 7 days and the haziness cleared up, but it was still difficult for the animal to see.
Necropsy
  Examiner: ERW
  Date of exam: 08-09-2018
  Body condition: Normal
  External exam: Left side, where it was stuck to the skimmer, had a few lesions. Did a skin scrape/gill clip – no parasites
  Internal exam: Internally, looked okay. No excess fluid or fat. Liver was friable. Stomach and intestines were empty.
  Samples Collected: Spleen, Gall bladder, intestines, liver, stomach

8/23/2018 MV
North Carolina Aquariums Medical Record

===== NECROPSY REPORT =====
Species: Bluehead Wrasse
Enclosure: SG05
ID #: 2017-00083-001
General
  Date of death: 23August2018
  Carcass post-mortem condition: scavenged
History: On 01Aug2018 bluehead has been exhibiting signs of disorientation, equilibrium imbalance, and possible spinal issues. Loss of bright coloration. Still has been eating and can swim around the tank but seems to be struggling. On 21Aug attempted to capture bluehead wrasse to place in holding for veterinary inspection but was not successful in capture. It decided to hide instead and was not seen the rest of the day. On 23Aug I decided to snorkel the tank to find the bluehead wrasse. Upon removing the ornaments, the head of the deceased fish was found.
Necropsy
  Examiner: MV
  Date of exam: 23Aug2018
  Exam: I found just the head of the deceased fish. Any remaining tissue was inconclusive for cause of death.
====== NECROPSY REPORT =====
Species: Eastern Painted Turtle
Enclosure: H17
ID #: 2014-00036

General
Date of death: 29 Aug 2018
Time of death: 12:45
Carcass post-mortem condition: fresh

History: Recent annual exam was unremarkable but was found on 6 August lethargic with some bubbles coming from nares, and left eye swollen and unwilling to open fully. Turtle is breathing okay and somewhat responsive. Blood sample obtained the following day for iStat, relatively unremarkable. Turtle was treated with ceftazidime at 20 mg/kg IM q72h x 5 doses, and ciprofloxacin eye drops SID to left eye for 7 days. Subsequently developed multifocal joint swellings with suspected purulent material on aspiration. Continued antibiotic treatment, but turtle was found dead on 29 August. Turtle is acting lethargic today. Not moving much. Swelling has reduced in eye and limbs, color is good. Animal did not eat this morning. Found dead at lunch (@12:45) sitting under basking light. Refrigerated overnight.

Necropsy
Examiner: EFC
Date of exam: 30 Aug 2018
External exam: eyes not notably different. Right cubital joint swollen. Previously swollen left knee joint has a firm depressed area
Internal exam: Small amount of hemorrhagic fluid in coelomic cavity. Large mass dorsal to the right pectoral muscle attached to bones of the shoulder – filled with opaque yellowish fluid.
Cytology (of joint): cellular debris, very few intact identifiable cells
Liver: mottled red to tan, more significant in focal areas
Cytology (liver touch impression): myriad mixed bacterial population
Heart: dependent congestion, otherwise unremarkable
Lungs: unremarkable
Spleen: mottled and grossly appears reactive. Cytology unremarkable.
Kidneys: diffusely pale, but otherwise unremarkable
Stomach: contains small amount of brown fluid ingesta, mucosa appears normal
Intestines: diffusely stiff/rigid with focal areas of distension with digesta
Ovaries: follicles of varying sizes
Brain: grossly unremarkable
Samples preserved in 10% NBF: Right front limb with abnormal mass, Kidney with adrenal gland, Heart, Lung, Trachea/esophagus/thyroid, Stomach/duodenum/pancreas, Intestines, Spleen, Liver (edge of abnormal coloration), Colon/urinary bladder/ovary, Brain, Left eye
Samples frozen: Liver, Kidney
==== NECROPSY REPORT =====
Species: Green Sea Turtle (REHAB)
ID #: 2018-00340

General
Date of death: 5Sept2018
Carcass post-mortem condition: fresh euthanized

History: 30Aug: Turtle has continued to deteriorate in mental status. Head/neck tilt is becoming consistently more pronounced, and turtle is nearly unable to navigate and/or comfortably raise head to breathe. There is no sign of ear infection that might provide an alternate explanation for the head tilt. Treatment with both ceftazidime and enrofloxacin injectable has not resulted in any improvement. Due to worsening status and poor prognosis, euthanasia is elected. Authorization provided by Matthew Godfrey, NCWRC. Turtle was left at room temperature overnight to ensure death prior to placing in freezer the following morning.

Necropsy
Examiner: EFC, HB
Date of exam: 6Sept2018
Exam: Determined to be a juvenile female on visual examination of gonads.
Small amount of hemorrhagic fluid in the coelom, possibly freeze-thaw artifact.
Heart is partially tan and friable, consistent with euthanasia solution artifact.
Gallbladder distended with green bile.
Small piece of plastic (scotch tape) in intestines, some gas in stomach, but otherwise GI unremarkable.
Froth in the trachea, but lungs appear grossly unremarkable.
Brain: several focal areas of granulation tissue compressing the normal parenchyma, located adjacent to the brainstem, as well as within the ventricles – brain abscessation consistent with the clinical signs and unsalvageable prognosis.
==== NECROPSY REPORT ====
Species: Northern Searobin
Enclosure: SG03
ID #: 2014-00079
General
Date of death: 30Aug2018
Carcass post-mortem condition: fresh euthanized
History: This fish began exhibiting atypical swimming behavior several months ago. Exams showed no medical indications for the behavior and it was suspected to be age-related. Recently started having difficulty competing for food on exhibit and was moved into a side compartment of the same system. The fish is eating there, but sometimes takes a couple of hours to pick up his full diet from the bottom. It has been on long-term low-dose oral prednisone with no changes in symptoms.
Update: Quality of life is a concern if fish is not able to sufficiently compete for food while on exhibit, and multiple exhibits have been tried to find a suitable population. In none of them has this fish thrived, and the decision was made to humanely euthanize.
Necropsy
Examiner: EFC, HB
Date of exam: 30Aug2018
Body condition: Thin
External exam: somewhat thin body condition with concave coelom but not emaciated/no obvious muscle atrophy. Fins tattered (chronic).
Internal exam: Coelom unremarkable.
Liver: unremarkable
Heart: unremarkable
Gills: grossly unremarkable
Swim bladder: unremarkable
Spleen: contains several firm, spherical, yellowish white granulomas
Kidneys: numerous firm, spherical yellowish white granulomas effacing a substantial portion of the normal tissue, extending the full length of cranial and caudal kidney
Stomach: unremarkable, extensive pyloric cecae presumed normal for this species
Intestines: unremarkable
Urinary bladder: greenish
Brain: grossly unremarkable
Cytology of spleen and kidney (acid-fast): no acid-fast positive staining bacteria seen
Samples preserved in 10% NBF: Right front limb with abnormal mass, Kidney with adrenal gland Heart, Gill, Trachea/esophagus/thyroid, Stomach, Intestines/pancreas, Liver, Swim bladder, Spleen Colon/urinary bladder/gonad, Brain, Left eye
====== NECROPSY REPORT =====
Species: Central Stone Roller
ID#: 2018-00311
General
  Date of death: 9-02-2018
  Time of death: 9-02-2018
  Carcass condition: Fair
History: These fish previously had endo- and ecto-parasitic infections/infestations and were treated with Dylox. The fish were cleared for exhibit, but found this one deceased in the AM, having been dead a few hours.
Necropsy
  Examiner: MV
  Date of exam: 9-02-18
  Body condition: Normal
  Score: 3.0
  External exam: No external abnormalities.
  Internal exam: Organ coloration seemed normal. Several squashes were examined under microscope-Only possible minor intestinal worm infestation, but some items may have been food.
  Samples Collected: None
====== NECROPSY REPORT =====
Species: Cherub fish
ID#: 2018-00360-01

General
  Date of death: 09/08/2018
  Time of death: 11:00 am
  Carcass condition: Fresh

History: Tank is under formalin treatment for newly arrived fish. No abnormalities noted previously.
One cherub fish found struggling in the morning. Tank has been under formalin treatment. Attempted to
move fish but it was too late, and the fish died.
Treatments: Formalin immersion

Necropsy
  Examiner: MV
  Date of exam: 09/08/2018
  Body condition: Normal
  Score: 3.0
  External exam: No abnormalities noted. Skin scrape and gill clip unremarkable.
  Internal exam: No abnormalities noted.
  Comments/diagnosis: Most likely stress due to quarantine treatment. Whole fish preserved in formalin
  if ever needed for histology.
  Samples Collected: Whole fish preserved in formalin if ever needed for histology.
North Carolina Aquariums Medical Record

====== NECROPSY REPORT ======

Species: Crested Blenny
ID#: 2013-00031

General
  Date of death: 09-09-2018
  Carcass condition: Fresh

History: Fish housed with pipefish.

Necropsy
  Examiner: EL
  Date of exam: 09-09-2018
  Body condition: Normal, Score: 3.0
  External exam: Obvious external abrasions along right side of abdomen and near right side of mouth. Abrasions were red and the fish was pale overall. The fins were slightly frayed.
  Internal exam: Fat: soft; Gills: white; Body cavity: red fluid; Liver: unremarkable; Spleen: pale brown/grey; Kidneys: some brown color; Stomach: unremarkable; Gall bladder: unremarkable; Intestines: rough and bloody
  Comments/diagnosis: Contained bloody fluid on right side and in intestines. Also possessed a large unknown mass. There appeared to be internal bleeding coupled with exterior injuries suspect of physical trauma.
North Carolina Aquariums Medical Record

======= NECROPSY REPORT ======
Species: Blue Chromis
Enclosure: W02
ID #: 2018-00368-001
General
  Date of death: 14Sept2018
  Carcass post-mortem condition: fresh
History: Recently acquired from Dynasty Marine in late August. Fish are generally doing well and feeding and have been started on formalin as part of routine quarantine. This chromis was noted to have a swollen right on 4September, was isolated into a basket, and started on treatment with ciprofloxacin and flurbiprofen drops BID. The right eye is buphthalmic with an enlarged globe and signs of direct trauma (hyphema in the anterior segment). Aquarist during hurricane ride out found blue chromis dead. It had been through 7 days of flurb and cipro drops but was still not looking very well.
Necropsy
  Examiner: KD
  Date of exam: 14Sept2018
  Exam: The eye had "burst open".
North Carolina Aquariums Medical Record

====== NECROPSY REPORT ======
Species: Silver Perch
Enclosure: D01
ID #: 2014-00139-005
General
  Date of death: 27Sept2018
  Carcass post-mortem condition: fresh, euthanized
History: Found with an eroded rostrum on exhibit on 25Sept2018. When the fish was moved from exhibit into holding, small bulges within the coelom were noted and the fish started floating at the surface ventrum-up. Treatment with betadine immersion (for the rostral erosions) and ceftazidime was initiated, but there was no improvement in behavior. 9/27/2018 Observations: QAR, floating upside down at surface. Coelom is irregularly distended with several palpable intracoelomic masses. The skin is focally hyperemic in several areas over masses, and deep erosions of the rostrum extend to the underlying bone. Ultrasound of coelom is suggestive of multifocal soft tissue masses, and humane euthanasia is elected.
Necropsy
  Examiner: EFC, HB
  Date of exam: 27Sept2018
External Exam: Gill filaments are tattered, no abnormalities on wet mount. A moderate amount of hypertrophic thyroid tissue (goiter) is present at the base of the gill arches bilaterally.
Internal exam: large portion of the coelomic cavity is occupied by a heterogeneous accumulation of pale tan to white-ish irregularly spherical masses. The tissue of origin is presumed to be gonad (testes), though some normal-appearing gonadal tissue is also present.
The liver is displaced cranially and compressed, as well as being divided into two distinctly appearing regions – one pale tan and irregular, the other lighter and smooth, with the appearance of fat tissue.
Heart, kidneys, spleen, swim bladder are grossly unremarkable.
GI tract contains only a small amount of liquid digesta, mucosa is smooth and pink.
Brain is grossly unremarkable.
Samples preserved in formalin: Kidney, Normal gonad, Heart, Gill, Swim bladder, Liver, stomach, GI, spleen en bloc, Goiter/thyroid, Mass (presumed gonad) section x 2, Brain, Left eye, Skin/muscle
North Carolina Aquariums Medical Record

====== NECROPSY REPORT ======
Species: Bluespotted Sunfish
Enclosure: FG02
ID #: 2016-00048-001
General
   Date of death: 09Oct2018
   Carcass post-mortem condition: fresh, euthanized
History: Pulled from exhibit and placed into holding tank due to low appearance quality. Animal is now laying on the bottom but has no issue swimming normally to retrieve food. Animal was removed from holding and examined within a small container. Pale white foci were visualized along dorsal and tail fins. Fish was manually restrained for skin scrape of lesions. Scrape (wet mount): normal cellular material from fish skin, no evidence of parasites or swollen fibroblasts. Impression smear of Granulomatous Lesions: extracellular acid fast positive rods or cocci visualized. Animal was QAR within transfer container of tank water. Reported fin lesions were still present at exam. Skin scrape did not reveal expanded fibroblasts which would have confirmed lymphocystis. Ectoparasites were also not suspected due to negative cytology. Due to the animal’s lack of improvement in buoyancy or skin lesions, we elected for humane euthanasia. Fish is in thin body condition, with marked tattering of fins, especially the caudal fin, that was not present at previous examination. Behavior/attitude has declined recently, though fish will still eat, it spends the remainder of its time in lateral recumbency without moving at all. Due to lack of exhibitability and visible decline in quality of life, euthanasia is elected.
Necropsy
   Examiner: EFC/HB
   Date of exam: 09Oct2018
   Body condition: Thin
Exam: Lesions within the spleen and kidney suggested granulomatous Mycobacterium sp. infection. The extension of the kidney into the swim bladder likely accounts for the fish’s negative buoyancy. Impression cytology of the spleen and kidney lesions revealed extracellular acid fast positive rods or cocci, potentially an atypical presentation for mycobacteriosis.
   Internal Exam: Kidneys were markedly expanded with multifocal to coalescing tan foci extending along the full length from head to tail. Kidney lesions expanded well into the swim bladder; Spleen - multifocal pale tan foci within the parenchyma of the organ; Gills appeared WNL; Heart appeared WNL; Brain appeared WNL; Liver appeared pale tan-orange, likely normal for this individual, though may represent decreased lipid storage; Swim bladder properly inflated aside from the renal infiltrate
   Samples Collected: The whole fish will be submitted for histopathology.
North Carolina Aquariums Medical Record

===== NECROPSY REPORT =====
Species: Bluegill
ID#: 2006-00009-003

General
   Date of death: 2018-10-14
   Carcass condition: Poor/decomposed
History: this tank has a history of mycobacterium.

Necropsy
   Examiner: JDF
   Date of exam: 2018-10-14
   Body condition: Normal, Score: 2.0
   External exam: Fins frayed, skin lost scales, necrotic. lacking pigmentation. Tank mates chewing on this animal when discovered. Eyes clear, Mouth clear, Fin/gill clip did not show any parasites.
   Samples Collected: no samples. Vets recommended to not save samples.
North Carolina Aquariums Medical Record

===== NECROPSY REPORT =====
Species: Bluehead Chub
ID#: 2016-00800-002

General
Date of death: 2018-10-15
Time of death: morning
Carcass condition: Fresh
History: Animal was found dead upside down floating in exhibit. Appeared to be fresh dead.

Necropsy
Examiner: JDF
Date of exam: 2018-10-15
Body condition: Normal

External exam: Skin scrape did not show any parasites. Scales look normal. Lateral Line, Eyes, mouth and fins all appear healthy. Gills were red in color. Weight 170g
Internal exam: Body Cavity: normal appearance no fluid observed. Liver: Sample taken, smooth, tan in color, sank in formalin, friable when touched. Heart: Sample taken, smooth, friable, smooth and red. Spleen: Sample taken, smooth, soft, red with white dot on it. Kidney: sample taken, red in color and feel apart when touched. Stomach: sample taken, lining rough and white in color. Gall bladder was not apparent. Gills: red in color, did not appear to have any parasites under microscope. Skin Scrape: Did not find any signs of parasites. Intestines smooth, white. Swim bladder: white, bi lobed?
Comments/diagnosis: water quality: 72F, Ammonia: .51 (might be because animals were just fed), nitrate .004, Nitrate 4.5. Water change done right away.
Samples Collected: liver, heart, spleen, kidney, stomach, intestines.
North Carolina Aquariums Medical Record

====== NECROPSY REPORT ======
Species: Lined Seahorse
ID#: 2018-00060

General
   Date of death: 10-16-18
   Time of death: found dead on morning rounds
   Carcass condition: Fair

History: Seahorse was found stranded on the beach by a visitor and brought to aquarium. Was a very feisty eater/swimmer and was well incorporated into exhibit. Noticed some periods of anorexia in September. The week prior to his death he was not seen eating.

Necropsy
   Examiner: MV
   Date of exam: 10-16-18
   Body condition: Thin
   Score: 1.5

   External exam: No obvious external abnormalities. Skin scrape and gill clip were normal.
   Internal exam: Internal exam revealed several egg-like cysts within the body cavity and on various organs. Further inspection under microscope revealed organisms within the eggs that were moving. Because these were found in the body cavity and not in the pouch, one would consider that these were not seahorse eggs. Liver was redder, intestines and stomach were empty, gallbladder did have some green fluid. Gills were very thick and red.
   Samples Collected: Whole seahorse preserved in formalin with internal organs.
==Necropsy Report ==
Species: Black Sea Bass
ID#: 2018-00303-002
Enclosure: SG03

General
History: Black sea bass adult, female was noticed breathing slightly heavier than normal (not quite labored) yesterday morning. Three animals have been scraped and clipped (skin and gills, respectively) for any sign of parasites. Findings were all within normal limits with no abnormalities. Black sea bass appeared BAR upon morning check. Slightly elevated breathing, but no sign of struggle or labored breathing/gasping in morning. Animal was found being preyed upon by lobster on exhibit this afternoon and was promptly removed.
  Date of Death: 2018-10-18, 11:35am
  Date of Exam: 2018-10-18
  Examiner: SDJ
  Body condition: poor, fresh dead.

External Exam:
Skin: minor lacerations and loss of scales caused by lobster postmortem. Scrape is clear/wnl. Eyes: some iridescence noted on both eyes, but otherwise clear. Gills: Clip WNL/clear/excess mucous. Pink. Some discoloration (yellowing) of underside of operculum. Small amount of mass from body cavity growing onto gills and gill arch.

Internal Exam:
北卡羅來納水族館醫療記錄

--- NECROPSY REPORT ---

**Species:** Northern Pipefish  
**ID#:** 2018-00332-001  

**General**
- **Date of death:** 10/19  
- **Time of death:** morning  
- **Carcass condition:** Fresh

**History:** Pipefish stopped eating 2 days prior. Had eaten perfectly leading to that point. Pipefish found deceased this AM and being feasted on by a hermit crab. No external abnormalities noted.

**Treatments:** Being fed 3x/day most weekdays and 2x/day on weekends

**Necropsy**
- **Examiner:** MV  
- **Date of exam:** 10-19-2018  
- **Body condition:** Thin  
- **Score:** 1.5

**External exam:** No abnormalities. Coloration normal. Skin scrapes negative.

**Internal exam:** No abnormalities. Very thin. Gallbladder full of clear fluid. Other organs appeared normal.

**Samples Collected:** Whole specimen preserved in formalin.
== NECROPSY REPORT ==

Species: Bluegill
ID#: 2006-00009-004

General
- Date of death: 10-30-2018
- Time of death: afternoon
- Carcass condition: Fresh

History: Animal was found on its side last week and was removed and treated with Dexamethazone and ceftazidime. Animal was not recovering, and it was recommended to euthanize it.

Necropsy
- Examiner: JDF
- Date of exam: 10/30/2018
- Body condition: Robust
  - Score: 2.5
- External exam: Fins, mouth, gills, scales and skin all looked normal. Left eye was cloudy and right looked ok.
- Internal exam: Body cavity revealed fat surrounding organs. Fat was white and friable. Liver had black splotches throughout it. There was a red growth on ventral side of liver. Heart looked normal. Stomach was thick and had granular substance adhered to the wall of the stomach. Gallbladder was found by color on fat. It was surrounded by fat and appeared to be small. Swim bladder was normal. Not able to find spleen, kidney, and intestines.
- Samples Collected: heart, liver, stomach, fat
==== NECROPSY REPORT =====
Species: Seaweed Blenny
ID#: 2014-00218

General
Date of death: 11/11/18
Time of death: afternoon
Carcass condition: Fresh

History: Temp: 72, pH: 8.4, Weight: 15 g, Length: 11 cm. Blenny was alive in AM but did not eat. No other abnormal behaviors noted.

Necropsy
Examiner: EL
Date of exam: 11/11/18
Body condition: Robust, Score: 4.0

Comments/diagnosis: No previous abnormal behaviors, large tumor noted in body cavity
Samples Collected: Preserved in buffered formalin
North Carolina Aquariums Medical Record

===== NECROPSY REPORT =====
Species: Honeycomb cowfish
ID#: 2017-00262

General
Date of death: 11/16/18
Time of death: 11/16/18
Carcass condition: Fair

History: On 11/15, fish was noted to have been bullied by the queen angelfish. When the aquarist went to retrieve the fish, it was on the bottom of the tank and barely alive with severe scrapings. The fish was removed to quarantine and given a dose of pain medication, but unfortunately did not last overnight.

Treatments: One dose of ketoprofen the night prior to death.

Necropsy
Examiner: MV
Date of exam: 11/16/18
Body condition: Thin, Score: 1.5

External exam: Fish appeared quite thin. Many superficial scrapes on each side. Mouth was red and irritated. Dorsal and pectoral fins were torn to the base with some irritation.

Internal exam: No glaring abnormalities. Body cavity was full of pink fluid. Gallbladder was full and green. Intestines still had some digested materials.

Comments/diagnosis: Fish was extremely stressed at the time of removal from exhibit and seemed quite thin.

Samples Collected: None.
North Carolina Aquariums Medical Record

===== NECROPSY REPORT =====
Species: Red Lionfish
ID#: 2016-00244

General
  Date of death: 11/11/18
  Time of death: 12:00pm
  Carcass condition: Fresh
History: This lionfish has a history of a long episode of anorexia and abnormal behavior at the end of 2017, possibly due to gas bubble disease vs stroke vs other. It eventually recovered and was returned to exhibit. Other lionfish in the system have been lost recently due to varying causes, including some supposed water quality issues. Aquarist has noted that this individual has been decreasing in appetite and activity level over the past few days. It is not eating at all now and spends most of the time sitting on the bottom, so it was moved to quarantine for closer exam. Physical exam and chemistry panel were unremarkable on 8Nov. This lionfish spent a lot of time in quarantine recovering from an unsure condition. Possible gas bubble issue, stroke, infection. Bounced back after months of treatment and force feeding. Only lionfish that survived after all other died due to water quality issue. Fish was found upside down on the bottom on 11Nov. Emergency treatment with dexamethasone and ceftazidime was initiated, but the fish was found dead later in the day. Aquarist performed necropsy.
Treatments: Ceftazidine, Dexameth

Necropsy
  Examiner: KD/CD
  Date of exam: 11/11/18
  Body condition: Normal, Score: 4.5
  External exam: Normal except for the neon orange spot on its side and coloration of body that this fish does get in times of stress
  Internal exam: Organs were completely encased in fat. Most organs were also mushy and hard to differentiate. Took samples. Brain was also mushy and just fell apart when touched.
No parasite found on gills or skin scrape.
Samples Collected: Brain, stomach, gall bladder, spleen, liver.
=== NECROPSY REPORT ===

Species: Pumpkinseed
ID#: 2006-00040-002

General
- Date of death: 2018-11-20
- Time of death: 3:30pm
- Carcass condition: Fresh

History: from Albemarle enclosure, in holding tank. Euthanized. Geriatric. 22cm long. Abnormal respiration. Animal has not been able to close mouth. Upon look at gills, it looks as if granulomas are forming. Tank has myco.

Water temp = 69, pH = 6.9.

Necropsy
- Examiner: ERW
- Date of exam: 2018-11-20
- Body condition: Normal,   Score: 2.5


Internal exam: Body cavity – normal. Liver mottled light brown, friable, did not float in formalin, sampled. heart - granular, light pink, mottled, friable, sampled. spleen - rough and granular, soft, homogenous reddish brown dark, very large, parasite worm- worm and spleen sampled. kidney - rough with lots of granulomas; sampled. stomach - white homogenous, smooth, and empty. intestines - normal, smooth, full, white; sampled. swim bladder – normal. no eggs, yes gonads
North Carolina Aquariums Medical Record

====== NECROPSY REPORT ======
Species: Rock Beauty
ID#: 2005-00129
General
  Date of death: 11/23/18
  Time of death: 11/23/18
  Carcass condition: Fresh
Necropsy
  Examiner: MV
  Date of exam: 11/23/18
  Body condition: Normal,  Score: 3.0
  External exam: Skin and Gill clips: Normal. Mouth had been picked at since death, but no injuries noted.
  Internal exam: All organs appeared normal. Coloration normal, consistency normal. Gall bladder and intestines were full of fluid.
  Comments/diagnosis: No abnormalities noted.
  Samples Collected: Samples of organs preserved in formalin.
North Carolina Aquariums Medical Record

===== NECROPSY REPORT =====
Species: Striped Burrfish
Enclosure: W01
ID #: 2013-00166
General
Date of death: 05Dec2018
Carcass post-mortem condition: fresh euthanized
History: Long term exhibit animal that was noted in July 2018 to have decreased body condition and believed to be failing to compete with conspecifics. It was removed from that system and has been trialed in various other systems to see if behavior would improve. The fish is now in quarantine and acts very skittish/reactive to surroundings. Caretakers believe it is fully visual. Treatment with ceftazidime was started on 30 August and has since been completed. Fish is reportedly eating Mysis cubes but not much else. It is continuing to lose body condition. Radiographs and plasma chemistry panel showed no obvious abnormalities. Empirical treatment with fenbendazole and Depomedrol was performed on 8Nov with no visible improvement. 05Dec2018 Update: No significant changes have been noted – still not eating more than Mysis cubes. Animal continues to lose body condition, and humane euthanasia is elected.
Necropsy
Examiner: EFC
Date of exam: 05Dec2018
Body condition: poor
External: Very poor body condition. Skin intact with no lesions - scrape is clear/WNL. Gills are diffusely mucous and pale pink, with no parasites seen on wet mount.
Internal:
Liver: Tan with sharp margins, homogenous texture, slightly ‘floppy’ (i.e. decreased lipid stores).
Gallbladder: distended with clear bile. Spleen: one small white nodule on capsular surface, presumed fat. Stomach/intestines: empty aside from a small amount of clear fluid, mucosa appears normal. Heart: unremarkable. Gonads (testes): unremarkable. Swim bladder: unremarkable. Kidneys: unremarkable – only found in cranial portion of coelom, believed to be normal species anatomical variation. Brain: grossly unremarkable; however, there are several nodular structures a combination of firm white and clear gelatinous that are associated with the brain within the cranial cavity. These do not appear to be part of the brain itself, but on squash-prep, one of the nodules resembled a placenta or macroscopic neuron? Possibly an encysted parasite, or species-specific anomaly?
====== NECROPSY REPORT =====
Species: Green treefrog
Enclosure: H17
ID #: 2014-00234
General
  Date of death: 05Dec2018
  Carcass post-mortem condition: fresh euthanized
History: This frog has a chronic history of lipid keratopathy and presumed limited vision. Until recently, it had appeared comfortable, moving around exhibit appropriately and feeding well (from tongs). Over the past few weeks, it has been increasingly lethargic and anorectic. Observations: QAR, emaciated, lipid depositions obscuring almost all of corneas bilaterally. Euthanasia elected based upon deteriorating quality of life despite supportive care.
Morphometrics: Body Mass = 6g (decreased from 7 g over a couple of weeks)
Necropsy
  Examiner: EFC
  Date of exam: 05Dec2018
Exam: Poor body condition, skin intact. Liver appears enlarged and is very dark and firm. Few nematodes present on surface of lungs (lungworm presence in population is historical).
Samples Collected: Whole carcass placed in formalin for submission to NCSU-CVM Histopathology lab.
====== NECROPSY REPORT ======
Species: Lined Seahorse
ID#: 2015-00511-002
General
  Date of death: 1-2-19
  Time of death: morning
  Carcass condition: Fresh
History: Seahorse had air trapped a few days prior to death, but air was released, and seahorse had returned to normal functionality.
Treatments: Air released from pouch.
Necropsy
  Examiner: MV
  Date of exam: 1-2-19
  Body condition: Normal, Score: 3.0
  External exam: No obvious abnormalities. Skin scrapes negative.
  Internal exam: Gills slightly thickened. Gallbladder full of green fluid. Excess fatty tissue in body cavity.
Samples Collected: Pieces of each organ preserved in formalin.
===== NECROPSY REPORT =====
Species: Northern Pipefish
ID#: 2018-00331-001
General
  Date of death: 01/05/2019
  Carcass condition: Fair
History: Had been handled earlier in the week in order to inspect pouch for eggs. Eggs had been aborted and animal stopped eating anything since. White patches were noticed yesterday and a small hole through the pouch appeared.
Necropsy
  Examiner: MV
  Date of exam: 01/05/2019
  Body condition: Normal
  External exam: Pale, pouch had been opened, had been nibbled upon by shrimps. Negative skin scrape.
  Internal exam: Liver had small green patch on it. Organs looked a little bit decayed.
Samples Collected: Whole specimen preserved.
North Carolina Aquariums Medical Record

=====NECROPSY REPORT=====  
Species: Black Rat Snake  
ID#: 2005-00042  
Exam Date: 10 January 2019  
Examiners: Emily Christiansen, DVM, MPH, DACZM; Gregory Scott, MA, DVM; Meghan Louis, DVM, Heather Broadhurst  
History: Long-term education animal (in collection for 13 years, likely adult when acquired), noted to have several firm raised bumps along the dorsum several months ago (18Sept), along with decreased flexibility in caudal half of spine. Not painful to touch, and the snake has been behaving normally. There was a recent shed with some small patches of retained and inflamed skin on the chin. Venipuncture on 9Oct for CBC/chemistry panel – results were unremarkable. Bone biopsy of the spine was consistent with inflammatory osteomyelitis, though an etiologic agent could not be identified, and culture was negative. Animal was treated with amikacin and SQ fluids q72h but did not resolve the disease or progression.  
Euthanasia: 9 January 2019 patient was euthanized due to poor prognosis and declining quality of life. Patient was placed in a cooler overnight and a full necropsy was performed 10 January 2019.  
External findings: Patient presented in fresh condition. Weight 2 kg. Ideal body condition. Snout to tail length 198 cm. Some retained shed is present over the caudal quarter of the body. Subtle vertebral protrusions are appreciated multifocally over the length of the body on the dorsum. A previous external biopsy site lesion has healed adequately.  
Internal Findings:  
There is adequate coelomic fat reserves and animal is adequately muscled. There is a moderate amount of serosanguinous free coelomic fluid in the caudal coelom. Cardiovascular: heart appears normal on epicardial and endocardial surfaces. Pulseless electrical contractions are observed. Hepatic: Liver appears normal on serosal and cut surfaces. Respiratory: Nares and choana are unremarkable. Trachea is clear. Pulmonary parenchyma appears normal. Gastrointestinal: No lesions appreciated. Intestine and colon contain a mild amount of tan fluid and 2-3 small fecal balls. Pancreas and spleen are identified and appear unremarkable. Hemipenes appear unremarkable. Urogenital: Two testes appear normal. Both kidneys appear normal. Small amount of urate is present in the cloaca/distal colon. CNS: Brain was removed and appeared unremarkable. Musculoskeletal: Multiple regions of the vertebral column have an abnormal alignment. Transected vertebrae have abnormal mineral proliferations. See below Cross sections of vertebrae. Notice mineral proliferation of vertebral bodies.  
Summary: Unremarkable internal appearance. Vertebral lesions pre and postmortem are consistent with vertebral osteomyelitis, often cause by Salmonella infection in snakes, though neoplastic changes cannot be ruled out grossly.  
Tissues saved in formalin: Spleen with pancreas, Liver, Heart, Right and left testicle, Kidney, Thyroid, Trachea, Lung, Stomach, Pylorus, duodenum, Small intestine, Cloaca, Hemipenes with musk glands, Colon, Skeletal muscle, Skin, Brain in tissue cassette, Spinal column sections (2)
---- NECROPSY REPORT ----
Species: Lined Seahorse
ID#: 2015-00511-001
General
   Date of death: 1/10/19
   Time of death: AM
   Carcass condition: Fresh
History: Had developed a hole through the right side that was growing larger. Suspected myco. Decision was made to euthanize. Male 4.5 yrs old
Treatments: Previously on ceftaz and forced feedings with no success.
Necropsy
   Examiner: MV
   Date of exam: 1/10/19
   Body condition: Normal, Score: 2.5
   External exam: Hole had enlarged. Skin scrape and gill clip negative. Sloughing of some skin underneath head. Had lost a little weight due to not eating for several days.
   Internal exam: It appeared like there had been some internal bleeding. Kidneys were dark. One possible granuloma was found. Liver, heart, and gallbladder appeared normal.
   Samples Collected: Whole specimen is preserved in formalin.
====== NECROPSY REPORT =====
Species: Northern Pipefish  
ID#: 2018-00331  
General  
Date of death: 1/11/19  
Time of death: afternoon  
Carcass condition: Fresh  
History: Euthanized. For over a week he would not eat and began piping at the surface. His abdomen was quite distended and air bubbles were visible. He remained quite strong and active, but condition only seemed to worsen.  
Treatments: He was treated with one dose of ceftaz at 20 mg/kg but was euthanized later that day due to such a lack of improvement.  
Necropsy  
Examiner: MV  
Date of exam: 1/11/2019  
Body condition: Normal, Score: 3.0  
External exam: Abdomen distended and air bubbles visible. Skin scrape and gill clip negative. Area near cloaca appeared inflamed.  
Internal exam: Air bladder appeared over-inflated. All other organs appeared normal, other than a bit of blood in the cavity near the cloaca.  
Samples Collected: Whole specimen preserved in formalin.
North Carolina Aquariums Medical Record

===== NECROPSY REPORT =====
Species: Gray Treefrog
IDS#: 2016-00757

General
   Date of death: 1/23/2019
   Time of death: overnight
   Carcass condition: Fair

History: found dead this morning. animal was being observed and tong fed due to leg deformations.
Animals in this exhibit have been known to have lung and digestive parasites. 4 yrs., female.

Necropsy
   Examiner: JDF
   Date of exam: 1/23/19
   Body condition: Normal,  Score: 3.0
   External exam: skin was normal, no injuries observed. back left leg was more deformed than the right.
   Eyes were clear except right eye was sunken in eye socket. mouth had clear mucous in it. Otherwise clear and no obvious signs of issues.
   Internal exam: Body Cavity: Clear fluid filled. Liver: Smooth surface, mottled black with white spots
   Heart was normal looking and firm and red in appearance. Lungs: Both Pink frothy and firm. When
   observed under the microscope found several worms present. Kidney: White and smooth. Stomach: No
   contents consistent with not eating for a few days. No parasites seen in stomach squash. Small intestines
   and Large intestines: Appear normal. Food present in small intestines. lining looked white and
   homogenous. No parasites. Eggs present.
NECROPSY REPORT

Species: Loggerhead (REHAB)
ID#: 2019-00030
28 January 2019
Examiners: Craig A. Harms, DVM, PhD, DACZM; Michelle Whitehead, DVM; Heather Broadhurst

History: Animal was found deceased in rehabilitation at NCARI/STAR (#28) on 23 January 2019 unexpectedly, after being diagnosed as an uncomplicated cold stunned turtle. Subadult, female.

Morphometrics:
Weight = 23.4 kg
SCL (n-n) 56.0 cm; SCL (n-t) 56.9 cm; SCW 46.0 cm
CCL (n-n) 60.4 cm; CCL (n-t) 61.0 cm; CCW 57.5 cm

EXTERNAL: Submitted to necropsy is a subadult female loggerhead sea turtle weighing 23.4 kg. The body is in adequate post-mortem condition as frozen/thawed specimen. There is brown algae epibiota covering approximately 20% of the carapace (multifocal to coalescing caudally). Oral cavity has approximately 3 cm firm irregular fibrosis of the distal to left lateral glossal surface consistent with historical Stomatolepas barnacle infestation. Approximately 10 mL of clear transitioning to dark red watery fluid exited from the glottis upon turning to dorsal recumbency.

INTERAL EXAM:
MUSCLE/FAT: Adipose stores (visceral and subcutaneous) and muscling are both mildly to moderately atrophied with overall thin body condition score (BCS 2/5) and mildly sunken plastron.
COELOM: The coelom contains approximately 200 mL of dark red, watery fluid.
HEART: The pericardial sac contains approximately 10 mL of pale red, watery fluid and both atria have pale dorsal surfaces. On cut section, the pallor appears to be associated with serum from freeze/thaw artifact and did not contain gas bubbles.
LIVER/GALL BLADDER: The liver is diffusely congested and firm, with multifocal fibrinous tags and fibrous adherence to the ventral peritoneum. The liver margins are rounded, mottled and bulging on cut section. The liver capsule is dark green to black, multifocally. The gall bladder is approximately 1/3 full with dark red, watery fluid.
GI TRACT: The gastrointestinal tract is abnormal with 40% of the intestinal loops having roughened irregular serosal surfaces. The esophagus is empty, stomach contains clear watery fluid, first half of the intestines have dark green bile stained mucoid fluid, and the last half of the intestines are fluid filled and distended. The gastric mucosa has multifocal to coalescing hyperemia and petechiation with 4-6 linear 1-2 cm ulcerations in the gastric cardia to fundus. The small intestinal mucosa similarly has multifocal petechiation with pinpoint to 1-3 cm crater-like ulcers with firm yellow fibrous tissue bordering the ulcerated tissue. The large intestine has two distinct 4-5 cm sections with extensive circumferential thickened firm yellow fibrous tissue and diphtheritic membrane. Multifocal ulcerations with fibrotic tissue extend into the descending colon.
SPLEEN: Spleen of appropriate size, rounded, and uniformly dark red on cut section.
UROGENITAL: Ovary has small <4 mm follicles and measures 9 cm (length) and 2 cm (width). The oviduct is white and straight with <3 mm diameter. The kidneys are pale on cut section with abundant peri-renal edema. Bladder is unremarkable with minimal urine within.
ENDOCRINE: thyroid and adrenal glands are unremarkable. Left adrenal gland of appropriate size, tan to yellow and uniform on cut section.
RESPIRATORY: Some white froth transitioning to pale red froth extends from trachea into bilateral mainstem bronchi. The middle section of the right lung has 2 firm pale tan 1-1.5 cm nodules. The pulmonary parenchyma appears wet, but the section floated in formalin.
CALVARIAL: Brain and salt glands are unremarkable.
JOINTS: Joint surfaces are smooth with straw-colored viscous fluid.
Fecal direct and flotation: no parasitic ova observed, but many white blood cells and some red blood cells are present.
Gross Diagnosis:
1. Stomach and small intestine: Moderate, multifocal to coalescing hyperemia, petechiation, with multifocal ulceration (ulcerative gastroenteritis)
2. Colon: Moderate, multifocal, fibrinonecrotic colitis
3. Coelom: Moderate, subacute to chronic, fibrinohemorrhagic coelomitis
4. Liver: Diffuse hepatic congestion with multifocal fibrous adherence to peritoneum
5. Lung: Mild to moderate, diffuse pulmonary edema with two right pulmonary nodules
6. Pericardial effusion, mild, acute
7. Renal: Diffuse nephrosis (renal pallor) and severe peri-renal edema.
Comments: No evidence of external trauma nor human interaction and no entangling material. Cause of death likely associated with the moderate fibrinonecrotic colitis and ulcerative gastroenteritis, complicating the presentation of cold stunning.
Tissues saved in formalin: Liver (2), lung, GI sections (stomach ulcers, colon ulcers), kidney
===== NECROPSY REPORT =====
Species: Blue Hamlet
ID#: 2018-00363

General
   Date of death: 1/28/19
   Carcass condition: Poor/decomposed

History: Fish came in with and immediately showed signs of lymphocystis. Fish was always secretive and not a good eater. Fish was recently moved to D1 to try and get it to clear up with a different environment.

Treatments: Went through formalin and copper during quarantine.

Necropsy
   Examiner: KD
   Date of exam: 1/28/19
   Body condition: Normal
   External exam: Fish was very decomposed and smelly. Could still visually see some white spots of lympho. Gills were flared out and completely white, no red/pink in color left. Did skin scrape and gill clip with no signs of parasites.
   Internal exam: All appear normal even though body very decomposed. No organs were saved due to condition of body decomposition.
   Comments/diagnosis: unknown
North Carolina Aquariums Medical Record

==== NECROPSY REPORT =====
Species: Slippery Dick
ID#: 2013-00152
General
   Date of death: 2/7/2019
   Carcass condition: Fresh
Necropsy
   Examiner: SDJ
   Date of exam: 2/7/2019
   Body condition: Normal, Score: 3.0
   External exam: Skin scrape= negative. Fin was frayed and bites were evident, most likely post-mortem.
   Internal exam: Gill clip = negative. Stomach contained lots of gravel. Gall bladder was enlarged.
Comments/diagnosis: Geriatric?
----- NECROPSY REPORT -----
Species: Spotted Turtle
ID#: 2008-00015

General
Date of death: 2019-02-20
Time of death: unknown, overnight
Carcass condition: Poor/decomposed
History: animal has been observed eating

Necropsy
Examiner: JDF
Date of exam: 2019-02-20
Body condition: Normal, Score: 2.0
External exam: animal was extremely bloated. Had blood coming from nose, mouth and eyes. Eyes were sunken and had mucus covering it. Head and neck had bubbling on skin from bloating. Cloaca was prolapsed. Weight = 131.2g. Animal was bloated when retrieved.

Internal exam: Liver: Dark black, friable, Floated in water. Little fat found inside body. Some fat deposits on back legs. Body Cavity had blood pooled inside. Heart; was flappy and appeared inflated. Otherwise unremarkable. Lungs: Pink, deflated but was elastic and did not fall apart. Blood appeared to be inside lungs the lungs however there was NO frothy substance indicating drowning. Blood was present in trachea as well. Squash prep done and found no parasites. Esophagus/ stomach/ intestines: Found some food in stomach which had thick walls. Squash prep did not show parasites. Lots of air throughout digestive tract. Little fecal material in small intestines. Kidneys were firm and black Oral cavity had blood pooled. Muscle surrounding neck appeared bruised and vertebrae appeared to have possible damage midway from head to fused spine on carapace.

Samples Collected: Head/neck, kidney, liver, stomach, lungs, heart

Comments/diagnosis: Due to lack of presence of frothy substance in lungs it appears this animal did not drown. Appears to have died of trauma to the head region due to severe bruising of the muscle on the neck and possible fracture of vertebrae. Animal was found stuck under a rock in holding.
===== NECROPSY REPORT =====

Species: Lined Seahorse  
ID#: 2016-00759-001  

**General**  
- Date of death: 2019-02-27  
- Time of death: morning  
- Carcass condition: Fresh  

**History:** Female, 3.1 years old, SG01 holding  
Individual was found floating at surface. Has not eaten in 2 days (stopped on 2/25). Pulled into holding tank off exhibit on 2/27, was unresponsive, lethargic and respiring heavily. Died the same afternoon. Aquarist Technician (Mel) found one female dead on the bottom in the morning. Stable exhibit animal with no premonitory signs were noted. Several animals from the same group died in a small outbreak a few months ago attributed to mycobacteriosis, but the population has since been stable with no recent losses or illness.  

**Necropsy**  
- Examiner: MF/EFC  
- Date of exam: 2019-02-27  
- Body condition: Normal to over-conditioned  

**External exam:**  
- Weight = 34.4g, Length = 21cm, photos taken. Scratches – yes. Skin - white spots from pouch to end of inside tail. There is a pale area of skin on the ventral neck area, but this is symmetrical and believed to be normal coloration. Eyes - clear, slightly bulged. Mouth – clear. Fin condition – normal. Fin clip – no. Injuries - tip of tail has red focal area  

**Internal exam:**  
- Fat - firm/soft. Gills - clipped - very small unknown organism; hemorrhage with fluid in gill cavity; gill red/ pale pink with no grossly notable autolysis. Body cavity - small amount of clear fluid, photo taken. Coelomic cavity is opened, no free fluid present, and ample fat deposits are seen. Liver - smooth, enlarged, firm, tan and heavily vascularized; photos taken; Large liver mass identified. There is a large (~1cm), discrete, mottled pink roughly spherical mass associated with the liver. Heart - smooth, red, firm. Kidney - smooth, red/pink; photos taken. Stomach - could not find. Gall bladder - full and enlarged, clear to light green, full of bile. Intestines - covered in fat, light tan to white, photos taken  
- Eggs – no. Left ovary is slightly larger than the right. No apparent granulomas.  

**Samples Collected:** The whole, opened carcass is preserved in 10% NBF for histopathology. Cytology slides prepared from cut surface of the liver mass, and the kidneys (for Mycobacterium screening).  
FNA/cytology (Diff Quick): hemodiluted with few hepatocytes, no overt etiology
===== NECROPSY REPORT =====
Species: Eastern Mudminnow
ID#: 2019-00035

General
  Date of death: 2019-03-02
  Time of death: morning
  Carcass condition: Fresh

History: Fish found deceased in tank in a.m. Enclosure Ponds Backup Holding.
Treatments: It had just completed the second formalin treatment. Fish was not eating prior to treatment and did not eat during treatment.

Necropsy
  Examiner: CAD
  Date of exam: 2019-03-02
  Body condition: Normal

Comments/diagnosis: Nothing abnormal found.
==== NECROPSY REPORT ====
Species: Northern Pipefish
Enclosure: SG01B
ID #: 2018-00331-002

General
- Date of death: 15 March 2019
- Time of death: found dead in morning checks
- Carcass post-mortem condition: fresh, scavenged

History: Pipefish was found dead on the bottom of the exhibit during morning checks. Was last seen alive and eating at evening checks the night before.

Necropsy
- Examiner: MF
- Date of exam: 15 March 2019

Exam: Had been so heavily consumed that no internal organs remained. Attempted a necropsy but was unsuccessful. Water parameters and chemistry for SG01B came back within range.

====NECROPSY REPORT====

Species: White catfish  
ID#: 2012-00113-001  
Exam Date: 25April2019  

History: This catfish was observed behaving oddly, rolling upside down and appearing to have difficulty maintaining buoyancy, last week. It is unclear if the fish has been eating. Capture of the fish for closer examination was planned for today, but fish was found deceased this morning. Animal found dead in am. upside down. Placed in refrigerator until necropsy.

External exam: good body condition. Eyes, oral cavity, vent unremarkable. Skin in good condition with very mild ulceration near anal fin. Gills light red as expected for time interval to necropsy


Spleen: unremarkable, fat on capsule. Gonads: not differentiable from fatty tissue, suspect male. Swim bladder: encapsulated by a surrounding layer of fatty tissue containing white-tan flocculent fluid, appears purulent. Swim bladder lumen also contains small amount of similar fluid. Caudal kidneys: subjectively large for size of fish but may be normal species variation. Left kidney ventral surface has a ~2cm raised soft red lesion continuous with the normal tissue. Possibly neoplastic vs benign hypertrophy. Cytology of fluid: myriad inflammatory cells and mixed bacterial population consistent with bacterial infection.

Comments: Cause of abnormal behavior antemortem as well as likely cause of death was an extensive bacterial aerocystitis (swim bladder infection) with associated tissue necrosis.
==== NECROPSY REPORT =====
Species: Blacknose Dace
Enclosure: FG03
ID #: 2016-00810-003
General
  Date of death: 01May2019
  Carcass post-mortem condition: fresh dead
History: No issues. Apparently healthy
Necropsy
  Examiner: MQ
  Date of exam: 01May2019
Exam: Gut cavity missing -seemingly eaten. Freshly dead, as eyes were clear and no foul odor present.
North Carolina Aquariums Medical Record

===== NECROPSY REPORT =====
Species: Spotted Moray Eel
Enclosure: SG06
ID#: 2015-00088
General
  Date of death: 2019-05-07
  Time of death: afternoon
  Carcass condition: Fresh
History: Animal was found dead in afternoon. Female eel appeared to be exhibiting normal behaviors during morning checks and ate yesterday as normal. Water quality tests yielded normal results/low levels WNL (NH3 = 0.02, NO2 = 0.007, NO3 = 1.3). Eel has a history of spinal injury (recovered) and chronic pop-eye. Animal was eating well, alert with normal behavior up to date of death.
Necropsy
  Examiner: SDJ
  Date of exam: 2019-05-07
  Body condition: Normal
  External exam: Weight 2.2kg. Eel is in good body condition, mild cloacal prolapse possibly due to postmortem relaxation. Skin in good condition with no other abnormalities. Skin scrape no parasites. Skin uniform. Eyes and mouth clear. skin scrape and gill clip were clear and within normal limits.
  Comments/diagnosis: Cause of acute death is unknown, the only major gross abnormality noted was in the kidneys.
  Samples of organs were saved to be sent out for testing.
Species: Chain dogfish  
ID#: 2012-00045  
Date of Exam:  
Examiner: EFC, HB

History: Animal has a history of absent OD (unknown cause; genetic or early life traumatic event) as well as atypical behavior/posture and swimming patterns on exhibit. She has historically exhibited inappetence and corresponding weight loss, with no remarkable findings on blood analysis, and general recovery off exhibit. On 14 Feb, she was noted to be anorectic and had substantial weight loss. She was reported to be more lethargic with a tilted posture on the bottom of the tank and was moved off exhibit into holding. Recent bloodwork was largely unremarkable, but leukocytosis is suspected based on smudge cells on blood film. She was treated with a course of injectable ceftazidime, with no change in behavior. Appetite has returned in holding, and shark routinely eats well, despite circling and barrel-rolling any time she is swimming. An attempt to supplement vitamin B on food was unsuccessful, as the shark would not eat any supplemented food. A steroid trial with Depo-Medrol (methylprednisolone acetate) at ~ 2 mg/kg (0.04 ml of 20 mg/ml) IM once was initiated on 18 April.

Update: There has been no obvious change in the shark’s behavior, though appetite remains good. The shark has been found upside down on occasions, and barrel-rolling behavior is nearly constant when swimming. Due to lack of response to treatment and concerns about overall quality of life and ability to thrive in anything but a restricted holding situation, humane euthanasia was elected.

External Exam:  
Female shark is in good body condition with slight fluid wave to coelom (recently laid 2 egg cases). No skin lesions or other external abnormalities aside from the historically absent OD. There may be a small opening in the palpebrae, but it is not clearly patent. Gills are dark red and appear normal.

Internal Exam: Coelomic cavity is opened, small amount of clear free fluid present. Heart: unremarkable. Liver is diffusely mottled tan and dark gray, with normal texture. Does not float in formalin. Gallbladder is empty. Stomach contains food items, intestines and spiral colon contain brown digesta, all mucosa appears normal. Spleen is dark red, smooth, no abnormalities seen. Pancreas is light pink and firm, no abnormalities. Kidneys pale red, no abnormalities. Ovary contains large number of follicles of mixed sizes. Left uterine horn contains two shelled eggs, right is empty. Oviducal glands unremarkable. Rectal gland light red and firm. Brain has mottled pigmentation on the dorsal surface, possibly accumulated melanomacrophages. Right eye phthistic with some vestigial periocular muscles and optic nerve still intact.

Comments: Cause of abnormal behavior is still undetermined but may be secondary to historical eye issue if this provided an entry point to the CNS for infectious agents or other irritants (cold water?). Samples preserved in 10% NBF for histopathology: Gill, Heart, Liver (x2), one section with gallbladder, Spleen, Section of intestine, spleen, pancreas en bloc, Stomach, Spiral valve, Rectal gland, Kidney, Ovary, Oviducal gland, Skin and muscle, Brain and eyes exposed en bloc with cartilaginous skull.
North Carolina Aquariums Medical Record

===== NECROPSY REPORT =====
Species: Northern Pipefish
Enclosure: SG01B
ID#: 2018-00332

General
Date of death: 5-10-2019
Time of death: Found around 11am
Carcass condition: Fresh day

History: Female had not eaten during morning rounds but was known to be picky eater in the past.
Seemed to be hanging closer to the bottom of the tank more than normal that morning. Found snout and
tail being eaten by two grass shrimp. Tank has known Myco. infection. Observed laying horizontally
earlier today, found dead with shrimp picking at her in afternoon.

Necropsy
Examiner: KB
Date of exam: 5-10-2019

External exam: Fair condition. Found nothing abnormal or noticeable. Snout and tail were partially
eaten. Weight 2.8g, length 16.5cm. No parasites on scrape. Skin uniform, lateral line normal, eyes clear,
Fin normal on clip, Injuries - tail and snout chewed on by shrimp post-mortem

Internal exam: Liver was orange in color and appeared to have white granules in sections otherwise
smooth and homogenous. Gills were a pinkish color, appeared light, no parasites. Heart looked a normal
red with nothing abnormal, smooth red homogenous. Gall bladder was dark green and full of bile.
Stomach contained no contents, but food (what appeared to be mysis) was found in the intestine track.
Stomach and intestinal track were white in color and smooth. Body cavity contained small amount of
clear fluid.
North Carolina Aquariums Medical Record

===== NECROPSY REPORT =====
Species: Bluegill
ID#: 2006-00009-005

General
  Date of death: 2019-05-13
  Time of death: morning
  Carcass condition: Fresh

History: Smaller bluegill - - Fish was hunched over on bottom upon examination of tank this morning. Fish was removed immediately. Dorsal, caudal, pelvic and anal fins were extensively damaged (scavenged). Breathing was slow and fish was severely hunched over. Animal euthanized.

Enclosure Albemarle.

Necropsy
  Examiner: MQ
  Date of exam: 2019-05-14
  Body condition: Emaciated
  External exam: Skin redness. Lateral line normal. Eyes and mouth clear. Fin frayed and bloody, injuries sustained.
====== NECROPSY REPORT =====
Species: Bluehead Chub
Enclosure: FG03
ID #: 2016-00800-004
General
  Date of death: 13May2019
  Time of death: found dead on morning checks
  Carcass post-mortem condition: fresh, heavily scavenged
History: No issues. Apparently healthy.
Necropsy
  Examiner: MQ
  Date of exam: 13May2019
  Exam: Internal organs were completely scavenged. Eyes were still clear (red), so somewhat freshly
dead. No abnormal markings apart from scavenging.
North Carolina Aquariums Medical Record

====== NECROPSY REPORT ======
Species: Atlantic Spadefish
ID#: 2007-00003-002

General
  Date of death: 2018-10-16
  Time of death: afternoon
  Carcass condition: Fresh

History: Animal was found gasping while swimming in water column. Moved to side compartment for gill clip/skin scrape. Upon returning later, fish was deceased on bottom. Enclosure SG03.

Necropsy
  Examiner: SDJ
  Date of exam: 2018-10-16
  Body condition: Thin
===== NECROPSY REPORT =====
Species: Feather Blenny  
ID#: 2014-00041

General
Date of death: 2018-12-27  
Time of death: found dead on morning checks  
Carcass condition: Poor/decomposed

History: Enclosure: TT02
Found dead on morning rounds. Found near screen/outflow in the shell he was always living in.

Necropsy
Examiner: ERW
Date of exam: 2018-12-27
Body condition: Normal

External exam: Weight = 12.0g, Length = 8.5cm
No parasites, skin uniform but paler than normal, Eyes cloudy, mouth clear, fin normal, no injuries.

North Carolina Aquariums Medical Record

===== NECROPSY REPORT =====
Species: Northern Puffer
Enclosure: SG07
ID#: 20015-00365

General
Date of death: 2018-12-28
Time of death: unknown
Carcass condition: Fresh

History: Female. Found on bottom, had not been eating well. Body cavity smelled bad for length of
death.

Necropsy
Examiner: BL
Date of exam: 2018-12-28
Body condition: Thin

External exam: Body condition fair. Weight 144.2g, Length 18.5cm. Scrape no parasites. Skin redness,
lateral line normal, eyes and mouth clear, Fin normal, no injuries.

Internal exam: No muscle atrophy, Fat firm, gills no parasites red and normal, body cavity small
amount of clear fluid, Liver smooth firm and brown, heart normal, spleen smooth firm red/black, kidney
smooth firm red, stomach smooth yellow/white clear no parasites and empty, gall bladder full green and
marble in size, intestines smooth yellow empty white clear no parasites, swim bladder smooth white,
eggs present.
North Carolina Aquariums Medical Record

===== NECROPSY REPORT =====
Species: Central Stoneroller
ID#: 2013-00026-002
General
  Date of death: 2019-02-09
  Time of death: morning
  Carcass condition: Fresh
History: ~1 day old when found dead. Adult.
Enclosure: Bowfront
Necropsy
  Examiner: JF
  Date of exam: 2019-02-09
  Body condition: Normal
  External exam: Skin normal, Lateral line normal, Eyes and mouth normal, Fin normal, gills pink and normal
  Internal exam: Body cavity red fluid filled, liver granular mottled brown-black and friable, heart smooth and firm, spleen smooth and soft homogenous red, Kidney not able to see, Stomach smooth and homogenous with food contents, gall bladder yellow and full, intestines smooth and fused, swim bladder normal
====== NECROPSY REPORT ======
Species: Bluespotted Sunfish
ID#: 2018-00414-001
General
  Date of death: 2019-03-19
  Time of death: 9:15am collected
  Carcass condition: Fresh
History: Enclosure: Ponds. No previous issues with fish.
Necropsy
  Examiner: MQ
  Date of exam: 2019-03-19
  Body condition: Normal
  External exam: Length = 7.6cm
  Scrape - no parasites
  Skin - uniform, lateral line - normal, eyes - clear, mouth - clear, fin clip - normal, no injuries.
  Internal exam: Musculoskeletal - no muscle atrophy, normal; fat - very little, gills - clip no parasites
  and red in color, body cavity - no fluid and clear, liver - normal, heart - normal, kidney - smooth
  homogenous, stomach - smooth homogenous and no parasites, intestines - smooth and homogenous, gall
  bladder - clear, swim bladder - smooth and homogenous